THE INFLUENCE OF RURAL-URBAN MIGRATION ON THE FERTILITY OF MIGRANTS IN DEVELOPING COUNTRIES: ANALYSIS OF KOREAN DATA

FINAL REPORT

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CONTENTS

CONTENTS (continued)

CONTENTS (continued)

Chapter 1: INTRODUCTION AND SUMMARY

Migration from rural to urban areas is a significant social and economic process throughout the world. It is a measure of the search by peoples at many levels of well-being for a better life. Many perceived social, cultural and economic opportunities in the urban areas of developing countries continue to attract rural-urban migrants. Migration has long been recognized as a selective process; certain identifiable classes of persons have either higher or lower probabilities of migrating than does the population as a whole; migrants are different from those who stay behind. But the process of migration and the environment at the destination also cause those who migrate to behave differently from those they leave behind; migrants adapt to their new homes. Migration obviously shifts the location of human capital in space. And thus it engenders consequent needs for physical capital (habitation, water and sewers, transport) that are often provided by government, particularly in urban areas.

Rural-urban migration, particularly in developing countries, can be both rapid in pace and high in volume. Such significant contributions to the growth of urban populations can be ignored by governments only at their political peril. Accordingly, urban policy must be a concern of most governments. And because of its impact on urban areas, migration may be a policy concern, later if not sooner. Moreover, in spite of obvious costs in terms of supplying new physical capital, migration may have several benefits (as well as some costs) in terms of economic development and "modernization." Important among these benefits is the ability of an economy to supply labor to industries efficiently from the work force of urban agglomerations. This is something that cannot usually be accomplished among a dispersed rural population. Although the merits of such urban industrialization may be debated, the process is widespread and also is often the goal of government policy.

It is within the above context that this study is set. Given rural-urban migration as a major process, particularly in developing countries, and given high levels of natural increase of population that strain supplies of always-scarce capital, this study has the objective of exploring the dynamics or mechanisms through which the migration process and the fertility behavior of migrants may be linked. This exploration is carried out with data from one country, Korea, but it is intended to serve as a model for analyses that might be carried out in several other developing countries having similarly rich sources of data on migration and fertility.

The immediate objectives of this study are to apply to these Korean data analytic methods that are as powerful as possible and, out of the results of those analyses, to derive the implications for government policies relating to migration and fertility. The next section explains the policy relevance of this study in more detail, and is followed by a section presenting the plan and scope of the study. The chapter closes with a summary of the results obtained.

1.1 Policy Relevance

The main issue we shall address is whether migrants tend to have lower fertility than those who remain in rural areas because of selectivity (migrants are more educated, possess higher occupational skills, or have high mobility aspirations and potential) or because of adaptation (the influence of the urban environment on migrants' fertility behavior). If the adaptation hypothesis is true, then increased migration to urban areas, although compounding some of the problems associated with rapid urbanization, may have the desirable by-product of reducing the fertility level of migrant women and thus reduce national fertility levels.

Policy makers will need to have more than a simple confirmation or denial of the adaptation thesis. The study quantifies the effect of adaptation on the fertility of rural-urban migrants by age at migration, year of migration, socioeconomic characteristics and destination city size. The results of this analysis should enable policy makers to evaluate those policies tending to have differential impacts on the young or old; on people with different levels of education; and on the size of city to which the migrants moved. Specific inferences and their policy implications are reported in the text below.

Specifically, the findings in this study are very important to policy makers in developing countries for the following reasons. First, as shown in Chapter 3, almost 40 percent of Seoul residents in 1970 were rural-urban migrants. Moreover, the population growth rate of urban areas within some countries is as high as eight percent per year mainly as a result of migration from rural areas. Assessing whether exposure to urban life and other modernizing factors by these large numbers of rural-urban migrants has actually reduced their fertility should have a significant bearing on identifying determinants of national fertility levels and predicting future trends in national fertility levels. Second, when governments are interested in stemming the rapid growth of urban areas it would seem very important for them to have an accurate assessment of the effect on natural population increase of any policy to discourage rural-urban migration and redistribute urban population to rural areas in order to ease the problems of excessively rapid urbanization. Third, there is a certain limit as to how much government can reduce continuing rural-urban migration. Therefore, the more feasible migration policy could be that of redirecting the rural-urban migration from the destination of the old, popular metropolitan areas to that of newly developing, smaller urban areas.

For the reasons enumerated above it is essential for policy makers to have accurate information on the selectivity and adaptation behavior among different size classes of cities and during differing periods of urbanization. However, it should be clearly emphasized that when policy makers utilize the statistical analyses presented in this report in evaluating policy tools to manage population growth, they should also consider the additional costs of meeting the service demands of urban inmigrants.

1.2 Plan and Scope of the Study

The purpose of this study is to assess the significance of fertility adaptation by rural-urban migrants to the urban environment. We do this by developing a model that controls for the selectivity of rural-urban migrants, thus allowing us to measure fertility adaptation of migrants compared to rural stayers as a function of age at migration and duration of current urban residence. The model is then tested on the 1974 Korean World Fertility Survey (KWFS) sample of approximately 5,000 married Korean women. At several points in the study we have supplemented this source with other data sources, such as the 1970 Korean Census of Population and Housing.

Korea has been chosen for this study mainly because of the richness of the 1974 Korean World Fertility Survey, which contains data on personal histories of migration, pregnancy, infant and child death, contraceptive use, breastfeeding, and employment of husband and wife. In particular, data on the year of migration, in addition to the place of birth, residence during early childhood (to 12 years), and the place of previous and current residence,

4

allow us to test whether the stages of urbanization affect the selectivity of rural-urban migrants and to follow the adaptation process of migrants to urban life according to the length of their exposure to the urban environment.

Chapter 2 contains a review of the literature of adaptation and selection effects on fertility in the context of rural-urban migration processes. Chapter 3 provides general demographic background for the study by describing the magnitude and trends of rural-urban migration in Korea since 1960. Chapter 4 is a description of migration patterns discerned in the KWFS data. This chapter considers the relation between marital status, economic and demographic status, and migration patterns. This chapter also provides some initial evidence on the relation between migration patterns and fertility.

Chapter 5 presents the basic fertility model that is used to control for selectivity and test for adaptation. We show two forms of the model, both of which are useful. Chapter 6 is the major chapter that applies the two forms of the autoregressive fertility model to test the adaptivity hypotheses. This chapter indicates that the adaptivity hypotheses can be tested by either looking at incremental fertility within a short duration after rural-urban migration, or by observing the total, cumulative effects of these incremental adaptations over the entire child bearing period. Chapter 7 provides tests of several selectivity hypotheses. There we explain why the selectivity hypotheses in the original proposal are less important to policy makers when we can test for adaptation using the autoregressive model.

Chapter 8 presents other studies that have dealt in a sophisticated way with the adaptivity issue addressed in this study. We point out that only two of these studies used duration of current urban residence as an important fertility-determining variable. We also replicate an important study by Ribe and Schultz using the KWFS. Chapter 9 tests whether we can find some of the subtle effects discovered in the data-rich KWFS in a less-rich data source, the 1970 Korean Census of Population and Housing. Unlike the former data source, the latter one does not have information on the duration of current urban residence and pregnancy histories. Chapter 10 is a summary of the study and a presentation of policy implications.

1.3 Summary

The primary purpose of this study was to test whether or not rural-urban migrants would significantly reduce their fertility rate because of adaptation to urban lifestyles. If rural-urban migrants move to urban areas and keep the same pattern of fertility they would have had if they remained in the rural area, rural-urban migration is not likely to reduce nationwide fertility levels significantly. In this case, rural-urban migration simply tends to select out those rural individuals with the least likelihood of large families; i.e., selectivity accounts for all the lower fertility typically observed among rural-urban migrants compared to rural stayers. On the other hand, if the rural-urban migrants had the same family preferences at migration as comparable rural stayers, any observed lower fertility in the urban area must be due to adaptation to urban life. Either they changed their preferences or the constraints on cost of children and earnings in the urban area were such that unchanged preferences would result in lower fertility.

The major problem in testing whether rural-urban migrants reduce their fertility below what it would have been in rural areas is that of establishing a hypothetical fertility level if they had not migrated. In other words, we would like to control for their pre-migration preferences and constraints. A traditional way of doing this is to control for various personal characteristics such as age, education, earnings, etc. However, these are only crude controls. We believe we have found a better way to control for these selectivity variables.

We directly control for family size preferences by comparing rural-urban migrant fertility in one (e.g., five-year) period to that of a rural stayer who had the same fertility as the rural-urban migrant at the beginning of the period. We attribute the difference in incremental fertility during the period to adaptation to the urban environment. If the rate of adaptation to the urban environment increases with time spent in the urban destination, this differential in incremental fertility should increase with the duration of urban residence. However, if the differential remains constant with respect to time spent at the urban destination, adaptation is at a constant rate over time.

We use an autoregressive model of fertility in which fertility at one point in time is a function of fertility at a previous point in time, as well as age, and additional socioeconomic variables, such as education. We estimated coefficients for the model for each rural-urban migration cohort and for various periods before and after migration.

Our major conclusion is that adaptation to urban life is a significant phenomenon in explaining lower fertility of rural-urban migrants compared with that of rural stayers. Incremental fertility during a (five-year) post-migration period was lower for rural-urban migrants than for comparable rural stayers even when fertility was controlled for at the beginning of the period. We found that the rate of adaptation, measured by the incremental fertility differential, increased with the amount of time spent in the urban area for several (five-year) periods, but then decreased.

We associate a major reduction in national fertility with the high volume of rural-urban migration that occurred during 1965-75. Estimates of these effects on overall national fertility in Korea were presented in Section 6.7 of Chapter 6. Recapitulating: we estimated that 945,000 women migrating from rural to urban areas during the years 1965-70 would reduce their fertility during the rest of their childbearing years by 1.31 million births (1.39 births per woman), or by 27 percent compared to the total fertility rate of 5.1 children that would have been expected for each rural stayer woman during the rest of her childbearing years. During the next five years, 1970-75, another 949,000 women migrated from rural to urban areas. Assuming fertility adaptation similar to that of the previous group, it is reasonable to estimate that another 1.3 million births would be averted by this migration. Thus, the effect of rural-urban migration during one decade is estimated to have the ultimate effect of averting some 2.6 million births among these migrants to the end of their childbearing years. This impact is by no means of small value. For example, in 1970 population grew annually by 690,000 or 2.2 percent.

Adaptation seemed to proceed at the greatest rate among women who migrated after they married. Contrary to our anticipation, adaptation among women who migrated before they married was much slower; however, women who waited longer to marry after migration adapted at a faster rate than those who married soon after migrating.

We had anticipated that adaptation would occur at a faster rate among women who migrated at younger ages. While there was some evidence that this was true among women who migrated before they married, we did not find this to be true for women who migrated after they married. Of course, even if young and old migrants adapt at equal rates, the simple fact that the young migrant has adapted to the urban environment for a greater number of childbearing years means the cumulative (or completed) fertility of a young migrant would be less than that of an individual who migrated at an older age. We found that women who migrated before age 25 would have 1.5 to 1.8 fewer children at completion of childbearing than a comparable rural stayer; but this differential fell to 0.8 fewer children for women who migrated after age 30.

Because of greater efficiency in assimilating information and greater flexibility it was expected that the more educated migrants would adapt more quickly to the urban environment than would less educated migrants. We found this expectation to be partially true. In some cases, we found that education increased adaptation, but at a decreasing rate. This nonlinearity in incremental fertility could be so great as to account for our apparently contradictory conclusion regarding cumulative fertility. We found that completed fertility of women with less than four years of school was 1.6 children less than that of comparable rural stayers; for women with four to six years of school, 1.0 less; and for women with more than six years of school, 1.2 less. These are declines of 25, 16, and 26 percent, respectively, compared to the fertility levels of rural stayer women with equivalent levels of schooling.

We found that employment prior to migration in jobs that were incompatible with childbearing and childrearing (mainly, jobs in nonagriculture sectors) actually reduced the cumulative effect of adaptation on completed fertility. Perhaps this could be explained by women in child-incompatible jobs who had such low fertility prior to migration that there was little latitude in which to adapt after migrating.

We also found that cumulative adaptation increased with the urban destination size. Migrants from rural areas to Seoul would have 2.9 fewer children than comparable rural stayers while migrants to Busan and other large cities would have 1.9 fewer children and migrants to medium and small cities would have only 1.2 fewer children. We did not have sufficient information to determine whether this result was due to the city size alone or to the fact that only selected migrants would pick one city over another. Our autoregressive model is designed to control for the selectivity of preferences; but it is possible that it does not control completely for all selectivity effects. It is possible the individuals who migrate to larger cities have stronger preferences for smaller families than those who migrate to smaller cities. However, as discussed shortly, evidence shows that the relationship between city size and the selectivity of rural-urban migrants attracted to that city is not positive in terms of fertility preferences. Therefore, it is reasonably safe to infer that cumulative adaptation increased with the urban destination size and that these fertility differentials are mostly due to the adaptation effect of city size.

Our autoregressive tests of the adaptation hypotheses were designed to test whether the fertility differential between rural-urban migrants and rural stayers widened with the amount of time spent in the urban area. An alternative test of adaptation is that the fertility differential between rural-urban migrants and urban natives narrows with the amount of time spent in the urban area. This is the test proposed by Ribe and Schultz. Without controlling for duration of marriage, their study of Colombian women showed that young rural-urban migrants initially had lower fertility rates than urban natives. However, because the young Colombian women spent more time in urban areas, their fertility rates converged upward to urban native levels. We found only weak support for this pattern within the Korean sample. However, we did find an exact opposite pattern of adaptation when we controlled for duration of marriage. Defining the marital fertility rates as the number of children-ever-born divided by duration of marriage, we found young rural-urban migrants having initially higher marital fertility rates than urban natives, and a convergence downward to the urban levels as they spent more time in the urban area. The pattern of higher initial marital fertility rates and a convergence downward to urban levels held for all age groups when migrants were limited to women who married after they migrated. The contrast of the results of Ribe and Schultz with ours suggests that duration of marriage is a crucial variable that must be controlled in testing the importance of adaptation to urban life.

In the proposal, we stated that we would test several selectivity hypotheses. We found, as expected, that rural-urban migrants are selected within the rural population by education and premarital work experience. We also found some evidence that this selectivity has diminished over time for a given destination. There was no evidence that selectivity was positively related to city size or that new destinations attracted migrants more selectively than old destinations. (New destinations are defined in this study as cities with a net migration rate of more than 10 percent during 1970-75 and with that rate being more than twice the rate in 1966-70.)

We used the 1970 Korean Census of Population and Housing to provide independent validation of some of our major findings from the much richer, but smaller, 1974 Korean World Fertility Survey. We found that long-term rural-urban migrants had higher fertility than urban non-migrants, but lower than rural stayers. For most age groups, long-term rural-urban migrant fertility was lower than that of recent rural-urban migrants; i.e., migrants within the five past years. These data support our adaptation results, but it is impossible to determine, given the shallowness of the Census data, whether these results are due to adaptation or selectivity. We cannot separate the migration-cohort effect from the duration-of-residence effect.

We have observed in the KWFS data that cumulative fertility of rural-urban migrants declines with city size. We noted that we could not distinguish the city-size effect from the migrant-selectivity effect, i.e., migrants who want smaller families move to larger cities. However, the Census data provide support for a city-size effect that is independent of the selectivity effect. We found an inverse relation between city size and urban non-migrant fertility, whereas among recent rural-urban migrants the size of destination did not make any significant difference for their fertility.

The overall result of this study suggests that selectivity, as measured by us, has only minor effects on adaptation. In fact, we found some evidence that highly selected migrants may adapt less than other migrants. There may be some behavioral reasons why less-selected migrants might adapt at least as well as highly selected migrants. Migrants with higher education and better occupational experience may not face cultural shocks after migration to urban areas because they were well prepared before migration. Conversely, migrants with lower education and occupational experience may face a completely unexpected lifestyle and be forced to change their ways of thinking and lifestyle even though the required changes are much harder to make for these lower class migrants. Also, migrants with lower socioeconomic backgrounds may be more heavily influenced by their environment and are more affected by other people's behavior in their current residence communities.

Policy makers in developing countries are well aware of the social and economic costs of rapid urbanization. This study shows that benefits accompany rural-urban migration in the form of lowered fertility on the part of migrants compared to the fertility they would likely have had if they had not migrated. This has been demonstrated for one country, Korea, and can be tested for other countries having the required data. The implications of our results are that achievement of the fertility objectives of a rural-urban migration policy will not be greatly affected by the age or educational selectivity of migration; fertility adaptation measured in reduced births per year of urban residence is not terribly sensitive to these factors. The fertility adaptation is, however, clearly and positively related to city size: greater fertility reductions occur in larger cities.

Thus, the policy maker must compare the benefits of reduced fertility and costs of increments of urban services for cities of various sizes. This study has provided analytic results for the fertility effects in Korea. We believe the approach used here can be applied in other countries having similar data. Then such results can be linked with analyses of the costs of urban services to evaluate alternative migration policies.

Chapter 2: REVIEW OF THE LITERATURE ON THE INFLUENCE OF RURAL-URBAN MIGRATION ON THE FERTILITY OF MIGRANTS

2.1 Introduction

The relationship between rural-urban migration and fertility has been an active research topic among demographers (Myers and Macisco, 1975; Zarate and Zarate, 1975; Findley and Orr, 1978). However, the abundance of findings has not resulted in a commensurate increase of our understanding of the processes involved. Reasons cited in the literature for this state of affairs include: differences in research procedures that are not taken into account when comparisons are made (Macisco, 1968), failure to take into account the context in which migration takes place (Long, 1970), absence of a systematic framework or organizing scheme (Goldscheider, 1971), lack of uniformity of emphasis on different aspects of migration and fertility (Simmons, 1976), and lack of a framework for the mechanisms influencing migrants in urban environments (Findley and Orr, 1978).

One source of confusion is the complexity of the topic. The interaction of such complex processes as migration and fertility poses difficult theoretical and methodological problems. Given the multiple dimensions of the relationship between migration and fertility, it is convenient to specify what dimension is addressed in this investigation.

The relationship between migration and fertility can be studied from several perspectives: (1) reasons for rural-urban fertility differentials; (2) fertility-related factors affecting migration; (3) impacts of ruran-urban migration on growth rates of rural and urban populations, as well as their spatial distributions; (4) the influence of rural-urban migration on the fertility behavior of migrants. As already indicated, this study concentrates on the last category. Thus this chapter will concentrate on a review of the available literature on the influence of rural-urban migration on the fertility of migrants. The main objective of this study will be to measure the reduction in the fertility of migrants attributable to their move from rural to urban areas.

Comprehensive reviews of the literature on migration and fertility have been made by Zarate and Zarate (1975), Findley and Orr (1978), Findley (1980), Ribe and Schultz (1980) and Wolowyna (1980). Here we shall discuss only the works relevant to the objective of this study. This review will be instrumental in formulating the conceputal framework used in the investigation. After a critical review of selected studies, a conceptual framework will be formulated to serve as a basis for the analysis presented in subsequent chapters.*

In this chapter we review specifically studies related to our major adaptation and selectivity hypotheses, namely:

a) evidence showing that the migrant's fertility is lower than the fertility of either rural stayers or urban natives;

b) evidence on the selectivity of migration and its decline, over time, as urbanization proceeds;

c) evidence supporting the theory that the more self-selective populations adapt more quickly to urban fertility patterns than less self-selective populations;

d) evidence indicating that even the more self-selective migrants, unless exposed to urban cultures, may not reduce their fertility;

e) evidence indicating that even the less self-selective migrants in less-developed countries will adapt to the urban fertility pattern, albeit more slowly.

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*Discussion in this chapter has greatly benefited from the Ph.D. dissertation by O. Wolowyna (1980). We are also grateful to Wolowyna and S. Findley for their suggestions on the relevant literature and review of the chapter draft.

2.2 Rural-Urban Fertility Differentials

Rural-urban fertility differentials have been posited by the theory of demographic transition (Davis, 1963; Friedlander, 1969), which states that fertility starts to decline in urban areas first, creating a rural-urban fertility differential that increases with time. This differential diminishes when fertility also begins to decline in rural areas.

This pattern has been observed in the western European experience, and has been empirically substantiated in many developing countries. Findley and Orr (1978) have shown that in a sample of 38 developing countries, all except two had lower urban than rural total fertility rates around 1970. The rural-urban differentials vary from very low to very high, illustrating different phases in urban and rural fertility declines.

This decline is related to degree of urbanization and varies by regional characteristics. In general, there is an inverse relationship between city size and fertility: the larger the city the lower the fertility, although many African countries do not conform to this pattern. There are also regional variations in age-specific fertility rates and tempo in childbearing. On the average, the larger rural-urban differential is among women under 20 years of age. This indicates that urban women generally start childbearing at a later age and finish at an earlier age than women in rural areas. These age differentials vary by cohorts, depending on the stage of rural-urban fertility decline. They are more prominent in Latin America and least prominent in most Islamic countries.

The rural-urban fertility differential in Korea was substantial: total fertility rates of 5.23 and 3.97, respectively, (a difference of 1.26 births) for 1971. Rural women had much higher fertility rates than urban women for the age groups 15-19 and 20-24 years of age. (Findley and Orr 1978, Tables 1 and A-1.)

2.3 Fertility of Rural-Urban Migrants

In the literature, the fertility rates of rural-urban migrants are compared either with the fertility rates of rural stayers or with those of urban natives. Even though the major concern of this study is whether the fertility rates of rural-urban migrants are lower than those of rural stayers, many studies that compare the fertility rates of migrants with those of urban natives are summarized in the following discussion, because these studies dominate the literature. Furthermore, in terms of testing both the selection and the adaptation hypotheses, either comparison would be useful even though the comparison of migrants to rural stayers might be more interesting to policy makers. These studies are discussed below and summarized in Table 2.1.

The comprehensive review of migration and fertility undertaken by Zarate and Zarate (1975) documents a variety of conflicting evidence available on the above questions. Different studies have concluded that migrant fertility is higher, lower or the same as that of non-migrants; but many of the differences in conclusions reflect differences in study design, in analytical methods, in definitions of migrants, and in the measures of fertility used. Clarification is needed, among other things regarding who the migrant is, who the urban native is, what constitutes urban fertility and what the effects of differences in urban size are, before one can have a clearer assessment of the interaction between migration and fertility and their joint impact on growth rates in both urban and rural areas.

At the outset, one should be aware of the incompatibility of results from studies with different designs, samples, operationalization of the key variables and so on (Macisco, 1969). For example, Macisco et al., (1970), Ro

(1976) and Goldstein (1973) define migration with respect to place of residence five years ago, while Hendershot (1976) deals with life-time migrants. Macisco et al., (1970) had only information about fertility of migrants and non-migrants at points of destination, while Ro (1976) and Goldstein (1973) also had information about fertility of migrants and non-migrants in rural and the urban areas, as well as similar information for life-time migrants.

Similarities among these four studies should also be pointed out. The four countries are still in the development process and in the middle of their demographic transitions. The destination areas are the primary cities in each country and the same measure of fertility was used: children ever born by age of mother.

In most studies comparing migrants and non-migrants, it has been found that rural-urban migrants have higher fertility than urban natives. The theoretical interpretation of this difference is known as the "assimilation model" (Hendershot, 1971). The model posits that migrants have initially higher fertility than urban natives and that with continuous exposure to urban ways of life the migrants assimilate the lower urban fertility norms. Because exceptions to this pattern of migrant fertility have been found, we shall name this the adaptation model in order to avoid the convergence implication in the term "assimilation model"

Several exceptions have been found to the expected pattern of higher fertility of rural-urban migrants in urban areas. As shown in Table 2.1, studies in Brazil, Chile, Korea, Philippines, Puerto Rico, and Thailand have found that rural-urban migrants have fertility equal to or even lower than urban natives (Berqueo, 1968; Elizaga, 1966; Ro, 1976; Park and Park, 1976;

Table 2.1. Findings of Empirical Studies of Migration and Fertility--Developing Countries Only

Author (Year) Country. Data Set	Children Ever Born Migrant/Non-Migrant at Destination	Relation with Fertility and controlled by: Education	Age	Origin	Other	Migrant Definition	Other - Comments
ierquao (1968) ao Paola, 1965	Young migrants have lower fertility, reverses at old ages.	No	Yes	Yes. Rural young migrants have lowest fertility		Includes once married women	
Lizaga (1966) antiago, Chile	Lower migrant fertility, if under 40.	No	Yes	No		All migrants	
oldstain (1973) nd (1977), Thai-and, 1960 Census nd 1970 Longitud-nal survey	Fertility of migrants does not exceed that of non-migrants. Recent migrants (5 yrs) have lower fertility than natives at destination and than stayers at origin.	No	Yes. Lower fertility for migr. under 40, higher for others.	Yes. Rural migrants have higher fertility. Inverse to Size.		Lifelong migrants and five year migrants. Uses husband's migration.	Rural-urban differences were important in explaining fertility differentials than migration status differences. Migration is a disruptive process which may explain lower fertility of recent migrants, also younger migrants may be a more innovative, selected and educated group.
Hendershot (1971) Phillipines 1960 and 1967 survey data by Phillipines Population Institute	Overall fertility of migrants lower. Fertility of migrants under 30 and those with short duration of marriage have higher fertility.	No	yes	No	duration of marriage	women between 15-39	
Hendershot (1976) Manila National Demographic Survey, 1973.	Migrants to Manila have lower fertility than nonmigrants at origin (stayers). Difference is small.	No	Yes	No	Labor force and duration of marriage	Women between 18-39	Social mobility hypotheses. In early stages of urbanization, migration is more difficult and more selective; this facilitates adaptation, which means later marriage and higher labor force participation and lower fertility among migrants. For later urbanization, selection of migrants is not positive and adaptation is more difficult.
Hiday (1978) Philippines 1970 household survey conducted by the Inst. of Behavioral Science, Univ. of Colorado.	Rural-urban migrants have lower fertility than stayer, especially after age 29.	No	Yes	Yes Migrants from larger sized origins have lower fertility, i.e., inverse of size		Compares 3 groups of women in 15-49 age; rur-urb-mig, rur-rur mig, rural stayer.	Social mobility hypothesis. Concludes that fertility is inversely related to "social" distance from rural home. Urbanization exerts major effect after age 20-29 after which migrants control family size.

17

Table 2.1. Continued--Findings of Empirical Studies of Migration and Fertility--Developing Countries Only

Author (year) Country, Data Set	Children Evern Born Migration/Non-Migrant at Destination	Relation with Fertility and Controlled by: Education	Age	Origin	Other	Migrant Definition	Others - Comments
Iutaka, Bock & Varnes (1971) Six cities. 1960 Brazil Census.	Higher migrant fertility.	Yes. General pattern remains	Yes	Yes. Those born in large cities have lower fertility.			Results hold for each category of age at marriage, occupation and education (one at a time and multiply). Age, age at marriage, color, size of city are related to fertility for natives and effect for migrants are stronger.
Macisco et al. (1969) San Juan, 1960 Pto. Rican Census	Lower migrant fertility, if arrived under 34. Reverses otherwise.	Negative Yes	Yes	Yes		Married women, husband moved within last 5 yrs. Non-metrop. migrant.	Social mobility hypotheses.
Macisco et al. (1970) San Juan, 1960 Pto. Rican Census.	Lower migrant fertility, if arrived under 34. Reverses otherwise.	No	Yes	Yes	Labor Force Participation	Married women, husband moved within last 5 yrs. Non-metrop. migrant.	Fertility results hold when controlled by labor force participation.
Martine (1975) San José and Bogotá, Celade	All migrants have higher fertility, but if duration of marriage is controlled, only rural born migrants have higher fertility.	No	Age at arrival. Lower fertility if arrived between 15-24	Yes		All migrants	Age at arrival is at least as important in explaining lower migrant fertility as origin or duration of marriage.
Myers & Morris (1966) San Juan, 1960 Pto. Rican Census	Lower migrant fertility	No	No	No		All migrant	
Park & Park (1976), Korea 1970 Census, 10% sample.	Lower migrant fertility, except for rural migrants after age 30. Migrants also have lower fertility than stayers at origin	Yes. Reduces differences among groups.	Yes	Yes. 3 types of location. Inverse to size.	Labor force.	Migrants who moved in last 5 years.	When labor force is considered, only those migrants in occupations incompatible with childbearing have lower fertility.
Ro (1976) Korea, 1% sample, 1970 Census	Lower migrant fertility than non-migrants regardless of age, residence and education	Yes Negative	Yes General pattern remains	Yes. Inverse to size; differences are smaller for migrants		Women that moved in the past 5 years	Uses multiple regression. Exception rural migrants in 16-29 age group have more children than non migrants.

Sources : All the information except for Hendershot (1971) is drawn from Tables 1.1 through 1.4 in Ribe and Schultz (1980).

Hendershot, 1971; Macisco et al., 1969, 1970; Myers and Morris, 1966; Goldstein, 1973; Goldstein et al., 1977). This relationship persists even when duration of marriage (Hendershot, 1971) or education and labor force participation of migrants' wives (Macisco et al., 1969, 1970; Park and Park, 1976) are controlled. Thus the evidence on migrant-non-migrant fertility differentials in urban areas has been termed as "mixed" (Goldstein, 1973), "inconsistent" (Zarate and Zarate, 1975) and "inconclusive, if not contradictory" (Martine, 1975).

Macisco et al., (1970) have suggested the so-called "social mobility model" or selectivity model to account for their findings. They suggest that the very act of moving out of rural areas demonstrates social mobility aspirations that are different from those of otherwise comparable non-movers. Their model assumes migration to be a selective process favoring individuals with certain characteristics. They found that five-year migrants in San Juan, Puerto Rico, had lower fertility than urban natives at younger ages and slightly higher fertility than urban natives at older age They suggest that the lower ferility of younger migrants is due to their social mobility aspirations; the higher fertility of women 35 years and older is due to the fact that they spent the major part of their reproductive lives in rural areas.

Ro (1976) found that among women of ages 16-29 (expected to have been less influenced by rural background) five-year rural-urban migrants have fewer children than do residents in Seoul, Korea. But among women aged 30-44, rural background appears to have exerted a stonger influence than migration. He theorizes that an individual's decision to migrate is usually influenced by his perception of and willingness to exploit the labor market disequilibrium and by the difference in opportunity in non-market activities (such as cultural or recreational activities) between the area of his origin and that of his destination. The act of migrating may mean that the migrants have a keener perception and a stronger willingness than non-migrants to increase the value of their human capital. This would mean that migrants could prefer smaller families and higher educational attainment for their children than non-migrant urban residents, other factors being equal.

The distinction between "adaptation" and "selection" has an important implication for the central question addressed in this study: Does rural-urban migration contribute to the overall fertility decline in a country? Ritchey and Stokes (1972) have made an important theoretical contribution that is relevent to this question. They argue that there has been no clear distinction in the literature between the effects of residence background and of migration on fertility. Residence background denotes a relationship between previous residence milieu and current residence environment. The independent migration effect is the fertility differential between migrants and rural stayers at point of origin, when the size of the destination is controlled.

Both concepts, as defined by Ritchey and Stokes, require further clarification. For example, the independent migration effect may take several different forms: the expectation of a move may affect the fertility of potential migrants or the level of fertility may affect the probability of migrating. Ritchey and Stokes hypothesize that both of these effects induce a negative relationship between migration and fertility. According to them the fertility differential between rural nonmigrants and rural-rural migrants is an indicator of the independent migration effect on migrant fertility. As will be discussed in detail in Chapter 8, these reasonings are in contrast to Ribe and Schultz's

(1980) hypothesis that due to the negative selectivity of rural-rural migrants favoring higher fertility, rural-rural migrants would have higher fertility than rural nonmigrants. However, restricting the independent migration effect to the fertility differential between rural-urban migrants and rural stayers at point of origin limits the utility of the concept of the independent migration effect. It excludes the possibility that migrants may have equal or higher fertility than stayers. Also one may have the independent migration effects at points of destination, for example, psychological and sociological disruption due to moving may have a negative effect on fertility. Nevertheless, a distinction between residence background and independent migration effect points to the usefulness of multiple comparisons like rural-urban migrants with rural non-migrants, as well as with rural-rural migrants.

Ritchey and Stokes claim the inverse relationship between size of urban place and fertility found in their analysis of U.S. data is a consequence of the residence background effect of rural-urban migration. They argue that instead of moving directly from rural areas to large cities, or metropolitan areas, rural-urban migrants often move to small or medium size cities first, and then to large cities or metropolitan areas. Therefore, Ritchey and Stokes hypothesize that the inverse relationship between size of urban place and fertility disappears when inmigrants of rural backgrounds are excluded. (As shown in Chapter 9, this hypothesis is not supported by Korean data.)

The contribution of pointing out the differences between residence background and the independent migration effect on fertility is very important. Residence background effect emphasizes the positive relationship between the urban size and the selectivity of inmigrants in terms of previous residence milieu. On the other hand, the independent migration effect emphasizes the selectivity of migrants in terms of fertility levels and migration decisions at the point of origin due to anticipatory behavior.

In a recent study, Ribe and Schultz (1980) tested the relative importance of selectivity compared to adaptation using Columbian data. Because of its importance we have discussed this study and performed additional analyses related to it. These are reported in Chapter 8.

2.4 Change of Selectivity of Rural-Urban Migrants Over Time

Time enters migration-fertility relations on two bases: First, time is measured relative to migration, thus: duration of residence after migration, and age at migration. Second, time is measured by the calender, thus: level of income or level of education of the population, extent of family planning services, or stage (degree) of urban development, which is related to city size. In the studies discussed in this section calendar time is emphasized.

Goldstein (1973) found for five-year residents in Bangkok, a pattern of migrant-non-migrant fertility differentials similar to that found in San Juan and Seoul. This leads him to hypothesize that the recent migrants in Thailand are more innovative in character compared to earlier migrants, who were "conservative." That is, the earlier migrant may have retained old behavior patterns, including high fertility levels. In contrast, more recent migrants, motivated by improved communication, more education and higher levels of modernization, may be leaving their old environments in order to achieve new goals and, therefore, may be more willing to adapt the lower fertility patterns of their destination.

On the other hand, Hendershot (1971) found that in Manila younger lifetime migrants had higher fertility and older migrants had lower fertility than urban natives. He proposed a conciliation between selectivity and adaptation models by linking the evolution of rural-urban migration with the process of urbanization. According to him, the relationship of rural-urban migration and fertility reduction depends on the stage of urbanization. During early urbanization migration is selective, adaptation is effective and the result is relatively lower migrant fertility; during late urbanization, however, migration is not selective, and the result is relatively high migrant fertility.

Like Hendershot, Browning (1971) also observes from Mexican data that rural-urban migrants have become less selected over time. For example, the percentages of male migrants to Monterrey who have 6 years or more schooling are 43, 35, and 34 percent for years of migration before 1941, 1941-50 and 1951-60, respectively. Similarly, percentages of migrants who were employed in non-agricultural activity in the year before migration are 71, 56, and 50 percent for the same years of migration, respectively. Migrant selectivity measured by these two indicators has decreased significantly, even though average educational attainment had increased over the period studied. Browning attributes this to a shift from "pioneer" to "mass" migration to Monterrey over the period from 1940-60. He also suggests that the longer a rapid rate of urbanization is maintained, the more probable the decline in selectivity of migration as the "reservoir" of rural potential migrants is diminished.

Additional support for Hendershot is provided by Findley (1980) who developed a model in which migration is viewed as a behavior toward risk: earlier migrants are innovative risk takers who undertake migration without information from previous migrants; later migrants will be comparatively risk averse and will migrate only if they get encouraging information from previous migrants. According to this model, the earlier migrants to a given destination are more selected than later migrants. Recent migrants are more likely to choose larger cities about which indirect information is more widely available. They are also likely to seek the migration destination of previous migrants from another village that has extensive social and economic interchange with their own.

The comparison between Manila and Bangkok is more interesting for several reasons. Philippines and Thailand are more similar in terms of culture, economic development and demographic characteristics than Puerto Rico. Thus, the fact that different migrant-non-migrant fertility differentials were found is puzzling.

A possible source of contradiction is the variously hypothesized evolutions of the fertility of rural-to-urban migration streams. Hendershot (1971) posits an evolution from a highly selected to a non-selected stream, linking this with the urbanization process. Goldstein et al., (1977) show that in Thailand rural migrants to Bangkok originally had high fertility and did not adapt to the lower urban fertility, while more recent, young migrants have initially lower fertility than urban natives, but later seem to make up the difference.

The evolution proposed by Balan (1969) may reconcile the apparent contradiction between Hendershot and Goldstein. He suggests that in the early stage of development migrants are composed of "conservative" rural elites, then migrants become increasingly selective and in the last stage selection decreases and perhaps becomes negative. The more advanced urbanization of the Philippines, as compared to Thailand, lends some plausibility to this hypothesis.

The possible temporal evolution in the character of rural-urban migration streams points out the necessity of considering cohorts of migrants as units of analysis. Analysis of the fertility of migrants without taking into account possible cohort effects may confound selectivity and adaptation effects on the fertility of migrants. To focus on cohorts of migrants is also essential for establishing a link between the evolution of rural-urban migration streams and level of urbanization. The fact that rural-urban fertility differentials are linked to urbanization levels is documented by Findley and Orr (1978) and makes the link between types of rural-urban migration streams and level of urbanization quite plausible.

2.5 The Effect of Selectivity on Fertility Adaptation

In another study, Hendershot (1976) hypothesizes that positively selected migrants engage in active adaptation in the urban environment, and thus their behavior is different from the behavior of rural stayers. Negatively selected migrants, on the other hand, differ little from the rural stayers, engage in little adaptation and their fertility will be similar to the rural stayer's fertility.

To support Hendershot's theory, it would be necessary to show that:

1. The gap between rural and urban fertility was greater in the initial stages of urbanization and later narrowed, ceteris paribus.
2. Migrants who arrived earlier had lower fertility than later arrivals, when other factors were controlled.
3. Earlier migrants are characterized by relatively higher socio-economic status than later migrants.

Unfortunately, Hendershot's study relies only on information for places of birth and current residence, because he did not have adequate data on migration histories, including the date of migration.

Due to insufficient data, the three hypotheses above could not be tested directly in his study. (The first hypothesis on the effect of the stage of the urbanization on the rural-urban fertility differentials is examined by

Findley and Orr (1978) using aggregate cross-country data.) To our knowledge, none of the previous studies has used individual data containing information on both date of migration and pregnancy history data.* However, Hendershot found the following using 1973 Philippines National Demographic data:

1. Rural-urban migration is highly selective and is comprised of persons with relatively high social standing in rural society;
2. Rural-urban migrants who married after migration tend to adopt the late marriage pattern of urban society, especially if their husbands are from rural families with relatively high social standing;
3. Rural-urban migrant wives tend to adopt the working wife pattern of urban society, but only if their husbands are from rural families with relatively high social standing;
4. Rural-urban migrant couples tend to have low fertility, but only if they married late and the wife worked after marriage;
5. In the longer-established urbanized regions such as Manila and in more recent periods, rural-urban migration is less selective, adaptation is less successful, and migrant fertility is not significantly different from the fertility of rural stayers.

Iutaka et al. (1971) took a step further than Hendershot by including the social class achieved by migrants in the city in addition to social class background as factors that influence the degree of adaptation. Using Brazilian data and multiple regression analysis, they found that changes in the fertility patterns of migrants are related to city of destination, social background and amount of time spent in the urban center. Cities vary in the sets of fertility "models" they present to migrants. "The 'model' utilized will depend on the class background of migrants as well as the social positions they finally

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*Goldstein and Tirasawat (1977) use data on date of migration for the Thailand survey. However, in their source the pregnancy data were not coded in an appropriate form so that exploitation of the data for this purpose was not possible. As they point out, use of information on children ever born has an obvious limitation in any attempt to relate fertility to migration. It presents a cumulative measure of fertility and fails to identify the specific ages at which a woman had a child and thus precludes relating childbearing to timing of migration; that is, it is impossible to ascertain how many of the children were born before a move and how many after.

achieve. . . . Factors predicting fertility patterns of migrants are more numerous and more significant than for the natives of cities. These results suggest that migrants form a more heterogeneous group and are experiencing more changes than . . . natives. . . . The integration of migrants in the urban environment will lead to a homogenization of the population, and the significant factors influencing fertility might be other than migratory status, for example, social class" (Iutaka et al., 1971:56, 62).

Iutaka et al. conclude that the age and social class background of migrants (especially the women) play a more important role in predicting family size than is true for natives. Family size is also affected by the social class level achieved by migrants to cities. This, together with the rural background of migrants, may limit their adaptation to the fertility patterns of urban areas, and it is possible that migrants are not influenced as much by other factors as the natives. Iutaka et al. ". . . hypothesize that factors such as mass communication, ideology of family size and awareness of contraceptive techniques are more important than social background for the natives" (1971:62).

In summary the above studies indicate:

1. The fertility differentials between rural-urban migrants and rural stayers could be accounted for, not by the act of migration itself, but by <u>selectivity</u>, i.e. personal attributes such as educational level, later age of marriage, higher labor force participation and by behavior toward risk.
2. The rural-urban migrants could have lower fertility rates than urban natives because of motivation, i.e. the migrant might possess a keener perception and stronger willingness than non-migrants to invest in human capital in the form of fewer but "higher quality" children.
3. Among the rural-urban migrants who do not possess either the socio-economic attributes or the motivations associated with lower fertility, adaptation to urban life is less satisfactory, and their fertility behavior does not differ significantly from that of their rural counterparts.

Holmes (1976), in a review of studies by Hendershot (1976) and Ro (1976), claims that if the above three points are true, the rural-urban migration is unlikely to be a major influence in lowering national fertility. Holmes argues that this will be the case because those rural-urban migrants who are relatively successful in acquiring the attributes normally associated with lower fertility such as higher educational levels, later age of marriage and higher labor force participation, or who have the attitude and motivation to prefer smaller families and higher levels of schooling for their children would also tend to have lower fertility had they remained rural residents. On the other hand, the rural-urban migrants who do not have the above mentioned attributes, attitudes and motivation will have difficulty in adapting themselves to urban life and, thus even though they migrate to an urban environment their fertility behavior may not differ significantly from that they might have had if they remained rural residents.

However, Holmes (1976) may have misinterpreted some of the major implications of Hendershot's (1976) finding. The crux of Hendershot's findings is that migrants of a relatively high social class background adapt more quickly to the lower urban fertility behavior than migrants of lower social class background. This does not imply that those of selected social class background would have had lower fertility had they remained rural residents. In Hendershot's study, the direct reason for lower fertility of migrants of higher social class background is not their selective attributes per se, but their rapid adaptation to urban life patterns. Therefore, contrary to Holmes' interpretation, Hendershot's findings should be understood as emphasizing the importance of adaptation (which results only from migration) in accounting for observed fertility differentials between rural-urban migrants and rural stayers. One could, then, hypothesize that even though most rural-urban migrants are selected disproportionately from those with higher social class background, the national fertility level could be reduced by continued rural-urban migration. If this hypothesis is true, then contrary to Holmes' claim, continued rural-urban migration will not necessarily widen the rural-urban fertility gap. Hendershot seems to support this hypothesis because his major policy implication is the value of redirecting rural-urban migration away from a currently popular destination, such as Manila, to other new destinations. He believes that the more selective the rural-urban migration, the more the national fertility levels fall, because the more selected migrants will adapt more rapidly to urban life conditions, including smaller family size norms than less selected ones. He argues that rural-urban migration to other new urban areas will be more selective than that to the old popular destination, such as Manila.

The above-mentioned hypothesis is based on the assumption that even for selected migrants, the adaptation to urban life causes changes in their fertility behavior and their socio-economic activities. This premise is partially supported by Hendershot's study, which compares the fertility and socio-economic activities of the rural-urban migrants with those of the rural stayers, controlling for social class background.

Furthermore, Thompson's study (1978) on urban Uganda seems to strongly support the above-mentioned hypothesis. The purpose of his paper was to examine the general hypothesis that social and psychological indicators of modernization are associated with lower fertility aspirations. For the total sample there was only marginal support for this hypothesis, although more-exposed urban dwellers did desire significantly fewer children than less-exposed rural dwellers. After disaggregating the sample into urban and non-

31

urban components, several interesting results emerge. The most significant is the finding that several psychological and social-structural indicators of modernity are significantly correlated with fertility in the urban sample but not in the non-urban sample. These results give some support to his initial expectation that the effects of modernization will vary across different sub-populations. His results suggest that traditional desires for large families and high fertility in the rural and semi-urban communities are largely unaffected by social and psychological conditions that are associated with lower fertility aspirations elsewhere. If we assume that fertility aspirations influence fertility-related behavior (e.g., use of contraceptives, frequency of intercourse, etc.), modernization would appear to have little impact on fertility outside of urban areas.

Thompson's work is significant because it helps us to evaluate correctly various studies such as Ro (1976), Macisco et al. (1970), Goldstein (1973) and Hendershot (1971) which indicate that rural-urban migrants' fertility rates are lower than those of urban natives. With the exception of Hendershot (1971) most of them attribute this phenomenon to the strong selectivity for younger migrants at the time of migration, reflecting their aspirations for upward social mobility. In particular, Ro's interpretation of the result is that it is the attitude and motivation, and not the act of migration, that brought about lower fertility rates for rural-urban migrants. Therefore, Ro argues that exposure to urban life is neither necessary nor sufficient for a lower fertility and the principal policy implication of his study is that the government should strive to create and foster an environment that encourages, among all people, the attitude and motivation for limiting family size, rather than to encourage rural-urban migration.

It is important to note that Thompson's study indicates that even the highly selected rural-urban migrants might not have reduced their fertility had they stayed in a rural environment and not been exposed to urban culture. In this context, Ro's policy implication may not be valid. Furthermore, Ro's conclusions are impractical. Despite governmental efforts people will continue to move to the cities. His work would be much more useful if it helped identify preferred types of destinations for the inevitable migrants. Hendershot's conclusion (1976) emphasizing the redirection of rural-urban migration away from currently popular destinations, such as Manila, to other new destinations is, therefore, significant. All this implies a need for investigating the differences in selectivity and adaptation among migrants to cities differing in size and location characteristics.

Hendershot (1976) and Iutaka et al. (1971) seem to imply that for rural-urban migrants of low social class background adaptation to urban life is difficult and migration does not change fertility behavior. This important issue needs to be tested more rigorously using migration history data and individual retrospective pregnancy data. However, when we include the social status attained by migrants in a city as the factor influencing the degree of adaptation and consider the fact that a large number of rural-urban migrants from low social class background improve their social status after migration it seems reasonable to assume that even migrants from a lower social class are likely to adapt an urban fertility pattern after they achieve a certain level of social class. Green (1978) studied the adjustment process of migrants in Seoul, Korea, with respect to employment and housing using the data on 978 households in 1974-1975. She concluded that over time, migrants do come to approximate the economic and housing patterns of lifetime urban residents.

In an illuminating paper based upon data for Thailand, Fuller finds that "While recent cityward migrants from rural areas occupy a relatively low position in the economic hierarchy of upcountry towns, more experienced city-ward migrants may be even more successful than native townspeople, as judged by occupational position and income level" (1981:65). In effect, migration is functional; it enables migrants to come closer to their goals. Moreover, migrants to outlying cities may do better economically than those to primate cities, according to Fuller. Thus, we find in Fuller support for the contentions of Berry (1973) that rural-urban migration in developing countries does not necessarily result in severe frustration of expectations for improving personal well-being or create widespread personal and social disorganization leading to political radicalization. And Berry reminds us that such negative interpretations of 19th century North American urbanization based on rural-urban migration are not necessarily applicable in today's developing countries.

2.6 The Contribution of this Study to the Literature on Fertility-Migration Relations

The primary purpose of this study is to develop and test a functional model that will allow us to assess the influence of rural to urban migration on the fertility of migrants in developing countries. The main issue concerns a debate among students of migration and fertility interactions about the relative importance of two factors accounting for lower fertility levels observed among rural-urban migrants compared to persons remaining in rural areas. One factor is the selectivity of the migration process--the tendency for a particular class (educational, age, sex, occupational, marital or family size preference) to be more or less likely to migrate than the population as a whole. The other factor is the adaptation process in which an individual migrant aligns his or her fertility behavior increasingly closely with that of other residents of the destination area. The distinction between the two causal chains is of great interest to researchers as well as policy makers. Important demographic consequences occur if one process predominates. For example, if selection is the primary force, rural-urban migration will not affect national fertility rates, and the gap between urban and rural fertility will increase. The opposite effect will occur if adaptation predominates: national fertility will fall and the rural-urban fertility gap will narrow. See Holmes (1976).

The consensus in the literature on this issue is that a large measure of the lower fertility among rural-urban migrants compared to that of rural stayers can be accounted for, not by the act of migration itself, but by a variety of socioeconomic background characteristics, of which education is the most important followed by labor force participation. Thus much of the literature predicts that rural-urban migration is unlikely to be a major influence in lowering national fertility and that continued migration is likely to widen the rural-urban fertility gap, thereby aggravating the problem of the already wide disparities in rural and urban standards of living. See Holmes (1976).

Our present study utilizing the 1974 Korean World Fertility Survey data will test the validity of the consensus in the literature. If this analysis refutes the consensus it will provide evidence that rural-urban migration is a major influence in lowering national fertility, and suggest that the main factor explaining the lower fertility of rural-urban migrants compared with rural stayers is not the selectivity of migrants but their adaptation to urban lower fertility norms.

For example, a preliminary analysis of the Korean experience, as presented in Chapter 3, seems to show the virtual disappearance of rural-urban fertility differentials in recent periods (even though Korea has had an extremely large volume of rural-urban migration during the last two decades). These findings disprove for Korea the mainstream prediction in the literature that continued rural-urban migration is likely to widen the rural-urban fertility gap.

So far we have not found any empirical study showing that the adaptation effect of rural-urban migration dominates the selectivity effect in explaining the lower fertility of rural-urban migrants compared with that of rural stayers. (For example, the rather comprehensive literature review section in the recent paper by Magnani et al. (1979) discusses only the selection hypothesis and the disruption hypothesis in explaining the lower fertility of rural-urban migrants and does not even mention the adaptation hypothesis.) Exceptions to the predominant literature supporting the selectivity hypothesis are Hendershot (1971 and 1976) and Goldstein and Tirasawat (1977).*

We believe that the absence of empirical studies in the literature supporting the adaptation hypothesis, which is of great interest to policy makers

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*Hendershot's studies of migration to Manila show lower fertility among older rural-urban migrants compared to urban natives of the same age, but higher fertility among younger rural-urban migrants compared to urban natives, with length of exposure to urban lifestyle likely to be a major difference between the older and younger migrants. Goldstein and Tirasawat (1977) propose the "disruption hypothesis" in their study of rural-urban migration to Bangkok: lower fertility among recent rural-urban migrants compared to urban natives of similar ages is due to the disruptive influence of migration (such as physical separation of spouses) on the childbearing patterns. However, none of these studies represents the genuine adaptation hypothesis: Hendershot theorizes that only highly selected migrants would adapt their fertility to an urban environment encouraging lower family size. This implies less fertility adaptation among migrants as they become less selected through time. Goldstein and Tirasawat posit that disruption shifts the timing of births, but not their eventual number. Thus they also conclude that migration itself would not change the completed fertility of migrants.

in developing countries, is due to the following limitations of previous studies, rather than to the actual dominance of selectivity in explaining the lower fertility of rural-urban migrants in many developing countries. First, most of the previous studies did not compare the fertility levels of rural-urban migrants with the fertility levels of rural stayers but with the fertility levels of urban natives. Such examples are Sao Paulo, Brazil (Berquo et al., 1968); Santiago, Chile (Elizága, 1966); Bangkok, Thailand (Goldstein, 1973; Goldstein and Tirasawat, 1977); Manila, Philippines (Hendershot, 1971); San Juan, Puerto Rico (Mascisco et al., 1970); Seoul, Korea (Ro, 1976); and Bangkok, Thailand and Bogota, Colombia (Magnani, et al., 1979). Some of these studies demonstrate that the rural-urban migrants have even lower fertility than do urban natives. These studies implicitly accept the a priori assumption that selectivity dominates adaptation because if one asserts the converse then one may expect rural-urban migrant fertility to be equal to that of urban natives, but never to be less than that of urban natives.

Second, data for many previous studies do not provide information on the year of migration. To our knowledge only two currently available studies, Goldstein and Tirasawat (1977) and Ribe and Schultz (1980), used data on the year of migration. However, to our knowledge, none of the previous studies have utilized both migration history data and pregnancy history data. This has caused well-known confusion and conflicting results in the study of the influence of rural-urban migration on migrant fertility. Therefore, it is not too extreme to claim that the reason why most of the previous studies were not able to find the dominance of the adaptation effect in explaining the lower fertility of rural-urban migrants is because their lack of data on migration and pregnancy histories did not allow them to trace the adaptation behavior of migrants.

Finally, previous studies were not successful in controlling for premigration selectivity. Unless one has a good control for premigration selectivity the adaptation effect of migration on migrant's fertility cannot be measured. Previous studies attempted to control for selectivity by using various socioeconomic characteristics of migrants. The approach has two serious drawbacks. For example, data do not tell us whether current education levels of migrants are achieved before migration or are the results of increased education obtained in urban areas after migration. The former education level is the legitimate selectivity but the latter is confounded with the adaptation effect of migration on migrant's education, not just the selectivity. The second drawback is that various socioeconomic characteristics are only crude controls for selectivity. This approach does not control for the unmeasurable preference for different family sizes. Ribe and Schultz (1980) clearly demonstrate that the unobserved personal preference is the most important selectivity characteristic between migrants and non-migrants. Our study will try to overcome deficiencies of the sort described here through the use of an extremely complete data base and a powerful analytic model that makes full use of those data.

2.7 A Conceptual Framework for the Effect of Rural-Urban Migration on Migrant Fertility

Two main processes related to migration and fertility have been identified in the literature: selection and adaptation. In order to evaluate the effect of adaptation on the fertility of migrants, one should control for their initial selectivity. This can be done in terms of their previous fertility and socio-economic characteristics that have been shown to be related to fertility. Comparing incremental fertility of migrants as duration of residence in urban areas increases, with incremental fertility of non-migrants at rural areas, gives a measure of their adaptation effect.

Because nuptiality has been shown to have a dynamic interrelationship with migration, the analysis should be made separately for nuptiality and for marital fertility. Distinction between background effect and independent migration effects points at the usefulness of making comparisons of rural-urban migrants with rural non-migrants and rural-rural migrants. This conceptual distinction also indicates the necessity of separating migration streams by size of destination area.

The possibility of a temporal evolution in the character of migration streams indicates the necessity of taking cohorts of migrants as units of analysis. Cohort effects on the selection or adaptation of migrants should be verified empirically. The operationalization of key concepts and the type of analysis to be performed on a set of data depend greatly on the kind of data available. The Korean World Fertility Survey data allow an extensive evaluation of a set of hypotheses related to "adaptation" and "selection." Factors that are also important but, due to data availability problems, cannot be treated adequately in this report are: the interrelationship between nuptiality and migration, the effects of return- and stage-migration on the fertility of migrants, and controls for selective fertility preferences by size of destination. Nevertheless, the extensive tests of several selectivity hypotheses and the quantification of the impact of adaptation on the fertility of migrants are contributions with important policy implications.

2.8 Summary of Chapter 2

Several hypotheses have emerged in the literature to account for fertility differentials between rural stayers and rural-urban migrants. According to one hypothesis, at the time of their migration rural-urban migrants would have high fertility comparable to that of rural stayers. But with continuous exposure to urban life they would adapt their fertility behavior and become comparable to the lower fertility of urban natives. This adaptation hypothesis did not account for instances in which the fertility of rural-urban migrants was lower than that of urban natives. Accordingly, the selectivity hypothesis was proposed; it posits that migrants are a selected group differing in social mobility aspirations from those who do not migrate. Such migrants are distinct from rural stayers in educational attainment, age at marriage, labor force participation rate, and behavior toward risk. Still another hypothesis suggests that the relation between migration and fertility reduction depends on the stage of urbanization. During early urbanization the migrants consist of conservative rural elites; then migrants become increasingly selective until the later stages of urbanization, when selectivity decreases and perhaps becomes negative.

The function of this study is to quantify whatever pattern that may exist of fertility adaptation by rural-urban migrants as a result of their exposure to the urban environment. In doing so we shall control for factors by which selectivity may be measured, thereby taking account of hypotheses related to selectivity and we shall make analyses by destination to provide results bearing upon the hypotheses about stages of urbanization.

In the next two chapters we shall describe the Korean demographic situation since 1960 and the characteristics of the migrants whose behavior is to be analyzed in the remainder of this study.

Chapter 3: BACKGROUND ON KOREAN RURAL-URBAN MIGRATION AND RURAL-URBAN FERTILITY DIFFERENTIALS AND GOVERNMENT POLICIES CONCERNING POPULATION DISTRIBUTION SINCE 1960

3.1 Introduction

The primary purpose of this study is to provide policy makers in developing nations with a functional model enabling them to better assess the influence of rural-to-urban migration on the fertility of migrants. The main issue to be analyzed is whether migrants tend to have lower fertility than rural stayers because of selectivity or because of the influence of the urban environment on their fertility behavior (adaptation).

Such analysis is feasible because of the richness of the 1974 Korean World Fertility Survey data, containing detailed personal histories of both migration and live births. Furthermore, extracting lessons from Korean experience concerning the rural-urban migration and its impact on the national fertility level should be particularly valuable to policy makers there and in other developing countries for the following reasons. First, heavy rural-urban migration is widespread in developing countries. Korea has experienced an extremely large volume of rural-urban migration since the early 1960's (about 1.9% of rural population annually left rural areas to move to urban areas). This migration has been associated with rapid economic growth-industrialization (a GNP growth rate of 9.4% per annum in the years of 1961-75). As long as Korea is determined to maintain such rapid economic growth, the rural-urban migration is not likely to decline drastically. Second, Korean rural-urban migration has gone very heavily to Seoul (capital city with 6.9 million inhabitants in 1975) although Korea now has policies discouraging migration to Seoul. Finally, the Korean rural-urban fertility differential was large until

1970 (the rural total fertility rate per woman was about two births higher than the urban TFR during the 1960's), but the differential has lessened drastically recently (the differential was less than one-half birth in 1980) and is projected to be negligible after 1990.

The Korean experiences discussed above allow us to tackle very interesting questions with important policy implications. Retherford and Ogawa (1978) show that 25% of the national fertility decline experienced by Korea in the period 1966-1970 is due to urbanization. Do the 1974 KWFS data support this observation? Has migration to Seoul furthered the goal of a lower rate of overall population growth? Would diversion of migrants destined to Seoul, as desired by the government, result in the same overall fertility effects, if they exist? Holmes (1976) predicted that continued rural-urban migration is likely to widen the rural-urban fertility gap. Does the Korean experience showing varying but declining rural-urban fertility differentials in recent periods in spite of extremely rapid rural-urban migration during the last two decades disprove this prediction?

The following sections present the general trend of the post-1960 Korean rural-urban migration using population census data.* Insights obtained from these sections will enable us to identify the characteristics of the recent autonomous rural-urban migration trend in Korea. Answers to the following questions will be sought in the following sections: What is the main cause of the dramatic increase in Korean urban population? (Section 3.2.) How different are the growth rates among different city size classes? (Sections 3.3 and 3.4.) Is there any significant recent change in the migration to and from Seoul, the capital city of Korea? (Section 3.5.) (Much material in these

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*In this study we shall use the definition of an urban area given in the Korean population census, namely, a municipality of at least 50,000 people.

sections concerns the trends and characteristics of inmigrants to and outmigrants from Seoul. This may be justified on the ground that Seoul continues to be the prime destination of outmigrants from rural areas--40% of rural-urban migrants moved to Seoul during 1965-75. The Korean government is trying very hard to discourage inmigration and encourage outmigration from Seoul.) How different are the socioeconomic characteristics of the rural-urban migrants from those of rural stayers? (Section 3.6.)

Section 3.7 describes rural-urban fertility differentials during the past two decades and in the future. Section 3.8 discusses a set of policies used by the Korean government to discourage migration to Seoul. Section 3.9 summarizes the chapter.

3.2 Economic Development and Rural-Urban Migration

Less than five percent of the Korean population lived in urban areas until 1930, as shown in Table 3.1. By 1960 28 percent of Korea's population lived in urban areas; and by 1975 this had nearly doubled to 50 percent.

According to Mills and Song (1977) the Korean urbanization level in 1975 was still lower than the average for all developed countries (67 percent in 1975), whereas it was much higher than the average for all developing countries, 28 percent. In 1975 Korea was about as urbanized as was the average developed country shortly after World War II. Although Korea's level of urbanization now is much closer to that of developed countries than in 1950, the gap is still substantial. Mills and Song suggest that, while the pace of urbanization will continue to be brisk in Korea during coming years, it will slacken somewhat, as it has in developed countries.

A substantial change in the industrial distribution of the Korean labor force has occurred since 1930. Until then more than 85 percent of the labor force was in the agricultural sector and less than two percent was in mining,

Table 3.1. Shares of Urban Population and Shares of Industrial Sectors Out of Total Labor Force in Korea, 1920-1977

Year	Urban Share of Total Population (%)	Agricultural Labor force as a percent of total labor force	Mining, Manufacturing, and Construction Sector	Services & other
1920	3.3	91.5	1.5	7.0
1925	3.5	89.3	1.6	9.1
1930	4.5	87.9	1.6	10.5
1935	7.4	85.8	1.9	12.3
1940	11.6			
1945	14.5			
1950	18.4	79.4[a]	3.7	16.9
1955	24.4			
1960	28.3	65.9[b]	9.2[b]	24.9[b]
1965	33.9	58.6	13.3	28.1
1970	43.1	50.5	17.2	32.3
1975	50.9	45.9	23.5	30.6
1977		41.8	27.3	30.9

[a]Figure for 1949.

[b]From Kwon, et al., 1975.

Industry figures for 1920-1955 and 1965 and share of urbanization for all years are from Mills and Song (1977).

Industry figures for 1970-1977 from KIFP data.

manufacturing and construction (see Table 3.1). During the period 1960-77 the percentage of the labor force in the agricultural sector declined from approximately 66 percent to 42 percent, whereas the percentage of mining, manufacturing and construction sectors tripled from 9.2 percent to 27.3 percent. It is also worth noting that the share of the service sector increased from 25 percent in 1960 to 31 percent in 1977. The share of urbanized population has risen steadily with these shifts in industrial structure.

Two projections of the proportion of Korean population living in urban areas show that proportion ranging between 70 and 80 percent as of the year 2000 (see Table 3.2), an increase from the present level of approximately 50 percent. If these projections prove accurate the changes in urbanization during the next two decades will be large, though not as great in relative terms as in earlier periods of similar length (see Table 3.3). The Korean government recognizes that urbanization entails major costs in terms of new physical capital to house and service migrants to urban areas. And it also recognizes (as do the migrants themselves) the costs of migration in terms of separation from family and place of upbringing, and in terms of crowding and other disamenities of urban life. Migrants make these choices in the context of a relatively free market and (since literacy is high) with relatively good information.

Accordingly, it is not surprising that the model of nearby Japan is considered relevant to Korea. Many Korean economists and demographers, such as Song (1976) and Hong (1978) believe that current Korean urbanization is similar to that of Japan in the early 1950's and hope that Korea can achieve the current level of Japanese urbanization by the year 2000.

Clearly, urbanization and industrialization have moved together in both Japan and Korea (see Table 3.3). To compare these time series in a more

Table 3.2. Alternative Projections of Population and Share of Urban Population, Korea, 1980-2000

	World Bank Population Projection[a/]				KDI Population Projection[b/]			
	Urban		Rural	Total	Urban		Rural	Total
Year	1000	%	1000	1000	1000	%	1000	1000
1975	16,796	48.4	17,913	34,709	16,796	48.4	17,913	34,709
1980	20,383	52.9	18,148	38,531	22,862	59.5	15,574	38,436
1985	24,545	57.9	17,847	42,392	27,889	66.4	14,112	42,001
1990	28,959	62.3	17,524	46,483	32,710	71.8	12,837	45,547
1995	33,357	66.1	17,107	50,464	36,960	76.0	11,673	48,633
2000	37,475	69.3	16,602	54,077	40,788	79.2	10,704	51,492

SOURCE:

a/ Hansan and Rao, 1979, Table 411, page 120.

b/ Hong, 1978.

Table 3.3. Comparison of Urbanization and Industrialization Between Korea and Japan, Selected Years, 1920-1975

	Korea		Japan	
Year	Urban Percent of Total Population	Non-agricultural Labor Force As a Percent of Total Labor Force	Urban Percent of Total Population	Non-agricultural Labor Force As a Percent of Total Labor Force
1920	3.3	8.5	18.1	45.6
1925	3.5	10.7	21.7	48.1
1930	4.5	12.1	24.1	50.4
1935	7.4	14.2	32.9	53.0
1940	11.6	N.A.	37.9	55.7
1945	14.5	21.8	27.8	43.4
1950	18.4	20.1	37.5	51.6
1955	24.4	N.A.	56.3	59.0
1960	28.3	20.5	63.5	67.4
1965	33.9	41.4	68.1	77.9
1970	43.1	49.6	72.2	83.5
1975	48.4	58.2	N.A.	N.A.
Mean	20.53	25.71	41.83	57.78
Std. Dev.	16.94	17.59	19.71	13.15

SOURCE: Song, 1976.
N.A. - Not available.

46

general way we have regressed the urban share (percent) of total population (URBP) on the share (percent) of nonagriculture labor force (INDL) for Korea and Japan. The results (with t-ratios in parentheses) are as follows:

Korea: $URBP = -3.199 + .923\ INDL$ $\quad N = 10$
$\qquad (-1.08) \quad (9.52)$ $\quad R^2 = .919$

Japan: $URBP = -39.376 + 1.405\ INDL$ $\quad N = 11$
$\qquad (-3.83) \quad (8.09)$ $\quad R^2 = .879$

The above regression result describing the statistically significant positive association between urban population shares and nonagricultural labor shares cannot be unambiguously interpreted since urban population share could contribute to, as well as result from, a larger nonagricultural labor share. However, as pointed out by Preston (1979), the lines of causation presumably run predominantly from nonagricultural labor shares to urban population shares. This could be particularly true in Korea because government policies have been a major force in promoting industrialization whereas urban population shares have been mainly influenced by individual choices due to economic opportunities.

Using the regression result for Korea one estimates that if Korea wants to achieve the 80 percent of labor force working in nonagricultural sectors in 2000 the share of urban population would be 71 percent, almost as projected by the World Bank. If Korea wants to achieve the 90 percent of labor force working in nonagricultural sectors in 2000 the share of urban population would rise to 80 percent, as projected by the Korea Development Institute. It is useful to note that the shares of nonagricultural labor force in 1975 are approximately 90 percent for Japan and 95 percent for the U.S.A.

Using the regression equations and data from Table 3.3, one can calculate the elasticity of percent urbanization with respect to percent industrialization as:

$$\text{Elasticity} = b \times \frac{I^*}{U^*}$$

where b = regression slope coefficient
I* = mean percent industrialized
U* = mean percent urbanized.

The results are:

$$\text{Elasticity, Korea: } [.923 \times \frac{25.71}{20.53} = 1.156]$$

$$\text{Elasticity, Japan: } [1.405 \times \frac{57.78}{41.83} = 1.94]$$

Note that the elasticity of urbanization with respect to industrialization for Japan, 1.94 is almost twice the elasticity for Korea, 1.16. In other words, while a 10 percent increase in industrial labor force share has brought an 11.6 percent increase in the urban population share in Korea, the same increase in industrial labor force share in Japan resulted in a 19.4 percent increase in the urban population share. Table 3.3 and the above elasticity estimates provide strong support for Preston's conclusion (1979) that the rate of change in the urban proportion of the population in developing countries is not exceptionally rapid by historical standards. He shows that the share of urban population grew from 17.7 to 28 percent in developing countries in the quarter-century from 1950 to 1975. While this is a rapid increase, it is very similar to the growth of the urban population percentage from 17 to 26 that occurred in more developed countries during the last quarter of the nineteenth century. Preston's conclusion is valid for the comparison between Japan and Korea. The growth of the Korean urban population share from 24 percent to 48 percent during the period of 1955-1975 is not more rapid than the growth from 33 to 56 percent that occurred in Japan during the period of 1935-1955. The main cause of hardships accompanying the rapidly growing economy of Korea is not the rapid urbanization, but the extremely rapid pace of industrialization. Whereas it took 35 years between 1920 and 1955 for

Japan to increase the industrial labor force share from 46 percent to 59 percent, Korea has achieved a similar increase within one decade, between 1965 and 1975. In spite of this greater speed, however, one should also note that Korean industrialization is occurring at a lower level of urbanization than did that of Japan.

The report by the Economic and Social Commission for Asia and the Pacific (1980) lists the following advantages and disadvantages in the large volume of rural-urban migration in the Republic of Korea during recent years.

> In rural areas, population pressure may have been relieved to some extent by the exodus of farm residents. Consequently, the exodus may have spurred the mechanization of farming in the rural areas since there has been a chronic shortage of farm laborers and seasonal shortages of workers have become more serious recently. This shortage necessitated cooperative farming in the rural areas. However, the age-sex selectivity of migration produced a different age-sex structure of the population in urban and rural areas. The transformation of the age-sex structure of the population is leading toward rapid changes in traditional ways of life which will ultimately raise many serious social problems.

> In urban areas, the large influx of rural-urban migrants has produced a large supply of inexpensive laborers, an important condition in the early phase of industrialization. The income gap between entrepreneurs and laborers has led to a serious problem, as the mass media have increased awareness of relative deprivation in low-income groups. An even more important problem is the concentration of population in large cities, which impairs the balanced development of the country. Air pollution, water pollution, and inadequate sewage systems in the cities all contribute to another serious problem--deterioration of living conditions in the cities, especially in large cities.

From reading reports by Korean scholars and having discussions with Korean scholars and policymakers it seems obvious that the Korean government and people have judged and still judge that the advantages of the large volume of rural-urban migration outweigh its disadvantages.

3.3 General Trend of Korean Population Distribution During 1960 - 1975

The above discussion shows that Korea has experienced rapid urbanization during the last two decades.* Also of importance are the differing rates of growth for different size cities. Table 3.4 shows that the population shares of Seoul, Busan and all other urban areas have increased from 9.8, 4.7 and 13.6 percent in 1960 to 19.8, 7.1 and 21.5 percent in 1975, respectively. In 1975 the two largest cities in Korea shared more than a fourth of total Korean population.

It is important to note that between 1960-75 the urban population doubled in all cities while it tripled in Seoul. At the same time, the rural population declined slightly even though total Korean population had increased by 39 percent.

Recognizing that rural fertility rates have been significantly higher than urban rates, the differentials of population growth between rural and urban areas are largely due to net migration. Seoul's population has grown by 7.15 percent annually while Busan and other cities have grown by a little more than five percent. In contrast, the rural population has remained almost constant, due to net outmigration.

Recently, Seoul's growth rate has slowed while the pace of growth of other cities has picked up. The annual growth rate for Seoul has declined from 9.8 percent during 1966-70 to 4.5 percent for 1970-75. At the same time the annual growth rate for other cities has increased from 4.9 percent to 6.2 percent.

Until 1970 there was a positive relationship between city size and annual growth rate, and larger cities generally grew faster than the smaller cities.

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*By 1960 virtually all return migration by war refugees had been completed. Most migration in Korea today is due to economic, demographic, or educational motivations.

Table 3.4. Distribution and Growth of Population by Residence, Korea, 1955–1975

	Year										Total growth between 1960-75		Annual growth rate (%)				
	1955		1960		1966		1970		1975								
	1000	%	1000	%	1000	%	1000	%	1000	%	1000	%	1960-75	1955-60	1960-66	1966-70	1970-75
Seoul	1,574.9	7.3	2,445.4	9.8	3,803.4	13.0	5,525.3	17.6	6,889.5	19.8	4,444.1	181.7	7.15	9.20	7.87	9.79	4.51
Busan	1,049.4	4.9	1,163.7	4.7	1,430.0	4.9	1,876.4	6.0	2,454.1	7.1	1,290.4	110.9	5.10	2.09	3.59	7.03	5.51
Other Cities	2,657.1	12.3	3,387.6	13.6	4,571.4	15.7	5,527.1	17.6	7,450.4	21.5	4,062.8	119.9	5.39	4.98	5.27	4.86	6.15
Rural	16,244.9	75.5	17,992.5	72.0	19,388.0	66.4	18,506.3	58.9	17,912.9	51.6	-79.6	-.4	-.03	2.06	1.29	-1.16	-.65
Total	21,526.4	100	24,989.2	100	29,192.7	100	31,435.3	100	34,708.5	100	9,719.3	38.9	2.21	3.03	2.71	1.67	2.0

From Korea Statistical Yearbook, 1977

1960—66 = 5.833 years

However, Table 3.5 shows that after 1970 a somewhat different trend emerged. All city sizes except cities of 100,000 - 499,999 persons have experienced declines in their annual growth rates since 1970. The declines in growth rates are particularly large for the three largest cities. This is a marked contrast to the continuing increases in the annual growth rate between 1960-75 for cities of 100,000 - 499,999 persons.

The significant post-1970 shift in the Korean population distribution also can be observed from Table 3.6. Table 3.6 reveals the number and distribution of cities of a given size class by annual population growth rates in 1966-70 and 1970-75. Whereas all of the five largest cities with at least 500,000 population had experienced growth rates exceeding five percent during the period of 1966-70, only one of those cities experienced a rate that rapid during the period of 1970-75. Also, while only four of the 14 cities with population size of less than 100,000 people had experienced annual growth rates of more than 3.5 percent during the period 1966-70, seven of those experienced growth rates of more than 3.5 percent during the period 1970-75. These shifts in growth rates occurred against a background of relatively constant total population growth for the entire ten-year period. Therefore, we can infer from Table 3.6 that the change in population distribution between these two periods is largely due to changes in migration trends.

3.4 Net Migration Rates for 32 Cities

The magnitude of population changes due to net migration alone can be estimated for each city, using a census survival ratio method described by Kwon et al. (1975). Table 3.7 presents net migration for 32 cities during 1960-66, 1966-70 and 1970-75.*

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*The detailed method of estimating net migration for each city between 1970 and 1975 is given in Appendix A.3.1.

Table 3.5. Rate of Population Growth and Increase of Urban Areas by Size Class, 1960-1975 Within the 1970 Constant Boundaries

City Size Class (according to 1970 population)	Population (1000) 1970	Population (1000) Growth 1970-75	Annual Growth Rate 1960-65	Annual Growth Rate 1966-70	Annual Growth Rate 1970-75
Seoul	5,525.3	1,364.2	7.64	9.79	4.51
Busan	1,876.4	577.7	3.49	7.03	5.51
Other cities					
Daegu	1,082.8	226.7	5.10	6.12	3.87
Cities of 500,000-999,999	1,148.8	254.9	5.18	5.20	4.09
Cities of 100,000-499,999	2,208.8	674.3	3.01	4.85	5.47
Cities of less than 100,000	1,097.8	155.6	2.80	3.02	2.69
Total	12,939.9	3,253.4	-	-	4.59

SOURCES: KIFP, Statistics on Population and Family Planning in Korea. 1978 Tables 37 and 38, pp. 206-207. and Kwon et al. (1975). Table 4.7, p. 74.

Table 3.6. Number and Percentage of Cities with Different 1970 Population Sizes by Population Growth Rates in 1966-70 and 1970-75

Annual Population Growth Rate	Total Number Cities		City Size Class based on 1970 population							
			Over 1,000,000		500,000 to 999,999		100,000 to 499,999		less than 100,000	
1966-1970	Number	(%)	Number	(%)	Number	(%)	Number	(%)	Number	(%)
greater than 5%	12	(37.5)	3	(100)	2	(100)	6	(46.2)	1	(7.1)
3.5% - 4.99%	5	(15.6)					2	(15.4)	3	(21.4)
2.0% - 3.49%	12	(37.5)					4	(30.8)	8	(57.1)
less than 2.0%	3	(9.4)					1	(7.7)	2	(14.3)
Total	32	(100%)	3	(100)	2	(100)	13	(100)	14	(100)
1970-1975										
greater than 5%	8	(25.0)	1	(33)			5	(38.5)	2	(14.3)
3.5% - 4.99%	12	(37.5)	2	(67)	2	(100)	3	(23.1)	5	(35.7)
2.0% - 3.49%	8	(25.0)					3	(23.1)	5	(35.7)
less than 2.0%	4	(12.5)					2	(15.4)	2	(14.3)
Total	32	(100)	3	(100)	2	(100)	13	(100)	14	(100)

SOURCE: Computed from KIFP (1978), Tables 37-38, pp. 206-207.

Table 3.7. Net Migration for 32 Korean Cities: 1960-66, 1966-79 and 1970-75 Within the 1970 Constant Boundaries

City	Total Population 1970 (1000)	1960-66[a] Net Migration Number (1000)	1960-66[a] Net Migration Rate (%)	1966-70[a] Net Migration Number (1000)	1966-70[a] Net Migration Rate (%)	1970-75[b] Net Migration Number (1000)	1970-75[b] Net Migration Rate (%)
Seoul	5,536.4	784.2	20.7	1400.5	25.4	683.7	9.9
Busan	1,880.7	42.3	3.0	322.0	17.1	325.7	13.3
Daegu	1,083.6	119.8	14.2	166.0	15.4	100.3	7.7
Incheon	646.0	56.7	10.8	74.1	11.5	75.4	9.5
Gwangju	502.8	68.0	16.9	66.6	13.3+	37.8	6.2
Daejeon	414.6	22.2	7.1	72.2	17.4	39.7	7.8
Jeonju	262.8	3.4	1.6	23.8	9.1	15.8	5.1
Masan	191.0	-26.5	-17.2	23.0	12.1	148.3	39.9*
Mogpo	177.8	.1	.1	2.8	1.5	-7.9	-4.1
Suweon	170.5	1.0	.8	31.7	18.6	31.6	14.1
Ulsan	159.4	19.5	17.3	37.0	23.2	62.3	24.7*
Cheongju	144.0	-.5	-.4	10.9	7.6	32.0	16.6*
Chuncheon	122.7	3.2	3.2	14.4	11.7	5.7	4.0
Jinju	121.6	7.2	6.7	5.4	4.4+	17.7	11.4*
Yoesu	113.7	.4	.4	3.7	3.3	2.3	1.8
Gunsan	112.5	-1.9	-1.9	1.3	1.2	26.0	16.8*
Weonju	112.0	13.5	13.0	-.3	-.3+	-3.0	-2.5
Jeju	106.5	7.1	8.2	9.3	8.8	12.9	9.6*
Euijeongbu	94.5	14.7	19.6	13.4	14.2 +	3.3	3.1
Gyeongju	92.1	-1.8	-2.1	-.8	-.8	7.2	6.6*
Jinhae	91.9	2.9	3.6	4.5	4.8	-.7	-.6
Suncheon	91.0	-1.6	-2.0	5.3	5.8	6.5	6.0*
Chungju	87.7	.8	1.0	1.6	1.8	7.8	7.4*
Iri	86.8	2.4	3.0	1.9	2.2+	18.8	16.1*
Pohang	79.5	-2.7	-4.1	7.9	10.0	40.6	30.2*
Cheonan	78.3	.3	.4	.9	1.2	9.7	10.0
Andong	76.4	2.1	3.2	7.5	9.8	9.8	10.3*
Gangreung	74.5	-3.7	-5.6	3.8	5.1	3.2	3.8
Sogcho	73.1	9.6	15.1	4.9	6.6 +	-8.6	-12.1
Gimcheon	62.2	-2.1	-3.7	-.5	.8	-1.3	-2.0
Chungmu	55.0	-4.3	-8.4	.0	.2	4.7	7.1*
Samcheonpo	55.0	-4.6	-8.6	-2.7	-4.9	-1.9	-3.2

NOTE: The rate is computed as the net migration divided by the terminal year population in each city for each period times 100.

*Denotes cities of which net migration rates in the 1970-75 period are larger than those in the 1966-70 period.

+Denotes cities of which net migration rates in the 1966-70 period are smaller than those in the 1960-66 period.

Source = Computed from Table 4.8 of Kwon, et al, and 1970 and 1975 Population Censuses.

Seoul absorbed a net migration of 1.4 million persons during the 1966-70 period; this represents more than one-quarter of Seoul's 1970 population. Moreover, during the 1966-70 period each of the six largest cities had a net inmigration that exceeded 10 percent of its 1970 population. Only six out of 32 cities had smaller net migration rates during the 1966-70 period than those during the 1960-66 period. Considering that the 1966-70 period is shorter than the 1960-66 period, Table 3.7 indicates that most of 32 cities experienced substantial increases in net migration rates during the 1966-70 period compared to the 1960-66 period.

The 1970-75 net migration to Seoul of 684,000 people was 9.9 percent of the 1975 Seoul population. This is less than half the size of net migration during the 1966-70 period. All of the seven largest cities experienced drops in their net migration rates between the 1966-70 period and the 1970-75 period. On the other hand, between these two periods, eleven out of sixteen middle sized cities with 1970 population in the range of 75,000 to 160,000 experienced increases in their net migration rates. This is strong evidence for a significant shift in Korean population movements during the 1970-75 period. Whereas the net migration to the biggest cities slowed down, the net migration to intermediate size cities accelerated.

3.5 The Five-Year Migration Survey Data

The net migration estimates presented in Table 3.7 have several limitations for further analysis of Korean population movements. First, net migration figures do not distinguish between inmigration and outmigration. Second, these figures do not provide information on the origins of inmigrants and the destination of outmigrants. Finally, we do not know how accurate these estimates are. To overcome these limitations we must use information on five-year migration, collected directly by the 10% and 5% sample surveys that accompanied the 1970 and 1975 population censuses, respectively.

Table 3.8 shows that 1,844,500 rural residents moved to urban areas during the period of 1965-70. This rural-urban migration represents 9.5 percent of total rural population in 1966. This implies that an average of 368,900 rural residents (about 1.9 percent of rural population) annually left rural areas to move to urban areas. During the following period (1970-75) 1,754,300 rural residents moved to urban areas and represent 9.5 percent of total rural population in 1970. Therefore, an average of 350,860 rural residents annually (about 1.9 percent of rural population) left rural areas to move to urban areas.

The comparison of data between these two periods reveals that the proportion of rural population migrating annually (1.9 percent) from rural areas to urban areas has been constant. Therefore the decrease in the number of rural-urban migrants seems to be due mainly to the shrinking base population in rural areas rather than due to the improvement in rural living conditions (decrease in push factors) or the reduction of attractiveness to urban areas (decrease in pulling factors).

Kim (1980) attributes the main cause of the large volume of rural-urban migration since the early 1960's in Korea to the fact that the rapid industrialization (as represented by a high GNP growth rate of 9.4 percent per annum in the years of 1961-1975) that Korea has enjoyed during the past two decades has called for a large labor force that had to originate from rural areas. He also considers the large volume of rural-urban migration in Korea to result from certain societal forces, including the possible relocation of major urban areas, the high motivation to achieve widely prevailing in the Korean population, and nuclearization of the family structure.

Table 3.8. Distribution by Destination of Two Migration Cohorts in Korea

	Migration Cohort								
	1965-1970			1970-1975			1965-1975		
Destination*	R/U	M	U	R/U	M	U	R/U	M	U
				(Thousands)					
Total	2,493.1			2,317.6			4,810.7		
Rural-Urban	1,844.5			1,754.3			3,598.8		
Seoul		822.2			647.0			1,469.2	
Busan		214.2			235.4			449.6	
Other Cities		808.1			872.0			1,680.1	
Different <u>do</u>†			216.5			263.5			480.0
Same <u>do</u>			591.0			608.5			1,200.1
Rural-rural	648.6			563.3			1,211.9		
				(Percent)					
Total	100.0			100.0			100.0		
Rural-Urban	74.0	100.0		76.0	100.0		75.0	100.0	
Seoul		44.0			37.0			41.0	
Busan		12.0			13.0			13.0	
Other Cities		44.0	100.0		50.0	100.0		47.0	100.0
Different <u>do</u>			27.0			30.0			29.0
Same <u>do</u>			73.0			70.0			71.0
Rural-rural	26.0			24.0			25.0		

SOURCE: Calculated from 1970 and 1975 population censuses.
* R/U: rural or urban; M: metropolitan; U: other urban.
† <u>do</u>: province

The data in Table 3.8 indicate that no significant decrease has occurred in economic and social factors causing rapid rural-urban migration during the last two decades.

Although Seoul remains the prime destination of rural-urban migrants, its share of them has declined from about half of them during the 1965-70 period to only 37 percent during 1970-75.

Table 3.9 shows the origins of inmigrants to Seoul during two periods. During 1965-70 total inmigration to Seoul was 1.19 million. Thirty-two percent came from other urban areas while 68 percent came from rural areas. Total inmigration to Seoul during the 1970-75 period declined to 1.05 million. The number of urban-origin migrants to Seoul increased from 378,000 during 1965-70 to 406,000 during 1970-75, mainly due to the increase in the number of migrants from urban areas in Gyeonggi do (province), in which Seoul is located. However, migration from rural areas to Seoul declined substantially from 813,300 during the 1965-70 period to 647,000 persons during the 1970-75 period. As mentioned in the note of Table 3.9, total number of rural-to-Seoul migrants, 813,000 is slightly less than 822,200 shown in Table 3.8.

As expected, the largest migration to Seoul during both periods (251,400 and 242,200) came from the neighboring province of Gyeonggi do. Nonetheless all other provinces except three sent more than four percent of their population to Seoul during both periods. Indeed, Seoul's migrants came from throughout the nation, not just a few provinces. Only the most distant province failed to send more than two percent of its population as migrants to Seoul, illustrating the deterrent effect of distance. Two more-distant provinces, Gyeongsangbug do and Gyeongsangnam do, are adjacent to metropolitan areas, Daegu Shi and Busan, respectively. Thus, it might be easier for people from these provinces to migrate to these metropolises than to Seoul. Jeju do is an

Table 3.9. Distribution of Inmigrants (5 Years and Older) to Seoul by Place of Origin, 1965-70 and 1970-75

Origin (From)	1965 - 1970 (1000)	(%) *	1970 - 1975 (1000)	(%) *
		URBAN		
Total	377.9	(31.7)	406.2	(38.6)
Busan	57.2		58.2	
Gyeonggi do	54.8		88.7	
Gangweon do	31.7		30.8	
Chungcheongbug do	21.3		18.9	
Chungcheongnam do	34.4		34.6	
Jeonrabug do	34.2		33.3	
Jeonranam do	55.8		50.8	
Gyeongsangbug do	56.9		51.3	
Gyeongsangnam do	23.8		26.6	
Jeju do	1.9		12.9	
Other	6.0			
		RURAL		
Total	813.3 **	(68.3)	647.0	(61.4)
Gyeonggi do	196.6		153.5	
Gangweon do	55.3		47.9	
Chungcheongbug do	63.8		43.6	
Chungcheongnam do	160.8		116.1	
Jeonrabug do	95.8		76.6	
Jeonranam do	118.2		117.1	
Gyeongsangbug do	75.4		61.3	
Gyeongsangnam do	41.8		28.1	
Jeju do	2.9		2.8	
Other	2.6			
		ALL		
		% †		% †
Total	1,191.2		1,053.2	
Busan	57.2	(3.0)	58.2	(2.4)
Gyeonggi do	251.4	(7.5)	242.2	(6.0)
Gangweon do	87.0	(4.7)	78.7	(4.2)
Chungcheongbug do	85.1	(5.7)	62.5	(4.1)
Chungcheongnam do	195.2	(6.8)	150.7	(5.1)
Jeonrabug do	130.0	(5.3)	109.9	(4.5)
Jeonranam do	174.0	(4.3)	167.9	(4.2)
Gyeongsangbug do	132.3	(2.9)	112.6	(2.3)
Gyeongsangnam do	65.6	(2.1)	54.7	(1.7)
Jeju do	4.8	(1.3)	15.7	(3.8)
Other	8.6			

Source: The 10% and 5% Sample Survey Reports for the 1970 and 1975 Population Censuses, Internal Migration

* of total immigrants

** The source cited reports two different values, 813,300 and 822,200 (as shown in Table 3.8), as total number of migrants from rural areas to Seoul during 1965-1970.

† of 1970 population

island located far to the south of Seoul, where the cost of moving to Seoul is probably prohibitively high. (See Figure 3.1 for location of Provinces.) While moving costs due to distance seem to have a significant influence on the direction of Korean population movement, the high migration costs from Jeju do either have been reduced substantially over time, or the economic benefits have increased substantially; in any case the share of migration from Jeju do to Seoul increased substantially from 1.3 percent of the do population for the 1965-70 period to 3.8 percent for the 1970-75 period.

Table 3.10 shows the distribution of destinations among the outmigrants from Seoul. Although the outmigration from Seoul doubled from 247,900 persons during 1965-70 to 524,000 during 1970-75, approximately 64 percent (176,000 persons) of the increase in the total outmigration from Seoul is due to the incease in the outmigration to neighboring Gyeonggi do, particularly to satellite cities or suburban areas. Fifty-seven percent (297,000 persons) of total outmigration from Seoul during 1970-75 was destined to this province. Thus, much of the observed outmigration is actually redistribution of population within the Seoul metropolitan area. Most of the remaining outmigration is to other large cities or the newly developing industrial and research centers. Busan, Gyeongsangbug do, Gyeongsangnam do, and Chungcheongnam do each absorbed more than five percent of total outmigrants from Seoul during the 1970-75 period. Outmigration to Busan is migration between metropolitan areas. Outmigration to Gyeongsangnam do is destined mainly to Masan Shi and Ulsan Shi, which are rapidly growing heavy industrial cities. Outmigration to Gyeongsangbug do is destined mainly to Pohang Shi (another rapidly growing heavy industrial city) and to another metropolitan area of over a million population, Daegu Shi. Outmigration to Chungcheongnam do is destined mainly to two counties (rural areas), Daedeog Gun and Boryeong Gun, which are recently

Figure 3.1. MAP of SOUTH KOREA

Source: Reproduced from Mills and Song (1977).

Table 3.10. Distribution of Outmigrants (Age 5 and Older) from Seoul, by Place of Destination, 1965-70 and 1970-75

Origin (From)	1965 - 1970 (1000)	(%) *	1970 - 1975 (1000)	(%) *
URBAN				
Total	106.3	(42.9)	296.3	(38.2)
Busan	22.4		40.6	
Gyeonggi do	32.3		158.1	
Gangweon do	7.7		10.5	
Chungcheongbug do	2.5		6.6	
Chungcheongnam do	7.9		14.3	
Jeonrabug do	4.8		9.1	
Jeonranam do	6.0		13.4	
Gyeongsangbug do	14.3		25.7	
Gyeongsangnam do	7.1		19.2	
Jeju do	1.2		2.2	
RURAL				
Total	141.6	(57.1)	227.9	(61.8)
Gyeonggi do	89.5		139.7	
Gangweon do	11.4		14.1	
Chungcheongbug do	5.4		7.5	
Chungcheongnam do	11.1		20.8	
Jeonrabug do	4.9		9.7	
Jeonranam do	7.0		8.3	
Gyeongsangbug do	7.1		17.2	
Gyeongsangnam do	4.0		8.1	
Jeju do	1.2		1.7	
ALL		%		%
Total	247.9	(100.0)	524.2	(100.0)
Busan	22.4	(9.0)	40.6	(7.7)
Gyeonggi do	121.9	(49.2)	297.7	(56.8)
Gangweon do	19.1	(7.7)	24.6	(4.7)
Chungcheongbug do	7.9	(3.2)	14.1	(2.7)
Chungcheongnam do	19.0	(7.7)	35.1	(6.7)
Jeonrabug do	9.6	(3.9)	18.7	(3.6)
Jeonranam do	13.1	(5.3)	21.8	(4.2)
Gyeongsangbug do	21.4	(8.6)	42.8	(8.2)
Gyeongsangnam do	11.1	(4.5)	27.3	(5.2)
Jeju do	2.3	(.9)	4.0	(.8)

Source: The 10% and 5% Sample Survey Reports for the 1970 and 1975 Population Censuses, Internal Migration

* of total outmigrants

developed science and technology research centers. Each gained more than 10,000 in population (10 percent increase including natural growth) during the 1970-75 period.

Overall, Tables 3.9 and 3.10 reveal a substantial decline in net migration to Seoul from 943,300 people during the 1965-70 period to 529,000 people during the 1970-75 period.*

Approximately 67 percent of the decline in net migration (414,300 people) to Seoul during these two periods is due to the increase in outmigration from Seoul. However, outmigration from Seoul is mainly confined to satellite cities, heavy industrial cities, and rural areas that have new developments for research facilities. This seems to indicate that in Korea there are still

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*Tables 3.9 and 3.10 allow us to calculate that net migration to Seoul was 943,300 during the 1965-70 period and 529,000 during the 1970-75 period. The latter figure is not far different from 683,700 estimated for the 1970-75 period in Table 3.7. We expect the latter to yield a higher estimate since the census survival method includes migrants aged 0-4 while Tables 3.9 and 3.10 exclude migrants aged 0-4. The consistency of these two figures seems to indicate that the census survival ratio method used for Table 3.7 is acceptable.

However, the net migration to Seoul, 943,300 people during the 1965-70 period shown in Tables 3.9 and 3.10 is far smaller than the 1.4 million people during the 1966-70 period in Table 3.7. Kwon's new estimate for the five-year interval of 1965 through 1970, as reported in KIFP (1978), is 1.53 million people. The substantial difference between the two figures could result from various factors. First, this could mean that the census survival ratio method does not generate accurate estimates. We do not believe that this is the case because, as discussed above, the same method generated a number very similar to the 5% migration survey results for the 1970-75 period. Second, while the census survival ratio method generated an accurate number for the recent period, the same method could have generated an inaccurate number for the earlier period. This would be true if we believe that the misstatement of age and the undercount or overcount for some ages have been reduced substantially over time. Third, the 1970 10% population survey might have substantially undercounted the true net migration and the sampling techniques might have improved significantly in the 1975 5% population survey. Both, the second and third reasons could be true. However, there is no way to judge which of these two factors is more important. Therefore, we conjecture that the true net migration to Seoul during the 1965-70 period is between 943,300 people and 1.41 million people, which is 1.53 million less 122,200 for ages 0-4.

64

very weak incentives to outmigrate from Seoul except in some special cases of government-induced industrial relocation programs.

While the inmigration to Seoul from other urban areas has remained almost constant except for the increase from satellite cities between the 1965-70 period and the 1970-75 period, the inmigration to Seoul from rural areas has declined substantially from 813,300 to 647,000 between these two periods. This implies that the critical element of the shift in Korean population movement since 1970 is the decline in the rural-to-Seoul migration.*

Before closing this section we turn to Table 3.11, which summarizes the patterns of internal migration in Korea during 1965-75. Whereas rural-urban migration accounted for half of total internal migration during 1965-70, during 1970-75 it accounted for 4 out of 10 migrants.

Rural-rural migration has decreased substantially in absolute numbers and relative shares. The migration originating from rural areas declined from 68 percent to 57 percent of internal migration between 1965-70 and 1970-75. This might be due to the declining base population in rural areas. On the other hand the migration originating from urban areas has increased from 32 percent to 43 percent of internal migration between the same two periods. Tables 3.12 and 3.13 show that while urban-urban migration destined to other cities excluding Seoul and Busan has doubled between 1965-70 and 1970-75, urban-rural migration originating from Seoul has increased by 60 percent between the two periods.

However, it is important to note that the earlier discussion implies that the majority of outmigration from Seoul may not be return migration but is either a movement to satellite cities because of a spillover effect from Seoul or a job-related movement. Therefore, we have no strong reasons to anticipate

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*Similar data for Busan and other cities are presented in tables in Section A.3.2 of the Appendix.

Table 3.11. Distribution of Total Internal Migrants by Destination and Origin

Directions (From/to)	1965-1970		1970-1975	
	Thousand Migrants	%	Thousand Migrants	%
Rural/Rural	648.6	17.8	563.3	13.9
Rural/Urban	1,844.5	50.5	1,754.3	43.3
Urban/Rural	387.1	10.6	558.5	13.8
Urban/Urban	769.2	21.1	1,177.1	29.0
Total	3,649.4	100.0	4,053.2	100.0

SOURCE: The 10% and 50% Sample Survey Reports for the 1970 and 1975 Population Censuses, Internal Migration.

Table 3.12. Distribution of Urban-Urban Migrants by Destination

Destinations	1965-1970		1970-1975	
	Thousand Migrants	%	Thousand Migrants	%
Seoul	369.0	48.0	406.2	34.5
Busan	94.9	12.3	141.0	12.0
Other Cities	305.3	39.7	629.9	53.5
Total	769.2	100.0	1,177.1	100.0

SOURCE: The 10% and 50% Sample Survey Reports for the 1970 and 1975 Population Censuses, Internal Migration.

Table 3.13. Distribution of Urban-Rural Migrants by Origin

Origins	1965-1970		1970-1975	
	Thousand Migrants	%	Thousand Migrants	%
Seoul	141.6	36.6	227.9	40.8
Busan	32.3	8.3	53.1	9.5
Other Cities	213.2	55.1	277.5	49.7
Total	387.1	100.0	558.5	100.0

SOURCE: The 10% and 50% Sample Survey Reports for the 1970 and 1975 Population Censuses, Internal Migration.

any significant difference in socio-economic characteristics between out-migrants from Seoul and stayer in Seoul.

In the U.S. there is some evidence indicating that return migrants are significantly different in their socioeconomic characteristics from migrants who did not return.* The point concerning return migration is very important for this study. For the type of demographic system being considered here, return migrants are mainly failures and are lower in their socioeconomic characteristics than migrants who do not return. If return migration is substantial, then our observation on the relationship between the duration of migration and migrants' fertility behavior might be misleading. It might not reflect the influence of adaptation to urban life-style on fertility behavior because the longer the duration of residence of migrants, the more the migrant is self-selected.

3.6 Socioeconomic Characteristics of the Rural-Urban Migrants

Tables 3.14, 3.15 and 3.16 show the age-sex distribution of net migrants to Seoul, Busan and other cities, respectively, during 1965-1970. While 43 percent of Seoul's male population (excluding migrants during 1965-1970) is in the prime working years of ages 15-34, 57 percent and 61 percent of the male migrants from other urban areas and rural areas, respectively, are these ages. This selectivity is further intensified for female migrants: 33 percent of Seoul's female population (excluding migrants during 1965-1970) is aged 15-29, but 49 percent and 56 percent of the female migrants from other urban

*A recent study by Kim and Lee (1979) attempts to demonstrate (using limited data from a sample survey for two rural areas and three cities of Korea) that, with respect to most of the adaptation variables, return migrants scored lower than those rural out-migrants who have remained in the city. See also an interesting study on the mobility patterns of Korean return migrants by Choi and Kwon (1980), which used residential mobility history data for return migrants from a sample survey of three rural towns in the south-eastern part of Korea.

Table 3.14. Distribution of Net Migrants (age 5 and older) to Seoul During 1965-1970 by Sex and Age

Age	Male			Female		
		Migrants from			Migrants from	
	1970 Seoul Population*	Other Cities	Rural	1970 Seoul Population*	Other Cities	Rural
			(percent)			
5-9	14.5	11.4	11.2	13.8	9.2	8.5
10-14	15.1	10.5	10.8	14.0	10.4	10.6
15-19	12.1	15.2	19.4	11.9	17.0	24.0
20-24	11.1	14.6	14.5	11.0	18.6	19.2
25-29	10.2	14.7	15.3	10.2	14.1	12.9
30-34	9.8	12.6	11.6	9.4	9.5	7.6
35-39	7.5	8.1	6.8	7.5	6.3	4.7
40-44	5.6	4.9	3.8	5.8	3.9	3.0
45-49	4.9	3.4	2.4	4.6	3.0	2.3
50 and up	9.1	4.6	4.2	11.2	8.0	7.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	1,843,500	177,300	388,200	1,808,100	191,700	434,000
Average Age **	26.56	25.74	24.65	27.46	26.36	24.95

SOURCE: The 10% and 5% Sample Survey Reports for the 1970 and 1975 Population Censuses, Internal Migration.

*Excluding migrants during 1965-70.

**Based upon mid-points for each age group and 60 years for the group "50 and up."

Table 3.15. Age-Sex Percentage Distribution of Migrants to Busan During 1965-1970 (5 years and older)

Age	Male			Female		
		Migrants from			Migrants from	
	1970 Basan Population*	Other Cities	Rural	1970 Basan Population*	Other Cities	Rural
			(percent)			
5-9	15.2	11.4	12.1	14.2	10.7	9.8
10-14	16.6	9.5	9.6	15.4	9.7	10.1
15-19	13.3	12.3	17.5	12.8	13.2	20.1
20-24	10.2	11.9	12.9	10.0	17.9	19.4
25-29	8.7	16.8	16.9	9.0	18.1	15.3
30-34	8.7	16.2	14.5	8.8	10.9	8.7
35-39	7.3	9.3	7.2	7.6	6.4	4.9
40-44	5.9	5.6	3.2	6.3	3.9	3.0
45-49	5.0	3.0	2.3	4.9	2.5	2.3
50 and up	9.0	4.0	3.8	10.9	6.7	6.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	660,400	46,379	105,478	658,800	48,512	108,749
Average Age**	26.08	26.45	24.86	27.21	26.14	24.96

SOURCE: The 10% and 5% Sample Survey Reports for the 1970 and 1975 Population Censuses, Internal Migration.

*Excluding migrants during 1965-70.

**Based upon mid-points for each age group and 60 years for the group "50 and up."

Table 3.16: Age-Sex Percentage Distribution of Migrants 5 years or more Other Cities excluding Seoul and Busan during 1965-1970

	Male			Female		
		Migrants from			Migrants from	
Age	1970 Basan Population*	Other Cities	Rural	1970 Basan Population*	Other Cities	Rural
			(percent)			
5-9	16.5	9.5	12.4	15.4	10.9	10.7
10-14	17.8	7.5	14.7	16.3	9.2	12.2
15-19	13.8	8.5	20.6	12.6	10.9	19.8
20-24	8.8	26.4	10.6	8.8	19.0	17.1
25-29	7.5	15.9	12.3	7.6	18.6	13.3
30-34	7.6	13.2	11.6	8.0	12.0	8.5
35-39	6.7	8.0	7.1	7.2	6.8	5.5
40-44	5.4	4.3	3.9	6.2	3.7	3.4
45-49	5.0	2.8	2.4	5.0	2.6	2.3
50 and up	10.6	3.9	4.3	12.9	6.2	7.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	1,841,530	168,100	401,400	1,852,800	137200	406,600
Average Age**	25.93	26.24	23.95	27.52	26.24	24.98

SOURCE: The 10% and 5% Sample Survey Reports for the 1970 and 1975 Population Censuses, Internal Migration.

areas and rural areas, respectively, are in the ages 15-29. Average (mean) age has been calculated for each population group and may be seen to be oldest in the cith populations and youngest among migrants from rural areas. Comparison of these tables reveals the following: male migrants to Busan from urban areas excluding Busan (57 percent) and rural areas (62 percent), respectively, which are very similar to the shares of migrants to Seoul are in the ages 15-34, whereas 64 percent and 55 percent of male migrants to other urban areas excluding Seoul and Busan from other cities and rural areas are in these ages. The age selectivity for female migrants from urban areas does not vary significantly according to destinations, i.e., about 49 percent of female urban-urban migrants are in the ages 15-29 for all three groups of destinations. On the other hand, the age selectivity for female rural-urban migrants becomes more intensified with the city sizes of destination, i.e., 56.1, 54.8 and 50.2 percent of female rural-urban migrants to Seoul, Busan and other urban areas are in the ages 15-29. For both sexes the peak migration age from rural areas is 15-19 for all rural-urban migration.

Table 3.17 reveals that the average age of migrants declined over time between 1965-1970 and 1970-1975; that is, for both sexes the proportion of the rural-urban migrants in the age group 15-19 has increased substantially during this period, (from 20% to 26% for male and from 22% to 28% for female). The ratios between the proportion of female rural-urban migrants at the age groups 15-19 and 20-24 in the 1965-70 period and the proportion of 1970 rural female population in those age groups are 2.4 and 2.6, respectively.* The corresponding ratios for 1970-1975 are 3.1 and 2.9. These indicate that our analysis of

*For example, the ratio for 1965-70 for ages 15-19 is given by:

$$\frac{\text{Percent of female migrants in 1965-70}}{\text{Percent of female rural population in 1970}} = \frac{21.8\%}{9.1\%} = 2.4$$

71

Table 3.17 Distribution of Total Rural-Urban Migrants by Sex and Age, Korea, 1965-70 and 1970-75

Age	1965-1970 migrants			1970-1975 migrants			1975 total urban population			1970 total rural population		
	male	female	total	male	female	total	male	female	total	male	female	total
						(percent)						
5-9	11.9	9.6	10.7	10.1	7.4	8.6	13.7	12.5	13.1	19.3	18.0	18.6
10-14	12.4	11.3	11.8	11.7	9.4	10.4	13.6	12.3	13.0	17.8	16.5	17.2
15-19	19.7	21.8	20.8	26.2	27.9	27.1	15.7	15.7	15.7	9.9	9.1	9.5
20-24	12.5	18.3	15.5	11.3	20.6	16.3	11.3	12.4	11.8	8.5	7.0	7.7
25-29	14.2	13.3	13.7	14.9	12.2	13.4	10.0	10.2	10.1	6.7	6.8	6.7
30-34	12.0	8.1	10.0	9.5	5.6	7.4	9.0	8.2	8.6	7.2	7.5	7.3
35-39	7.0	5.0	5.9	6.1	4.4	5.2	8.0	7.3	7.6	6.4	6.9	6.7
40-44	3.8	3.1	3.4	3.7	2.9	3.3	5.8	5.6	5.7	5.0	5.9	5.4
45-49	2.3	2.3	2.3	2.2	2.2	2.2	4.1	4.4	4.2	4.8	5.2	5.0
50-54	1.5	1.9	1.7	1.5	1.8	1.7	3.3	3.4	3.4	4.1	4.3	4.2
55-59	1.0	1.7	1.4	1.1	1.7	1.4	2.3	2.5	2.4	3.5	3.8	3.7
60-64	0.7	1.6	1.2	0.8	1.5	1.2	1.5	2.0	1.8	2.7	3.2	2.0
65-69	0.4	0.9	0.7	0.6	1.1	0.9	1.0	1.5	1.2	1.7	2.3	2.0
70+	0.5	1.5	0.8	0.5	1.1	0.9	0.8	1.9	1.3	2.6	3.6	2.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number (1000)	895	949	1,844	805	949	1,754	7,297	7,403	14,700	7,918	7,922	15,840

Source: From the table II-4-1 in Moon and Kim (1979) the influence of the rural-urban migration on migrant's fertility should pay special attention to the behavior of female migrants who migrated at the ages 15-24. Migration at these ages will be highly interrelated with marriage.

Table 3.18 leads to the inference that rural-urban migrants are highly selected with respect to education. Comparisons of Column 1 with Column 2 and Column 4 with Column 5 reveal that while 75 percent of rural male population and 90 percent of rural female population had no schooling beyond the compulsory elementary school, only 45 percent of male rural-urban migrants and 70 percent of female migrants had no schooling beyond elementary school. However, the above comparisons exaggerate the selectiveness of migrants by education levels because migrants are much younger than the rural population in general and younger cohorts in Korea generally attain higher education levels than their predecessors. Columns 3 and 6 in Table 3.18 are age standardized to remove this bias. These columns represent the hypothetical distributions of rural population by education level obtained by assuming that the age distribution of the rural population is identical to that of rural-urban migrants. These standardized figures reveal a somewhat weakened selectiveness of migrants by education level. However, even these standardized figures could exaggerate the selectiveness of migrants by education level because current education levels of many young migrants could be the results of increased schooling obtained recently (within five years after migration) in urban areas. This discussion implies that many analyses on the migrant's selectivity in terms of education, using data similar to those shown in Table 3.18, could be misleading. From data shown here we are not in a position to make conclusions about the degree to which rural-urban migration is selective with respect to education.

Table 3.18. Distribution (in percent) of Korean Rural-Urban Migrants by Educational Levels, 1965-70

Education Level	Male: Migrants	Male: 1970 Rural population	Male: 1970 Rural population adjusted by age composition of migrants*	Female: Migrants	Female: 1970 Rural population	Female: 1970 Rural population adjusted by age composition of migrants*
	1	2	3	4	5	6
No education	5.6	19.1	10.0	13.2	33.3	20.0
under age 15	(2.3)	(2.7)	-	(2.3)	(3.0)	-
15 and over	(3.3)	(16.4)	-	(10.9)	(30.3)	-
Elementary school	39.8	55.5	54.9	56.8	56.5	63.0
enrolled	(14.1)	(25.5)	(17.9)	(10.8)	(23.5)	(15.0)
dropouts or graduates	(25.7)	(30.0)	(37.0)	(46.0)	(33.0)	(48.0)
Middle school	25.1	14.6	18.7	19.9	7.6	12.0
enrolled	(6.1)	(5.7)	(5.8)	(3.3)	(3.2)	(4.0)
dropouts or graduates	(19.0)	(8.9)	(12.9)	(16.6)	(4.4)	(8.0)
High school	21.7	8.4	13.0	8.7	2.3	5.0
enrolled	(5.7)	(1.6)	(3.1)	(2.2)	(0.7)	(2.0)
dropouts or graduates	(16.0)	(6.8)	(9.9)	(6.5)	(1.6)	(3.0)
College	7.8	2.3	3.2	1.4	0.3	0.0
enrolled	(2.1)	(0.3)	(0.5)	(0.6)	(0.3)	(0.0)
dropouts or graduates	(5.6)	(2.0)	(2.7)	(0.8)	(0.04)	(0.0)
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Calculated from Table 4 in <u>1970 Population and Housing Census Report</u>, Vol. 1 Complete Enumeration, 12-1 Republic of Korea and Table 6 in 1970 Population and Housing Census Report, Vol. 2 10% Sample Survey, 1-3 Internal Migration.

*Distribution of 1970 rural population by education levels is adjusted for age composition of rural-urban migrants as follows:

$$D = A \times B \text{ where } D = (d_j) = \begin{bmatrix} d_1 \\ d_2 \\ \vdots \\ d_{15} \end{bmatrix} \qquad A = (a_{ji}) = \begin{bmatrix} A_{11} & \cdots & A_{1.12} \\ A_{21} & \cdots & \vdots \\ \vdots & \cdots & \vdots \\ A_{15.1} & \cdots & A_{15.12} \end{bmatrix} \qquad B = (b_i) = \begin{bmatrix} b_1 \\ b_2 \\ \vdots \\ b_{12} \end{bmatrix}$$

d_j is the share of rural population that had jth level of education when composition of rural population is adjusted according to age distribution of migrants.

a_{ji} is the number of rural population in the ith age group with jth level of education as a share of total rural population with jth level of education.

b_i is the number of rural-urban migrants in the ith age group as a share of total rural-urban migrants.

74

3.7 Korean Fertility

As we begin this study of the influence of rural-urban migration on Korean national fertility level, it will be useful to describe the fertility situation in general terms. In the early 1960's Korean fertility was high: crude birth rates of around 40 births per thousand of population, crude death rates of about 13, crude rates of natural increase approaching three percent, and total fertility rates of about six births per woman. (See Table 3.19). Within 20 years crude rates have declined to about half the levels of the early 1960's and total fertility rates were at a national level of about 2.8 births per woman.

Table 3.19 reveals that the total fertility rate per rural woman was about two births higher than that of urban women during the 1960's. However, the rural-urban fertility differentials diminished substantially after 1969. For 1980 the TFR differential between rural and urban areas was estimated at 0.43 births per woman. The Korean government projects that after 1990 the rural-urban fertility differential will virtually disappear in Korea. This implies that as a less-developed country achieves an advanced level of demographic transition the influence of rural-urban migration on the national fertility level will be minimal. However, this does not reduce the importance for fertility reduction of the large volume of rural-urban migration that occurred in Korea during 1965-1975 or that is currently occurring in other developing countries that still have large rural-urban fertility differentials. (See Findley 1978). Furthermore, it is challenging to ascertain whether the large volume of rural-urban migration during 1965-1975 has contributed to the reduction of rural-urban fertility differentials (as the adaptation hypothesis suggests) or to widening the rural-urban fertility gap (as the selectivity hypothesis predicts).

-15

Table 3.19. Crude Birth Rates, Crude Death Rates, Net Population Growth Rates, and Total Fertility Rate by Residence

Year	Crude Birth Rate	Crude Death Rate	Crude Rate of National Increase (Percent)	Total Fertility Rate Per 1,000 Women		
				National	Urban	Rural
1960	42.0	13.0	--	6,540	5,475	7,160
1961	42.0	13.0	2.97	6,020	4,895	6,725
1962	41.0	13.0	2.86	5,610	4,535	6,235
1963	40.0	12.0	2.78	5,860	3,850	6,750
1964	39.0	11.0	2.61	5,140	3,850	5,990
1965	37.0	10.0	2.55	4,590	3,465	5,365
1966	35.0	9.1	2.51	5,050	3,730	5,990
1967	32.0	8.9	2.34	4,295	3,465	4,895
1968	29.0	8.6	2.32	4,690	3,555	5,560
1969	28.0	8.5	2.26	4,555	3,725	5,205
1970	27.0	7.6	2.18	4,272	3,680	4,715
1971	29.4	6.8	1.97	4,553	3,861	5,211
1972	25.5	7.9	1.87	4,077	3,548	4,585
1973	25.3	7.2	1.77	3,736	3,043	4,440
1974	24.6	7.0	1.71	3,497	3,267	4,743
1975	23.1	7.0	1.68	3,224	2,928	3,417
1976	23.6	7.0	1.64	3,210	2,980	3,600
1977	23.3	6.8	1.61	3,080	N.A.	N.A.
1978	23.2	6.6	1.60	2,980	N.A.	N.A.
1979	23.2	6.5	--	2,880	N.A.	N.A.
1980	23.3	6.3	--	2,790	2,680	3,108
1990	19.7*	--	--	2,100*	2,100*	2,152*
2000	17.2*	--	--	2,100*	2,100*	2,100*

Source: Korean Institute for Family Planning--Statistics on Population and Family Planning in Korea, 1978.

N.A. - Not available.

* - Projected by Korea Development Institute (unpublished)

3.8 Policies of Korean Government Concerning Internal Migration

As Kim (1980) has correctly pointed out, until recently Korean population redistribution policies have been subordinate to an overriding sectoral approach seeking rapid economic growth and the only explicit migration policy of the Korean government to date has been a population dispersal policy with the prime purpose of controlling the size of the population of Seoul. The enormous population increase in Seoul has caused severe shortages of housing and classrooms in the elementary schools, congestion of transportation and communication facilities, inadequacies in the sewage system, as well as pollution of water and air. In addition, the huge population growth of Seoul raises a serious concern for national defense because Seoul is located less than 40 miles south of the demilitarized zone. (See ESCAP (1980).)

The first major population dispersal plan, pursued by the government since the early 1970's, seeks to relocate a portion of the existing urban population of Seoul into the designated fringe areas of Seoul and its satellite cities. The rate of population growth in such satellites as Incheon, Suweon and Euijeongbu was higher recently than that in Seoul. As discussed earlier, a large volume of outmigration from Seoul to its surrounding area, Gyeonggi do, should be the result of this policy.

The second major population dispersal plan, adopted by the Korean government during the mid 1970's, has two objectives: first, to encourage gradual removal of the existing industrial installations and their employees from the geographical boundary of Seoul and its vicinity, that is, a 25 mile commuting zone; and second, to develop five growth poles (Daejeon, Daegu, Gwangju, Jeonju and Masan cities) to absorb prospective migrants headed for Seoul. These five medium-sized cities with populations of 200,000 to one million have been observed to have increased rapidly in population due to their prosperous urban economies as provincial administrative centers and/or industrial complexes. (See Kim (1980).)

3.9 Summary

This study analyzes the relative impact on fertility among rural-urban migrants of two processes: selectivity and adaptation. In this chapter we have considered the basis for choosing Korea as an appropriate country for in-depth study and have described relevant aspects of the Korean demographic situation.

Like many other developing countries, Korea has experienced a large and rapid shift of population to urban areas from rural ones. And like other such countries much of that urbanization has accompanied industrialization, that is, the growth of non-agricultural employment relative to that of the agricultural sector. The changing character of both residence and employment, along with changes in services for education and health and in other aspects of the society represent powerful forces affecting the attitudes and behavior of the Korean people. Because of this and because the Korean World Fertility Survey of 1974 provides data on both fertility and migration history for individuals, it is both possible and desirable to test the hypotheses about the interrelations between rural-urban migration and fertility in the Korean context.

In describing that context, we note that in 1975 about 50 percent of the Korean population lived in urban areas, placing this country between the averages for developing and developed countries. That urbanization has been closely correlated with the proportion of nonagricultural labor in the total labor force, as it has in Japan, a country with which Korea compares itself. Recent population projections assume continuing increases in the degree of urbanization in Korea for the next two decades. Moreover, this rural-urban migration has continued in the face of widely known urban difficulties, notably inadequate and crowded housing, and despite government policies attempting to moderate the rural-urban flow, especially that to the primate and other large cities. Accordingly, insofar as urbanization may affect fertility, policy makers will wish to understand such effects in order to choose policies most likely to help the country reach its goals for economic growth (both industrial and agricultural), urbanization, housing, the environment, population growth and migration.

During the 15 years from 1960 to 1975 Korea's urban population has more than doubled (that of Seoul itself tripled). Outmigration has been large enough to offset natural increase in rural areas, causing a small decline in that population segment. For the first ten years of this period larger cities also tended to grow more rapidly than smaller ones; from 1970 to 1975, however, net migration to and the growth rates of the largest cities declined, while those of intermediate sized cities rose.

Sample data on five-year migration from the censuses of 1970 and 1975 show that nearly ten percent of the rural population moved to urban areas in each of the five-year periods preceding the censuses. Those data allow us to describe origin/destination pairs for both inmigration and outmigration. The share of all migrants destined for Seoul dropped from nearly one-half in the earlier period to about 37 percent during the latter one. And from the earlier period to the later one the proportion of these migrants coming from rural areas declined from 68 to 61 percent.

When inmigrants to urban areas are compared to the destination populations one notes that the inmigrants are younger than the general population and that those from rural areas are younger, on the average, than those from other cities. Comparing time periods, one finds a decrease in the age at migration between 1965-70 and 1970-75. And comparing city size, larger cities tend to attract younger persons more strongly than smaller ones, particularly in the case of women.

Rural-urban migrants are known to be strongly selected for a higher level of education as compared to the rural population in general when this comparison is based on the proportions of each population having specified amounts of education. Standardization of the rural population to the age distribution of the migrants, who are generally younger, reduces the degree of educational selectivity, but does not eliminate it. The measure of pre-migrational educational attainment for migrants may be biased upward, however, by education received in urban areas within the period of up to five years after migration. Thus, drawing clear conclusions about educational selectivity from these data is not possible.

A review showed that total fertility rates for the rural population exceeded those of the urban population by about two births per woman for the years between 1960 and 1970. After 1970 this difference diminished to less than one-half birth per woman in 1980, and it is projected to approach zero by 1990.

All of the foregoing demographic trends have occurred in the context of government policies favoring redistribution of the population away from Seoul and favoring overall reduction of fertility. The overriding policy, however, was that favoring economic growth. This was implemented largely through enlargement of the nonagricultural sector; urbanization, including that of Seoul, the primate city, was tolerated even if it was not wholeheartedly desired by policy makers because of the personal and social costs involved.

In this review of Korean rural-urban migration trends we have shown that such migration has been large at both origins and destinations, that it has varied across time and by city size, that it has been age selective and possibly education selective, and that it has been, to some degree, contrary to population distribution objectives. These findings, based largely on census data, provide a foundation and context against which to examine the migration, marital, and fertility findings that are developed from the Korean World Fertility Survey of 1974. The preliminary examination of the KWFS data is undertaken in Chapter 4 and then followed by rigorous analyses of the same data in Chapters 5, 6, and 7.

CHAPTER 4: DESCRIPTIVE ANALYSIS OF MIGRANT CHARACTERISTICS AND FERTILITY FROM THE 1974 KOREAN WORLD FERTILITY SURVEY (KWFS)

4.1 Introduction

Tests of the adaptation and selectivity hypotheses concerning the effect of the rural-urban migration on migrants' fertility presented in this study are mainly based on data contained in the 1974 Korean World Fertility Survey. The 1974 KWFS was undertaken jointly by the Korean Institute for Family Planning and the Bureau of Statistics of the Economic Planning Board of Korea as part of the World Fertility Survey. It is composed of two surveys: households and individuals. The survey of individuals included data for 5,417 ever-married women aged 15-49 in the sample on the following items: migration history, full pregnancy history, interval-by-interval full contraceptive usage history, woman's employment history and other demographic and socioeconomic characteristics.

In order to place the subsequent analyses in perspective, this chapter reports the characteristics of the whole sample for such items as migration patterns, education, labor force participation and marital status. The sample upon which this chapter is based was, like most national fertility surveys, complex, multistage, stratified and clustered. Thus, it should be remembered that variation due to sampling exists; sample and population will differ somewhat in observed characteristics.

The sample design for the survey aimed for a self-weighting, nationally representative probability sample, using basically a two-stage design for the household survey with a further sampling stage for the individual survey. Census enumeration districts were used as the primary sampling units, with households in the selected primary sampling units constituting the ultimate sampling units. Sample sizes of 21,248 and 6,849 households for the household and individual surveys were drawn, respectively, the latter being a sub-sample of the former. An overall sampling fraction was approximately 1/340 for the household survey. Schedules were completed for 20,932 households, or 95.6 percent of the total household sample. In fact, 5,724 eligible women (all ever-married women in the ages 15-49) were identified in the 5,271 households and 5,417 (94.6 percent) of them were successfully interviewed. The response rates for the household survey and the individual survey were thus relatively high.

The 1974 KWFS permits investigation of migration histories of the wife and husband. This information includes years of residence in the current location; the place of current residence, previous residence, and birth, and the type of community resided in during growth to age twelve.*

The subsample of the 1974 KWFS used in this study consists only of 4,540 currently married wives aged 20-49, married only once, and having had at least one live birth. Zero-birth women are excluded for two reasons. First, young women without any live-birth experience may not yet have formed their attitudes about desired family size. Second, a substantial proportion of the currently-married women in many low income societies such as Korea are known to be without children for reasons of subfecundity rather than choice.

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*Relevant questions in the 1974 KWFS from which data on migration status have been obtained are as follows:

(a) Have you always lived in city, town or village of current residence since you were born?
(b) Where (name of city, town or village) do you live?
(c) Where were you born?
(d) In what kind of area did you live mostly when you were growing up, say to age 12? Was it in the village, town or city?
(e) Where did you live before you moved to the city, town or village of current residence?
(f) How many years ago did you move to the city, town or village of current residence?

This sample of 4,540 women may be classified into rural non-migrants, rural-rural migrants, rural-urban migrants, urban-urban migrants, urban natives and urban-rural migrants. Since the purpose of this study is to investigate the influence of rural-urban migration on migrant fertility we will be mainly interested in two categories; rural stayers (which include rural non-migrants and rural-rural migrants) and rural-urban migrants. The rural stayers included in our analyses are the individuals whose birthplace, previous residence, and current residence are all rural areas, while the rural-urban migrants are those whose current residence is urban but whose birthplace and previous residence are both rural. Therefore, our analyses ignore the multistage migrants. "Rural" is defined as town (eup) plus village (myun), whereas "urban" is defined as city (shi), which is an administrative unit with more than 50,000 people.

4.2 Migration Patterns

Table 4.1 shows the distribution of the sample by the rural-urban character of the birth community and community of current residence. About 45 percent of the women were born and currently resided in a rural community, while nearly 35 percent had a rural birthplace but currently resided in an urban community. Moreover, Table 4.2 shows that 88 percent of the 1,920 "rural birth, rural residence" individuals also had both rural childhood and rural previous locations. Only 12 percent had intervening urban experience. Therefore, 1,687 women in our sample are rural stayers. In Table 4.2, 1,133 women are classed as direct rural-urban migrants. An additional 298 (285 + 13) women born in rural areas but whose previous and current residences are urban are included in the lifetime rural-urban migration category as used in this chapter (i.e., Tables 4.3 and 4.5). When we test the adaptation and selectivity hypotheses

Table 4.1 Community of Birth and Community of Current Residence Subsample

Community of Birth	Community of Residence R	Community of Residence U	Total
R	1,920 (44.6)[a]	1,497 (34.7)	3,417
U	166 (3.9)	726 (16.9)	892
Not Stated	92	139	231
TOTAL	2,086	2,223	4,540

[a]Percent of grand total is in parentheses.

SOURCE: KWFS data tapes.

Table 4.2 Selected Birth-to-Current Residence Location Patterns

Birthplace	Residence: Childhood	Residence: Previous	Residence: Current	Number	Percent
R	R	R	R	1687	37.1
R	R	R	U	1133	25.0
R	R	U	U	285	6.3
R	U	U	U	13	0.3
U	U	U	U	515	11.3
			Other	591	13.0
			Not Stated	316	7.0
			Total	4540	100.0

SOURCE: KWFS data tapes.

in Chapters 5 and 6, however, these multistage rural-urban migrants are dropped from our sample.

Table 4.3 shows the years in current residence by lifetime migration history. We see that 536 of those with a rural birth and rural residence, or 28 percent had always lived in their current location; the remaining 72 percent, or 1,152 women, are rural-rural migrants who changed type of community (town or village) between birth and current residence.

Table 4.4 shows the female migration history by life stage and type of community. Of 4,225 individuals in the once-married subsample who responded to the relevant questions 21 percent were born in an urban community and apparently had less preference for urban life than the parents of individuals born in rural communities had for rural life. This is because only 74 percent born in an urban area were raised in an urban area, while 98 percent of those born in a rural area were also raised there. Individuals with a solely urban birth and growth history were more likely to have an urban previous residence (92 percent) than rural-born and raised individuals were to have a rural previous residence (85 percent). Carrying this to its extreme, individuals with an observable total urban history were more likely to remain urban in current residence (87 percent) than rural individuals were likely to remain rural in current residence (60 percent). An interruption in the type of community during an individual's lifetime appears to be less permanent if the interruption is from urban to rural than if it is from rural to urban. Individuals with an urban birth but rural growth returned to urban life 83 percent of the time. Individuals with a rural birth but urban growth returned to rural life 58 percent of the time. A similar pattern exists if the interruption is from growth community to previous residence.

Table 4.3 Years of Residence in Current Location by Lifetime Migration History

Years in Current Residence	Rural Birth, Rural Growth, Rural Previous Residence, Rural Current Residence	Rural Birth, Rural Current Residence	Rural Birth, Urban Current Residence
0-4	227	348	495
5-9	201	236	426
10-14	208	244	224
15-19	192	205	149
20-24	151	162	112
25-29	96	105	49
30-34	66	72	17
35-39	7	8	2
40-44	3	3	1
45-49	1	1	0
Always	535	536	6
Not Stated	0	0	16
TOTAL	1,687	1,920	1,497

SOURCE: KWFS data tapes.

Table 4.4 Female Migration History by Urban/Rural, from Birth to Current Residence

	Place of Birth	Place of Growth	Previous Residence	Current Residence
4225	U 871 (20.6%)	U 644 (73.9%)	U 594 (92.2%)	U 515 (86.7%)
				R 79 (13.3%)
			R 50 (7.8%)	U 31 (62.0%)
				R 19 (38.0%)
		R 227 (26.1%)	U 189 (83.3%)	U 144 (76.2%)
				R 45 (23.8%)
			R 38 (16.7%)	U 18 (47.4%)
				R 20 (52.6%)
	R 3354 (79.4%)	U 53 (1.6%)	U 22 (41.5%)	U 13 (59 %)
				R 9 (41 %)
			R 31 (58.5%)	U 26 (83.9%)
				R 5 (16.1%)
		R 3301 (98.4%)	U 481 (14.6%)	U 286 (59.5%)
				R 195 (40.5%)
			R 2820 (85.4%)	U 1133 (40.1%)
				R 1687 (59.9%)

SOURCE: KWFS data tapes.

Next, let us investigate how the migration pattern varies depending on whether it is interprovincial or intraprovincial migration. Table 4.5 shows birth and current residence by province. As expected, Seoul and Busan were net gainers. Adding along the diagonal, 2,541 of the 4,308 women, or 59 percent, had the same birth and current location province. Of those who did not have the same birth and current location province, 727 moved to Seoul and 324 to Busan. Movement to these two cities accounted for 60 percent of the 1,767 interprovincial lifetime migrants.

Table 4.6 shows the interprovincial migration pattern of all migrants in the sample. Of the 3,178 migrants whose provinces of birth and current location are known, more than 1,768, were interprovincial migrants. Among individuals with a rural birth, 51 percent were interprovincial migrants while 84 percent of those with an urban birth were interprovincial. Among those who were rural migrants with a rural birth and rural current residence 23 percent of the lifetime migration was interprovincial. Among those who were rural-urban migrants, 76 percent of the lifetime migration was interprovincial. Most rural-rural moves are within the same province, while the opposite holds for rural-urban movers. This is consistent with empirical evidence elsewhere that rural-urban migrants tend to go longer distances than rural-rural migrants.

In summary, a slight majority of the interprovincial lifetime migration moved to the two largest cities in Korea. The shares of the interprovincial lifetime migration (out of total migration) are, in descending order: urban-urban, rural-urban, urban-rural and rural-rural.

Tables 4.7 and 4.8, like Table 4.3, show the distribution by age and years in current residence for the sample. Table 4.7 shows that the percentage of rural stayers who never changed location increases with age (from 21 percent

89

Table 4.5 Distribution of Wives by Province of Birth and Current Residence

Birth Province[a]	Current Residence Province 1	2	11	12	13	14	15	16	17	18	19	Total
1) Seoul	166	8	38	3	4	10	5	1	1	3	0	239
2) Pusan	13	67	7	1	0	1	7	11	0	1	0	108
3) Kyunggi-do (South)	131	2	247	8	6	6	4	1	1	2	0	408
12) Kangwon-do (South)	37	10	19	162	8	6	5	4	0	0	0	251
13) Chungcheong Pukdo	49	10	20	8	110	16	7	9	2	0	0	231
14) Chungcheong Namdo	128	4	39	5	32	301	11	17	11	2	1	551
15) Kyungsang Pukdo	105	52	18	25	19	8	492	43	2	0	0	764
16) Kyungsang Namdo	41	192	9	12	2	4	28	328	2	5	1	624
17) Cholla Pukdo	79	12	13	3	2	15	2	2	240	9	0	377
18) Cholla Namdo	85	17	27	13	8	5	5	19	12	388	2	581
19) Cheju-do	1	3	0	1	0	0	0	0	0	1	40	46
Hamkyung Pukdo	3	1	0	1	0	0	1	0	0	0	0	6
Hamkyung Namdo	10	6	1	3	0	0	0	0	0	0	0	20
Pyongan Pukdo	8	0	2	0	1	0	0	0	0	0	0	11
Pyongan Namdo	9	0	0	1	0	0	0	1	0	0	0	11
Hwanghae-do	13	0	14	1	2	1	1	4	2	1	0	39
Kyunggi-do (North)	8	0	3	0	0	0	0	0	0	0	0	11
Kangwon-do (North)	3	0	0	0	0	0	0	0	0	0	0	3
Japan	4	5	4	0	0	1	10	1	0	0	1	26
China	0	0	0	0	0	0	0	1	0	0	0	1
Total	893	389	461	247	194	374	578	442	273	412	45	4308

[a]Provinces are listed according to Korean population census.

SOURCE: KWFS data tapes.

Table 4.6 Wife's Interprovincial and Intraprovincial Rural/Urban Lifetime Migration Pattern

Community of Birth	Current Location: Interprovincial Migrants[a] [b] R	U	Total	Intraprovincial Migrants[c] R	U	Total	All R	U	Total
R	293 (22.8%)	1078 (76.0%)	1371	992	341	1333	1285	1419	2704
U	108 (68.8%)	289 (91.2%)	397	49	28	77	157	317	474
TOTAL	401 (27.8%)	1367 (78.7%)	1768	1041	369	1410	1442	1736	3178

[a] Interprovincial migrants are those whose province of current location differs from their province of birth.

[b] Percentages in the parentheses are obtained by dividing values for interprovincial migrants by values for all migrants.

[c] Intraprovincial migrants are those who changed location at least once in their lifetime, but whose province of birth is the same as their province of current location.

SOURCE: KWFS data tapes.

Table 4.7 Female Rural Stayers (R/R), by Age and Years in Current Rural Location

Years in Current Location	Age Group 20-24 (2)	25-29 (3)	30-34 (4)	35-39 (5)	40-44 (6)	45-49 (7)	TOTAL
0-4	99	126	56	28	17	13	339
5-9	35	99	56	24	11	11	236
10-14	3	31	119	51	21	18	243
15-19	1	2	37	125	29	11	205
20-24	2	2	2	62	79	15	162
25-29	0	1	3	3	74	24	105
30-34	0	0	0	1	12	59	72
35-39	0	0	0	1	1	6	8
40-44	0	0	0	0	0	3	3
45-49	0	0	0	0	0	1	1
Total R/R Migrants	140	261	273	295	244	161	1374
Always Total (Non-Migrants)	38	77	96	129	111	82	533
TOTAL	178	338	369	424	355	243	1907
Always / TOTAL (%)	21.3	22.8	26.0	30.4	31.3	33.7	27.9

SOURCE: KWFS data tapes.

92

Table 4.8 Female Rural-to-Urban Lifetime Migrants (R/U) by Duration of Migration and Age*

Years in Urban Location	Age Group 20-24 (2)	25-29 (3)	30-34 (4)	35-39 (5)	40-44 (6)	45-49 (7)	Total
0-4	85	205	102	49	32	19	492
5-9	31	166	116	57	36	20	426
10-14	3	43	60	63	33	21	223
15-19	4	17	19	61	26	21	148
20-24	2	12	11	35	34	18	112
25-29	0	0	10	12	13	14	49
30-34	0	0	1	3	5	8	17
35-39	0	0	0	1	1	0	2
40-44	0	0	0	0	0	1	1
45-49	0	0	0	0	0	0	0
Unascertained	1	8	7	2	2	2	22
Total	126	451	326	283	182	124	1492
Percent moving before age 25	33	16	13	18	10	7	

[a]KNFS/WFS Lifetime Rural-to-Urban migrants are those who stated an urban current residence and rural birthplace.

SOURCE: KWFS data tapes.

for age group 2 to 34 percent for age group 7). From Table 4.8 one can infer the increasing share of younger rural-urban migrants over time.

4.2.a Husband and Wife Migration Similarity

Table 4.9 shows the similarity between the birth communities of husbands and wives. Of those couples currently living in a rural residence, 89 percent both ha[illegible] birthplaces. For those currently residing in an urban area only 54 per[illegible] had rural birthplaces. The distributions are similar for childhood locations, as shown in Table 4-10.

It was expected that background similarities among spouses would have decreased over time as general mobility of the population increased. This expectation is supported in Tables 4.11 and 4.12. The value 0 was assigned if place of birth or childhood was rural and 1 otherwise, and the correlation coefficient between the husband's and wife's values are shown in these two tables. In Tables 4.11 and 4.12, we see the correlation increasing with age of couples with an urban current residence, indicating more homogeneous marriages for older women. Couples with rural residences have correlations that decrease with age. One might expect that increased urbanization would result in more marriages of individuals with varied backgrounds either because the urban area is a melting pot or because individuals with varied backgrounds are more likely to migrate to urban areas.

Table 4.13 shows the previous and current residence of the wife by pre-marital and post-marital migration status. Out of 4,229 women whose previous and current communities were known, 1,702 (40 percent) moved from their previous community prior to marriage, 1,600 (38 percent) moved after marriage, and 927 (22 percent) never moved. Among pre-marital migrants the largest share (45 percent) remained rural. The largest share of post-marital migrants (40 percent) were rural-to-urban migrants. Whereas 64 percent of rural-rural

Table 4.9 Relation Between Community of Birth of Husbands and Wives by Current Residence

Birth Community	Current Residence					
	Rural			Urban		
Wife/Husband	R	U	Total	R	U	Total
R	1767 (89.0)	63 (3.2)	1830	1069 (54.4)	270 (13.7)	1339
U	132 (6.7)	24 (1.2)	156	280 (14.2)	347 (17.7)	627
TOTAL	1899	87	1986	1349	617	1966

SOURCE: KWFS data tapes.

Table 4.10 Relation Between Community of Childhood of Husbands and Wives by Current Residence

Childhood Community	Current Residence					
	Rural			Urban		
Wife/Husband	R	U	Total	R	U	Total
R	1823 (91.9)	56 (2.8)	1879	1220 (62.2)	237 (12.1)	1457
U	90 (4.5)	15 (0.8)	105	262 (13.4)	244 (12.4)	506
TOTAL	1913	71	1984	1482	481	1963

SOURCE: KWFS data tapes.

Table 4.11 Pearson Correlation Coefficient
Between Birth Community of Husband and Wife

Age	Rural Residence	Urban Residence	All
20-24	.24	.28	.30
25-29	.17	.30	.33
30-34	.12	.35	.37
35-39	.11	.37	.42
40-44	.17	.48	.47
45-49	.08	.43	.44
All	.16	.35	.38

SOURCE: KWFS data tapes.

Table 4.12 Pearson Correlation Coefficient
Between Childhood Community of Husband and Wife

Age	Rural Residence	Urban Residence	All
20-24	.28	.27	.31
25-29	.17	.32	.34
30-34	.10	.33	.34
35-39	.03	.31	.34
40-44	.13	.38	.38
45-49	.25	.34	.40
All	.14	.32	.35

SOURCE: KWFS data tapes.

96

Table 4.13 Previous and Current Residence of Wife by Date of Migration Relative to that of Marriage

Current Residence Community[a]

Previous Community	Pre-Marital Migrants			Post-Marital Migrants			Non-Migrants			Total		
	R	U	Total	R	U	Total	R	U	Total	R	U	Total
R	762 (44.8)	569 (33.4)	1331	430 (26.9)	641 (40.1)	1071	539 (58.1)	---	539	1731	1210	2941
U	152 (8.9)	219 (12.9)	371	178 (11.1)	351 (21.9)	529	---	388 (41.9)	388	330	958	1288
TOTAL	914	788	1702	608	992	1600	539	388	927	2061	2168	4229
										Not Stated		311

[a] Values in the parentheses show numbers of women in each cell as a percentage of total pre-marital migrants, post-marital migrants or non-migrants

SOURCE: KWFS data tapes.

migrants were pre-marital migrants, only 47 percent of rural-urban migrants were pre-marital migrants.

4.3 Migration Status and Economic/Demographic Variables

Table 4.14 shows the schooling of different age cohorts cross-classified by lifetime migration status.* In all age cohorts, women with more time spent in cities tend to be more educated. This is more clearly seen by assigning years of schooling to the schooling categories shown in Table 4.14 and calculating their mean. Tables 4.15 and 4.16 show mean education for women and their husbands, respectively, using the following years of schooling assignments:

Schooling Category	Years of Schooling
None	0
Primary	3.5
Middle	7.5
High	10.0
College	13.5

Increased exposure to urban areas results in high mean education levels for both women and husbands. However, there is a more distinct cohort effect among the women than among husbands. The effect of the urban residence on education is greater for older cohorts, especially among women. (See the last column of Table 4.15). Younger age cohorts have more equal schooling. The differential in education between women and their husbands is shown in Table 4.17. This differential increases with age, but to a much smaller degree among ultra-urban couples (U/U). This differential is highest among the rural-urban migrants (R/U). As would be expected from the data on education, Table 4.18 shows that

*In this section we include, unless otherwise noted, only individuals whose lifetime migration status was rural childhood/rural current residence (R/R), rural childhood/urban current (R/U), and urban childhood/urban residence (U/U). Childhood here is defined as ages up to 12.

Table 4.14 Frequency Distribution of Once-Married Women, by Age, Schooling, and Migration Status

Age	Schooling	Migration Status[a]					
		R/R		R/U		U/U	
		N	%	N	%	N	%
20-24	None	8	4.4	1	0.8	2	5.3
	Primary	34	73.6	68	53.5	7	18.4
	Middle	36	19.7	46	36.2	14	36.8
	High	4	1.1	12	9.5	12	31.6
	College	0	0.0	0	0.0	3	7.9
25-29	None	37	10.6	19	3.8	2	1.1
	Primary	283	68.1	244	49.3	36	20.5
	Middle	50	14.3	161	32.5	40	22.8
	High	21	6.0	63	12.7	65	38.0
	College	3	0.9	8	1.6	33	18.8
30-34	None	90	22.1	39	10.1	2	1.2
	Primary	260	63.9	205	52.8	41	24.6
	Middle	43	10.6	95	24.5	39	23.4
	High	14	3.5	40	10.3	59	35.3
	College	0	0.0	9	2.3	26	15.6
35-39	None	175	38.9	41	12.6	7	6.1
	Primary	249	55.3	187	57.4	41	35.9
	Middle	21	4.7	52	15.7	24	21.1
	High	5	1.1	43	13.2	28	24.5
	College	0	0.0	4	1.2	14	12.3
40-44	None	174	46.9	39	18.2	8	10.0
	Primary	185	49.8	127	59.4	28	35.1
	Middle	3	0.8	10	4.7	11	13.8
	High	8	2.1	32	15.0	24	30.0
	College	1	0.3	6	2.8	9	11.3
45-49	None	179	69.7	51	34.2	8	15.4
	Primary	72	28.0	79	53.1	21	40.4
	Middle	3	1.2	3	2.0	2	3.8
	High	3	1.2	11	7.3	12	22.0
	College	0	0.0	5	3.4	9	17.3

[a]R/R = rural childhood/rural current residence
R/U = rural childhood/urban current residence
U/U = urban childhood/urban current residence

SOURCE: KWFS data tapes.

99

Table 4.15 Mean Education of Once-Married Women, By Age and Lifetime Migration Status

Age	Migration Status R/R (A)	R/U (B)	U/U (C)	Ratio of U/U to R/R
		(years)		
20-24	4.29	5.58	7.79	1.82
25-29	4.21	5.72	8.83	2.10
30-34	3.39	5.08	8.42	2.48
35-39	2.40	4.73	7.07	2.94
40-44	2.07	4.38	6.93	3.35
45-49	1.19	3.23	6.46	5.43

SOURCE: KWFS data tapes.

Table 4.16 Mean Education of Husbands of Once-Married Women, by Age and Lifetime Migration Status

Age	Migration Status R/R (A)	R/U (B)	U/U (C)	Ratio of U/U to R/R
		(years)		
20-24	6.33	7.85	10.07	1.59
25-29	6.54	8.77	10.44	1.60
30-34	6.50	8.71	10.61	1.63
35-39	6.17	9.03	10.45	1.69
40-44	5.80	8.67	10.39	1.79
45-49	5.45	7.88	9.48	1.74

SOURCE: KWFS data tapes.

Table 4.17 Years by which Mean Education of Husbands Exceeds that of Wives, by Age and Lifetime Migration Status

Age	Migration Status		
	R/R	R/U	U/U
20-24	2.04	2.26	2.28
25-29	2.33	3.06	1.61
30-34	3.11	3.63	2.19
35-39	3.77	4.29	3.37
40-44	3.73	4.29	3.47
45-49	4.26	4.65	3.02

SOURCE: Tables 4.16 minus Table 4.15

Table 4.18 Literacy Distribution of Once-Married Women by Age and Lifetime Migration Status

AGE	Literacy	Migration Status R/R N	R/R %	R/U N	R/U %	U/U N	U/U %
20-24	Graduated Primary or Higher	155	85.2%	120	94.5%	35	92.1%
	Able to Read	16	8.8	5	3.9	1	2.6
	Unable to Read	11	6.0	2	1.6	2	5.3
			100 %		100 %		100 %
25-29	Graduated	271	77.7	456	92.1	171	97.2
	Able	37	10.6	26	5.3	3	1.7
	Unable	41	11.7	13	2.6	2	1.1
30-34	Graduated	256	62.9	318	82.0	161	96.4
	Able	65	16.0	38	9.8	5	2.9
	Unable	86	21.1	31	8.0	1	0.6
35-39	Graduated	189	40.7	246	75.5	99	86.8
	Able	109	24.2	41	12.6	9	7.9
	Unable	158	35.1	39	12.0	5	4.4
40-44	Graduated	125	33.7	144	67.3	65	81.3
	Able	89	24.0	32	15.0	7	8.8
	Unable	157	42.3	38	17.8	8	10.0
45-49	Graduated	58	22.6	86	57.7	37	71.2
	Able	59	23.0	25	16.8	7	13.5
	Unable	140	54.5	38	25.5	8	15.4

SOURCE: KWFS data tapes.

illiteracy rates increase with age cohorts, decrease with the exposure to urban areas, and the effect of urban residence increases for older age cohorts.

Labor force participation before marriage declines with age, regardless of degree of the exposure to urban areas, as shown in Table 4.19. Labor force participation prior to marriage was higher for ultra-urbanized women than others for most age groups. (Age groups 20-24 had had only 38 observations for ultra-urbanized women.) Labor force participation for rural-urban migrants is neither consistently higher nor lower than for the other migration statuses. Table 4.20 shows that the mean duration of work prior to marriage for those who worked before marriage does not vary much with age. If anything, there appears to be an inverted U-shaped relation with age. Duration of work prior to marriage decreases with the exposure to urban areas across most age groups.

Labor force participation after marriage is shown in Table 4.21. The percentage of women who worked at least once after marriage is highest for the ultra-rural women; and, for most age groups, work after marriage decreases with the exposure to urban life. Table 4.22 shows the mean duration of work after marriage for women who worked after marriage. As one would expect, mean work duration increases with age. However, it increases less rapidly with age the more the woman is exposed to urban life. Mean work duration also declines with the exposure to urban life for most groups.

Table 4.23 shows the share of women working after marriage who worked in the first birth interval. A larger share of young working women worked in the first birth interval than older women. The share of working women who worked in the first interval is considerably greater for ultra-rural women than other women.

Table 4.24 shows the occupation of the women in the sample prior to marriage. For all age groups, the percentage of women in professional, clerical,

Table 4.19 Labor Force Participation Prior to Marriage (Percentage Working) of Once-Married Women by Age and Lifetime Migration Status

Age	Migration Status R/R	R/U	U/U
20-24	66.5	58.3	55.3[a]
25-29	56.2	66.3	63.1
30-34	46.9	52.1	55.1
35-39	47.6	40.5	53.5
40-44	39.8	35.5	46.3
45-49	35.8	38.9	38.5

[a]Only 38 observations.

SOURCE: KWFS data tapes.

Table 4.20 Mean Duration of Work Prior to Marriage (Years) For Once-Married Women Who Worked Prior to Marriage, by Age and Lifetime Migration Status

Age	Migration Status R/R	R/U	U/U
20-24	4.07	3.31	2.80[a]
25-29	4.82	4.10	3.77
30-34	5.26	4.79	4.14
35-39	4.51	4.44	3.98
40-44	3.95	4.78	4.14
45-49	4.12	4.12	2.90

[a]Only 38 observations.

SOURCE: KWFS data tapes.

Table 4.21 Labor Force Participation After Marriage (Percentage Who Worked at Some Time) of Once-Married Women by Age and Lifetime Migration Status

Age	Migration Status		
	R/R	R/U	U/U
20-24	51	28	42[a]
25-29	64	37	31
30-34	74	47	39
35-39	86	56	53
40-44	80	62	59
45-49	87	35	38

[a]Only 38 observations

SOURCE: KWFS data tapes.

Table 4.22 Mean Duration of Work After Marriage (Years) For Once-Married Women Who Worked After Marriage, by Age and Lifetime Migration Status

Age	Migration Status		
	R/R	R/U	U/U
20-24	2.98	1.49	0.81[a]
25-29	5.44	2.58	2.97
30-34	9.97	4.98	4.60
35-39	14.74	7.69	6.83
40-44	19.36	11.10	8.57
45-49	24.96	14.89	8.35[b]

[a]Only 16 observations.

[b]Only 20 observations.

SOURCE: KWFS data tapes.

Table 4.23 Women Who Worked in the First Birth Interval as a Percentage of All Women Who Worked After Marriage by Age and Lifetime Migration Status

	Migration Status		
Age	R/R	R/U	U/U
20-24	79	51	44[a]
25-29	70	60	62
30-34	70	50	49
35-39	70	40	42
40-44	68	42	32
45-49	73	40	10[b]

[a]Only 16 observations.

[b]Only 20 observations.

SOURCE: KWFS data tapes.

Table 4.24 Frequency Distribution of Once-Married Women, by Age, Occupation Before First Marriage, and Migration Status

Age / Occupation Before First Marriage		20-24 R/R N	%	R/U N	%	U/U N	%	25-29 R/R N	%	R/U N	%	U/U N	%	30-34 R/R N	%	R/U N	%	U/U N	%
Professional	(1)	1	0.5	1	0.8	1	2.6	4	1.1	11	2.2	12	6.8	5	1.2	10	2.6	17	10.2
Clerical	(2)	5	2.7	7	5.5	7	18.4	13	3.7	48	9.7	41	23.3	4	1.0	17	4.4	28	16.8
Sales	(3)	6	3.3	4	3.2	0	0.0	10	2.9	18	3.6	5	2.8	3	0.7	6	1.5	6	3.6
Self-Employed Farm	(4)	3	1.6	0	0.0	0	0.0	1	0.3	1	0.2	0	0.0	0	0.0	1	0.3	0	0.0
Non-Self-Employed Farm	(5)	51	28.0	19	15.0	1	2.6	112	32.1	110	22.2	5	2.8	143	35.1	90	23.2	7	4.2
Private Household	(6)	2	1.1	0	0.0	0	0.0	2	0.6	1	0.2	2	1.1	4	1.0	1	0.3	0	0.0
Other Service	(7)	4	2.2	4	3.2	1	2.6	14	4.0	17	3.4	9	5.1	3	0.7	22	5.7	11	6.6
Production Workers and Craftsman	(8)	46	25.3	38	30.0	11	28.9	37	10.6	116	23.4	34	19.3	28	6.9	49	12.6	20	12.0
Unskilled Workers	(9)	2	1.1	1	0.8	0	0.0	3	0.9	5	1.0	3	1.7	0	0.0	3	0.8	2	1.2
Never Worked	(99)	61	33.5	53	41.7	17	44.7	153	43.8	167	33.7	65	36.9	216	53.1	186	47.9	75	45.0
			100.0%		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%

Age / Occupation Before First Marriage		35-39 R/R N	%	R/U N	%	U/U N	%	40-44 R/R N	%	R/U N	%	U/U N	%	45-49 R/R N	%	R/U N	%	U/U N	%
Professional	(1)	1	0.2	9	2.8	7	6.1	1	0.3	15	7.0	6	7.5	0	0.0	4	2.7	5	9.6
Clerical	(2)	4	0.9	14	4.3	15	13.2	3	0.8	3	1.4	9	11.3	2	0.8	7	4.7	5	9.6
Sales	(3)	5	1.1	1	0.3	2	1.8	0	0.0	1	0.5	2	2.5	2	0.8	0	0.0	0	0.0
Self-Employed Farm	(4)	2	0.4	2	0.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Non-Self-Employed Farm	(5)	172	38.2	67	20.6	14	12.3	120	32.3	49	22.9	5	6.3	78	30.4	37	24.8	0	0.0
Private Household	(6)	3	0.7	0	0.0	0	0.0	0	0.0	1	0.5	0	0.0	1	0.4	0	0.0	0	0.0
Other Service	(7)	1	0.2	6	1.8	4	3.5	1	0.3	0	0.0	4	5.0	0	0.0	0	0.0	1	1.9
Production Workers and Craftsman	(8)	24	5.3	29	8.9	15	13.2	24	6.5	7	3.3	11	13.8	9	3.5	7	4.7	9	17.3
Unskilled Workers	(9)	0	0.0	4	1.2	3	2.6	0	0.3	0	0.0	0	0.0	0	0.0	3	2.0	0	0.0
Never Worked	(99)	236	52.4	194	59.5	54	47.4	221	59.6	138	60.5	43	53.8	165	64.2	91	61.0	32	61.5
			100.0%		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%

SOURCE: KWFS data tapes.

and production worker categories increases with the exposure to urban life, as expected.

4.4 Marriage Pattern and Labor Force Behavior of Pre-Martial Migrants

Table 4.25 implies that the timing of marriage and the timing of migration are behaviorally related. Table 4.25 shows that out of 3,586 migrants, 1,076 either married in the year of ther last migration or within a year of the last migration. Among the 1,797 who migrated before marriage, 588, or one-third, married within one year after migration. This section further analyzes the relationship between migration and marriage for pre-marital migrants.

Pre-marital migration occurs for two main purposes. First, women may migrate for human capital reasons. This involves either the continuation of formal or informal training; in other words, for increased schooling or labor force activity. Second, migration may be for marital purposes; either for marriage immediately, or to enter a more desirable marriage market. We might expect age and education to affect the length of residence in a new location prior to marriage, as a result of these two affects. Older age cohorts should be more traditional and marriage minded. This should be particularly true for women who chose to migrate within rural areas rather than from rural to urban areas. Table 4.26 shows ordinary least squares regression on age and education of the years in current residence before marriage. Only women who last migrated before marriage are included in this subsample.* For all women combined, the effect of age on pre-marital residence is positive. However, when rural-rural migrants (RR) are separated from rural to urban migrants (RU)† the ex-

*There is a selectivity bias here. If more migrant women are less traditional, women who have migrated before marriage may show a smaller effect of age on duration of residence prior to marriage.

†Only individuals with rural growth and previous residence were included.

Table 4.25 Distribution of Women by Timing of Migrations and Marriage

Migrated in same year as marriage	332
Migrated after marriage[a]	1,457
1) Migrated within one year after marriage	156
2) Migrated more than one year after marriage	1,301
Migrated before marriage[a]	1,797
1) Migrated within one year before marriage	588
2) Migrated more than one year before marriage	1,209
TOTAL	3,586[b]

[a]Excludes women who migrated in the same year as marriage.

[b]Only individuals for whom both duration of marriage and years of residence in the current location were available are included.

SOURCE: KWFS data tapes.

Table 4.26 Regressions Explaining Length of Wife's Pre-Marital Residence Among Pre-Marital Migrants, by Migration History

Variable	Migration Status RR	RU	All Pre-Marital Migrants
Intercept	3.389 (6.2)[a]	-0.135 (-0.1)	0.723 (1.2)
Age	-0.029 (-2.1)	0.042 (1.3)	0.035 (2.1)
Education of Wife	-0.059 (-1.8)	0.455 (7.4)	0.334 (11.6)
R^2	.01	.10	.07
F	2.7	27.8	70.1
N	737	525	1815

[a]Numbers in parentheses are t-values.

SOURCE: KWFS data tapes.

110

pected negative effect of age is found for rural-rural migrants, but age has no effect for rural to urban migrants.

Education should have a complex effect on the number of years between migration and marriage for pre-marital migrants. First, increased education raises earnings, hence marital opportunity costs, and may result in a delay of marriage. Second, more educated individuals may be more selective in mating and have a lower probability of finding a comparable mate (i.e., more educated). Third, if migration is for educational reasons, length of pre-marital residence may increase with education. All three reasons suggest a positive relation between pre-marital residence and education. These positive effects should be greater for individuals migrating to urban areas than for individuals migrating between rural areas since labor market and educational opportunities are greater in urban areas. Also, more educated women may migrate to urban areas for cultural opportunities and excitement and thus have a preference for deferred marriage. Table 4.26 shows that increased education increases length of pre-marital residence at the destination for rural-to-urban migrants. However, the education effect is negative for rural-rural migrants.

Although we do not present tables that show it, the positive effect of education on length of pre-marital residence increases with the husband's education when age cohorts are controlled. This may indicate mating selectivity. This effect was observable for both rural-rural migrants and rural-to-urban migrants. When age cohorts were controlled for, we also found the wife's education had a positive significant effect on length of work after marriage.

Table 4.27 shows that increased exposure to urban life increases pre-marital residence for each age and education group.

In order to test whether the urban exposure phenomenon is a labor market or marital search effect, we tested whether there was an urban exposure effect

Table 4.27 Mean Years of Pre-Marital Residence for Pre-Marital Migrants by Migration Status, Age, and Education

Age Group	Education of women	Migration Status RR	RU
20-24	Zero	--	--
	Primary	2.80[a]	3.76[a]
	Middle	2.00	3.21
	Above	--	--
25-29	Zero	3.24	3.71
	Primary	2.02[a]	3.91[a]
	Middle	3.68	4.12[a]
	Above	3.33	5.43[a]
30-34	Zero	2.47[a]	4.40
	Primary	1.83[a]	4.04[a]
	Middle	1.64	3.72[a]
	Above	--	11.04[a]
35-39	Zero	1.96[a]	1.58
	Primary	1.82[a]	3.12[a]
	Middle	3.60	5.47
	Above	--	8.13
40-44	Zero	2.28[a]	3.75
	Primary	1.90[a]	3.37
	Middle	--	--
	Above	--	9.14
45-49	Zero	2.60[a]	--
	Primary	1.43	2.78
	Middle	--	--
	Above	--	--

[a]Greater than 20 observations.

SOURCE: KWFS data tapes.

on work before marriage. If the urban exposure effect is primarily a labor market effect we would expect work before marriage to increase with the exposure to urban life. Table 4.28 shows there is no consistent tendency for premarital work experience to increase with the exposure to urban life.

4.5 Migration Status and Fertility

The mean number of desired children, shown in Table 4.29, increases with age. This may be due to an age cohort effect or a birth experience effect. The birth experience effect refers to the likelihood that the stated desired number of children may be positively related to the number of children the women has. The data show that the desired number of children decreases with the exposure to urban life. There is no distinct interaction between age and the exposure to urban life.

The mean number of children ever born, given in Table 4.30, decreases with the exposure to urban life for all age groups. The mean number of children increases with age less rapidly for more urbanized women. The difference between means for the ultra-rural women and other women increases with age. There is only a slight increase with age in the mean differentials for rural-urban and ultra-urban women. Part of the differences in children-ever-born by age may be due to differences in marital duration. Therefore, we correct for these differences in Table 4.31. As expected, this mean adjusted nuptial life birth rate (ANLBR) declines with age.*

The mean duration of marriage, DURMR in Table 4.32, decreases with urbanization across most age groups. Apparently, this cannot be explained by increased work prior to marriage among urbanized women, since more-urbanized women were found to work less prior to marriage (see Table 4.20). This may be

* $ANLBR = \frac{CEB}{DURMR}$.

Table 4.28 Mean Years of Pre-Marital Work Experience for Pre-Marital Migrants by Migration Status, Age, and Urbanization

Age Group	Education of women	Migration Status	
		RR	RU
20-24	Zero	2.25	2.00
	Primary	2.71[a]	2.61[a]
	Middle	1.50	2.03
	Above	--	2.33
25-29	Zero	2.94	3.42
	Primary	3.12[a]	2.85[a]
	Middle	2.57	2.86[a]
	Above	1.33	1.78[a]
30-34	Zero	2.98[a]	2.80
	Primary	2.25[a]	2.74[a]
	Middle	2.91	2.50[a]
	Above	2.00	2.91[a]
35-39	Zero	3.08[a]	2.76
	Primary	1.90[a]	2.77[a]
	Middle	--	3.18
	Above	--	2.12
40-44	Zero	1.93[a]	5.25
	Primary	1.73[a]	1.42
	Middle	--	--
	Above	--	5.71
45-49	Zero	1.76[a]	5.50
	Primary	1.50	2.33
	Middle	--	--
	Above	--	--

[a]Greater than 20 observations.

SOURCE: KWFS data tapes.

Table 4.29 Mean Number of Desired Children of Once-Married Women, by Age and Lifetime Migration Status

Age	Migration Status		
	R/R	R/U	U/U
20-24	2.98	2.71	2.61
25-29	3.16	2.74	2.68
30-34	3.48	2.98	2.77
35-39	3.80	3.17	2.94
40-44	3.92	3.36	3.10
45-49	4.10	3.33	3.54

SOURCE: KWFS data tapes.

Table 4.30 Mean Number of Children Ever-Born of Once-Married Women by Age and Lifetime Migration Status

Age	Migration Status					
	R/R		R/U		U/U	
	N	MEAN	N	MEAN	N	MEAN
20-24	182	1.55	127	1.38	38	1.53
25-29	349	2.52	495	2.11	176	1.99
30-34	407	4.01	388	3.28	167	2.80
35-39	450	5.21	326	3.99	114	3.50
40-44	371	6.19	214	4.56	80	4.25
45-49	257	7.00	149	5.76	52	5.02

SOURCE: KWFS data tapes.

Table 4.31 Mean Adjusted Fertility (ANLBR) of Once-Married Women, by Age and Lifetime Migration Status[a]

Age	Migration Status		
	R/R	R/U	U/U
20-24	0.57	0.59	0.70[b]
25-29	0.43	0.45	0.44
30-34	0.35	0.34	0.33
35-39	0.30	0.25	0.24
40-44	0.26	0.20	0.20
45-49	0.23	0.20	0.19

[a]Adjusted fertility (ANLBR) - the ratio of children ever-born to marital duration, i.e. number of births per year of married life.

[b]Only 38 observations.

SOURCE: KWFS data tapes.

Table 4.32 Mean Duration of Marriage of Once-Married Women, by Age and Lifetime Migration Status

Age	Migration Status		
	R/R	R/U	U/U
20-24	3.28	2.82	3.21[a]
25-29	6.30	5.34	4.90
30-34	11.74	10.16	9.08
35-39	17.67	16.36	14.70
40-44	24.06	22.32	21.43
45-49	30.38	29.24	27.81

[a]Only 38 observations.

SOURCE: KWFS data tapes.

due simply to increased education of more-urbanized women. There is evidence that marital duration increases less rapidly with age as exposure to urban life increases. This may be an education or cohorts effect, since education may decrease with age at a less rapid rate among more-urbanized women. The differences between mean marital durations increase with age for each migration status pairing.

There is some evidence that ultra-rural women have less knowledge of efficient birth control methods than more urban women. Except for the age group 20-24, Table 4.33 shows that the percentage of women having knowledge of efficient methods increases with the exposure to urban life, and the percentage ignorant of any method decreases with the exposure to urban influences. Beyond the youngest age group, knowledge of efficient methods decreases with age and ignorance of any method increases with age. For most groups, women had either no knowledge or had knowledge of at least one efficient method. Only two women knew only folk methods or inefficient non-folk methods.

The use of efficient birth control methods first increases then decreases with age, as Table 4.34 shows. In three of the six age groups, ages 30-34, 35-39, and 45-49, use of efficient methods increases with the exposure to urban life. In four age groups, the above three and age 25-29, the use of no method declined with the exposure to urban influences. In the remaining age groups there was no distinct pattern.

4.6 Summary of Chapter 4

The raw data from the 1974 KWFS permit a detailed analysis of lifetime migration. Among 4,540 once-married, currently married women, 20 percent had never moved from their community of birth, 45 percent had a rural birth and current residence, and 35 percent had a rural birth and urban current residence. A large share of the women born and currently residing in rural areas,

Table 4.33 Frequency Distribution of Once-Married Women, by Age, Knowledge of Efficient Birth Control Method and Lifetime Migration Status

Age	Knowledge of Efficient Method	Migration Status					
		R/R		R/U		U/U	
		N	%	N	%	N	%
20-24	a) At Least One	174	95.6	126	99.2	36	94.7
	b) At Least One Non-Folk, no Efficient	0	0.0	0	0.0	0	0.0
	c) Folk Method Only	0	0.0	0	0.0	0	0.0
	d) No Method	8	4.4	1	0.8	2	5.3
			100.0		100.0		100.0
25-29	a)	346	99.1	490	99.0	176	100.0
	b)	0	0.0	0	0.0	0	0.0
	c)	0	0.0	0	0.0	0	0.0
	d)	3	0.9	5	1.0	0	0.0
30-34	a)	399	98.0	388	100.0	167	100.0
	b)	0	0.0	0	0.0	0	0.0
	c)	0	0.0	0	0.0	0	0.0
	d)	7	1.7	0	0.0	0	0.0
35-39	a)	439	97.6	324	99.4	114	100.0
	b)	0	0.0	0	0.0	0	0.0
	c)	0	0.0	0	0.0	0	0.0
	d)	11	2.4	2	0.6	0	0.0
40-44	a)	359	96.8	205	95.8	80	100.0
	b)	0	0.0	0	0.0	0	0.0
	c)	1	0.3	0	0.0	0	0.0
	d)	11	3.0	9	4.2	0	0.0
45-49	a)	234	91.1	140	94.0	50	96.2
	b)	0	0.0	1	0.7	0	0.0
	c)	0	0.0	0	0.0	0	0.0
	d)	22	8.6	8	5.4	2	3.8

SOURCE: KWFS data tapes.

Table 4.34 Frequency Distribution of Once-Married Women by Age, Use of Efficient Birth Control Method and Lifetime Migration Status

Age	Use of Method	Migration Status R/R #	R/R %	R/U #	R/U %	U/U #	U/U %
20-24	a. At Least One Efficient Method	53	29	40	32	8	21
	b. " " " Ineffficient Method and no Efficient Method	7	4	7	5	2	5
	c. Folk Method Only	0	0	0	0	0	0
	d. No Method	121	67	79	63	28	74
		181		126		38	
25-29	a.	174	50	231	47	95	54
	b.	15	4	34	7	15	9
	c.	0	0	1	0	0	0
	d.	159	46	224	46	65	37
		348		490		175	
30-34	a.	241	60	249	65	116	69
	b.	25	6	23	6	10	6
	c.	0	0	1	0	0	0
	d.	136	34	113	29	41	25
		402		386		167	
35-39	a.	300	67	242	74	86	75
	b.	13	3	18	6	7	6
	c.	1	0	0	0	0	0
	d.	136	30	65	20	21	18
		450		325		114	
40-44	a.	222	60	119	56	46	58
	b.	6	2	16	7	4	5
	c.	1	0	1	0	0	0
	d.	141	38	78	36	30	38
		370		214		80	
45-49	a.	80	31	57	38	21	40
	b.	7	3	2	1	7	13
	c.	1	0	0	0	1	2
	d.	168	66	90	60	23	44
		256		149		52	

SOURCE: KWFS data tapes.

88 percent, had no intervening urban experience. A large share of rural-urban migrants, 62 percent, moved to their current location with the ten-year period prior to 1974. There was evidence that women with a consistent urban residence were more likely to remain urban than women with comparable consistent rural residence. We found that residence backgrounds of husbands and wives have become more dissimilar over time, especially among couples with an urban current residence.

Within the sample, of the 78 percent who had migrated, over half (40 percent of all sampled) had last migrated prior to marriage. While the largest share of pre-marital migrants (45 percent) remained rural, the largest share of post-marital migrants (40 percent) were rural-urban migrants. Again, we expect differences in selectivity and adaptivity between pre-marital and post-marital migrants.

Women were characterized by the extent of urban background, which ranged from rural birth-rural residence to urban birth-urban residence. Using the 1974 Korean World Fertility Survey tapes, we found that education of once-married females increased with the extent of urban background and this effect was greater for older age cohorts. The same was true for literacy, as expected.

The probability of labor force participation prior to marriage increased with the extent of urban background although the average duration of work prior to marriage declined with urban residence. We found that education increased the duration of residence at the new location prior to marriage only among rural-urban migrants. Among rural-rural migrants, the education effect was negative. The duration of pre-marital residence also independently increased with the husband's education level. Urbanization increased the duration of premarital residence, even when age and education were controlled. We feel that the motivational factors for migration after marriage are quite different from those before marriage, and motivations (for work, schooling, or marriage) among pre-marital migrants may depend upon whether migration is rural-urban or rural-rural.

The wife's education had a positive effect on the duration of work after marriage. Unexpectedly, the percentage of women working at least once after marriage declined with the extent of urban background. The share of women working in the interval from marriage to first birth declined with the extent of urban background. We may find that work is more compatible with child rearing, or more necessary, for rural women.

The mean number of desired children, as well as actual children-ever-born, decreased with the extent of urban background for each age cohort.

The mean duration of marriage decreased with the extent of urban background even though the mean duration of work prior to marriage also decreased with urban background. Education may simply be delaying marriage among urbanized women.

There was evidence that the extent of urban background was associated with more knowledge and use of efficient birth control methods, although the contrast was not as great as expected.

Among migrants, 1,076 of 3,586 (30 percent) married within a year of their last migration. It is likely that marriage and migration are behaviorally related, although causation can run either way. We found that the length of residence of migrants was positively related to the duration of marriage primarily for rural-rural migrants. The fact that this was not consistently true among rural-urban migrants suggests that rural-urban migration may be more for labor market reasons than for marriage reasons. However, when we consider only pre-marital migrants, the relation becomes positive and significant for all migrant groups. This relation between duration of residence and duration of marriage suggests that a possible spurious correlation will exist between duration of residence and marital fertility.

122

CHAPTER 5: THE AUTOREGRESSIVE MODEL AND ITS APPLICATION TO THE 1974 KWFS

In previous chapters we have outlined the literature that has supported the alternative hypotheses of adaptation or selective migration as explanations of reduced fertility observed among rural-urban migrants. We have described the rapid, large-scale rural-urban migration that has occurred in Korea, especially during the last 15 years or so. We also reported the socio-economic characteristics and migration patterns of the whole sample in the 1974 KWFS for such items as migration pattern, education, and age at marriage. In this chapter we propose to use an autoregressive (lagged variable) model for analyzing the effect on fertility of rural-urban migration after controlling for the selectivity of that migration. The 1974 Korean World Fertility Survey data are used for this analysis. As is often the case in studying fertility, we wish to draw conclusions about individual preferences and actual behavior with respect to family size without waiting for the women in question to complete their child-bearing years. Moreover, we wish to compare the fertility behavior of the rural-urban migrants with an "appropriate" control group. To achieve these analytic objectives we shall start with the theory of consumer utility.

5.1 Consumer Utility Theory

Figure 5.1 illustrates the nature of children-goods decisions. The utility-maximizing individual facing budget constraint "a" (representing the prices of children and goods relative to one another) plans to be at point X in the children-goods plane. Identifying budget constraint "a" and the number of children can identify the preference function, V. A different budget constraint "b" may result in a different equilibrium position, as point Y shows. Suppose that rural-urban migration has only the effect of changing the

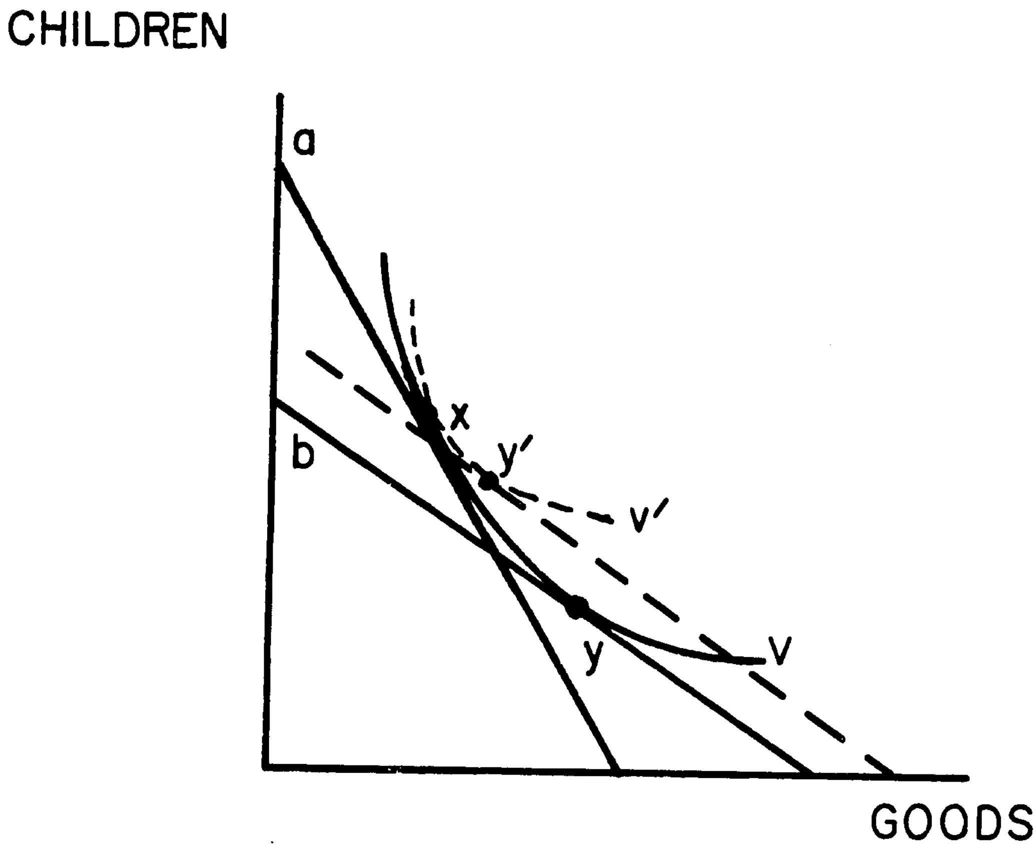

Figure 5.1. Consumer Children-Goods Equilibrium

budget constraint of an individual from "a" to "b", where the relative cost of children is greater. The change in equilibrium from X to Y represents the rural-urban migration effect. Unless we observe completed fertility, we cannot observe X and Y. We are limited to observing rural-urban migration in the middle of the process of a family attempting to reach X or Y.

In order to isolate the effect of rural-urban migration on the fertility process, we must determine how fertility of the rural-urban migrant differs from what it would have been had the individual not migrated. This can be done by directly comparing the rural-urban migrant to rural stayers with similar family structure preferences (both size and spacing) and premigration constraints. In the absence of explicit knowledge of preferences, we shall assume that individuals facing the same budget constraint and having identical desired number of children will have identical preferences, at least in the neighborhood of their equilibrium. Furthermore, we shall assume that individuals at the same point in their life cycle (age, marriage, etc.), facing identical budget constraints, and having the same number of actual children will have identical preferences. Thus, reasonable statistical control for preferences consists of individuals with the same budget constraints, stage of life cycle, and number of children. By controlling for these three variables <u>prior to migration</u>, we control for preferences and isolate the effect of rural-urban migration alone.

This statistical control is not perfect. Its validity can be tested by using different comparison groups to represent fertility in the absence of migration. The problem is that we do not know a priori which comparison group will be most likely to have similar preferences. In the approach above we assume that preferences are identical if the observed situations prior to migration are identical. However, rural-urban migrants may be more willing to trade off between children for market goods than rural stayers, as preference function V' for non-migrants in Figure 5.1 shows. In this case, the observed effect of migration on fertility, X-Y, will overstate the adaptation of fertility to the new urban constraints. If rural stayers with preference function V' had migrated to the urban area, their fertility response would have been less than X-Y. A portion, Y'-Y, of the measured migration effect, X-Y, is due to the selectivity bias of different preferences and not to migration.

We should pick a comparison group with similar children-goods trade-offs around the point of equilibrium; i.e., with a similar preference function. Except for involuntary migration, migrants probably are more flexible than non-migrants to changes in budget constraints. For this reason, comparison of rural-urban migrants with rural-rural migrants, holding pre-migration fertility, life cycle, and budget constraints constant, should reduce the selectivity bias in the test of fertility adaptation to changing constraints through rural-urban migration.*

5.2 The Autoregressive Model

An analytic tool providing the statistical controls required to isolate the effect of rural-urban migration on the fertility of migrants may be found in an autoregressive (or lagged variable) model in which fertility at a given time, t, is a function of fertility at previous times, and several other variables. This model has been adopted from the work of Ashenfelter (1978) in which he used an autoregressive earnings function to ascertain the effect on earnings of participation in manpower training programs. (In Chapter 8 we

*This is analogous to the problem of finding a comparison group with which to test the effect of manpower training programs. Rather than using non-participants as a control, some researchers have suggested that a better control is enrollees in a program who chose not to participate (Ehrenberg, 1979, p. 159).

compare the results of our analysis with those from alternative models used in previous studies of rural-urban migration fertility changes.)

Analogous to Ashenfelter, an autogressive fertility function can be defined as:

$$y_{it} = \beta_0 + \sum_{j=1}^{k} \beta_j \, y_{i(t-j)} + \sum_{j=1}^{k'} \beta'_j \, A^j_{it} + \sum_{j=1}^{k''} \beta''_j \, \eta^j_{it} \qquad (5.1)$$

$$+ \alpha_{t(t-s)} M_{i(t-s)} + \varepsilon_i + \varepsilon_t + \varepsilon_{it},$$

where for each individual (i), at time (t):

- y_{it} = children ever born (number)
- A_{it} = age (years)
- D_{it} = marital duration (years)
- $M_{i(t-s)}$ = migration dummy variable (1 if the individual migrated "s" periods ago; otherwise zero)
- ε_i = fixed effect for i^{th} individual
- ε_t = fixed effect for t^{th} time period
- ε_{it} = residual error term
- j = index of number of variables (lagged or raised to a power) being included.

The fixed effect, ε_i, captures such factors as preferences and is invariant over time. Holding t constant, A_{it} captures both birth cohort and biological constraints. D_{it} captures marital exposure, or the stage in the marital cycle. Since $M_{i(t-s)}$ = 0 or 1 according to whether the individual migrated s periods ago, $\alpha_{t(t-s)}$ represents the incremental effect of migration s periods ago on the number of children born during period t. Note that $M_{i(t-s)}$ effectively separates rural-urban migrants from non-migrants and allows comparison of their respective fertility behavior when values for the other variables, including previous fertility, are equivalent.*

*In Section 5.5 we discuss the possible biases of estimates of this migration dummy variable.

Figure 5.2 illustrates the interpretation of the migration coefficient, α, in Equation 5.1. Abstracting from age and duration of marriage and assuming that $\beta_j = 0$ for $j > 1$, $y_t = \beta_0 + \beta_1 y_{t-1} + \alpha_t M_{t-s}$. Assuming $\beta_1 = 1$ and $M = 0$, the line, ON, has slope β_0. Letting the horizontal axis represent years since migration so that $t = s = 1$, $\alpha_1 < 0$ is the effect of migration on fertility in the (0,1) interval. In other words, the number of children increased by α_1 less for migrants in this interval than for non-migrants. If $\alpha_3 < \alpha_2 < \alpha_1 < 0$, the pattern would be Oabe. Pattern Oabc represents temporary fertility rate adjustment to urban life immediately after migration but with no effect on post-migration fertility rates. Pattern Oabd shows a permanent reduction in fertility rates but with no change due to length of urban residence. Pattern Oabe shows continued downward adjustment in fertility rates with exposure to urban life. If selectivity has been controlled, only pattern Oabe shows adaptation of fertility to increasing urban residence duration.

The specification in Equation 5.1 is constraining in these ways: First, it assumes that migration at time t-s is random so that β, β', and β'' are independent of migration status. In other words, migrants and non-migrants are assumed to have the same fertility functions prior to migration. Second, it assumes that migration affects fertility additively with no age or duration of marriage interactions.

Writing Equation 5.1 explicitly for t, t-1, ... t-n, for the set of individuals who either never migrated or migrated s years ago:

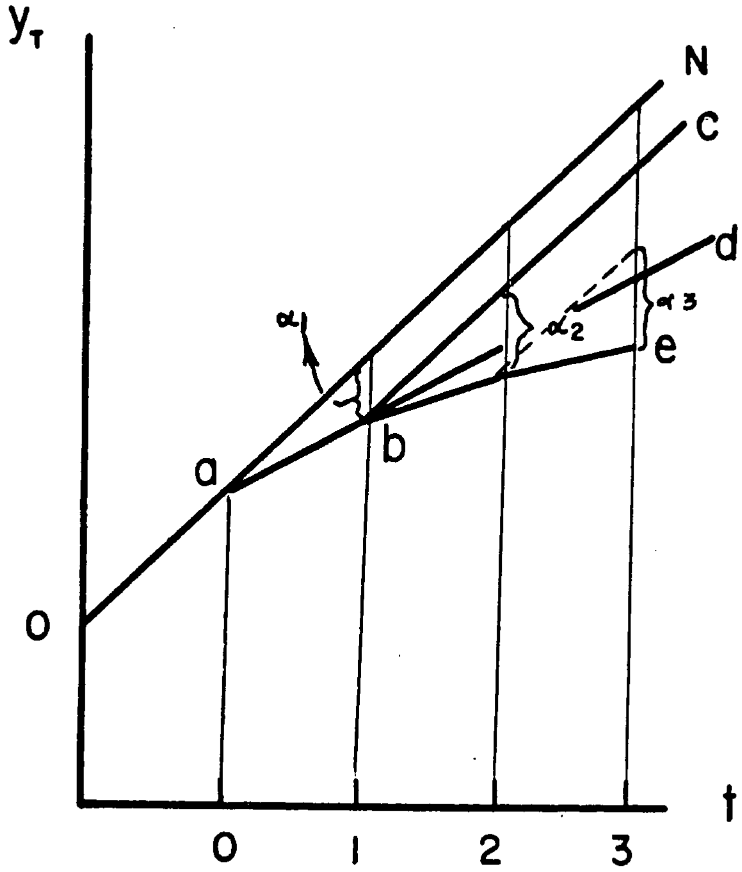

Figure 5.2. Fertility Adaptation Through Time After Migration

$$y_{it} = \beta_0 + \beta_1 y_{i,t-1} + \beta_2 y_{i,t-2} + \ldots \sum_j \beta'_j A^j_{it} + \sum_j \beta''_j D^j_{it} + \alpha_{t,t-s} M_{i,t-s} + \varepsilon_i + \varepsilon_t + \varepsilon_{it}$$

$$y_{i,t-1} = \beta_0 + \beta_1 y_{i,t-2} + \beta_2 y_{i,t-3} + \ldots \sum_j \beta'_j A^j_{i,t-1} + \sum_j \beta''_j D^j_{i,t-1} + \alpha_{t-1,t-s} M_{i,t-s} + \varepsilon_i + \varepsilon_{t-1} + \varepsilon_{i,t-1} \quad (5.2)$$

$$\vdots$$

$$y_{i,t-n} = \beta_0 + \beta_1 y_{i,t-n-1} + \beta_2 y_{i,t-n-2} + \ldots \sum_j \beta'_j A^j_{i,t-n} + \sum_j \beta''_j D^j_{i,t-n} + \alpha_{t-n,t-s} M_{i,t-s} + \varepsilon_i + \varepsilon_{t-n} + \varepsilon_{i,t-n}$$

Equation 5.2 can be estimated directly. The coefficient of the migration dummy, $\alpha_{t,t-s}$, measures the <u>incremental</u> effect of migration in period t-s on fertility at time t.*

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*Substituting y_{it-1} into the equation for y_{it}, we obtain:

$$y_{it} = \beta_0 (1+\beta_1) + (\beta_1^2+\beta_2) y_{i,t-2} + (\beta_1\beta_2+\beta_3) y_{i,t-3} + \ldots + \sum \beta'_j A^j_{it} + \beta_1 \sum \beta'_j A^j_{i,t-1} + \sum \beta''_j D^j_{it} + \beta_1 \sum \beta''_j D^j_{it-1} + (\alpha_{t,t-s} + \beta_1 \alpha_{t-1,t-s}) M_{i,t-s} + (1+\beta_1) \varepsilon_i + \varepsilon_t + \beta_1 \varepsilon_{t-1} + \varepsilon_{it} + \beta_1 \varepsilon_{i,t-1} \quad (5.3)$$

Where $(\alpha_{t,t-s} + \beta_1 \alpha_{t-1,t-s})$ is the cumulative effect of migration at time t-s on fertility in the periods t and t-1. More generally, for t-n, by substituting $y_{i,t-2}$, $y_{i,t-3}$ ...recursively into (5.3):

$$y_{it} = \beta_0^* + \beta_n^* y_{i,t-n-1} + \beta_{n-1}^* y_{i,t-n-2} + \ldots + \sum \beta'^*_j A^j_{it} + \ldots + \sum \beta''^*_j D^j_{it} + \ldots + \alpha^*_{t,t-s} M_{i,t-s} + \varepsilon_i^* + \varepsilon_t^* + \varepsilon_{it}^* \quad (5.4)$$

Equation 5.4 can be estimated directly. Again, α^* represents the <u>cumulative</u> effect of migration in period t-s on fertility over the entire n <u>periods</u> t through t-n.

Both equations, (5.2) and (5.4), are useful. Equation 5.2 can be used to estimate the <u>incremental</u> effect of migration by year, and Equation 5.4 can be used to estimate the <u>cumulative</u> effect of migration over a time period. However, knowing $\alpha_{t,t-s}$, $\alpha_{t-1,\ t-s}$ ... and β_1, β_2, ...permits the derivation of $\alpha^*_{t,t-s}$, as shown in Equation 5.3.

5.3 Specification of Recursive Fertility Equations

We could use Equation 5.2 to estimate the incremental effect of migration on fertility, or we could use Equation 5.4 to estimate the cumulative effect. Before estimating either equation it is necessary to specify the recursive structure; in order to determine how many lagged fertility values to include, we estimated Equation 5.2 for different migration cohorts and lag structures. For example, the first two rows of Table 5.1 show estimates of Equation 5.2 for migration cohort 1970-74 using different lag structures. Let y_t in the first equation of Equation 5.2 be children ever born prior to and including 1974; y_{t-1} children ever born prior to and including 1969; y_{t-2} children born by 1964; y_{t-3} children born by 1959; M = 1 if a rural-urban migrant, 0 if a rural stayer (migrant or non-migrant).

Row 1 of Table 5.1 shows that $\beta_1 = 1.034$, $\beta_2 = -.195$, $\beta_3 = .119$, and $\alpha_{74,70-74} = -.260$. (Table 5.1 does not include A and D variables.) Row 2 of Table 5.1 estimates fertility Equation 5.2 with restricted recursive structure $\beta_2 = \beta_3 \equiv 0.0$. The migration effect is estimated to be -.260 when the three-period lag structure is used, and -.271 when the one-period lag structure is used.

Three-period and one-period lag structures produce very little difference in the estimates of migration effects. This is true for all migration cohorts, as Table 5.1 shows. This is further confirmed using Equation 5.2 for different base years, as Tables A.5.1 through A.5.4 in the Appendix show. For this reason we believe using only a one-period lag structure is sufficient to isolate the migration effect.

Using one-period lag structures, we found that including quadratic terms for age and duration of marriage resulted in the best fits (adjusted R^2's).

Table 5.1 Recursive Structure of Fertility Equation 5.2 for the Year of Observation 1974 by Years of Migration Cohort

Migration Cohort	Periods of Lag	Migration Dummy Variable	Coefficient of Fertility in		
			1969	1964	1959
1970-74	1	-.260	1.034	-.195	.119
		(-4.13)	(25.57)	(-3.56)	(2.08)
	3	-.271	.947	-	-
		(-4.29)	(36.84)	-	-
1965-69	1	-.142	.995	.210	.176
		(-2.27)	(23.97)	(-3.79)	(2.99)
	3	-.140	.919	-	-
		(-2.22)	(34.24)	-	-
1960-64	1	-.293	1.103	-.220	.076
		(-4.01)	(26.44)	(-3.97)	(1.28)
	3	-.304	.986	-	-
		(-4.15)	(36.46)		
1955-59	1	-.380	1.111	-.199	.023
		(-4.52)	(24.95)	(-3.30)	(.38)
	3	-.419	.985	-	-
		(-4.98)	(35.73)	-	-

t-values are shown in parentheses.

All regressions of Equation 5.2 will include such terms. Consequently, we first estimate equations of the following form for different migration cohorts for different years of observation.

$$y_{it} = \beta_0 + \beta_1 y_{i,t-1} + \beta_1' A_{it} + \beta_2' A_{it}^2 + \beta_1'' D_{it} + \beta_2'' D_{it}^2 + \alpha_{t,(t-s)} M_{i,t-s} + \varepsilon_t \tag{5.5}$$

where y_t is children ever born by year t, A is age at time t, D is duration of marriage at time T, and $\varepsilon_t = \varepsilon_i + \varepsilon_t + \varepsilon_{it}$.

It was noted above that selecting the proper comparison group, one with child-bearing preferences similar to rural-urban migrants, would permit the isolation of the rural-urban migration effect. Rural-urban migrants differ in two ways from rural non-migrants. First, they chose to migrate and, second, they chose to leave the rural area. These two effects are confounded in using the rural non-migrants as the comparison group: a migration effect and an urban preference effect. On the other hand, rural migrants who remain in rural areas chose to migrate, but chose not to leave the rural area. Comparing rural-urban migrants with rural-rural migrants should isolate the effect of rural-urban changes in constraints on fertility. However, in order to test whether the Ashenfelter model is effective in controlling for preferences, we will make separate estimates, using both rural non-migrants and rural-rural migrants as the comparison groups for rural-urban migrants. There is still a selectivity bias present in this comparison if rural stayers (rural non-migrants together with rural-rural migrants) have different fertility preferences from rural-urban migrants. For example, rural stayers may have less elastic preference functions than rural-urban migrants even when controlling for their position in the children-goods plane and their budget constraints.

In our first regressions, we used the rural non-migrants as the comparison group. We let $M_{t-s} = 1$ in Equation 5.5 if the woman changed her place of residence from a rural to urban residence s periods prior to year t; 0 otherwise. Place of residence is defined in the 1974 KWFS as the city, town, or village of residence. Given t, s determines the year of migration. Alternatively, given the year of migration, s determines t, the year of observation. We can estimate Equation 5.5 for a migration cohort that migrated in a given year, but observe the incremental effect of migration in that year on fertility at various times before and after migration.

The recursive model assumes that autoregressive structures for migrant and non-migrant are identical. The importance of this assumption can be shown in Figure 5.3. If migrants actually had an autoregressive structure represented by b'b, our measure of the migration effect in Equation 5.5, ac in Figure 5.3, would overestimate the migration effect.

We tested whether the autoregressive structure of post-marital migrants and non-migrants differed prior to migration. Taking only the 1970-74 migration cohort, we performed two Chow (1960) tests on the constancy of the β_1 coefficient in Equation 5.5 using y_t = C69, y_{t-1} = C64 for one test and y_t = C64, y_{t-1} = C59 for the other test, where CXX represents children ever born prior to and including year XX. Both Chow tests showed no significant difference in the first order autoregressive structures between rural non-migrants and rural-urban migrants prior to migration. We performed a similar test for the 1965-69 migration cohort and obtained identical results.* We

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*For migration cohort 1970-74, the respective F values were .30 and .18 with (12/731) degrees of freedom. For cohort 1965-69, the F values were .003 and 0.005 with (14,674) d.f. using y_t = C64, y_{t-1} = C59 and y_t = C59, y_{t-1} = C54, respectively.

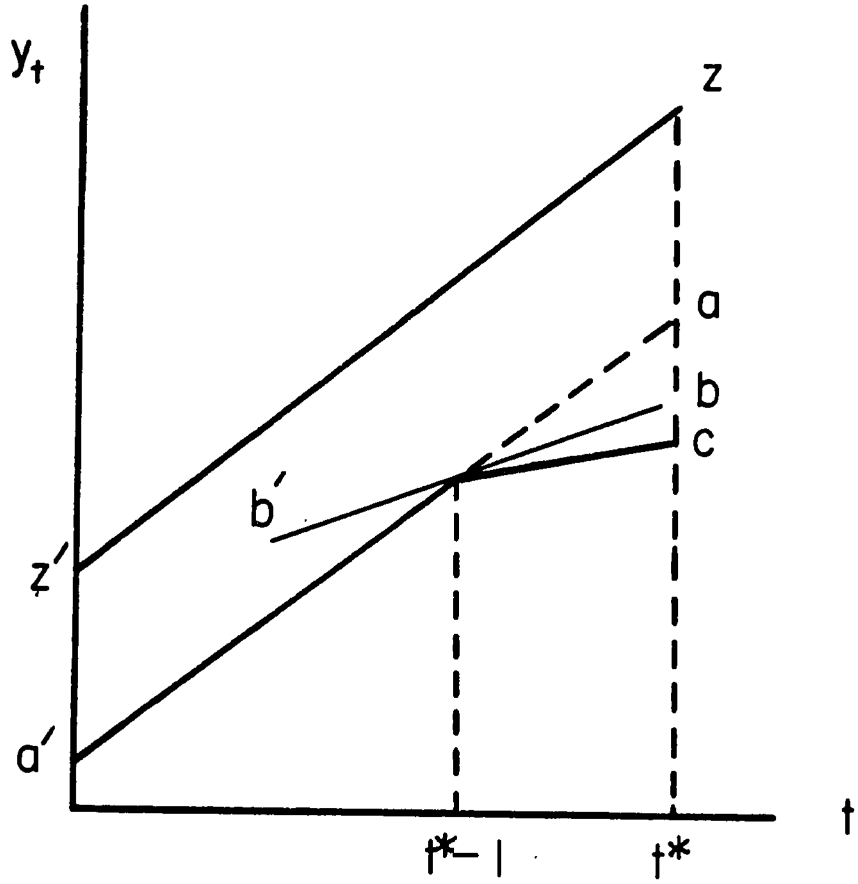

Figure 5.3. Migration Effect in an Autoregressive Structure

135

concluded from these tests that the autoregressive model is appropriate to use as a model for estimating migration effects.

5.4 Estimates of Equation 5.5

The analyses presented in Sections 6.2, 6.4a, 6.5a, and 6.5d in Chapter 6 investigate the incremental effect of rural-urban migration on the fertility of migrants in order to test the adaptation hypotheses. These analyses are based on the 25 regression estimates of Equation 5.5 for five-year interval migration cohorts for each of the five years of observation: 1974, 1969, 1964, 1959, and 1954.

The fertility data for the years prior to the survey year, 1974, were obtained from the individual woman's lifetime fertility history. To cover the longer period of a woman's lifetime fertility pattern, we chose observation years at five-year intervals, 1974, 1969, 1964, 1959, and 1954 rather than consecutive years.* All women in the sample were currently married in 1974 and had been married only once. They also had at least one live birth by 1974 and were aged 20 to 49, inclusive.

Table 5.2 reports the coefficient estimates of M_{t-s} from 25 regressions of Equation 5.5 using our basic rural-urban migrants and rural non-migrants comparison group.

5.5 Estimates of the Autoregressive Model Pooling Different Migration Cohorts

The analyses presented in Sections 6.3, 6.4b, 6.5b, 6.5c, and 6.6 investigate the effect of rural-urban migration on a migrant's completed fertility to test the adaptation hypotheses and are based on a slightly modified form of Equation 5.5.

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*Furthermore, as pointed out by Hiday (1978) in her Philippine study, a measure of fertility based on five-year intervals rather than one-year intervals makes the child-woman ratio more stable.

Table 5.2 Rural-Urban Migration Coefficients from 25 Regressions of Equation 5.5 for Korean Currently Once-Married Women With At Least One Live Birth by Migration Cohort and Year of Observation; Comparison Group: Rural Non-Migrants (t-values in parentheses)

Migration Cohort	Year of Observation				
	1974	1969	1964	1959	1954
1970-74	-.2707 (-4.29)	-.2142 (-4.03)	.0057 (.12)	.0250 (0.61)	-.0157 (-0.54)
1965-69	-.1396 (-2.22)	-.2084 (-4.05)	-.0909 (-2.09)	-.0356 (-0.94)	-.0049 (-0.17)
1960-64	-.3040 (-4.15)	-.2720 (-4.13)	-.0795 (-1.41)	.0096 (0.20)	-.0295 (-0.81)
1955-59	-.4187 (-4.98)	-.3682 (-4.98)	-.0009 (-0.01)	-.0077 (-0.13)	-.0315 (-0.74)
1950-54	-.4345 (-4.57)	-.4609 (-5.37)	-.1766 (-2.37)	.1267 (1.77)	-.0082 (-0.16)

We can pool all rural-urban migrant cohort groups to test the adaptation hypotheses by amending Equation 5.5:

$$y_{it} = \beta_0 + \beta_1 y_{i,t-5} + \gamma_1 A_{it} + \gamma_2 A_{it}^2 + \sum_{j=1}^{7} \alpha_j M_{ij} + \varepsilon_{it} \qquad (5.6)$$

where y_t and y_{t-5} (CEB05) are children ever born to women by year t and t-5, respectively; A_t (AGEC) is the woman's current age at year t; ε_t is an error term; and M_{ij} are dummy variables for women who migrated during a given five-year-migration interval, j, with j = 1, 2, 3, 4, 5, 6 and 7 for the migration periods 1970-74, 1965-1969, 1960-1964, 1955-59, 1950-54, 1945-49, and before 1945, respectively.* We can estimate Equation 5.6 for t = 1974, 1969, 1964, 1959, and 1954.†

Equation 5.6 states that when the fertility levels five years prior to time t of both rural-urban migrants and rural stayers are equal, the current fertility levels are a function of age, the square of age and the migration status. The coefficients, α_j, of the migration dummy variables represent the fertility differential (between rural stayers and rural-urban migrants who migrated during the jth period) occurring during the past five years controlling for women's fertility level at the beginning of the period and age.

The selectivity of the rural-urban migrants out of rural populations is expected to be captured by the fertility level of the previous period, y_{t-5}. The changes in fertility patterns over the life cycle due to the biological factors that are not influenced by deliberate birth control behavior are expected to be captured by the nonlinear function of the age variables.

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*Note that Equation 5.6 includes two more migration cohort periods, namely, 1945-49 and before 1945, than Table 5.2 includes.

†Equation 5.6 was also regressed for each of ten years of observations 1965-1974 and the results of these estimates are presented in Section A.5.2 in the Appendix. In these estimates, y_{t-5} is replaced by y_{t-1}.

Unlike Equation 5.5, the marriage duration variables are not included in Equation 5.6. The reason for this is that we can attribute the difference between the fertility behavior of rural-urban migrants and rural stayers due to the different marriage patterns and marital fertility controls to the effect of migration status.* If, for example, migrants delay marriage and thus have lower fertility, inclusion of duration of marriage will tend to reduce the fertility depressing effect estimated for migration. Also, as discussed later, the duration of the marriage is influenced by both migration status and the desired family size. Thus the inclusion of the duration of marriage variables in Equation 5.6 could cause simultaneous equation bias problems.

All the women in our sample are currently married with at least one live birth by 1974. Whenever the woman was not married or had no children ever born in earlier observed years, for example 1969, the observation for this woman is omitted in the regression for that year of observation, t = 1969. The distribution of total rural-urban migrants and rural stayers by year of observation and migration status used to estimate Equation 5.6 is presented in Table 5.3. In our working sample of 2,871 currently married women, 1,641 women are rural stayers and 1,230 women are rural-urban migrants. (Rural stayers include rural-rural migrants as well as rural non-migrants). More

*The concept employed here is very similar to the age-ratio, ARAT (a) introduced by Boulier and Rosenzweig (1978b). The age-ratio is defined as the ratio of the children ever born to women of a given age divided by the number of total births that would be observed by that age if the women had reproduced from age 12 at fertility rates given by the natural fertility schedule. The number of total births (denominator) here is computed on the assumption that all the women are married by age 11 and so it does not depend on the women's actual ages at marriage. They used this concept to standardize cumulative fertility by age patterns of fecundity and decompose the influence of socio-economic variables on the standardized cumulative fertility into one part acting through the age at marriage and another part acting through deliberate control exerted within marriage to reduce fertility.

Table 5.3 Distribution of Total Rural-Urban Migrants and Rural Stayers by Year of Observation and Migration Status

Migration Status	Year of Observation				
	1974	1969	1964	1959	1954
Rural Stayers	1641	1379	1113	795	448
Migrants	1230	887	591	395	203
1970-74	323	159	96	54	30
1965-69	379	264	122	73	30
1960-64	192	163	113	67	34
1955-59	135	113	103	71	22
1950-54	112	104	85	70	40
1945-49	61	56	45	35	25
Before 1945	28	28	27	25	22
Total	2871	2266	1704	1190	651

than one-fourth of the rural-urban migrants had migrated within five years of the survey year 1974 and more than one-half of migrants migrated within ten years. Only 89 women migrated before 25 years ago. (However, it is important to warn that this observation does not necessarily imply that the majority of Korean rural-urban women migrants have migrated within the last ten years. Our sample is not representative since it includes only currently married women aged 20 to 49 inclusive.) Table 5.3 also reveals that only 651 women (448 rural stayers and 203 rural-urban migrants) appear in each of the regressions for all five years of observation.

It is tempting to pool time series and cross-sectional data rather than to do a separate regression of Equation 5.6 for each of the five years of observation. However, this is not acceptable due to period effects. For example, the fertility level in 1969 of migrants who migrated during 1960-64 should be compared with that of comparable rural stayers at the same year, 1969, not with the average fertility level of rural stayers over the years 1954 through 1974. In rapidly developing societies such as Korea, the general fertility pattern at the different calendar years varies substantially due to the increased family planning programs sponsored by government, economic development and other things that are independent of birth cohort, age, and the individual woman's socioeconomic characteristics.

As pointed out by Cooley, McGuire and Prescott (1979), the least squares regression estimation of the autoregressive model originally developed by Ashenfelter (1978) could yield inconsistent estimators of the coefficients for the migration status dummy variables, M_j in Equation 5.6. The rationale for including the previous period fertility variable, y_{t-5}, in our equation is that y_{t-5} serves as a proxy for the observable and unobservable selectivity characteristics of migrants. Women's education level and occupational experience prior to migration are examples of the observed factors, while preferences for smaller family size and mobility aspirations are examples of the unobserved factors. Since it is reasonable to assume that both y_{t-5} and M_j are influenced by the selectivity of migrants, it is not difficult to see why the least square estimators of the coefficients for M_j could be inconsistent. A possible solution to the above problem exists if the coefficient of y_{t-5} is not significantly different from 1. If this is true, we can modify Equation 5.6 by subtracting $y_{i,t-5}$ from both sides of the equation:

$$y_{it} - y_{i,t-5} = \beta_0 + \gamma_1 A_{it} + \gamma_2 A_{it}^2 + \sum_{j=1}^{7} \alpha_j M_{ij} + \varepsilon_{it} \tag{5.7}$$

Table 5.4 shows our estimates of Equation 5.6 for the five different years of observation. The t-test statistics for the null hypothesis, $\beta_1 = 1$, are computed based on the estimates for the coefficient of CEB05 in Table 5.4. These t values are 5.1, 4.93, 1.16, -.42 and .04 for years of observation, 1974, 1969, 1964, 1959, and 1954, respectively.

The critical value at the five percent significant level is 1.96. The hypothesis $\beta_1 = 1$ cannot be rejected for the years 1964, 1959 and 1954; but it is rejected for the years 1974 and 1969. Thus, Equation 5.7 is not statistically acceptable for the years 1974 and 1969.

However, the proposed tests presented above could be inappropriate statistically. Since the estimate of β_1 for the lagged dependent variable is precisely the coefficient that is subject to a recognized bias, the least squares estimate of β_1 may not be the appropriate coefficient to test the hypothesis that the true β_1 is equal to 1.

One route to estimating without bias the value of β_1 is first, as shown in Equation 5.8, to reformulate alternative dependent variables which are the first differences of the dependent variable and its lagged value, $(y_t - \beta_1 y_{t-5})$,

Table 5.4 Regression Results for the Basic Equation 5.6 for Korean Currently Married Women, Rural-Urban Migrants and Rural Stayers

Variable Names	1974 b	1974 t	1969 b	1969 t	1964 b	1964 t	1959 b	1959 t	1954 b	1954 t
	Year of Observation									
Intercept	1.458	(5.01)	-1.304	(-3.12)	-3.906	(-6.74)	-4.164	(-5.23)	-.133	(-.79)
CEB05	.950	(94.17)	.935	(69.53)	1.017	(62.69)	.991	(44.00)	1.003	(25.07)
AGEC	.046	(2.73)	.221	(8.50)	.403	(10.20)	.403	(6.63)	.207	(1.46)
AGEC2	-.001	(-6.23)	- .004	(-9.89)	- .007	(-10.52)	- .007	(-5.87)	-.004	(-1.24)
M1	-.202	(-4.68)	- .206	(-3.27)	- .209	(-2.89)	- .151	(-1.63)	-.210	(-1.68)
M2	-.094	(-2.35)	- .267	(-5.19)	- .105	(-1.61)	- .001	(- .02)	-.101	(- .80)
M3	-.212	(-4.04)	- .274	(-4.41)	- .243	(-3.62)	- .026	(- .31)	-.096	(- .81)
M4	-.358	(-5.84)	- .276	(-3.77)	- .173	(-2.46)	- .084	(-1.02)	-.233	(-1.61)
M5	-.324	(-4.83)	- .424	(-5.58)	- .361	(-4.72)	.112	(1.36)	-.068	(- .62)
M6	-.299	(-3.34)	- .260	(-2.55)	- .595	(-5.77)	.094	(.83)	.084	(.62)
M7	-.192	(-1.46)	- .449	(-3.13)	- .484	(-3.63)	.050	(.37)	-.025	(- .17)
# of OBS	2871		2266		1704		1190		651	
F Stat	2643.52		1662.73		1280.26		658.07		161.52	
R^2	.90		.88		.88		.85		.716	

where the difference is weighted by β_1, then to iterate on the value of β_1 and choose the smallest error sum of squares (ESS). (Choosing the highest R^2 [$R^2 = 1 - (ESS/TSS)$] is not appropriate for this case because total sum of squares (TSS) value varies with the value of β_1.)

This procedure may no longer be the optimal strategy but at least it provides a maximum likelihood consistent estimator.

$$y_{it} - \beta_1 y_{i,t-5} = \beta_0 + \gamma_1 A_{it} + \gamma_2 A_{it}^2 + \sum_{j=1}^{7} \alpha_j M_{ij} + \varepsilon_{it} \tag{5.8}$$

Table 5.5 reports the different values of ESS according to the different values for β_1 for each year of observation. For the years 1964, 1959, and 1954 the smallest error sums of squares were obtained when β_1 was equal to 1.0, whereas the smallest ESS's for the years 1974 and 1969 occurred when β_1 equaled 0.9. This evidence indicates the coefficient estimates for β_1 in Equation 5.6 presented in Table 5.4 are not biased and that the above t-tests, using these coefficient estimates are not inappropriate.*

5.6 Summary of Chapter 5

In this chapter we proposed an autoregressive model, originally developed by Ashenfelter (1978), to ascertain the rural-urban migration effect on migrant fertility, controlling for the selectivity of migration. After careful consideration of various specifications for the model using our data for Korean women, we decided to use Equation 5.5 as the basic equation in Sections 6.2, 6.4a, 6.5a and 6.5d to assess the incremental effect of the rural-

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*The above alternative test procedure using the iterative maximum likelihood was suggested by T. Paul Schultz, who reviewed the draft final report of this study. In order to be accurate we should use Equation 5.8 instead of Equation 5.6 in our analysis in Chapter 6. However, the maximum likelihood estimates of β_1 are almost identical to the coefficient estimates for the variable y_{t-1} in Table 5.4. Therefore, we do not believe that the use of Equation 5.6 invalidates our analysis.

Table 5.5 Sensitivity of Error Sum of Squares (ESS) of Equation 5.8 to Different Values of β_1 (Coefficient for y_{t-5})

Value of β_1	Year of observation				
	1974	1969	1964	1959	1954
	(Error Sum of Squares)				
0.6	1,865.5	1,578.2	1,076.0	638.0	323.3
0.7	1,595.4	1,405.9	948.0	580.1	304.0
0.8	1,415.5	1,294.2	854.8	539.1	290.2
0.9	1,325.9	1,243.3	796.5	515.2	281.8
1.0	1,326.5	1,253.2	773.0	508.3	278.9
1.1	1,417.4	1,323.7	784.3	518.5	281.4
1.2	1,598.5	1,455.1	830.5	545.6	289.3
1.3	1,869.8	1,647.1	911.4	589.8	302.7

urban migration on migrant's fertility and Equation 5.6 in Sections 6.3, 6.4b, 6.5b, 6.5c and 6.6 in Chapter 6 to assess the cumulative effect of the rural-urban migration on migrant's completed fertility.

Thus, parallel analyses of our adaptation hypotheses are made using two different basic Equations 5.5 and 5.6 in Chapter 6. Differences between sections using Equation 5.5 and those using Equation 5.6 can be summarized as follows: first, regressions of Equation 5.5 are estimated separately for each of the five-year migration cohorts by the years of observation resulting in 25 regressions. Regressions of Equation 5.6 are estimated pooling different migration cohorts by the year of observation, resulting in five regressions. In Equation 5.6, coefficients of y_{t-5} and age variables are constrained to be constant across different migration cohort periods. Second, estimates of Equation 5.5 ignore the migration cohorts who migrated before 1950, whereas estimates of Equation 5.6 include all the migration cohorts in the 1974 KWFS data. Therefore, the number of the five-year rural-urban migration cohorts is five for the estimates of Equation 5.5 and seven for those of Equation 5.6 including the earliest migration cohort period with open interval. Third, unlike Equation 5.5, Equation 5.6 does not include the duration of marriage variables and other socioeconomic variables. Fourth, the comparison group in the estimates of Equation 5.6 is always the rural stayers, which include rural nonmigrants and rural-rural migrants. The estimates of Equation 5.5 use the following four different comparison groups to assess the sensitivity to different comparison groups in estimating the rural-urban migration coefficients:

(1) Rural non-migrant comparison group with a broad definition of the rural-rural migration (rural non-migrants here include only women who never left their town or villages of birth);

(2) Rural-rural migrant comparison group with a broad definition of the rural-rural migration (rural-rural migrants here include women whose towns or villages of current residence are different from those of previous residences);

146

(3) Rural non-migrant comparison group with a narrow intercounty definition of the rural-rural migration; (rural non-migrants here include the rural-rural migrants who changed their town or village within the same county in addition to the rural nonmigrants in (1));

(4) Rural-rural migrants comparison group with a narrow definition of the rural-rural migration (rural-rural migrants here are obtained by excluding the rural-rural migrants who changed town or village within the same county from the rural-rural migrants in (2)).

The use of two different basic equations in Chapter 5 is needed because we are attempting to achieve two slightly conflicting goals: rigorous statistical tests of our adaptation hypotheses and provision of information to policy makers on the quantified impact of the adaptation by rural-urban migrants on their fertility, controlling for selectivity. Until substantial progress is made in the research techniques for the migration-fertility studies we realize that these two goals are very difficult to achieve using a single approach. As one will note in Chapter 6, the sections using Equation 5.5 concentrate on rigorous statistical tests of our adaptation hypotheses but are limited in providing the quantified fertility impacts of the rural-urban migration that can be directly used in policy decisions. On the other hand, sections using Equation 5.6 concentrate on quantifying the impact of migration on the migrant's completed fertility. This information should be of great value to policy makers interested in determining the effect on national fertility levels of various government interventions in population redistribution. Unfortunately, some findings from the latter sections cannot be scrutinized by rigorous statistical tests.

Chapter 6. TEST OF ADAPTATION HYPOTHESES

6.1 Introduction

6.1a Major Hypotheses Concerning the Adaptation Effect

In this chapter the following five major hypotheses concerning the adaptation effect of rural-urban migration on migrant fertility are tested using the basic model presented in the previous chapter:

Hypothesis 1: Completed fertility of the rural-urban migrant is lower than that of a comparable rural stayer when the migrant's fertility at migration is equalized to the rural stayer's fertility at a comparable point of time in her life cycle. This is true for both highly selected migrants and less selected migrants.

Hypothesis 2: The differential in completed fertility between the rural-urban migrant during the post-migration period and a comparable rural-stayer is greater for migrants with higher socioeconomic backgrounds than for migrants with lower backgrounds.

Hypothesis 3: A rural-urban migrant has fewer additional births after migration during each given period, say a 5-year-period, over her remaining post-migration life cycle than a comparable rural stayer when fertility levels at the beginning of each period are controlled for.

Hypothesis 4: The differential in completed fertility between the rural-urban migrant during the post-migration period and a comparable rural stayer is larger the younger the age at migration.

Hypothesis 5: The differential between the rural-urban migrant and a comparable rural stayer in completed fertility attributable to the post-migration period varies according to the size class of destination city and the following environmental characteristics of those destination cities: average child mortality rates, average adult education levels, average percentage of teenage school enrollment, average percentage of teenage labor force participation in non-agricultural sectors, average rates of female labor force participation, average months worked by women per year, and average percentage of women working in occupations incompatible with childbearing or childrearing.

Hypotheses 1 - 4 are basically similar to hypotheses 5-8 in our research proposal, although completed fertility was not mentioned as the adaptive criterion. We feel that the comparison of completed fertility is more valuable to policy decision makers than fertility levels at any point of time. As pointed out by Goldstein and Tirasawat (1977), some rural-urban migrants reduce fertility immediately before or after migration (we call this "a shock effect" of migration) and then make up the delayed fertility, say during the period 5 to 10 years after migration. Therefore, the comparison of migrant and rural stayer fertility at one point of time in a woman's life cycle does not provide the total effect of rural-urban migration on the migrant's norm for family size. Goldstein and Tirasawat (1977) also suggest that residence may have a greater impact on completed fertility size than on the spacing of children. Hiday (1978) suggests that urbanization may affect migrant fertility only in later reproductive years. However, since it is possible that the tempo of fertility might influence the national fertility level independent of family size norms, Hypothesis 3, which considers fertility rates by period and is more stringent in proving adaptation than Hypothesis 4, is included in this report.

Unlike Hypotheses 5 - 8 in the original research proposal, the effect of urban adaptation on the migrant's age at marriage is omitted in all our new hypotheses. Since marriage is a one time event for most Korean women, it is not possible to disentangle the effect of adaptation on the migrant's age at marriage from that of migrant selectivity using individual lifetime historical data. Furthermore, as discussed in Chapter 9, the effect of rural-urban migration does not necessarily delay the marriage. Rural-urban migration seems to provide a better marriage market for some migrant women and encourages them to marry immediately after migration.

Marriage seems to be more culturally rooted and change much more slowly than the norm for family size. Data presented in Chapter 9 indicate that the proportion of ever-married women for the young age group, 20-24, is generally higher among recent rural-urban migrants than among rural stayers. Hiday (1978) found in her studies of Philippine data that the proportions of married women among rural-urban migrants at age groups 15-19 and 20-24 were 45.7 and 79.6 percent, respectively; in contrast to the proportions married among the rural nonmigrants of similar age, 17.3 percent and 63.7 percent respectively. Hiday argues that a large proportion of women less than 20 years of age migrated from rural areas to accompany or join a husband, reducing the proportion married at the point of origin and raising the proportion married among the migratory groups. She further states that the large difference in married women between rural-urban migrants and rural nonmigrants indicates the positive effects of marital status on migration of young women. However, since her data do not reveal whether migrant women married before or after migration, one should not rule out the opposite causal effect of migration on marital status. Even though newly married women migrate to accompany or join a husband, it is possible that the anticipation of migration has encouraged early marriage*

The above discussion implies that the relationship between migration and marital status is complicated and should be studied in a simultaneous equation framework. Also, that the effects of adaptation and selectivity on migrants' marriage behavior cannot be distinguished with the currently available data and method. Because of these reasons the effect of migration on marriage behavior is not investigated in this chapter.

Hypothesis 5 is added because we believe that the characteristics of the destination of rural-urban migration not only influence the selectivity of migrants attracted to the city but also determine the degree of adaptation by migrants to an urban life style. Goldstein and Tirasawat (1977) raised a similar point. They observed that the lower average number of children born to women in each migrant category in Bangkok compared with the corresponding migrant categories in other urban areas (provincial urban places) implied either that migrants moving to Bangkok are more positively selected or that migrants to Bangkok adapt to fertility norms of Bangkok natives that are lower than those of the natives of other urban areas. They argue that the facts that the fertility levels of the nonmigrants in provincial urban places are somewhat higher than those in Bangkok and that a comparison of the fertility levels of the recent migrants (who could be selective but who did not have time to adapt) with the nonmigrants shows quite similar ratios for both Bangkok and provincial urban places lend weight to the latter interpretation. As discusse

* In addition to rural-urban migrants and rural nonmigrants Hiday's study includes a separate category, rural-to-rural migrants. We ignored her observation on the rural-to-rural migrants because it is likely that her rural-to-rural migrants include rural women who moved to the neighboring town or village. It does not seem consistent to treat women who moved from one village to another within the same county as rural-to-rural migrants, whereas the women who moved from one ward to another one within a metropolitan area are not treated as urban-to-urban migrants.

in Chapter 9, particularly Table 9.2, the 1970 Korean census reveals a similar but somewhat a more telling observation. For most age groups, the average children ever born to women is inversely related to the size classes of cities among either urban nonmigrants or long term rural-urban migrants; whereas among recent rural-urban migrants the size classes of destinations did not make any significant difference for the average children ever born. In Chapter 9 we consider these results as a strong support of the adaptation hypothesis.

6.1.b <u>Further Discussions on Our Major Adaptation Hypotheses</u>

Hypothesis 2 states that more highly selected rural-urban migrants are more adaptive than less selected migrants; but Hypothesis 1 states that there is some adaptation even among the least selective rural-urban migrants. The problem in implementing tests of these two hypotheses is finding an independent measure of selectivity. The concept of selectivity is ambiguous. Selectivity may refer to self-selection within the population, in the sense that migrants selected migration and non-migrants did not. The recursive model estimated above is designed to control for this type of sample selectivity by controlling for pre-migration fertility. Selectivity in the sense of migration tending to select out individuals with low fertility propensities is controlled for.

Another meaning of selectivity refers to the superiority of a group with respect to some criteria, such as earnings ability, social status, mobility, or ability to adapt to change. When selectivity refers to the ability to adapt to change, the measure of selectivity and adaptation are not independent and Hypotheses 1 and 2 are tautological. However, we can test whether particular identifiable groups, such as more educated individuals, are more adaptive than others.

158

The theoretical reason for the influence of selectivity on adaptation is derived from the theory on the individual's ability to deal with the disequilibrium situations as suggested by T. W. Schultz (1975). Decoding the information in the urban area and implementing the adjustment in fertility behavior to fit the urban environment require the efficiency of education. This effect of education on fertility adaptation is different from the effect of the higher value of time for highly educated women which results in a lower desired fertility. This effect of education is on the speed of adaptation to the desired lower fertility.

It is important to distinguish between Hypothesis 2 and the selectivity hypothesis. The selectivity hypothesis claims that the rural-urban migrants have lower fertility than rural stayers because migrants are more educated, possess higher occupational skills or have strong preferences for the small family size, not because of the influence of the urban environment on their fertility behavior (adaptation). On the other hand, Hypothesis 2 implies that one cause of the lower fertility for the rural-urban migrants is the adaptation to urban small family norms. But Hypothesis 2 goes further and emphasizes that the degree of selectivity determines the migrant's ability to adapt to urban norms. While the selectivity hypothesis contends that women of higher education would have lower fertility even though they remained in rural areas, perhaps because of their higher value of time, Hypothesis 2 argues that women of higher education, when exposed to urban family size norms, they would reduce their fertilities faster than less educated women.

Adaptation to urban life can include improving education and labor force experience, in addition to changing fertility goals. In Hypotheses 1 and 2 we are only interested in the effects of socioeconomic characteristics on adaptation and not the effects of adaptation on socioeconomic characteristics. For this reason, we must measure such characteristics prior to migration. Therefore, in this chapter we consider only the pre-migration education level and labor force experience as the socioeconomic variables determining the selectivity of the rural-urban migrants. In Korea it has been generally true until very recently that very few women continue their education after they are married. Therefore, if we consider only the rural-urban migrants who migrated after their marriages, we can be fairly sure that their current education levels and premarital work experience are not influenced by the rural-urban migration or urban environments.

As discussed earlier, restricting our rural-urban migrant sample to post-marital migrants requires a careful selection of comparable rural stayers. For each observation year, different years of migration predetermine the minimum duration of marriage for post-marital migrant sample. Therefore, for each migration cohort the rural stayers sample should be selected to insure that the rural stayers sample also has a comparable minimum duration of marriage. For example, when the observation year is 1974 and the year of migration for the women falls between 1965 and 1969 the post-marital migrants sample would have been married at least five years. Therefore, it becomes necessary to limit the rural stayers sample to women who had been married at least five years. However, even this limitation for the rural stayers sample does not make both migrants and rural-stayers samples exactly comparable in terms of the duration of marriage. This is due to the fact that the year of migration variables are defined by five year intervals rather than by single year. For example, the woman who migrated in 1968 but married in 1966 is excluded from the post-marital migration sample even though she had been married for eight years in 1974. The fact that the rural stayers sample includes all the rural stayers married at least five years whereas some of the migrants who married more than five years have been excluded from the post-marital migrants sample makes the two samples not perfectly comparable. To overcome this shortcoming, we decided to exclude from both migrant and rural stayer samples all the women who had been married less than seven years, rather than five years, in this example (the midpoint value between 1965 and 1969 in 1974). However, this last restriction has been applied only to sections which assess the effect of migration on migrants completed fertility.

As discussed above, our desire to control for the selectivity (fixed effects) of rural-urban migrants by pre-migration education level and labor force experience leads us to treat the post-marital and pre-marital migrants separately in the analysis. This is also the main reason the majority of the comparisons in this chapter are for post-marital rural-urban migrants. This approach could be criticized because for the post-marital migration group the effect of marriage is parceled out in a way that must bias the comparisons and limit their value for the inferences policy makers wish to draw. However, we feel that the benefit of concentrating our analyses on the post-marital migrants rather than on all pre- and post-marital migrants outweighs the loss for the following reasons. First, one of the most important reasons for Korean young men and women to migrate from rural to urban areas is to obtain higher education in urban areas. Therefore, controlling the selectivity of pre-marital migrants by current education levels would be meaningless for many of them. Second, if migrants generally delay their marriages to settle down in urban areas, then our approach will certainly underestimate the fertility-depressing effect of rural-urban migration, which works through the delayed marriage. As discussed in the previous section, this is not the case for Korean women. There is some evidence indicating that the rural-urban migration fosters migrants' marriage. When we consider that the above two opposite factors on migrants' marriage are partially offsetting each other, we are not convinced that our approach will substantially underestimate the fertility-depressing effect of migration.

6.2 Testing Hypothesis 3 Using Equation 5.5

6.2a Estimates of Rural-Urban Migration Coefficients in Equation 5.5

Hypothesis 3 is the basic adaptation hypothesis. If rural-urban migrants bear fewer children than comparable rural stayers in every period, and this difference is attributable to migration, certainly the completed fertility of the migrant will be less than that of the comparable rural stayer.

In Chapter 5 we derived the basic recursive equation 5.5, and 25 regressions of equation (5.5) were estimated by the five-year migration cohort interval for each of the five years of observations, 1974, 1969, 1964, 1959 and 1954 as shown in Table 5.2.*

*In our research proposal we suggested an alternative model to be used for testing our eight major hypotheses. In this model both the selectivity and the adaptation hypotheses are treated in parallel fashion by estimating the reduced forms of both the duration of marriage equation and marital fertility determination equation in terms of a vector of exogeneous environmental conditions, x, such as regional wages, incomes, prices, mortality, child schoolings, etc., and a vector of exogeneous individual parental characteristics, z, such as education, vocational skills or experience before marriages. Assuming that persons were randomly assigned to the rural-urban migrant and the rural stayers categories, one could determine the degree to which adaptation or selectivity accounted for the observed differences between the mean fertility of the migrants and rural stayers, $\overline{F_m} - \overline{F_\gamma}$. The share of the difference due to adaptation would be equal to that which could be accounted for by mean differences in $\overline{X}$'s, $A = \alpha(\overline{X}_m - \overline{X}_\gamma) / (\overline{F}_m - \overline{F}_\gamma)$ and the share of the difference due to selectivity would be that which could be accounted for by mean differences in Z's, $S = \delta(\overline{Z}_m - \overline{Z}_\gamma) / (\overline{F}_m - \overline{F}_\gamma)$, with the remainder (positive or negative) being an unexplained residual: $1 = A+S+R$. The adaptation hypothesis suggests that the adaptation share A, should increase with the duration of migration.

156

Figure 6.1 illustrates the values of the coefficients for M_{t-s} in equation (5.5) for all rural-urban migrants by migration cohort, i.e., time period of migration, and for each five year period before and after migration using the rural non-migrant comparison. These values are given in Table 6.1. which is derived from Table 5.2. For example, for individuals who migrated between 1970 and 1974 the incremental effect of migration during this period of migration, s = 0, was -.2707. This means that rural-urban migrants had one-quarter fewer children during the five year post-migration period 1970-74 than rural non-migrants of similar age and duration of marriage. For this same migration cohort, the effect of migration on children ever born during the five year period prior to migration, 1965-69, s = -1, was -.2142. This means that there was an effect of migration on fertility prior to migration. The direction of causation of this effect is ambiguous. Either families

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We decided not to employ this model in our study because of the following two reasons:

First, we felt that the autoregressive model, which attracted our attention recently, is much more powerful than the alternative model discussed above for the goals of our study. The alternative model attempts to ascertain which factor, selectivity or adaptation, is dominant in reducing the rural-urban migrant's fertility. On the other hand, the autoregressive model attempts to quantify the reduction of migrant's fertility due to the additional year of exposure to urban lifestyle controlling for the selectivity variables. As emphasized repeatedly, the main goal of this study is to provide the answer to policy decision makers on the influence of the rural-urban migration on the national fertility level. It is obvious that determining which factor, selectivity or adaptation, is dominant in fertility behavior is not good enough information for policy decision makers who need to know how many births could be avoided by spending additional resources on various government intervention schemes.

Second, a vector of exogenous environmental conditions, x, such as mortality, schooling, and job opportunities, etc. in the current residence community does not vary significantly in our sample. The most serious shortcoming of the 1974 Korean World Fertility Survey is that the data do not identify the wards of metropolitan areas where women currently live. Therefore, 490 rural to Seoul migrants would have the same values for the x vector and 447 migrants who migrated from rural areas to Busan and three other large cities would have only four different values for the x vector. (The total number of our rural-urban migration sample is only 1230 women.)

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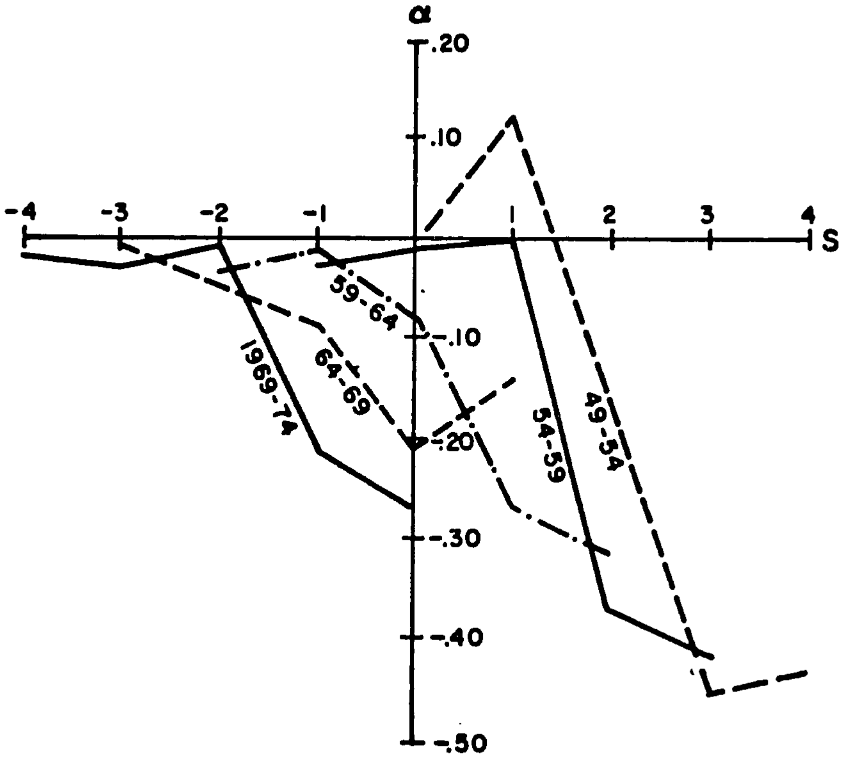

Figure 6.1. Incremental Adaptation of Fertility by Migration Cohort and Period Before and After Migration, All Rural-Urban Migrants vs. Rural Non-Migrants (Eq. 5.5)

Table 6.1. Incremental Five Year Period Rural-Urban Migration Effect by Periods After and Before Migration: All (Post-Marital + Pre-Marital) Migrants with Rural Non-Migrant Comparison Group[a]
(t-Values in parentheses)

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	-0157 (-0.54)	.0250 (0.61)	.0057 (0.12)	-.2142* (-4.03)	-.2707* (-4.29)					850
1965-69		-.0049 (-0.17)	-.0356 (-0.94)	-.0909* (-2.09)	-.2084* (-4.05)	-.1396* (-2.22)				880
1960-64			-.0295 (-0.81)	.0096 (0.20)	-.0795* (-1.41)	-.2720* (-4.13)	-.3040* (-4.15)			712
1955-59				-.0315 (-0.74)	-.0077 (-0.13)	-.0009 (-0.01)	-.3682* (-4.98)	-.4187* (-4.98)		649
1950-54					-.0082 (-0.16)	.1267* (1.77)	-.1766* (-2.37)	-.4609* (-5.37)	-.4346* (-4.57)	617

*Significant at .10 level-one tail test

[a]Derived from Table 5.2

159

anticipated migration and reduced fertility, an adaptation phenomenon; or low fertility families were more likely to migrate, a selectivity phenomenon. However, the insignificant effect of migration for $s < -1$ implies that adaptation is more important.

Figure 6.1 suggests two general patterns. First, in the range of periods observed, the migration effect on fertility within a migration cohort increases with time after migration. Second, the migration effect seems to become greater for more recent migration cohorts. In fact, for the two most recent migration cohorts, there are significant migration effects both prior to and after migration.*

The second point, regarding the greater effect of migration on the recent migration cohorts, may be interpreted in several different ways. First, price and wage effects today may be inducing larger rural-urban differences than they did several decades ago for earlier cohorts and the increasing rural-urban fertility differentials might provide a stronger incentive for rural-urban migrants to adapt to the small family urban norms. However, evidences in Chapter 3 showing the significant reduction of the rural-urban fertility differentials during the last two decades in Korea indicate that this interpretation is not valid for Korean data. Second, recent rural-urban migration might be more selective in terms of education or more innovative (according to Goldstein's hypothesis) than that of earlier migrants. As shown in Chapter 7, the opposite of this is true for Korean migration. Finally, recent rural-urban migrants might be better informed before migration, more integrated into the urban society and, therefore, more successful in adapting to urban life

*It is important to stress here that the declining size of cells for earlier migration cohorts makes it difficult to obtain statistically significant results for all the small cells encompassed in the full table. Only in the first three migration cohorts are there really enough observations to make a very strong statement.

style. This last interpretation seems most appropriate for Korean situations where communication, transportation, education and availabilities of manufacturing jobs for migrants have improved remarkably during the last two decades.

6.2b Post-Marital Migrants

Figure 6.2, corresponding to Table 6.2, shows the migration effect using Equation 5.5 for only post-marital migrants. The post-marital migrants results reveal much stronger adaptation effect than all migrants data. However, we can see that the ever-increasing negative migration effect in Figure 6.1 does not exist for post-marital migrants. There appears to be an eventual decrease in the negative migration effect with years after migration. We still observe pre-migration effects on fertility for the most recent migration cohorts.

Equation 5.5 does not control for the fixed effects, ε_i in Equation 5.1 which captures such factors as preferences and is invariant over time. We can control for these effects by either using first differences or introducing proxies for these effects. From Equation 5.1 we see that factors affecting the level of fertility are controlled in $y_{i(t-j)}$, but the fixed effects, ε_i, affect the change in fertility, Δy_t. Since these fixed effects are definitionally constant over time, taking first differences permits the control of ε_i by including Δy_{it-1} as an independent variable.

There are two statistical problems to be considered in either including or excluding a proxy for the fixed effects in Equation 5.1. First, if the added variable is a proxy for the fixed effect and influences the level of fertility, there will be collinearity between that variable and $y_{i(t-j)}$. The resulting coefficients for the proxy and the β_j's will be meaningless. This suggests extrem caution in interpreting the coefficients of the proxy variables. Second, and more importantly for our purposes, proxies for the fixed effect may be correlated with the migration decision, therefore, with $M_{i(t-s)}$. In this case,

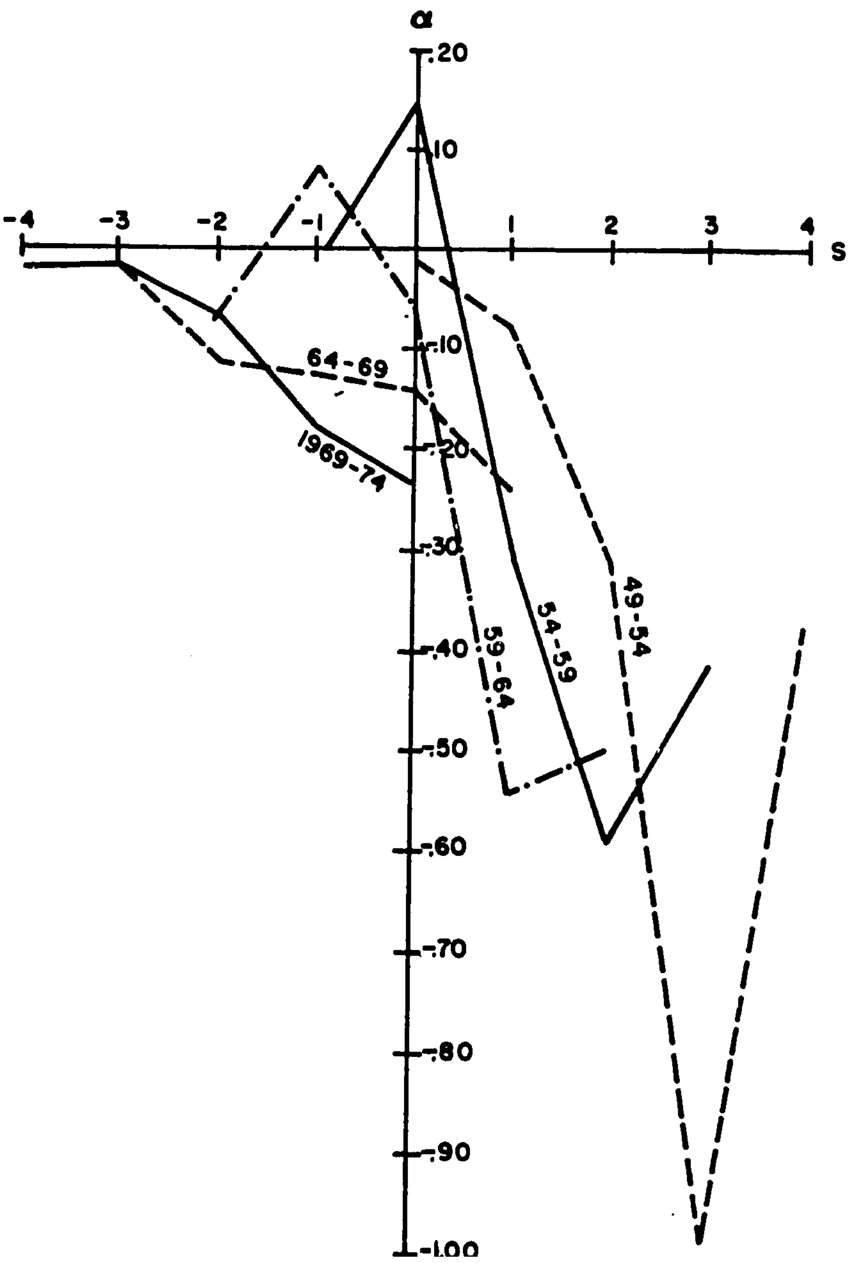

Figure 6.2. Incremental Adaptation of Fertility by Migration Cohort and Period Before and After Migration, Post-Marital Rural-Urban Migrants vs. Rural Non-Migrants (Eq. 5.5)

Table 6.2. Incremental Five Year Period Rural-Urban Migration Effect by Periods After and Before Migration: Post-Marital Migrants Only With Rural Non-Migrant Comparison Group (t-Values in parentheses)

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	-.0200 (-0.62)	-.0141 (-0.31)	-.0641 (-1.23)	-.1794* (-2.96)	-.2315* (-3.42)					739
1965-69	-	-.0189 (-0.49)	-.1122* (-2.15)	-.1256* (-2.11)	-.1380* (-2.07)	-.2398* (-3.12)				686
1960-64	-	-	-.0652 (-1.20)	.0803 (1.11)	-.0592 (-0.74)	-.5422* (-6.08)	-.5004* (-5.00)			607
1955-59	-	-	-	-.0180 (-0.22)	.1484* (1.39)	-.3015* (-2.55)	-.5881* (-4.57)	-.4078* (-2.75)		560
1950-54	-	-	-	-	-.0090 (-0.10)	-.0747 (-0.64)	-.3092* (-2.49)	-.9789* (-7.14)	-.3782* (-2.34)	556

*Significant at .10 level-one tail test

167

excluding the correlated fixed effects proxy will result in a biased estimate of the effect of migration. If α is the true independent effect of migration on fertility, α the estimated effect excluding the correlated proxy, p, r_{mp} the partial regression coefficient of the proxy on the migration decision variable, and γ_{yp} the effect of the omitted proxy on fertility: $\alpha = \alpha + r_{mp} \cdot \gamma_{yp}$ For example, if child mortality experience has a positive effect on both fertility and migration, excluding a mortality variable will bias upwards the effect of migration on fertility.

Table 6.3 shows the migration coefficients of regressions for post-marital migrants only which include the fixed effects as socioeconomic selectivity variables: education and earnings of the husband, education and earnings of the wife, the family's child mortality rate, and the family's share of sons. As expected, a comparison of Tables 6.2 and 6.3 shows that adding these proxies for the fixed effects reduces the magnitude of the migration coefficient.

We have noted above that using rural non-migrants as a comparison group may confound the two effects of migration and urbanization on fertility. We suggested that using rural-rural migrants as a comparison group should eliminate the migration effect and isolate the pure urbanization effect. Equation (5.5) was estimated using a rural-rural migrant comparison group.* Chow tests showed that the pre-migration autoregressive structures were identical for the rural-urban group and this comparison group. The coefficients for the rural-urban migration dummy are shown in Table 6.4. The regressions used to derive Table 6.4 included the same socioeconomic variables as the regressions used in deriving Table 6.3 for the rural non-migrant comparison group. Like the rural non-migrant comparison, there do appear to be significant negative effects of rural-urban migration in the period immediately preceeding migration.

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* Rural-rural migrants, as defined here, would have changed their place of residence but may have not changed their county of residence.

Table 6.3. Rural-Urban Migration Effect by Periods After and Before Migration: Post-Marital Migrants with Rural Non-Migrant Comparison Group, Controlled for Socioeconomic Variables[a]

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	-.0297 (-0.84)	-.0185 (-0.37)	-.0586 (-1.03)	-.1333* (-2.04)	-.1469* (-2.06)					739
1965-69		-.0288 (-0.69)	-.1492* (-2.73)	-.1329* (-2.12)	-.1045* (-1.50)	-.1724* (-2.21)				686
1960-64			-.0779* (-1.35)	-.0474 (0.63)	-.0338 (-0.40)	-.4588* (-4.97)	-.4168* (-4.12)			607
1955-59				-.0167 (-0.20)	.1479* (1.31)	-.3126* (-2.50)	-.5166* (-3.83)	-.2512* (-1.66)		560
1950-54					-.0006 (-0.01)	-.0734 (-0.61)	-.2932* (-2.27)	-.9126* (-6.50)	-.2716 (-1.69)	556

*Significant at .10 level-one tail test

[a]Variables controlled are: education of husband and wife (S_h and S_w), earnings of husband and wife (W_h and W_w), child mortality experience of wife (MORT) share of sons (SHSN).

Table 6.4. Rural-Urban Migration Effect by Periods After and Before Migration: Post-Marital Migrants with Rural-Rural Migrant Comparison Group, Controlled for Socioeconomic Variables

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	-0585* (-1.69)	.0044 (0.09)	-.0335 (-0.58)	-.2179* (-3.25)	-.2209* (-3.37)					1117
1965-69		-.0662* (-1.40)	-.1050* (-1.76)	-.0971* (-1.30)	-.1828* (-2.40)	-.2461* (-3.14)				874
1960-64			-.1529* (-2.17)	-.0064 (-0.07)	-.0790 (-0.80)	-.3430* (-3.35)	-.3665* (-3.69)			629
1955-59				-.1017 (-0.80)	-.0126 (-0.10)	-.2395* (-1.65)	-.2370* (-1.54)	-.1714* (-1.38)		364
1950-54					-.1513 (-0.79)	-.0284 (-0.15)	-.3100* (-1.57)	-.3858* (-1.86)	-.0725 (-0.55)	215

*Significant at .10 level-one tail test

166

In the period of migration and after, using the rural-rural migrant comparison group results in a larger estimate of the adaptation effect than using a rural non-migrant comparison group for the two most recent migration cohorts. This can be seen by comparing the coefficients in Tables 6.3 and 6.4. For example $\alpha = -.1828$ in the migration period, $s = o$, for migration cohort 1965-69 in Table 6.4, while $\alpha = -.1045$ for the similar group in Tables 6.3. For the older migration cohorts, however, a comparison of Tables 6.3 and 6.4 shows that using a rural-rural migrant comparison group results in a lower estimate of adaptation than using a rural non-migrant comparison group.

In the pre-migration periods, we observe a greater number of cases in which α's are significantly negative in Table 6.4 than in Table 6.3 This implies that rural non-migrants may be a better control group for measuring post-migration adaptation than rural-rural migrants, under the criterion that we seek a comparison group whose pre-migration child preferences are most similar to preferences of migrants.

For the two most recent migration cohorts, the migration coefficients for the rural-rural migrant comparison shown in Table 6.4 have greater negative values than the coefficients for the rural non-migrant comparison shown in Table 6.3.* If coefficients for the rural non-migrant comparison include both the migration and urbanization effect on fertility, these results imply a positive effect of migration on fertility but a negative effect of urbanization on fertility.

For the three oldest migration cohorts, migration coefficients for the rural non-migrant comparison have greater negative values than for the rural-rural migrant comparison. These cases imply that among older cohorts

*As discussed in Chapter 8, Ribe and Schultz (1980) found similar results for Colombian data.

161

migration and urbanization both have negative independent effects on fertility.

As discussed earlier, if we restrict our migrants to only post-marital migrants and control for years since migration, we also implicitly restrict duration of marriage to be greater than or equal to years of residence in the current location. A proper comparison group of nonmigrants would then consist of nonmigrants with duration of marriage in a similar range to that of the migrants from a given migration cohort. Of course, when the comparison group is rural-rural migrants, this problem does not arise.

Tables 6.5 and 6.6 show the incremental rural-urban migration effects by post-marital migration cohort and period before and after migration when the duration of marriage for migrants and rural non-migrants are similarly restricted. For example, the sample used to estimate the migration effect for migration cohort 1970-74 in the period of migration, period 0, consisted of rural-urban migrants and rural non-migrants who were married at least five years in 1974. For the migration effect of migrant cohort 1965-69 in the period of migration, the sample was restricted to individuals married at least ten years in 1974; etc.

The effects of controlling for the implicit restrictions on duration of marriage by defining post-marital migration cohorts can be seen by comparing Table 6.2 and 6.5, which do not control for socioeconomic variables, and Tables 6.3 and 6.6, which do control for socioeconomic variables. We note that the apparent pre-migration effect in Table 6.3 is considerably reduced when the duration of marriage is controlled. Only for migrant cohort 1970-1974 is there a significant pre-migration effect in Table 6.6 which is the most preferred table in this section. However, the basic

165

Table 6.5. Rural-Urban Migration Effect by Periods After and Before Migration Controlling for Duration of Marriage Restrictions: Post-Marital Migrants with Rural Non-Migrant Comparison Group Not Controlled for Socioeconomic Variables

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	-.0217 (-0.54)	.0607 (1.12)	-.0443 (-0.72)	-.2631* (-3.71)	-.3421* (-4.56)					630
1965-69		-.0143 (-0.28)	-.0596 (-0.84)	-.0806 (-1.06)	-.2883* (-3.69)	-.3752* (-4.27)				515
1960-64			-.0876 (-1.12)	.0240 (0.25)	-.1266* (-1.28)	-.5477* (-5.10)	-.4464* (-4.03)			370
1955-59				-.0710 (-0.53)	-.0025 (-0.02)	-.2472* (-1.84)	-.4401* (-2.81)	-.3288* (-2.35)		226
1950-54					-.0717 (-0.36)	-.1311 (-0.70)	-.3170* (-1.77)	-.7311* (-3.72)	-.3406* (-1.89)	135

*Significant at .10 level-one tail test

Table 6.6. Rural-Urban Migration Effect by Periods After and Before Migration Controlling for Duration of Marriage Restrictions: Post-Marital Migrants with Rural Non-Migrant Comparison Group Controlled for Socioeconomic Variables

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	-.0317 (-0.74)	-.0548 (-0.93)	-.0217 (-0.33)	-.2223* (-2.88)	-.2217* (-2.77)					630
1965-69		-.0283 (-0.51)	-.0858 (-1.25)	-.0581 (-0.71)	-.2507* (-2.98)	-.2758* (-2.99)				515
1960-64			-.1079 (-1.27)	.0514 (0.50)	-.0450 (-0.42)	-.4739* (-4.06)	-.3574* (-3.02)			370
1955-59				-.0959 (-0.64)	.0657 (0.42)	-.2803* (-1.84)	-.4462* (-2.54)	-.2325* (-1.50)		226
1950-54					.0125 (0.05)	-.0412 (-0.19)	-.1615 (-0.77)	-.7365* (-3.15)	-.3309* (-1.59)	135

*Significant at .10 level-one tail test

Note: The entire estimate of Equation 5.5 underlying the migration coefficient for the 1970-74 migration cohort in period zero is:

$$y_{it} = \underset{(-0.22)}{-.338} + \underset{(37.45)}{1.008}\, y_{i,t-1} + \underset{(2.69)}{.261}\, A_{it} - \underset{(-3.22)}{.004}\, A_{it}^2 - \underset{(-5.68)}{.208}\, D_{it} + \underset{(4.65)}{.005}\, D_{it}^2$$

$$- \underset{(-2.77)}{.2217}\, M_{i,t-s} - \underset{(-1.89)}{.055}\, ED + \underset{(.217)}{.077}\, ED^2 + \underset{(.858)}{.020}\, EDH - \underset{(-1.[illegible])}{.022}\, EDH^2$$

$$+ \underset{(2.05)}{.422}\, MORTR + \underset{(1.06)}{.001}\, EARNH + \underset{(0.032)}{.00006}\, EARNW$$

$R^2 = .8618$

N = 630

where ED and EARNW are woman's education and earnings level and EDH and EARNH are comparable values for the husband.

post-migration pattern remains: The negative migration effect first increases with time after migration, then diminishes.*

6.2c <u>County-Based Definition of Rural-Rural Migrants</u>

Heretofore, rural nonmigration has been defined as never having changed the village or town of current residence. This narrow definition of rural non-migration allowed an individual to be classified as a migrant even if she moved only within the county. We could also define a rural non-migrant as someone who has never changed her county of residence.

Table 6.8 shows the sample sizes under various definitions of non-migration. The previous definition of non-migration results in a sample size of 528 rural non-migrants, and 2264 (442 +1822) migrants of which 1129 (442 + 687) were rural-rural migrants and 1135 were rural-urban migrants. When non-migration is defined as having never changed county of residence, there are 970 (528 + 442) rural non-migrants and 687 rural-rural migrants.

Table 6.9 shows the post-marital migration coefficient when rural non-migrant is defined as the person who maintains the same county between previous and current residences. The only major difference between these results and those using the narrower definition of non-migrants, Table 6.6 is some significantly negative pre-migration coefficients. The migration coefficients

*One problem with estimating the difference between migrant and nonmigrant fertility prior to migration is that marital status, while constant for post-migration periods, can vary for pre-migration periods. One method of controlling for marital status prior to migration is to estimate the fertility function in each period for a sample consisting of individuals currently married in that period. Migration coefficients for periods prior to migration are shown in Table 6.7 where in each pre-migration period only rural-urban migrants and rural nonmigrants who were married for that entire period are included. For example, for migration cohort 1965-69, only individuals married during the period which is two periods prior to 1965 are used to estimate the migration coefficient two periods prior to migration. Comparing Tables 6.6 and 6.7, we see that controlling for pre-migration marital status among post-marital migrants does not change the general conclusion that there is, in most cases, no significant pre-migration effect on fertility.

Table 6.7. Rural-Urban Migration Effect by Periods Before Migration Using Only Women Married in the Period: Post-Marital Migrants with Rural Non-Migrant Comparison Group Controlled for Socioeconomic Variables

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	-.2607 (-1.25)	.0752 (0.49)	-.0410 (-0.36)	-.2482* (-2.76)						
1965-69		-.1616 (-0.60)	-.1302 (-0.88)	-.0250 (-0.24)						
1960-64			-.0628 (-0.28)	.1028 (0.76)						
1955-59				-.0081 (-0.03)						
1950-54				-.0878 (-0.17)						

*Significant at .10 level-one tail test

Table 6.8. Distribution of Rural-Urban Migrants and Rural Stayers by Migration Status

	Rural-Urban	Rural Stayer	Total
Never Moved	0	528	528
Moved but Never Changed County	0	442	442
Changed County	1135	687	1822
Total	1135	1657	2792

Table 6.9. Rural-Urban Migration Coefficients for Post-Marital Migrants: Rural Intercounty Non-Migrants Comparison Group, Controlled for Socioeconomic Variables and Duration of Marriage Restriction

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	-.0686* (-1.78)	.0131 (0.25)	-.0524 (-0.85)	-.2552* (-3.56)	-.2728* (-3.69)					847
1965-69		-.0605 (-1.19)	-.1127* (-1.80)	-.0670 (-0.86)	-.2400* (-3.02)	-.3102* (-3.59)				680
1960-64			-.1724* (-2.26)	-.0009 (-0.01)	-.0547 (-0.54)	-4951* (-4.53)	-.3460* (-3.06)			495
1955-59				-.1616 (-1.20)	.0347 (0.26)	-.2632* (-1.82)	-.4296* (-2.63)	-.1789* (-1.28)		298
1950-54					-.1076 (-0.53)	-.0505 (-0.27)	-.3353* (-1.67)	-.7170* (-3.22)	-.0522 (-0.30)	176

*Significant at .10 level-one tail test

using the narrower definition are neither consistently larger nor smaller than coefficients for the county-based definition.

When the county-based definition of rural non-migrants is used, (i.e., the rural-rural migrants include only persons who changed their counties of residence) and rural-rural migrants are the comparison group we obtain the migration effects in Table 6.10. The post-migration effects in Table 6.10 are neither consistently higher nor lower than when rural-rural migrants include intracounty migrants (Table 6.4).

6.2d <u>Seemingly Unrelated Regression Estimates (SURE) For Post-Marital Migrants</u>

Our equation system for any rural-urban migrant is the recursive form of equation (5.5):

$$6.1)\quad y_t = \beta_o + \beta_1 y_{t-1} + \beta_1' A_t + \beta_2' A_t^2 + \beta_1'' D_t + \beta_2'' D_t^2 + \ldots + \alpha_{t,t-s} M_{t-s} + \varepsilon_t$$

$$y_{t-1} = \beta_o + \beta_1 y_{t-2} + \beta_1' A_{t-1} + \beta_2' A_{t-1}^2 + \beta_1'' D_{t-1} + \beta_2'' D_{t-1}^2 + \cdots + \alpha_{t-1,t-s} M_{t-s} + \varepsilon_{t-1}$$

$$\vdots$$

$$y_{t-n} = \beta_o + \beta_1 y_{t-n-1} + \beta_1' A_{t-n} + \beta_2' A_{t-n}^2 + \beta_1'' D_{t-n} + \beta_2'' D_{t-n}^2 + \ldots + \alpha_{t-n,t-s} M_{t-s} + \varepsilon_{t-n}$$

The set of explanatory variables in this equation system is not identical for each rural-urban migrant and the disturbance terms in this equation system have nonzero correlations because $\varepsilon_t = \varepsilon_i + \varepsilon_t + \varepsilon_{it}$

or, in other words, each equation has a common component of disturbance

Table 6.10. Rural-Urban Migration Coefficients for Post-Marital Migrants: Rural-Rural Intercounty Migrant Comparison Group, Controlled for Socioeconomic Variables

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	-.0416 (-1.15)	.0047 (0.09)	-.0468 (-0.80)	-.1957* (-2.80)	-.1962* (-2.87)					913
1965-69		-.0493 (-1.01)	-.1002* (-1.59)	-.0987* (1.29)	-.1784* (-2.25)	-.2213* (-2.70)				720
1960-64			-.1297* (-1.74)	-.0031 (-0.03)	-.0829 (-0.81)	-.3441* (-3.19)	-.3850* (-3.69)			509
1955-59				-.0675 (-0.50)	-.0584 (-0.40)	-.2534* (-1.72)	-.2529* (-1.59)	-.2532* (-1.91)		296
1950-54					-.0886 (-0.43)	-.0896 (-0.43)	-.1974 (-1.01)	-.3382* (-1.59)	-.1226 (-0.84)	174

*Significant at .10 level-one tail test

term reflecting a person-specific factor, ε_i *. Since the above two conditions hold, the seemingly unrelated regression estimators, proposed by Zellner (1962), will be asymptotically more efficient than those obtained by the application of ordinary least squares to each equation in turn.

This method uses a three stage least square method of adjusting for the covariance between error terms in different equations. In actual estimation the equation system (6.1) is further modified by assuming that the coefficient of lagged fertility, β, in equation (6.1) is equal to one. Therefore, the

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* The theoretical reason for the high correlations between the disturbance terms in equation system (6.1) can be further explained in the framework of household decision model. The individual makes family planning decisions under a budget constraint:

6.2)
$$P_x X + \sum_{t=o}^{T} p\Delta y_t = I_T,$$

where p_x is the price of goods, X is the number of goods consumed, p is the cost of raising a child, Δy_t is the change in the stock of children in year t (i.e. new children in year t), T is years since marriage and I_T is the current income constraint. In this decision model:

6.3)
$$\Delta y_T = g_o(\Delta y_{T-1} \ldots)$$
$$\Delta y_{T-1} = g_1(\Delta y_{T-2} \ldots)$$

and, therefore

6.4)
$$\Delta y_T = h_o(\ldots M, \ldots \varepsilon'_t, \varepsilon'_{t-1})$$
$$\Delta y_{T-1} = h_1(\ldots M, \ldots \varepsilon'_{t-1}, \varepsilon'_{t-2})$$

In this model, the number of children a woman has in one period may affect the number she has in another period. The errors in equations in 6.4 will be interrelated in this case.

dependent variables become $y_t - y_{t-1}$ and the explanatory variables do not include y_{t-1} anymore.

The sample used was the post-marital, rural-urban migrants with rural non-migrant comparison group, controlled for the implicit duration of marriage. In order to make certain that the number of observations in each equation of the system (6.1) is identical, the sample used in SURE estimates is further restricted to the rural-urban migrants and rural non-migrants who were married at all the years of observation.

The estimates of migration coefficients when age, duration of marriage and socioeconomic variables are controlled in equation system (6.1) are shown in Table 6.11. The sample used was the post-marital rural-urban migrants with the rural non-migrant comparison group, controlled for the implicit duration of marriage restrictions. Comparing Tables 6.6 and 6.11 shows that the magnitude of the migration coefficient estimates is quite insensitive to the recursive error structure in system (6.1) and the assumption that $\beta = 1$. We tested whether $\alpha_t = \alpha_{t-1}$ in equation system (6.1). We note in Table 6.11 whether the hypothesis $\alpha_t = \alpha_{t-1}$ could be rejected at the 10% level. Where a " = " sign appears between two columns for a migration cohort, this hypothesis was not rejected. Where a " $\neq$ " sign appears, the hypothesis was rejected. For example, in migration cohort 1970-74 we should not reject the hypothesis that the migration effect in the period 1970-74, α_{74} =-.2233, is equal to the migration effect in the period 1965-69 prior to migration, α_{69} =-.2210. On the other hand, for migration cohort 1965-69 we reject the hypothesis that the migration effect in the period prior to migration, α_{64} =-.0528, equals the migration effect in the migration period, α_{69} =-.2421.

Table 6.11. SURE Estimate of Rural-Urban Migration Coefficient Controlling for Duration of Marriage Restriction and Socioeconomic Variables: Post-Marital Migrants with Rural Non-Migrant Comparison Group

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74				-.2210* (-.289)=	-.2233* (-2.80)					630
1965-69				-.0528 (-0.65)≠	-.2421* (-2.88)≠	-.2804* (-3.07)				515
1960-64				.0585 (0.56)=	-.0445 (-0.41)≠	-.4225* (-4.05) =	-.3770* (-3.22)			370
1955-59				.0497 (0.47) =	.0668 (0.43)≠	-.2790* (-1.84)=	-.4451* (-2.55)=	-.2428* (-1.58)		226
1950-54				-.0758 (-0.42)=	-.1130 (-0.64)≠	.0435 (-0.20)=	-.1741 (-0.82)≠	-.7436* (-3.20)≠	-.3629* (-1.78)	135

*Significant at .10 level-one tail test

Inspecting Table 6.11, we see for most cohorts a significantly negative migration effect in the period of migration or later. For earlier migration cohorts, the migration effect occurs at a later time after migration. This implies adaptation occurs but occurs later for earlier migration cohorts. The most recent migration cohort, 1970-74, experienced pre-migration adaptive behavior, perhaps in anticipation of migration. Second, we note that once adaptation occurs it occurs at the same rate for all but the earliest cohort. This can be seen by observing that once $\alpha_t \neq \alpha_{t-1}$, subsequent α's are equal for all but the 1950-54 migration cohort. In their case, once adaptation occurred three periods after migration, $\alpha_{69} = -.7436$, it was abrupt (in fact, equaling the sum of any two periods of adaptation for more recent cohorts) but was immediately and significantly reduced to $\alpha_{74} = -.3629$ in the subsequent period.

For the three earliest cohorts, the greatest rate of adaptation (i.e. α's are lowest) occurs in the interval from 1965 to 1969 (i.e. one period after migration for 1960-64 migration cohort, 2 periods after for 1955-59 and 3 periods after for 1950-54). There may be a calendar time effect that makes it appear that adaptation is greatest in this period. We also observed the greatest migration effect in this interval when rural-rural migrants were compared to rural non-migrants.

Another set of SURE estimates of the migration coefficient when the comparison group is the rural-rural migrants is shown in Table 6.12. A comparison of Tables 6.4 and 6.12 shows that the general adaptive pattern of rural-urban migrants vis-a-vis rural-rural migrants is similar to that of the rural non-migrant comparison group after adjusting for the recursive error problems in the equation system.

180

Table 6.12. <u>SURE</u> Estimate of Rural-Urban Migration Coefficient Controlling for Socioeconomic Variables: Post-Marital Migrants with Rural-Rural <u>Migrant</u> Comparison Group

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74				-.0490 ≠ (-0.49)	-.2995* (-3.11)					
1965-69				-.0482 = (-0.41)	-.1818* (-1.48)=	-.3154* (-2.28)				
1960-64				.1804* = (1.40)	-.0333 (-0.22)=	-.3876* (-2.65)=	-.3432* (-2.78)			
1955-59				.1836 = (1.24)	-.0827 (-0.38)=	-.0217 (-0.08)=	-.1184 (-0.56)=	-.3402* (-1.66)		
1950-54				-.1696 = (-0.71)	-.2141 (-0.89)=	.1470 (0.41)=	-.4479* (-1.28)=	-.1538 (-0.67)=	-.0717 (-0.38)	

*Significant at .10 level-one tail test

6.2e Estimates of Equation 5.5 for Pre-Marital Rural-Urban Migrant Sample

We have separated post-marital and pre-marital migrants because of the possibility that migration may have different motivations for the two groups. Preferences for children may differ between the two groups. At one extreme, post-marital migrants may prefer small families and move to urban areas; at the other extreme, pre-marital migrants may move to urban areas in order to marry and have large families. Also, residence in urban area may result in different rates of adaptation for pre-marital and post-marital migrants. For example, unmarried migrants may be more aware of urban amenities and adjust desired fertility more rapidly than married migrants.

Just as in the case of post-marital migrants, controlling the migration cohort automatically restricts the range of duration of marriage of pre-marital migrants. For example, women who migrated in the 1965-69 period and were not married upon migration would have been married less than ten years in 1974. Since the migration cohort restricts the duration of marriage, a comparable non-migrant group should have a similarly restricted duration of marriage.

Since it is meaningless to estimate the fertility function when the woman is unmarried (assuming no illegitimate births), pre-marital migration places further restrictions on duration of marriage when estimating migration effects by migration cohort and period after migration. Table 6.13 shows the restrictions placed on duration of marriage in 1974 of pre-marital migrants when the migration effect is estimated for post-migration periods by migration cohort. For example, in order to estimate a migration effect one period (5 years) after migration for migration cohort 1960-64, individuals must have been married by 1969, implying duration of marriage in 1974 must be less than fifteen but greater than or equal to five.

Table 6.13. 1974 Duration of Marriage, D, Restrictions Placed on Pre-Marital Migrants by Estimating the Fertility Function by Migration Cohort and Period After Migration

MIGRANT COHORT	PERIODS AFTER MIGRATION				
	0	1	2	3	4
1970-74	$D \leq 5$	-	-	-	-
1965-69	$5 \leq D < 10$	$D < 10$	-	-	-
1960-64	$10 \leq D < 15$	$5 \leq D < 15$	$D < 15$	-	-
1955-59	$15 \leq D < 20$	$10 \leq D < 20$	$5 \leq D < 20$	$D < 20$	-
1950-54	$20 \leq D < 25$	$15 \leq D < 25$	$10 \leq D < 25$	$5 \leq D < 25$	$D < 25$

As we see from Table 6.13, for any migration cohort the acceptable range of duration of marriage, and, therefore, the sample itself must vary with the different periods after migration. This was not true when we measured migration effects for the post-marital migrants. This may present a problem in determining whether adaptation varies with time spent in the urban location since the sample will vary with the post-migration observation period. One control for this problem is to distinguish individuals according to the length of time they waited after migration to be married. For a given pre-marital migration cohort, the duration of time after migration and before marriage will determine a duration of marriage in 1974. For any given post-migration non-married period and migration cohort, the sample will remain the same across all periods after migration.

Adaptation of unmarried migrants may be a function of years of pre-marital residence, independently of total years-of-residence in the urban area. For this reason and the statistical reason noted above, we cross-classified pre-marital migrants by years of residence intervals and years of residence minus years of pre-marital residence. This cross-classification also controls for duration of marriage. In order to determine adaptive behavior relative to rural non-migrants, we must compare rural-urban migrants in each cross-classified cell with rural non-migrants of identical duration of marriage as defined by the cell. Since the cells actually represent intervals, duration of marriage is determined within a range. Therefore, we continued to include the duration of marriage variable in the estimation of equation (5.5).

Table 6.14a shows the value of the migration coefficient in equation (5.5) for women who married within their first four years in an urban area compared to rural non-migrants. For migration cohort 1970-74, the duration of marriage was 0-4 years. Therefore, the comparison group of rural non-migrants was

Table 6.14a. Rural-Urban Migration Coefficients for Pre-Marital Migrants Married in Period 0-4 Years After Migration: Rural Non-Migrants Comparison Group (No Control for Socioeconomic Variables)

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74					.0918 (1.01)					162
1965-69					-.1028 (-1.05)	-.0632 (-0.42)				124
1960-64					.0886 (0.53)	-.0747 (-0.46)	-.0708 (-0.32)			112
1955-59					-.0467 (-0.37)	-.1134 (-0.67)	-.4414* (-2.80)	.2384 (-1.14)		140
1950-54					-.0511 (-0.23)	.1977 (0.68)	-.0066 (-0.03)	-.3558 (-1.09)	-.3556 (-1.26)	88

*Significant at .10 level-one tail test

also limited to those for whom duration of marriage was 0-4, and a regression of the form, $y_{74} = f(y_{69}, \ldots M)$ was estimated. For migration cohort 1965-69 duration of marriage was 5-9 years. A similar rural non-migrant comparison group was used to estimate the two fertility functions, $y_{74} = f(y_{69}, \ldots M)$ and $y_{69} = f(y_{64}, \ldots M)$.

Table 6.14a suggests that the post-migration pattern of α coefficients for the migration dummy variable in equation (5.5) is similar for post-marital migrants and pre-marital migrants who married within their first four years after migration. The magnitudes of the coefficients in Table 6.14a suggest increasing adaptation with time spent in the urban location. However, only one of these coefficients, α for the migration cohort 1955-59 two periods after migration, was significantly negative. (Since pre-marital migrants were not married before migration no migration coefficients are estimated for pre-migration periods.)

Table 6.14b shows the coefficients for the rural-urban migrants who married from five to nine years after migration compared to rural non-migrants of similar duration of marriage. Table 6.14b shows a definite eventual adaptation for women who waited from five to nine years after migrating to marry. However, for earlier migration cohorts, this adaptation occurred at later periods after migration. Tables 6.14c through 6.14e show migration coefficients for rural-urban migrants who waited even longer to marry after migration. All show some evidence of adaptation with length of residence, but few coefficients are significant.

In summary, there appears to be adaptation by pre-marital migrants. This adaptation is slow, however. In no case was there evidence of adaptive behavior immediately after marriage. This contrasts to post-marital migrants who showed some adaptive behavior among recent migrant cohorts

Table 6.14b. Rural-Urban Migration Coefficients for Pre-Marital Migrants Married in Period 5-9 Years After Migration: Rural Non-Migrant Comparison Group (No Control for Socioeconomic Variables)

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69						-.0600 (-0.75)				171
1960-64						-.1207 (-1.13)	-.3104* (-2.02)			103
1955-59						-.0256 (-0.17)	-.2324* (-1.47)	-.5192* (-2.61)		118
1950-54						.1469 (0.96)	.0614 (0.33)	-.5829* (-3.36)	-.5631* (-2.45)	131

*Significant at .10 level-one tail test

Table 6.14c. Rural-Urban Migration Coefficients for Pre-Marital Migrants Married in Period 10-14 Years After Migration: Rural Non-Migrant Comparison Group (No Control for Socioeconomic Variables)

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69										
1960-64							-.1286 (-1.04)			99
1955-59							-.0709 (-0.43)	-.7462* (-2.98)		70
1950-54							.1505 (0.70)	.1030 (0.47)	-.3679 (-1.27)	103

*Significant at .10 level-one tail test

Table 6.14d. Rural-Urban Migration Coefficients for Pre-Marital Migrants Married in Period 15-19 Years After Migration: Rural Non-Migrant Comparison Group (No Control for Socioeconomic Variables)

MIGRANT COHORT	BEFORE MIGRATION					AFTER MIGRATION				SAMPLE SIZE N
	-4	-3	-2	-1	0	1	2	3	4	
1970-74										
1965-69										
1960-64										
1955-59								-.1721 (-1.18)		85
1950-54								.1652 (0.90)	-.4707* (-1.72)	71

*Significant at .10 level-one tail test

Table 6.14e. Rural-Urban Migration Coefficients for Pre-Marital Migrants Married in Period 20-24 Years After Migration: Rural Non-Migrant Comparison Group (No Control for Socioeconomic Variables)*

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69										
1960-64										
1955-59										
1950-54									-.4157 (-0.85)	72

*Significant at .10 level-one tail test

immediately after migration. Like post-marital migration, earlier migration cohorts showed slower adaptation with time spent in the new location.

Pre-marital rural-urban migrants have the opportunity to receive information about urban life and urban constraints prior to marriage. This may permit a level of adaptation superior to that of post-marital migrant couples who have, perhaps, set family size goals prior to migration and must jointly adjust those goals after migration. The length of pre-marital exposure to urban life may have two effects on observed adaptation. First, women who migrate to the urban area and marry immediately upon arrival are likely to have migrated in order to marry. These women may have had to delay marriage and may be highly fertile immediately after migrating, in order to compensate for lost marital exposure, but they may later adapt. For these women, one pattern of adaptation may show "negative" adaptation immediately upon marriage, but some "positive" adaptation later.

Women who wait longer after migration to marry will have had more pre-marital exposure to urban life than women who marry soon after migration; and they may also have shown, by not marrying so soon, a preference for small family size. Our measure of adaptation would then show greater adaptation for women who wait longer after migration to marry.

We can determine from Tables 6.15a through 6.15d whether the length of pre-marital residence has an effect on adaptive behavior. For example, in Table 6.15a we have the 1950-54 migration cohort classified by years of pre-marital residence. The α migration coefficients for each five-year-duration-of-marriage interval are shown by years of pre-marital residence. For the same stage of marriage, say, married 5-9 years, (i.e., 2nd five in marriage interval) we see the α coefficient declining for most migration cohorts as pre-marital urban residence increases. This implies that rural-urban migrants who waited longer to marry after migration reduced their fertility rates more in comparison to their rural non-migrant counterparts than those who married earlier.

Table 6.15a. Rural-Urban Migration Coefficients for Pre-Marital Migrant Cohort 1950-54 by Years of Residence Before Marriage in the Urban Area and Marriage Interval: Rural Non-Migrant Comparison Group (No Control for Socioeconomic Variables)[a]

MARRIAGE INTERVAL	YEARS BEFORE MARRIAGE 0-4	5-9	10-14	15-19	20-24
1st Five	-.0511	.1469	.1505	.1652	- .4157
2nd Five	.1977	.0614	.1030	-.4707*	-
3rd Five	-.0066	-.5829*	-.3679	-	-
4th Five	-.3556	-.5631*	-	-	-

[a]From Tables 6.14a through 6.14e

*Significant at the .10 level-one tail test.

192

Table 6.15b. Rural-Urban Migration Coefficients for Pre-Marital Migrant Cohort 1955-59 by Years Residence Before Marriage in the Urban Area and Duration of Marriage Interval: Rural Non-Migrant Comparison Group (No Control for Socioeconomic Variables)[a]

MARRIAGE INTERVAL	YEARS BEFORE MARRIAGE				
	0-4	5-9	10-14	15-19	20-24
1st Five	-.0467	-.0256	-.0709	-.1721	
2nd Five	-.1134	-.2324*	-.7462*		
3rd Five	-.4414*	-.5192*			
4th Five					

[a]From Tables 6.14a through 6.14e
*Significant at the .10 level-one tail test

Table 6.15c. Rural-Urban Migration Coefficients for Pre-Marital Migrant Cohort 1960-64 by Years of Residence Before Marriage in the Urban Area and Duration of Marriage Interval: Rural Non-Migrant Comparison Group (No Control for Socioeconomic Variables)[a]

MARRIAGE INTERVAL	YEARS BEFORE MARRIAGE 0-4	5-9	10-14	15-19	20-24
1st Five	.0886	-.1207	-.1286		
2nd Five	-.0747	-.3104*			
3rd Five					
4th Five					

[a]From Tables 6.14a through 6.14e
*Significant at the .10 level-one tail test.

Table 6.15d. Rural-Urban Migration Coefficients for Pre-Marital Migrant Cohort 1965-69 by Years of Residence Before Marriage in the Urban Area and Duration of Marriage Interval: Rural Non-Migrant Comparison Group (No Control for Socioeconomic Variables)[a]

MARRIAGE INTERVAL	YEARS BEFORE MARRIAGE*				
	0-4	5-9	10-14	15-19	20-24
1st Five	-.1028	-.0600			
2nd Five					
3rd Five					
4th Five					

[a]From Tables 6.14a through 6.14e
*Significant at the .10 level- one tail test.

195

The differences in α coefficients across pre-marital urban residence groups may represent a combined effect of adaptation and selectivity, since women who waited longer to marry may have had different family preferences. However, for marriage intervals beyond the first interval these preferences are partially controlled in equation (5.5) by fertility at the beginning of the marriage interval.

Tables A.6.1a through A.6.1e and Tables A.6.2a through A.6.2d in the Appendix are equivalent to Tables 6.14a through 6.14e and Tables 6.15a through 6.15d respectively, except that in the Appendix the rural-urban premarital migrants are compared to rural-rural migrants whereas in the text the rural-urban premarital migrants are compared to rural non-migrants. A brief discussion of Tables A.6.1a through A.6.1e and A.6.2a through A.6.2d is also presented in the Appendix A.6.1.

6.2f <u>Estimations of the Basic Fertility Equation in the ~~First Differences~~ Form</u>

In section 6.2d we tested whether $\alpha_t = \alpha_{t-1}$ in equation system (6.1) using the seemingly unrelated regression estimators. However, one could perform further tests on whether α_t increases or decreases with time spent after migration by estimating the first differences form of equation (5.1) in Chapter 5.

Taking first differences in equation (5.1) yields;*

*For a given migration cohort M = 1 and is constant over time.

$$6.5)\quad \Delta y_{it} = \sum_{j=1}^{K} \beta_j \Delta y_{i,t-j} + \left(\sum_{j=1}^{k'} \beta_j' A_{it}^j - \sum_{j=1}^{k'} \beta_j' A_{i,t-1}^j\right) + \left(\sum_{j=1}^{k''} \beta''_j D_{it}^j - \sum_{j=1}^{k''} \beta_j'' D_{i,t-1}^j\right) + \Delta\alpha_{t,(t-s)} M_{i,(t-s)} + \Delta\varepsilon_t + \Delta\varepsilon_{it}$$

In the first differences formulation, fixed effects, ε_i, assumed constant over time, are eliminated. Furthermore, the coefficient of the migration dummy, $\Delta\alpha$, allows us to test whether α_t increases or decreases with time spent after migration. Limiting ourselves to only post-marital migrants, estimating (6.5) for post-migration periods, and assuming $\beta_j' = \beta_j'' = 0$ for $j > 3$ and $\beta_j = 0$ for $j > 1$, (6.5) becomes

$$6.6)\quad \Delta y_{it} = \beta_1 \Delta y_{i,t-1} + \beta_1' A_t + \beta_2' A_t^2 + \beta_1'' D_t + \beta_2'' D_t^2 + \Delta\alpha_{t,(t-s)} M_{i,(t-s)} + \Delta\varepsilon_t + \Delta\varepsilon_{it}.$$

Table 6.16 shows the estimated coefficients of the migration dummy in the first differences estimation, equation (6.6), for periods after migration. The sample was restricted to post-marital migrants with a rural non-migrant comparison group. The coefficient of M in equation (5.5) estimates α_t while the coefficient of M in equation (6.6) estimates $\alpha_t - \alpha_{t-1} = \Delta\alpha_t$.
A comparison of Tables 6.3 and 6.16 suggests that $\alpha_t = \Delta\alpha_t$; or $d\alpha/dt = \alpha_t$, which is true when $\alpha(t) = a e^t$. It appears that migration has an exponential effect on fertility. Negative values of $\Delta\alpha$ in Table 6.16 reflect declining values (increasing negative values) and imply greater adaptation with time spent in the current location. For migrant group 1955-59, α_1, which is the effect of migration on fertility one period after migration, found to be negative in Table 6.3, has a larger negative value than α_o, since $\Delta\alpha_1 = \alpha_1 - \alpha_o = -.2655 < 0$ in Table 6.16. The significances of successive $\Delta\alpha$'s in

Table 6.16. Coefficient for Rural-Urban Migration Variable in First Differences Equation: Post-Marital Migrants; Rural-Non-Migrant Comparison Group

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74					-.1888* (-2.76)					
1965-69					.0404 (0.52)	-.2035* (-2.71)				
1960-64					.0615 (0.65)	-.4547* (-4.36)	-.4506* (-4.53)			
1955-59					.1848* (1.66)	-.2655* (-.1.87)	-.6526* (-4.24)	-.3659* (-2.43)		
1950-54						-.0269 (-0.22)	-.3447* (-2.29)	-1.0759* (-6.54)	-.2421* (-1.48)	

*Significant at .10 level-one tail test

Table 6.16 with increasing duration of residence test Hypothesis 3, that the longer the duration of residence the more the rural-urban migrant adapts to urban norms and budget constraints.

Several refinements of the $\Delta\alpha$'s can be made. First, we should establish the proper comparison group for the migrants, recognizing the implicit duration of marriage restrictions of a given post-marital migration cohort. Second, we can establish the rural-rural post-marital migrant group as the comparison group. These refinements are considered below.

Table 6.17 shows the rural-urban migration coefficients in the first differences equation when the duration of marriage of rural non-migrants is restricted to equal that of the post-marital migrants in a given migration cohort. We see from Table 6.17 that $\Delta\alpha < 0$ for most migration cohorts after migration, implying that adaptation increases with length of residence in the urban area. We already concluded from Tables 6.5 and 6.7 that, after controlling for duration of marriage restrictions, $\Delta\alpha = 0$ for periods prior to migration. Table 6.17 also shows that $\Delta\alpha = 0$ for pre-migration periods for all groups but the 1970-74 migrant cohort in the period immediately preceeding migration.

Table 6.18 shows the migration coefficient in the first differences equation when rural-rural migrants are the comparison group. Comparing Tables 6.17 and 6.18 suggests that in cases where the coefficients are significant, $\Delta\alpha$ in Table 6.17 generally has a greater negative value than $\Delta\alpha$ in Table 6.18. This implies that the measured effect of the increase in adaptation with length of post-migration urban residence ($\Delta\alpha = \alpha_t - \alpha_{t-1}$) is greater when the comparison group is rural non-migrants. This implies that the fertility of the rural-rural migrants deviate increasingly from those of the rural non-migrants with the time spent after migration.

Table 6.17. Coefficients for Rural-Urban Migration in First Differences Equation: Post-Marital Migrants, Rural Non-Migrant Comparison Group, Controlling for Duration of Marriage Restriction

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74				-.2128* (-2.79)	-.1961* (-2.51)					630
1965-69				-.0619 (-0.76)	-.2399* (-2.93)	-.2471* (-2.76)				515
1960-64				.0509 (0.49)	-.0399 (-0.37)	-.4734* (-4.19)	-.3129* (-2.71)			370
1955-59				-.1017 (-0.68)	.0622 (0.40)	-.2778* (-1.82)	-.4178* (-2.43)	-.1440 (-0.97)		226
1950-54				-.0929 (-0.52)	-.0047 (-0.02)	-.0562 (-0.26)	-.1716 (-0.80)	-.6952* (-3.05)	-.1567 (-0.77)	135

200

Table 6.18. Coefficients for Rural-Urban Migration in First Differences Equation: Post-Marital Migrants, Rural-Rural Migrant Comparison Group

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74				-.2083* (-3.09)	-.2035* (-3.11)					1117
1965-69				-.1029* (-1.38)	-.1719* (-2.26)	-.2164* (-2.79)				874
1960-64				-.0223 (-0.25)	-.0831 (0.85)	-.3367* (-3.29)	-.3101* (-3.16)			629
1955-59				-.0994 (-0.78)	-.0155 (-0.12)	-.2425* (-1.67)	-.2136* (-1.39)	-.1312 (-1.08)		364
1950-54				-.1034 (-0.66)	-.1513 (-0.80)	-.0461 (-0.24)	-.3373* (-1.70)	-.3604* (-1.76)	-.0298 (-0.23)	215

*Significant at .10 level-one tail test

Tables 6.19 and 6.20 show that rural-rural migrants are also doing some adapting vis-a-vis rural nonmigrants. Table 6.19 shows the coefficient α in Equation 5.5 and Table 6.20 shows the coefficient $\Delta\alpha$ in Equation 6.6 for post-marital rural-rural migrants with a rural non-migrant comparison group. We see from these tables that α and $\Delta\alpha$ are significantly negative in only a few cases. Among rural migrants, migration appears to have a small negative effect on fertility. These results are important because α and $\Delta\alpha$ are not significantly positive. Ribe and Schultz (1980) argue that rural-rural migrants should prefer larger family sizes than rural nonmigrants.

6.3 Tests of Hypothesis 3 Using the Completed Fertility Rates

We turn to the test of Hypothesis 3 using equation (5.6). To expedite this test the coefficient estimate for the cohort dummy variables in Table 5.4 in Chapter 5 are rearranged by the calendar year of migration and the duration of residence in Table 6.21. The results in Table 6.21 are summarized in Figure 6.3. Table 6.21 shows that for each migration cohort the rural-urban migrants have fewer births during almost every five-year interval after migration than rural stayers. The statistically significant negative values of most coefficients in Table 6.21 imply that Hypothesis 3 cannot be rejected. There is strong support for the hypothesis that rural-urban migrants adapt to urban life by reducing fertility rates after migration.

Using an analysis of variance technique similar to that used by Cooley, McGuire and Prescott (1979), we model the estimated differential between the rural-urban migrants and rural stayers in additional births during the past five years, $\frac{\partial \hat{y}_t}{\partial M_j}$, (i.e. the estimated coefficients

Table 6.19. Coefficient for Post-Marital Rural-Rural Migrants with Rural Non-Migrants Comparison Group, Controlling for Duration of Marriage Restriction, but not for Socioeconomic Variables

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	.0347 (0.65)	.0198 (0.30)	-.0872 (-1.17)	-.1587* (-1.85)	-.0082 (-0.09)					555
1965-69		-.0700 (-0.98)	-.1315* (-1.45)	-.0341 (-0.34)	-.0823 (-0.76)	-.0472 (-0.39)				449
1960-64			.0518 (0.57)	-.0788 (-0.72)	.0260 (0.23)	-.0179 (-0.15)	-.0850 (-0.66)			350
1955-59				.0432 (0.29)	-.0075 (-0.05)	-.1420 (-0.98)	-.3088* (-1.73)	.0455 (0.29)		220
1950-54					.0409 (0.18)	-.1081 (-0.53)	.3559* (1.77)	-.6560* (-2.94)	-.1979 (-1.00)	131

*Significant at .10 level-one tail test

Table 6.20. Coefficient for Post-Marital Rural-Rural Migration in First Differences Equation with Rural Non-Migrant Comparison Group

MIGRANT COHORT	BEFORE MIGRATION					AFTER MIGRATION				SAMPLE SIZE N
	-4	-3	-2	-1	0	1	2	3	4	
1970-74	.0327 (0.61)	.0286 (0.43)	-.0870 (-1.18)	-.1619* (-1.89)	.0002 (0.00)					555
1965-69		-.0695 (-0.97)	-.1301 (-1.43)	-.0451 (-0.45)	-.0777 (-0.72)	-.0473 (-0.39)				449
1960-64			.0532 (0.59)	-.0774 (-0.71)	.0229 (0.21)	-.0165 (-0.13)	-.0859 (-0.68)			350
1955-59				.0424 (0.29)	-.0075 (-0.05)	-.1432 (-0.99)	-.3001* (-1.68)	.1023 (0.68)		220
1950-54					.0423 (0.19)	-.1117 (-0.55)	.3558* (1.75)	-.6796* (-3.02)	-.0327 (-0.17)	131

*Significant at .10 level-one tail test

Table 6.21. Fertility Differentials Due to Migration When Fertility of 5 Years Ago is Controlled for: Total Rural-Urban Migrants and Rural Stayers*

DURATION OF RESIDENCE

Period of Migration	-20 ~ -16	-15 ~ -11	-10 ~ -6	-5 ~ -1	0 ~ 4	5 ~ 9	10 ~ 14	15 ~ 19	20 ~ 24	25 ~ 29	30 ~ 34
1970 - 74 (M1)	-.210*	-.151	-.209*	-.206*	-.202*						
1965 - 69 (M2)		-.101	-.001	-.105	-.267*	-.094*					
1960 - 64 (M3)			-.096	-.026	-.243*	-.274*	-.212*				
1955 - 59 (M4)				-.233	-.084	-.173*	-.276*	-.359*			
1950 - 54 (M5)					-.068	.112	-.361*	-.424*	-.324*		
1945 - 49 (M6)						.084	.094	-.595*	-.260*	-.299*	
before 1945 (M7)							-.025	.050	-.484*	-.449*	-.192

Source: Table 5.4 in Chapter 5.

*Significant at the .05 level.

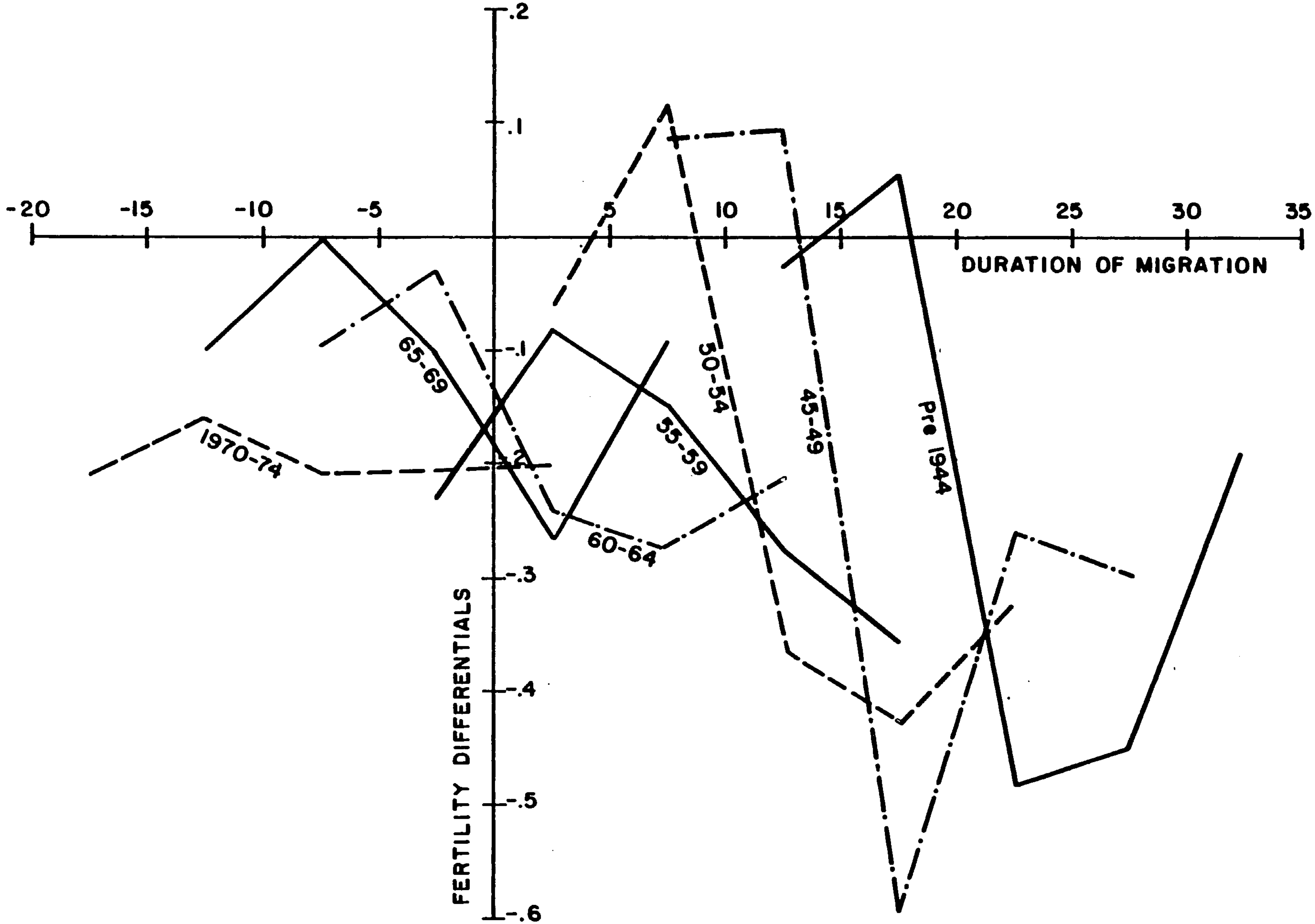

Figure 6.3. Incremental Adaptation of Fertility by Migration Cohort and Period Before and After Migration, All Rural-Urban Migrants vs. Rural Stayers (Eq. 5.6)

of the migration cohort dummy variables in Table 5.4 or 6.21) as a function of the duration of residence and the year of migration:

6.7)
$$Q_{tj} = \frac{\partial \hat{y}_t}{\partial M_j} = \sum_{j=1942}^{1972} \phi_j C_j + \sum_{t-j=-18}^{32} \tau_{t-j} D_{t-j} + \varepsilon_{t,j}$$

j = 1972, 1967, 1962, 1957, 1952, 1947, and 1942;

t = 1974, 1969, 1964, 1959, and 1954

where Q_{tj} is obtained from Table 6.21,

C_j = the dummy variables reflecting the year of migration cohort. C_{1972} = 1 if the dependent variable is for the migration cohort migrated during 1970-74, otherwise zero. Other dummy variables are similarly defined for the migration cohorts migrating during 1965-69, 1960-64, 1955-59, 1950-54, 1945-49 and before 1945 (YM67, YM62, YM57, YM52, YM47 and YM42 in Table 6.22.)

t = indexes the observation year.

D_{t-j} = the dummy variables reflecting the duration of residence. For example D_2 is 1 if the dependent variable is for the duration of residence 0 - 4 years after migration, otherwise zero. Other dummy variables are similarly defined for the duration of residence -15 to -19, -10 to -14, -5 to -9, -1 to -4, 0 to 4, 5 to 9, 10 to 14, 15 to 19, 20 to 24, 25 to 29 and 30 to 34 (D18, D13, D8, D3, DP2, DP7, DP12, DP17, DP22, DP27 and DP32 in Table 6.22).

To avoid the singularity of the independent variables matrix, we drop

Table 6.22. Regressions of Fertility Differentials on Migration Cohort and Duration of Migration Dummy Variables

Variable Names	All Migrants		Post-Marital Migrants		Premarital Migrants		Total Migrants Older Than 29 in 1974	
	b	t	b	t	b	t	b	t
YM67	.081	(.77)	.083	(.60)	NA	(NA)	.072	(.66)
YM62	.059	(.53)	.044	(.30)	-.142	(- .58)	.087	(.75)
YM57	.085	(.70)	.168	(1.06)	-.127	(- .54)	.133	(1.07)
YM52	.180	(1.38)	.104	(.61)	.008	(.03)	.231	(1.73)
YM47	.281	(2.0)	.159	(.85)	.083	(.36)	.330	(2.29)
YM42	.317	(2.11)	NA	(NA)	.057	(.23)	.351	(2.27)
D18	-.210	(-1.35)	-.207	(-1.02)	NA	(NA)	-.210	(-1.31)
D13	-.166	(-1.36)	-.164	(-1.03)	NA	(NA)	-.162	(-1.29)
D8	-.149	(-1.35)	-.140	(- .97)	NA	(NA)	-.155	(-1.37)
D3	-.199	(-1.88)	-.207	(-1.50)	NA	(NA)	-.217	(-2.00)
DP2	-.254	(-2.43)	-.204	(-1.49)	NA	(NA)	-.301	(-2.81)
DP7	-.206	(-1.69)	-.401	(-2.51)	.019	(.10)	-.268	(-2.13)
DP12	-.341	(-2.60)	-.370	(-2.13)	.016	(.07)	-.384	(-2.86)
DP17	-.548	(-3.87)	-.702	(-3.67)	-.216	(- .90)	-.588	(-4.05)
DP22	-.615	(-3.98)	-.259	(-1.19)	-.412	(-1.66)	-.649	(-4.09)
DP27	-.673	(-3.86)	-.378	(-1.37)	-.499	(-1.87)	-.715	(-3.99)
DP32	-.509	(-2.35)	NA	(NA)	NA	(NA)	-.590	(-2.66)
No. of OBS	35		30		19		35	
F-STATS	4.33		3.24		2.88		4.30	
R^2	.8036		.7639		.7619		.8026	

the intercept term and C_{1972} in the regression. As a result, the coefficients of the year of migration are contrasted to the 1970-74 migration cohort effect.

The estimates of equation (6.7) are presented in the first column of Table 6.22. Table 6.22 shows that adaptivity of rural-urban migrants has generally increased over time. When the duration of migration is controlled, rural-urban migrants who migrated before 1950 seem to have adapted less than women migrating between 1970 and 1974 (i.e., coefficients for C1947 and C1942 are significantly larger than that for C1972). Table 6.22 also indicates that the rural-urban migrants continue to reduce fertility rates with time spent in urban areas compared to rural stayers (i.e., absolute values of coefficients for positive duration of migration are increasing with duration of migration and all of them except for D_7 are significantly less than zero).

The first column of Table 6.23 presents adjusted means of differentials in current fertility rates between the rural-urban migrants and rural stayers according to the duration of residence.* In the last row of Table 6.23 the

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* Table 6.23 describes the results of the multiple regressions shown in Table 6.22. The results are in terms of "adjusted means of fertility differentials " rather than the regression coefficients. There is an adjusted mean of fertility differentials corresponding to every migration cohort dummy variable. Each adjusted mean is to be interpreted as an estimate of what the mean of fertility differentials for rural-urban migrants with a given duration of residence would have been had these migrants been "typical" in terms of all other sets of dummy and continuous variables. "Typical" is in reference to the year of migration in the regression of equation (6.7). In effect, the net regression coefficients for the other sets of variables, i.e., the year of migration dummy variables, are used to standardize the fertility differentials for the set of dummy variables in question; i.e., the duration of residence. The advantage of presenting sets of adjusted means of fertility differentials in lieu of regression coefficients is that they convey information about levels of fertility differentials and not the differences in fertility differentials between different durations of residence categories. For the exposition of the process for calculating the adjusted fertility differentials, refer to Bowen and Finegan (1969).

209

Table 6.23. Adjusted Means of Differentials in Additional Fertility of Rural-Urban Migrants, $\frac{\partial CEB}{\partial M}$, According to Duration of Residence

Duration of Residence	All Migrants	Post-Marital Migrants	Premarital Migrants	Total Migrants Older than 29 in 1974
-15 ~ -19	-.066	-.114		-.037
-10 ~ -14	-.023	-.071		.010
-5 ~ -9	-.006	-.047		.017
-1 ~ -4	-.055	-.114		-.045
0 ~ 4	-.110	-.111		-.129
5 ~ 9	-.063	-.308	-.001	-.095
10 ~ 14	-.197	-.277	-.005	-.212
15 ~ 19	-.404	-.609	-.236	-.416
20 ~ 24	-.472	-.166	-.432	-.477
25 ~ 29	-.530	-.285	-.519	-.542
30 ~ 34	-.365	NA	NA	-.418
Sum of Values for Post-Migration Period	-2.141	-1.756	-1.193	-2.289

sums of adjusted means of current fertility differentials for the post-migration period are presented. Table 6.23 indicates that if a rural-urban migrant woman spent her entire 34 childbearing years in urban areas, her completed fertility will be lower by 2.14 children than that of a comparable rural stayer. This differential is much larger than the differentials .72 to 1.37 children estimated from Table 8.5 of Chapter 8. However, the value of 2.14 children is not much larger than the differential in total fertility rates, for the rural to metropolitan migrants, 1.95, and for the rural to other urban areas migrants, 1.36, estimated by Park and Park (1976) using the 1970 Korean population census.

It is important to note that the childbearing period for most women is less than 34 years. Therefore, the value of 2.14 children is the hypothetical maximum differential in current fertility rates due to migration.

6.4 Age at Migration and Adaptation - Hypothesis 4

Hypothesis 4 states that individuals will adapt more to the urban environment the younger they are at the time of rural-urban migration. This hypothesis actually has two dimensions. First, younger individuals could adapt more quickly to the new environment. This would result in a greater fertility change in a given time interval for younger migrants. Second, younger migrants could adapt more over their lifetime than older migrants. The two interpretations are independent of each other. Even if younger migrants were no faster in adapting than older migrants, their completed fertility could be lower than the older migrants simply because of longer lifetime exposure to urban life. If there is no difference in the rates of adaptation between younger and older migrants, younger migrants will adapt "more." Certainly, the extent of total adaptation depends upon the length of exposure to urban life.

Hypothesis 4 embodies the hypothesis that younger migrants are more responsive to a change in environment. This includes the response to value differences between environments as well as response to changes in economic constraints. Human capital theory, for example, suggests that occupational change is less likely for older individuals since they have already invested in skills and training and can expect less discounted benefits from occupational change over their remaining lifetime than younger individuals. We might expect that older migrants to urban areas are less able than younger migrants to take advantage of the occupational opportunities available in the urban area. Therefore, they may not expect as great changes in economic opportunity in moving from rural to urban areas as younger migrants. If this were true, we might observe less adaptation to urban life among older migrants simply because their economic opportunity changes less. In summary, the rather transparent argument for the effect of the age at migration on fertility adaptation follows merely from the fact that a migrant who moves after the age of childbearing cannot alter, or adapt, fertility in response to the new urban environment. However, we must deal with two effects in a single cross section. One is the effect that may occur because different people migrate at different ages, and these differences in the age at migration are correlated with different propensities to adapt to the environment or selective characteristics, which lead to different fertility. Second is the effect of the cumulative period of exposure to the urban environment, hence the period for adaptation to occur.

Unfortunately, there is no existing method of separating the above two effects, namely, the age at migration and the duration of migration effects, while at the same time controlling for the migration cohort effect. For example, one cannot test the independent effect of age at migration on adaptation in a single cross section since the procedure of fixing the migration cohort and allowing age at migration to vary also forces the duration of migration to vary. Although we can study several years of observation using the pregnancy history data, each regression should be considered as a single cross section. As discussed in Chapter 5, we cannot pool different years of observations into a single regression due to the period effects. The migrant fertility should be compared with the fertility of rural stayers at the same year, not with the average fertility level of rural stayers over different years of observations. The above discussion indicates that one should understand at the outset the complexity and the limitations of the analyses in this section.

6.4.a Age at Migration and the Rate of Adaptation

In order to test the hypothesis that younger rural-urban migrant fertility behavior adapts more quickly to urban life, we can estimate fertility functions for separate migration cohorts with age at migration as an independent variable. In this case, we can estimate the following functions for migrant cohort T:

$$y_t = \beta_o^T + \beta_1^T y_{t-1} + \beta_1'^T A_t + \beta_2'^T A_t^2 + \alpha_t^T M + \alpha_t'^T M \cdot a^T + \alpha_t''^T M \cdot (a^T)^2 + \varepsilon_t$$

$$y_{t-1} = \beta_o^T + \beta_1^T y_{t-2} + \beta_1'^T A_{t-1} + \beta_2'^T A_{t-1}^2 + \alpha_{t-1}^T M + \alpha_{t-1}'^T M \cdot a^T + \alpha_{t-1}''^T M \cdot (a^T)^2 + \varepsilon_{t-1} \quad (6.8)$$

$$\vdots$$

$$y_{t-n} = \beta_o^T + \beta_1^T y_{t-n-1} + \beta_1'^T A_{t-n} + \beta_2'^T A_{t-n}^2 + \alpha_{t-n}^T M + \alpha_{t-n}'^T M \cdot a^T + \alpha_{t-n}''^T M \cdot (a^T)^2 + \varepsilon_{t-n},$$

where a^T is age at migration and A_t is age in year t.* If individuals who are older at the time of migration are slower to adapt $\alpha_t'^T > 0$. This hypothesis can be tested for both premarital and post-marital migrants.**

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* We expect a quadratic effect of age at migration on adaptation since older women would be nearer the end of their childbearing years. If we used age at time t, A_t, instead of a^T then

$$\alpha' M \cdot a^T + \alpha'' M \cdot (a^T)^2 = \alpha' M \cdot (A_t - x) + \alpha'' M \cdot (A_t - x)^2$$
$$= (\alpha' - 2\alpha'' x) M \cdot A_t + \alpha'' M \cdot A_t^2 - (\alpha' - \alpha'' x) M \cdot x,$$

where x is years since migration. If $\alpha' > 0$ and $\alpha'' < 0$, as expected, using age in year t would overestimate the retarding effect of age at migration on adaptation.

**Other tests of Hypothesis 4 can be constructed utilizing the linear relation between year of migration T, age at time t, and and age at migration. For example, we could estimate the following function for each age group A:

$$6.9) \quad y_t = \beta_o^A + \beta_1^A y_{t-1} + \ldots \alpha_{t,69}^A M_{69} + \alpha_{t,64}^A M_{64} + \ldots \varepsilon_t$$

where M_T is a dummy variable for migration cohort T, and $\alpha_{t,T}^A$ measures the adaptation in year t of individuals who were age A in 1974 and migrated in year T. Testing whether $|\alpha_{t,T}^A| > |\alpha_{t,T}^{A'}|$ where A <A', tests Hypothesis 4. There are two advantages of equation (6.8) over equation (6.9). Equation 6.8 is simpler since the t-value for $\alpha_t'^T$ is a direct test of the hypothesis. Equation (6.9) requires a more complex test of the hypothesis. In addition, equation (6.8) allows us to directly control for a similar range of duration of marriage for post-marital migrants and nonmigrants by restrictions on the sample size. In equation (6.9), if we are considering adaptation of only post-marital migrants, there will be a different range of the duration of marriage variable for one migrant cohort than for another. This may present statistical problems.

Table 6.24 shows the coefficients for $M \cdot a$ and $M \cdot a^2$ in equation (6.8) above. Only post-marital migrants were included and the comparison group was rural non-migrants. Table 6.24 does not provide general support for the hypothesis that younger age migrants adjust at faster rates. In only seven cases out of the twenty possible cells do the $M \cdot a$ and $M \cdot a^2$ coefficients have positive and negative signs, respectively, that support this hypothesis. In only two of these cases are the coefficients significant.* In thirteen cases, the coefficients suggest that individuals who are older at the time of their last migration adapt more rapidly. In three of these cases the coefficients are significant.

Table 6.25 shows the values of the $M \cdot a$ and $M \cdot a^2$ coefficients for post-marital migrants when the comparison group is rural-rural migrants. The signs of these coefficients support the age at migration hypothesis in half the cases but in only two of these cases are the coefficients significant.

In summary, there is no support for the hypothesis that individuals adapt more quickly when they migrate from rural to urban areas at a younger age. The test used, equation (6.8), may not be able to test the

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* The signs and t-values for the regression coefficients for $M \cdot a$ and $M \cdot a^2$ in the regression (6.8) of Table 6.24 are the bases for concluding that the hypothesis should be rejected based on these data. However, since $M \cdot a^2$ is uniquely determined by $M \cdot a$, the investigation of the signs and t-values separately for the two regression coefficients is not satisfactory. Another approach is to investigate the sign and the statistical significance of the overall response, or

$$\frac{\partial^2 \hat{y}_t}{\partial M \cdot \partial a} = \alpha_t' + 2\alpha_t'' a.$$

The variance of this response estimate is then $\mathrm{Var}(\alpha_t') + 4a\,\mathrm{Cov}(\alpha_t', \alpha_t'') + 4a^2\mathrm{Var}(\alpha_t'')$. (See Lee and Schultz (1980)). However, this alternative approach does not invalidate our conclusion based on the simplistic approach. For example, when the age at migration is 20 years old, none of the twenty cells in Table 6.24 reveals different signs between the overall response and the coefficient for $M \cdot a$.

Table 6.24. Coefficients for M × Age at Migration (M•a) Interaction in Post-Marital Fertility Equation: Rural Non-Migrant Comparison Group, Controlled for Duration of Marriage Restrictions and Socioeconomic Variables†

MIGRANT COHORT		BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	M•a				.1553*	-.0706					
					(1.61)	(-0.70)					
	$M\cdot a^2$				-.0023*	.0011					
					(-1.67)	(-0.72)					
1965-69					.0870	.1901	-.0759				
					(0.48)	(1.02)	(-0.36)				
					-.0017	-.0030	.0013				
					(-0.59)	(1.04)	(0.40)				
1960-64					.0451	-.0892	-.5087*	.5709*			
					(0.14)	(-0.26)	(-1.40)	(1.56)			
					-.0013	.0018	.0084*	-.0084*			
					(-0.24)	(0.33)	(1.42)	(-1.40)			
1955-59					-.2253	-.1460	-.3013	-.6995*	-.1919		
					(-0.54)	(-0.34)	(-0.71)	(-1.43)	(-0.45)		
					.0046	.0024	.0061	.0124*	.0045		
					(0.60)	(0.31)	(0.79)	(1.41)	(0.59)		
1950-54					-.2113	-4.2569*	2.8145	-1.7353	-.0845	.0389	
					(-0.11)	(-1.70)	(1.23)	(-0.79)	(-0.04)	(0.02)	
					.0025	.0839*	-.0530	.0345	.0015	.0025	
					(0.07)	(1.70)	(-1.18)	(0.79)	(0.03)	(0.06)	

* Significant at .10 level-one tail test

† Equation: $y_t = f(y_{t-1}, A_t, A_t^2, D_t, D_t^2, M, MORT, M\cdot a, M\cdot a^2)$ where MORT = own child death rate experienced by the woman.

216

Table 6.25. Coefficients for M × Age at Migration (M•a) Interaction in Post-Marital Fertility Equation: Rural-Rural Migrant Comparison Group

MIGRANT COHORT		BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	M•a				.0275 (0.21)	.0202 (0.16)					277
	M•a^2				-.0007 (-0.39)	-.0003 (-0.15)					
1965-69					.0406 (0.18)	.2662 (1.12)	-.0966 (-0.35)				170
					-.0010 (-0.29)	-.0042 (-1.14)	.0013 (0.31)				
1960-64					-.1038 (-0.32)	.4013 (1.05)	-.4213 (-1.14)	.4433* (1.41)			113
					.0014 (0.27)	-.0062 (-1.00)	.0068 (1.13)	-.0066* (-1.29)			
1955-59					-.3367 (-0.72)	-.3987 (-0.82)	-.6314 (-1.02)	.2546 (0.53)	.3324 (0.74)		56
					.0061 (0.70)	.0069 (0.77)	.0134 (1.16)	-.0064 (-0.73)	-.0047 (-0.56)		
1950-54					- 1.2138 (-0.38)	-.8448 (-0.25)	4.6627* (1.58)	-3.1889 (-1.04)	-.6558 (-0.32)	1.7561 (0.79)	35
					.0224 (0.36)	.0204 (0.30)	-.0852* (-1.50)	.0620 (1.05)	.0098 (0.24)	-.0299 (-0.69)	

* Significant at .10 level-one tail test

independent effect of age at migration since the procedure of fixing the migration cohort and allowing age at migration to vary also forces the birth cohort to vary. Conceivably, age at migration may have a negative effect on adaptation, but older birth cohorts are generally more adaptive. The age at migration and birth cohort effects on adaptation could cancel out in this case. There does not seem to be any method of separating the age at migration and birth cohort effects, while at the same time controlling for the migration cohort effect. For example, if we use equation (6.8) holding the migration cohort constant, and add (M × age at migration) interaction terms, age in year t and age at migration will be perfectly correlated since the birth cohort defines age at migration identically when the migration cohort is fixed.

This finding that age at migration does not have an independent effect on the rate of adaptation does imply that if there is adaptation at all, as section 6.3 suggests, lifetime adaptation will obviously be greater the earlier the individual migrated. We could conclude that younger migrants adapt "more" than older migrants in the sense that completed fertility of migrants who migrated at a younger age will be below that of migrants who migrated at an older age because of longer lifetime exposure to urban life.

The above tests of the age at migration hypothesis were performed only on post-marital migrants. These were individuals who were married at the time of migration. Marriage itself may reduce adaptation if it creates a conservatism in decision making. We might not expect as much adaptive behavior among young married couples as among young single individuals. Single individuals may, after some adaptation, seek out similarly adapted mates. We might find that pre-marital migrants adapt at more rapid rates the younger their age at migration, even though we did not find this to be true for post-marital migrants. Although we found above that there is little adaptation of younger post-marital migrants to urban life, younger pre-marital migrants may still adapt more to urban life than older pre-marital migrants.

Tables 6.26a to 6.26d show the values of the (migration x age at migration) interaction coefficients for pre-marital rural-urban migrants who waited varying numbers of years after migration to marry. For example, Table 6.26a includes those who waited 0-4 years after migration to marry. The rural non-migrant comparison group has a restriction placed on duration of marriage in order to be compatible with the duration of marriage restriction implicitly imposed on the migrants. In Table 6.26a, eight of the fifteen cases have the correct signs for support of the hypothesis that younger migrants adapt more rapidly. However, only in one case were both the first and second order interaction terms significant. In one significant case, the signs were opposite those necessary to support the hypothesis. In Table 6.26b, six of ten had the correct sign and two were significant. In Table 6.26c, four of six had the correct sign and two were significant. In Table 6.26d, all had the opposite sign and two were highly significant.

In the case of post-marital migrants, Table 6.24, only seven of twenty cases had the correct signs; and when the coefficients were significant, three of five had the wrong sign. For pre-marital migrants, at least half of the coefficients had the correct sign, except for the group who waited long after migration to marry (Table 6.26d). In the eight cases in which both the M·a and M·2 coefficients were significant, five had the correct sign. One might interpret this as suggesting that pre-marital, rural-urban migrants are more likely to adapt at a faster

Table 6.26a. Coefficients for Pre-Marital, Rural-Urban Migration × Age at Migration (M·a) Interaction Coefficients: Rural Non-Migrant Comparison, Married 0-4 Years After Migration

MIGRANT COHORT		BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	M x a					-.3633 (-1.24)					162
	M x a²					.0063 (0.96)					
1965-69	"					.2197 (0.60)	.3074 (0.55)				124
						-.0064 (-0.74)	-.0072 (-0.56)				
1960-64	"					1.251 (0.66)	.2429 (0.13)	-2.0129 (-0.85)			112
						-.0299 (-0.67)	-.0041 (-0.09)	.0438 (0.78)			
1955-59	"					.2656 (0.27)	.2296 (0.17)	-1.5709 (-1.27)	-1.6217 (-0.98)		138
						-.0056 (-0.23)	-.0019 (-0.06)	.0412* (1.34)	.0404 (0.99)		
1950-54	"					7.5103* (1.42)	-13.1648* (-1.83)	2.9834 (0.48)	-.3962 (-0.05)	-.2350 (-0.03)	87
						-.1970* (-1.41)	.3538* (1.86)	-.0792 (-0.48)	.0164 (0.08)	.0080 (0.04)	

* Significant at .10 level-one tail test

Table 6.26b. Coefficients for Pre-Marital, Rural-Urban Migration × Age at Migration (M·a) Interaction Coefficients: Rural Non-Migrant Comparison, Married 5-9 Years After Migration

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69	M x a					-.1070				171
						(-0.50)				
	M x a^2					.0023				
						(0.42)				
1960-64						.5063*	.1761			103
						(1.54)	(0.45)			
						-.0123*	-.0056			
						(-1.43)	(-0.56)			
1955-59						.0989	-.5728	-.0172		118
						(0.18)	(-0.98)	(-0.02)		
						-.0026	.0166	-.0006		
						(-0.17)	(1.04)	(-0.03)		
1950-54						.0152	-.5290	.5249*	.1593	130
						(0.05)	(-1.27)	(1.32)	(0.32)	
						-.0011	.0160	-.0169*	-.0039	
						(-0.10)	(1.26)	(-1.39)	(-0.26)	

*Significant at .10 level-one tail test.

Table 6.26c. Coefficients for Pre-Marital, Rural-Urban Migration × Age at Migration (M·a) Interaction Coefficients: Rural Non-Migrant Comparison, Married 10-14 Years After Migration

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69										
1960-64	M x a						.1260 (0.52)			98
	M x a^2						-.0064 (-0.83)			
1955-59							.9347* (1.55)	1.5836* (1.83)		70
							-.0377* (-1.59)	-.0642* (-1.88)		
1950-54							.3026 (0.47)	-.3805 (-0.57)	-.4149 (-0.49)	102
							-.0119 (-0.51)	.0140 (0.59)	.0097 (0.32)	

*Significant at .10 level-one tail test

Table 6.26d. Coefficients for Pre-Marital, Rural-Urban Migration × Age at Migration (M•a) Interaction Coefficients: Rural Non-Migrant Comparison, Married 15-19 Years After Migration

MIGRANT COHORT		BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74											
1965-69											
1960-64											
1955-59	M x a								-.9345* (-3.15)		85
	M x a^2								.0392* (2.93)		
1950-54									-.6472* (-2.14)	-.0568 (-0.13)	71
									.0304* (1.96)	.0035 (0.16)	

* Significant at .10 level-one tail test

rate when they migrate at younger ages than are post-marital migrants. However, this conclusion had only weak support.

Table A.6.3 in Section A.6.3 of the Appendix shows coefficients for (post-marital migration x age at migration) interaction terms when the comparison group is non-migrants, defined as those who have not changed their county of residence and Table A.6.4 shows those when the comparison group is rural-rural migrants who changed their county of residence. Tables A.6.5a through A.6.5d show coefficients for (pre-marital migration x age at migration) interaction terms when the comparison group is non-migrants, defined as not leaving the county of origin. As discussed in section A.6.3 the main conclusions about the effect of age at migration on adaptation drawn from the current section are not sensitive to different comparison groups for both post- and pre-marital rural-urban migrants.

6.4.b Age at Migration and Completed Fertility - Hypothesis 4.

We have established strong support for adaptation Hypothesis 3 in Section 6.3 above. In Section 6.4.a we found only weak support among pre-marital migrants that younger age migrants adapt at a faster rate than older migrants. There was virtually no support for this effect among post-marital migrants. However, even if rates of adaptation were equal, younger age migrants should have a lower completed fertility than older migrants simply because they face a longer exposure to urban life before ending their childbearing. In this section, we test whether completed fertility depends on the age at migration. This is Hypothesis 4.

Table 6.23 in section 6.3 showed that if a rural-urban migrant spent her entire 34 childbearing years in urban areas, her completed fertility would be lower by 2.1 children than that of a comparable rural stayer. Based on Table 6.23, Table 6.27 estimates the fertility differentials for the different ages

Table 6.27. Estimated Differentials in Current Fertility Rates by Current Age and Age at Migration

Current Age	Age at Migration						
	5	10	15	20	25	30	35
20 ~ 24	-.404	-.197	-.063	-.11	0	0	0
25 ~ 29	-.472	-.404	-.197	-.063	-.11	0	0
30 ~ 34	-.530	-.472	-.404	-.197	-.063	-.11	0
35 ~ 39	-.365	-.530	-.472	-.404	-.197	-.063	-.11
Total	-1.771	-1.603	-1.136	- .774	- .37	- .173	- .11

* Source: Table 6.23.

at migration. To simplify our computation we assume that most women start childbearing at age 20-24 and stop at age 40. For example, the woman migrating at age five would have 15-19 years in urban areas when she starts childbearing at age 20-24, so the differential in her current fertility rates compared with a comparable rural stayer at age 20-24 would be -.404 children, which is the value for the duration of residence 15-19 years at the 1st column of Table 6.23.

Table 6.27 shows that a woman who migrated to urban areas in her childhood (up to 12 years old) would have between 1.771 and 1.603 fewer children in her completed fertility than a comparable rural stayer. Women who migrated at ages 15, 20, 25, 30 and 35 would have 1.1, .8, .4, .2 and .1 fewer children at completion of fertility than a comparable rural stayer. Table 6.27 informally indicates that our major Hypothesis 4 should not be rejected despite the weak modelling support.

An alternative way of testing Hypothesis 4 is to estimate equation (5.6) for each age at migration group. Table 6.28 shows the distribution of the rural-urban migrants by year-of-migration period and age-at-migration group. Since our working sample is limited to the currently married women ages 20-49, the younger age-at-migration groups have very few recent migrants and the older age-at-migration group have very few earlier migrants. It is, however, interesting to note that the peak age at migration falls between 20-24 years; i.e., 424 women out of 1230 total migrant women have migrated between ages 20-24.*

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*This result is consistent with the evidence from the population census presented in Chapter 3. While the proportion of women ages 20-24 is 7 percent of the 1970 rural population, the proportion of the rural-urban migrant women in the age group 20-24 is 21 percent during the 1970-75 period.

Table 6.28. Distribution of Total Rural-Urban Migrants by Year of Migration and Woman's Age at Migration in 1974

Year of Migration	Age at Migration 0 ~ 14 (1)	15 ~ 19 (2)	20 ~ 24 (3)	25 ~ 29 (4)	30+ (5)
1970 - 74	0	15	116	85	107
1965 - 69	5	65	149	84	76
1960 - 64	7	42	71	39	33
1955 - 59	23	33	51	21	7
1950 - 54	34	34	30	14	0
1945 - 49	35	19	7	0	0
Before 1945	16	12	0	0	0
Total	120	220	424	243	223

Table 6.29 is similar to Table 6.23 and reports adjusted mean differentials of additional fertility during the past five years by the rural-urban migrants compared with the rural stayers adjusted by the duration of migration.* We circled the entry associated with age at migration of 15-19 and duration of residence of 15-19, that is, the cell -.514 in Table 6.29. Combined with this cell is the next cell upward and to the right -.300 and again, upward to the right -.220 and finally, upward to the right -.156. All of these cells are generated by women of the same birth cohort migrating at different ages. In Table 6.28, the cohort cells fall on a downward sloping diagonal line.

The last row of Table 6.29 gives the sums of the adjusted means of post-migration period fertility differentials. Table 6.29 indicates that the completed fertility differentials are -1.8, -1.5, -1.8, -1.3 and -.8 for age at migration groups 0-14, 15-19, 20-24, 25-29, and 30 years and over, respectively. These figures indicate that one should not reject Hypothesis 4. The only exception to the principle that the younger the age at migration the greater the total adaptation to the urban family size norm is the large differential for the age at migration group 20-24, which reveals larger differentials than the younger group 15-19. This is not an unexpected finding. Ages 20-24 are the peak ages for marriage and childbearing in our sample and so the disruptive effect of the migration process itself on marriage and childbearing might be most severe for women migrating at this age.

It should be noted that the fertility differentials estimated in Table 6.29 are substantially larger than those in Table 6.27, except for age at migration younger than fifteen. We feel that estimates in Table

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*Like Table 6.23, Table 6.29 is obtained after estimating equation (5.6) and then equation (6.7) for each age at migration group.

Table 6.29. Estimates of Adjusted Differentials of Current Fertility Rates, $\frac{\partial CEB}{\partial M}$, by Age at Migration

Duration of Residence	Age at migration				
	0 - 14	15 ~ 19	20 ~ 24	25 ~ 29	30 +
-15 ~ -19					-.075
-10 ~ -14					-.028
- 5 ~ - 9			-.197	-.143	-.009
- 1 ~ - 4			-.049	-.118	-.101
0 ~ 4		-.049	-.153	-.098	-.156
5 ~ 9	-.216	-.011	.034	-.220	-.430
10 ~ 14	-.056	-.065	-.300	-.554	-.120
15 ~ 19	-.143	-.514	-.592	-.439	-.037
20 ~ 24	-.410	-.460	-.612	-.030	
25 ~ 29	-.633	-.292	-.193		
30 ~ 34	-.360	-.120			
Sum of the post-migration period values.	-1.818	-1.511	-1.816	-1.341	-.756

6.27 are crude and biased because unlike Table 6.29, identical parameters are used for different age at migration groups in Table 6.27.

Combining the results from Section 6.4.a and 6.4.b, we would conclude that the age at migration to an urban area may not increase the speed of adaptation. However, because of longer exposure to urban life before completing childbearing, the younger rural-urban migrant will have a lower completed fertility than a comparable rural stayer. For example, rural-urban migrants migrating before the age of 25 would have 1.5 to 1.8 fewer children in their completed fertility than comparable rural stayers. However, women migrating after the age of 29 would have only 0.8 fewer children than rural stayers.

6.5 Selectivity and Adaptation - Hypotheses 1 and 2

6.5.a Education and Adaptation - Rates of Adaptation

After controlling for sample selectivity bias in comparing rural-urban migrant and rural non-migrant fertility by using the recursive fertility equation, we can test whether more educated couples are more adaptive. This is easily tested by adding an (education x migration) interaction term, $M \cdot ED_o$, into the basic recursive equation:

6.10) $$y_t = \beta_o + \beta_1 y_{t-1} + \beta_1' A_t + \ldots + \alpha_t M_{t-s} + \gamma_t' M_{t-s} \cdot ED_o$$

$$y_{t-1} = \beta_o + \beta_1 y_{t-2} + \beta_1' A_{t-1} + \ldots + \alpha_{t-1} M_{t-s} + \gamma_{t-1}' M_{t-s} \cdot ED_o$$

$$\vdots$$

where ED_o represents education of the couple at the time of migration. If more educated couples are more adaptive, $\gamma_t' < 0$.*

* When equation system (6.10) is estimated by migration cohort, ED_o for non-migrants is education as of a given year. However, when we estimated (6.10) by migration cohort, A_t controls not only for age in year t but also for age at migration. Age at migration and education may be correlated. If education is inversely correlated with age, individuals who migrated at a younger age may have been more educated at the time of migration. In this case A_t and ED_o will be inversely correlated.

As discussed earlier, when we limit our migrants to post-marital migrants, a couple's education is more likely to be complete before migrating than in the case of pre-marital migrants. Since we do not have a measure of education completed prior to the time of migration and must use education completed in 1974, using post-marital migrants may reduce the likelihood that education in 1974 overestimates education at time of migration.* Table 6.30 shows the rural-urban (education x migration) interaction coefficients when the comparison group is rural non-migrants and when the duration of marriage restriction is controlled. We used three education measures of selectivity: education of the wife, S_W; education of the husband, S_H; and the average education of both, S_{WH}.

If education speeds adaptation, the (education × migration) interaction terms should be negative. When the wife's education is used and the pre-migration period is included, out of twenty possible cases in Table 6.30, fourteen had the correct sign and four of these were significant. In one case the sign was significant but incorrect. Considering only the fifteen post-migration cases ($s \geq 0$), eleven had the correct sign and four remained significant. Using the husband's education, the same results are obtained for all twenty cases. However, when only post-migration is considered, twelve cases have the correct sign, but only three are significant. When we use the average of the husband and wife's education, twelve of the twenty cases have the correct sign, and five of these are significant. There are no cases in which the sign is significant but incorrect. When only post-migration cases are considered, ten of the fifteen have the correct sign and

* If $Ed_O = ED_{74} - x$, where x is constant or random across migrant and non-migrant groups, there would be no bias in the estimate of γ_t' in (6.10) above. However, x may be greater for pre-marital migrants and vary with their length of pre-marital residence if they finish education in the urban area. Using ED_{74} in their case might bias γ_t'.

Table 6.30. Coefficients for Post-Marital, Rural-Urban Migration × Education Interaction Terms: Rural Non-Migrant Comparison, Controlled for Duration of Marriage Restriction

MIGRANT COHORT	BEFORE MIGRATION					AFTER MIGRATION				SAMPLE SIZE
	-4	-3	-2	-1	0	1	2	3	4	N
1970-74	M x Education of Wife (S_W)			-.0163	-.0485*					
				(-.85)	(-2.42)					
	M x Education of Husband (S_H)			.0108	-,0150					
				(0.73)	(-0.96)					
	M x (Wife + Husband) (S_{WH})			.0004	-.0172*					
				(0.04)	(-1.77)					
1965-69	"			-0.0091	-0.0007	-.0302*				
				(-0.46)	(-0.04)	(-1.34)				
				-0.0241*	-0.0131	-.0332*				
				(-1.37)	(-0.73)	(-1.66)				
				-0.0114	-0.0050	-.0208*				
				(-1.07)	(-0.46)	(-1.72)				
1960-64	"			0.0007	-0.0500*	-0.0107	0.0177			
				(0.03)	(-2.21)	(-0.44)	(0.71)			
				0.0024	-0.0340*	-0.0071	-0.0032			
				(0.12)	(-1.67)	(-0.32)	(-0.14)			
				0.0011	-0.0261*	-0.0055	0.0039			
				(0.09)	(-2.17)	(-0.42)	(0.29)			
1955-59	"			0.0239	0.0148	0.0353	-0.0075	-0.0552*		
				(0.70)	(0.42)	(1.03)	(-0.19)	(-1.58)		
				-0.0217	0.0189	-0.0013	0.0232	-0.0328		
				(-0.71)	(0.59)	(-0.04)	(0.64)	(-1.04)		
				-0.0008	0.0111	0.0098	0.0061	-0.0276*		
				(-0.04)	(0.57)	(0.53)	(0.28)	(-1.47)		
1950-54	"			-0.0088	-0.0544	0.0822*	-0.0600	-0.0001	-0.0300	
				(0.18)	(-0.84)	(1.38)	(-1.05)	(-0.01)	(-0.53)	
				0.0194	0.022	-0.0047	-0.0863*	-0.0161	-0.0388	
				(0.47)	(0.04)	(-0.09)	(-1.80)	(-0.43)	(-0.82)	
				0.0093	-0.0129	0.0193	-0.0466*	-0.019	-0.0217	
				(0.37)	(-0.40)	(0.64)	(-1.62)	(-0.15)	(-0.76)	

*Significant at .10 level-one tail test

five remain significant. It is reasonable to conclude that there is some more rapid adaptation to urban life of more educated couples, but the effect is not strong.

In order to test whether there is a quadratic effect of education on adaptation, we added $M \times ED$ and $M \times ED^2$ terms to the basic estimating equation. The sign of the coefficient on the quadratic $M \times ED^2$ term indicates the rate of change for education's effect. Negative signs indicate increased effect for education, while positive indicate the reverse. Table 6.31 shows only the significant signs for $M \cdot ED$ and $M \cdot ED^2$ only where there is a significant quadratic effect. Looking at the pattern of signs we see that in the period of migration, Period 0, increased education speeds adaptation, but at a decreasing rate. Although we do not show the values of the coefficients, the fastest rate of adaptation ($\frac{\partial y}{\partial ED} = 0$) for migrant cohort 1965-69 occurred when the husband's schooling was 9.4 years. For migrant cohort 1960-64, the fastest rate of adaptation occurred when the wife's education was 8.8 years; and for migrant cohort 1955-59, when the husband's education was 7.3 years.

Table 6.31 shows that education of the husband raises the fertility rate prior to migration in some cases. This may be in anticipation of rural-urban migration. There is little evidence of consistent and significant quadratic effects of education on adaptation after migration. Combining results from Tables 6.30 and 6.31, we would conclude there is weak evidence of education increasing adaptation, especially during the migration period itself.

Tables A.6.6 and A.6.7 in the Appendix are equivalent to Tables 6.30 and 6.31 except that non-migration is defined as not changing the county of origin. Tables A.6.8 and A.6.9 are also equivalent to Tables 6.30 and 6.31

Table 6.31. Significant Signs (at 10%) for Migration × Education (S) and Migration × Education Squared (s^2): Rural Non-Migrant Comparison, Controlled for Duration of Marriage Restrictions

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	S_W/S_W^2 S_H/S_H^2 S_{WH}/S_{WH}^2									
1965-69					-/+					
1960-64				+/- +/-	-/+	+/-				
1955-59					-/+		-/+			
1950-54				+/- +/-						

except that the comparision group is rural-rural migrants who changed their county of origin. Discussions of Tables A.6.6 through A.6.9 presented in section A.6.4 of the Appendix indicate that the conclusions drawn from Tables 6.30 and 6.31 is not sensitive to different comparison groups. Section A.6.5 of the Appendix presents regression results for (Migration × Education) interaction terms for pre-marital migrants. However, it was warned there that the evidence for pre-marital migrants should be interpreted cautiously because higher education levels for some pre-marital migrants could be the result of adaptation rather than reflecting higher selectivity of migrants.

6.5.b Education and Adaptation - Completed Adaptation

As discussed earlier, we consider only the pre-migration education level and labor force experience as the socio-economic characteristics determining the selectivity of the rural-urban migrants and so we consider only the post-marital rural-urban migrants in this section.

Since we must restrict the duration of marriage of the rural stayer comparison group to match the implicit restriction resulting from using post-marital migrants, equation (5.6), which compares the additional fertility of different migration cohorts with those of all rural stayers, is no longer useful. For each observation year, each migration cohort should be compared separately with a different rural stayer sample tailored to different minimum durations of marriage. The estimating equation becomes:-

$$6.11)\quad y_{itj} = \beta y_{it-5,j} + \gamma_1 A_{itj} + \gamma_2 A^2_{itj} + \alpha_1 M_{ij} + \varepsilon_{itj}$$

Equation (6.11) can be estimated separately for each migration cohort and year of observation allowing the implicit duration of marriage restriction to determine the rural stayer sample.

The distribution of our post-marital, rural-urban migrants by year of migration and year of observation are presented in Table 6.32. A comparison of Table 6.32 with Table 5.3 in Chapter 5 indicates that a slight majority of rural-urban migrants in our 1974 sample are the post-marital migrants, i.e., 645 out of 1230 migrants. However, since the sample for each observation year includes only women who were married in that observation year, the earlier the observation year, the greater the share of post-marital migrants; i.e., 162 out of 203 migrants in 1954.

The regression results of equation (6.11) are summarized by cohort and duration of residence in Table 6.33. The results in Table 6.33 are presented graphically in Figure 6.4. A comparision of Table 6.33 with Table 6.21 reveals an interesting result: the post-marital migrants with the duration of residence 5-14 years have significantly larger differentials in five year fertilities, compared with the rural stayers, than all (pre- and post-) migrants combined. This can be seen more clearly in the second column of Table 6.23. For the duration of residence 5-19 years the adjusted means of differentials for post-marital migrants in column 2, Table 6.23, are significantly larger in the absolute terms, than those for all migrants, shown in column 1 of Table 6.23. This observation is not unexpected because migrant women who married right after migration may have relatively high fertility to achieve family size goals within the desired childbearing period, whereas post-marital migrants may have passed such a high fertility period (usually coming right after marriage and before migration). However, it is interesting to note that the total post-migration fertility differential for post-marital migrants, -1.8, is less in absolute magnitude than that for all migrants as shown in the last row of column 1 in Table 6.23.

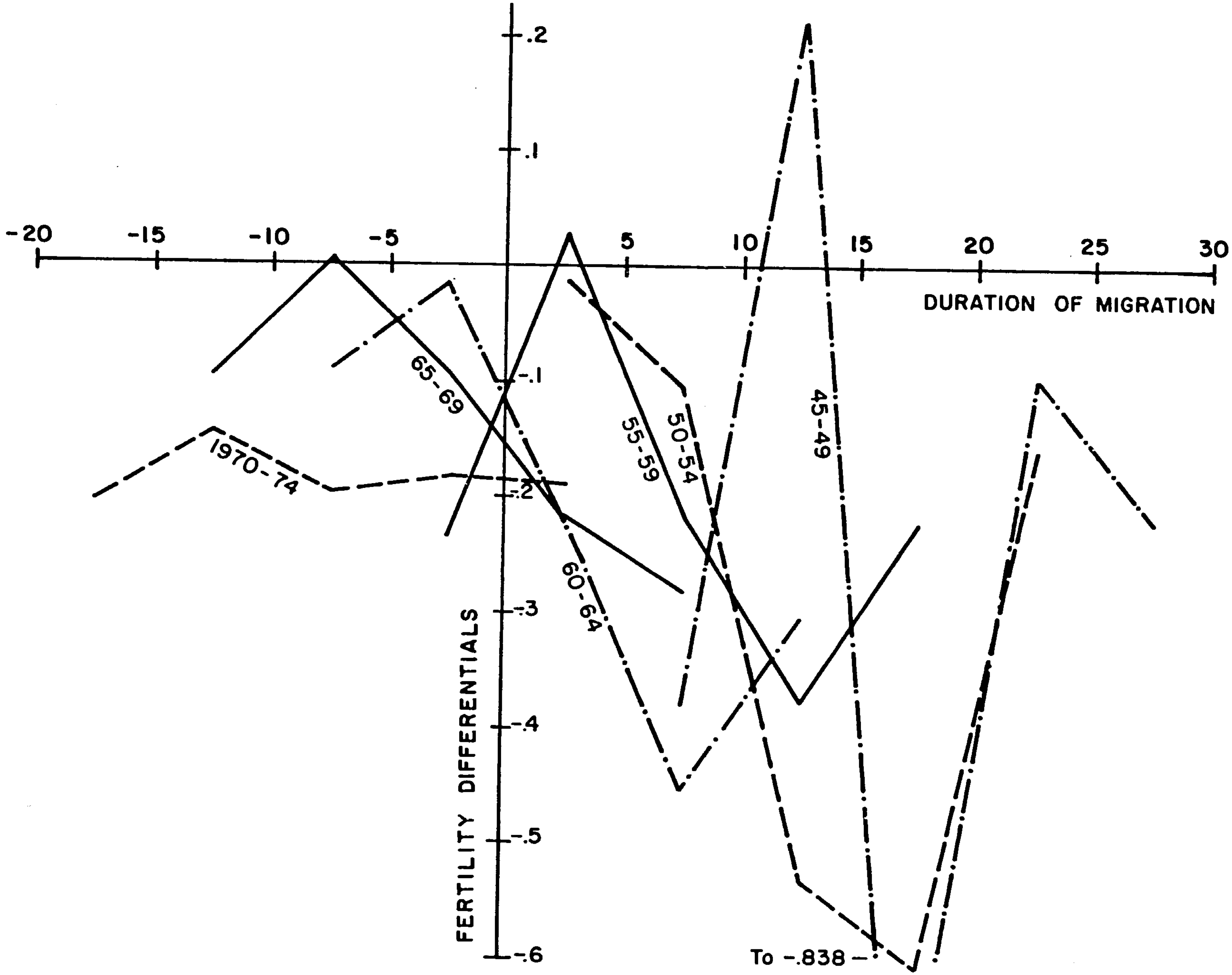

Figure 6.4. Incremental Adaptation of Fertility by Migration Cohort and Period Before and After Migration, Post-Marital Rural-Urban Migrants vs. Rural Stayers with Same Duration of Marriage (Eq. 6.11)

Table 6.32. Distribution of Post-Marital Rural-Urban Migrants by Year of Migration and Year of Observation

Year of Migration	Year of Observation				
	1974	1969	1964	1959	1954
1970 - 74	234	159	96	54	30
1965 - 69	211	205	122	73	30
1960 - 64	100	100	96	67	34
1955 - 59	46	46	46	45	22
1950 - 54	41	41	41	40	33
1945 - 49	9	9	9	9	9
Before 1945	4	4	4	4	4
Total	645	564	414	292	162

Table 6.33. Fertility Differentials Due to Migration When Fertility of 5 Years Ago is Controlled for Post-Marital Migrants and Rural Stayers with Comparable Duration of Marriage

Year of Migration	Duration of Residence									
	-20 ~ -16	-15 ~ -11	-10 ~ -6	-5 ~ -1	0 ~ 4	5 ~ 9	10 ~ 14	15 ~ 19	20 ~ 24	25 ~ 29
1970 - 74 (1)	-.207*	-.147	-.198*	-.181*	-.189*					
1965 ~ 69 (2)		-.098	.002	-.097	-.222*	-.286*				
1960 ~ 64 (4)			-.096	-.019	-.224*	-.456*	-.306*			
1955 ~ 59 (6)				-.237*	.029	-.223*	-.380*	-.233*		
1950 ~ 54 (8)					-.014	-.107	-.530*	-.605*	-.158	
1945 ~ 49 (10)						-.375	.212	-.838*	-.097	-.219
Before 1945 (11)							NA	NA	NA	NA

This is probably due to the shorter childbearing period available for the post-marital migrants.*

Table 6.34 presents the distribution of post-marital, rural-urban migrants by year of migration and education level. The first and last rows of Table 6.34 also present the educational distribution of rural stayers and total rural-urban migrants, including pre-marital and post-marital migrants. A comparison of the first row with the second row of Table 6.34 indicates that post-marital migrants are highly selective among rural population in terms of education level. Only eight percent of rural stayers had schooling beyond the compulsory education of six years in 1974, whereas 23 percent of post-marital migrants had the same level of schooling. Schooling of all rural-urban migrants shown in the last row, implies that pre-marital migrants might have more schooling than the post-marital migrants. However, this does not necessarily imply that pre-marital migrants are more selected from rural populations than post-marital migrants because education for many pre-marital migrants may have come after their migration to urban areas. In their case, some of their educational characteristics may actually be adaptation. Furthermore, the above comparisons

* The last two columns of Tables 6.22 and 6.23 present regression results and estimates of adjusted means for current fertility differentials for the pre-marital migrants sample and the sample excluding migrants and non-migrants younger than thirty in 1974. The reason for choosing the latter sample is that rural stayers of younger age cohorts in 1974 might include a large number of candidates for the future rural-urban migration whereas very few of the rural stayers older than 29 in 1974 would migrate to urban areas in the future. Therefore, one expects that the new sample with older age cohorts only would produce a stronger adaptation effect. The last columns of Table 6.22 and 6.23 confirm this expectation. Table 6.23 reveals that the effect of pre-marital migration on the migrants' completed fertility is much smaller than that of post-marital migration. This unexpected result might be due to our sampling problem rather than to real factors. Most of our pre-marital migrants sample might have recently married and so are in their peak childbearing period during which the migrants in general do not have lower fertility than rural stayers.

Table 6.34. Distribution of Post-Marital Rural-Urban Migrants and Rural Stayers by Year of Migration and Education Level in 1974

Year of Migration	Education: 3 or less years	4 to 6 years	More than 6 years	Total
Rural stayers	773 (47.1%)	739 (45.0%)	129 (7.9%)	1641 (100%)
Total post-marital migrants	161 (25.0%)	336 (52.1%)	148 (22.9%)	645 (100%)
1970 - 74	39 (16.7%)	124 (53.0%)	71 (30.3%)	234 (100%)
1965 - 69	53 (25.1%)	117 (55.5%)	41 (19.4%)	211 (100%)
1960 - 64	34 (34.0%)	46 (46.0%)	20 (20.0%)	100 (100%)
1955 - 59	14 (30.4%)	22 (47.8%)	10 (21.7%)	46 (100%)
1950 - 54	15 (36.6%)	21 (51.2%)	5 (12.2%)	41 (100%)
1945 - 49	3 (33.3%)	5 (55.6%)	1 (11.1%)	9 (100%)
Before 1945	3 (75%)	1 (25%)	0 (0%)	4 (100%)
All migrants, including pre-marital migrants	230 (18.7%)	611 (49.7%)	389 (31.6%)	1230 (100%)

exaggerate the selectiveness of migrants by education levels because migrants are much younger than the rural population in general and recent birth cohorts in Korea generally obtain higher educational levels than their predecessors.

A comparison of education distributions of post-marital migrants by migration cohort indicates that the selectivity of these migrants declined steadily from 1955 to 1970 and then increased substantially after 1970; shares of migrants with more than six years of schooling were 21.7 percent to 19.4 percent during 1955-70 and 30.3 percent during 1970-74. The relative decline of education levels among post-marital migrants between 1955 and 1970 is much more substantial than shown in the third column of Table 6.34 because the average education level of the Korean rural population has increased substantially during those periods. According to the 1975 Korean Population Census approximately 34 percent of women aged 25-29 who were 20-24 years old in 1970 (the peak age at migration) had some schooling beyond primary school whereas only four percent of women ages 40-44 who were 20-24 years old in 1955 had the same level of schooling. The sudden rise of the selectivity among the rural-urban migrants since 1970 could be attributed to the remarkably successful "New Village Movement" initiated by the Korean government in the early 1970's, which improved the living standards and welfare of rural population very rapidly and must have discouraged some of mass rural-urban migration and encouraged the highly selected migrants.

Table 6.35 reports regression results for equation (6.7) for post-marital, rural-urban migrants by education levels. The dependent variables are the estimated coefficients for the migration dummy variable in the regressions of equation (6.11) for each migration cohort and observation year. The adjusted means of differentials in incremental fertility adjusted by duration of migration for each education level is reported in Table 6.36. The bottom of

Table 6.35. Regression Results of Fertility Differentials on Migration Cohort and Duration of Residence Dummy Variables: Post-Marital Migrants by Wife's Education Level

Variable Names	Post-Marital Migrants with Schooling of: Less than 4 years		4 to 6 years		More than 6 years	
	b	t	b	t	b	t
YM67	-.044	(- .42)	113	(1.41)	-.010	(- .04)
YM62	.000	(.00)	.129	(1.50)	-.218	(- .82)
YM57	.263	(2.19)	.109	(1.19)	-.238	(- .83)
YM52	.250	(1.91)	-.054	(- .54)	-.214	(- .69)
YM47	NA	(NA)	NA	(NA)	NA	(NA)
YM42	NA	(NA)	NA	(NA)	NA	(NA)
D18	-.147	(- .96)	-.154	(-1.31)	-1.615	(-4.43)
D13	-.100	(- .83)	-.178	(-1.93)	- .456	(-1.59)
D8	-.081	(- .74)	-.148	(-1.78)	- .142	(- .55)
D3	-.080	(- .76)	-.219	(-2.74)	- .262	(-1.06)
DP2	-.225	(-2.17)	-.161	(-2.03)	- .121	(- .49)
DP7	-.342	(-2.77)	-.343	(-3.63)	.048	(.16)
DP12	-.426	(-3.11)	-.462	(-4.40)	- .132	(- .41)
DP17	-.719	(-4.57)	-.268	(-2.22)	- .098	(- .26)
DP22	-.381	(-1.89)	-.058	(- .38)	- .233	(- .49)
DP27	NA	(NA)	NA	(NA)	NA	(NA)
No. of OBS	26		26		26	
F-STAT	4.18		6.65		2.95	
R^2	.819		.878		.762	

NA: No observation for the dummy variable.

Table 6.36. Adjusted Means of Differentials in Incremental Fertilities, $\frac{\partial CEB}{\partial M}$: Post-Marital Migrants by Duration of Residence and Wife's Education Level

Duration of Residence	Schooling: less than 4 years	4 to 6 years	more than 6 years
-15 ~ -19	-.053	.094	-1.751
-10 ~ -14	-.006	-.118	- .592
-5 ~ -9	.013	-.089	- .278
-1 ~ -4	.014	-.159	- .398
0 ~ 4	-.131	-.101	- .257
5 ~ 9	-.248	-.284	- .088
10 ~ 14	-.332	-.402	- .268
15 ~ 19	-.625	-.208	- .234
20 ~ 24	-.287	.001	- .369
25 ~ 29	NA	NA	NA
Sum of values for post-migration period	-1.623	-.994	-1.216
Children ever born to rural stayer women aged 45-49*	6.42	6.08	4.64

*From Table A.9.1

Table 6.36 suggests that the completed adaptation by post-marital, rural-urban migrants is largest among migrants who are least selective. We expect migrants with less than four years of schooling to have completed fertility of 1.6 fewer children than rural stayers with the same level of education. Migrants with schooling of four to six years would have only one less child than similar rural stayers. However, the sum of adjusted mean differentials for migrants with schooling of more than six years is -1.2 children, which falls between those of the other education levels. This suggests that the relationship between selectivity of migrants and adaptation is not a positive linear one, as suggested by Hendershot (1976), but a nonlinear one.

Evidence in Table 6.36 indicates that one should not reject Hypothesis 1, that even migrants with lower socioeconomic classes do some adapting to urban fertility norms. However, the above mentioned nonlinear relationship between selectivity and adaptation does not support Hypothesis 2, that the higher the socioeconomic class of the migrant, the more she adapts to urban norms. The latter conclusion is divergent from that obtained in section 6.5.a. However, one should keep in mind that it is not inconceivable that women with the lowest education level might reveal little adaptation in terms of incremental fertility but experience substantial adaptation in terms of completed fertility. There could be some concern for the above results analyzing the effect of migrants' education on fertility adaptation in absolute terms.* One could argue that the fertility in rural and urban areas is lower for women with greater education. Consequently the decline in fertility associated with the rural-urban migration for women with more education may be smaller in absolute, but not relative, terms than that decline recorded for less educated women. In line with this concern that the change in fertility due to migration should be expressed in relative terms, we included the mean fertility in the rural

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* These concerns were raised by both Gerry Hendershot and T. Paul Schultz who read the draft final report of this study.

stayer group within the three schooling groups in the last row of Table 6.36, which was derived from the 1970 population census data. The comparisons of the declines of 1.6, 1.0, and 1.2 children for migrant women with less than four years' four to six years', and more than six years' education against the fertility levels of rural stayer women with equivalent levels of schooling reveals the relative fertility declines of 25.3, 16.3 and 26.2 percents, respectively. This evidence indicates that the effect of education on the migration impact on relative fertility is still nonlinear. Our test results on Hypotheses 1 and 2 are not invalidated even when we use the relative terms rather than the absolute terms because the least educated migrant women reveal almost the same level of adaptation as the most educated migrant women. We prefer the comparison in absolute terms to that in relative terms because we feel that the former should be more useful to policy decision makers who try to assess the influence of rural-urban migrations by different levels of education on the national average fertility level.

6.5.c Pre-Migration Work Experience and Completed Fertility Adaptation

Tables 6.37, 6.39 and 6.40 are similar to Tables 6.34, 6.35 and 6.36 except that post-marital migrants and rural stayers are classified by another selectivity characteristic, premarital work experience in occupations incompatible with childbearing and childrearing. These occupations include jobs for women who work either for someone else or are self-employed in the nonagricultural sectors.

Table 6.37 provides evidence of the change in selectivity of rural-urban migrants over time. As expected, a higher percentage of post-marital rural-urban migrant women worked in jobs incompatible with childbearing or childrearing activities, 13%, than the percentage for rural stayers, 9%. The selectivity of rural-urban migrant cohorts in terms of pre-marital work experience in

Table 6.37. Distribution of Post-Marital Rural-Urban Migrants and Rural Stayers by Year of Migration and Premarital Work Experience in 1974

Year of Migration	Pre-Marital Work Experience: Worked in incompatible job	Pre-Marital Work Experience: Never Worked or Worked in compatible jobs	Total
Rural Stayers	139 (8.5%)	1502 (91.5%)	1641 (100%)
Total post-marital migrants	83 (12.9%)	562 (87.1%)	645 (100%)
1970-74	38 (16.2%)	196 (83.8%)	234 (100%)
1965-69	20 (9.5%)	191 (90.5%)	211 (100%)
1960-64	17 (17.0%)	83 (83.0%)	100 (100%)
1955-59	3 (6.5%)	43 (93.5%)	46 (100%)
1950-54	5 (12.2%)	36 (87.8%)	41 (100%)
1945-49	0 (0.0%)	9 (100.0%)	9 (100%)
Before 1945	0 (0.0%)	4 (100.0%)	4 (100%)

Table 6.38. Distribution of Rural Stayers by Age Cohorts and Premarital Work Experience in 1974

Age Cohort	Pre-Marital Work Experience: Worked in in Incompatible Jobs	Pre-Marital Work Experience: Never Worked or Worked in compatible Jobs	Total
20 ~ 24	28	101	129
	(21.7%)	(78.3%)	(100%)
25 ~ 29	41	229	270
	(15.2%)	(84.8%)	(100%)
30 ~ 34	25	289	314
	(8.0%)	(92.0%)	(100%)
35 ~ 39	18	374	392
	(4.6%)	(95.4%)	(100%)
40 ~ 44	17	301	318
	(5.3%)	(94.7%)	(100%)
45 ~ 49	10	208	218
	(4.6%)	(95.4%)	(100%)
Total	139	1502	1641
	(8.5%)	(91.5%)	(100%)

Table 6.39. Regression Results of Current Fertility Differentials on Migration Cohort and Duration of Residence Dummy Variables for Post-Marital Migrants by Premarital Work Experience

Variable Names	Pre-Marital Work Experience			
	Worked in incompatible jobs		Never worked or worked in compatible jobs	
	b	t	b	t
YM67	.131	(.30)	.076	(.57)
YM62	-.283	(-.60)	.071	(.49)
YM57	-.298	(-.59)	.204	(1.32)
YM52	-.457	(-.83)	.151	(.91)
YM47	NA	(NA)	.196	(1.08)
YM42	NA	(NA)	NA	(NA)
D18	-1.042	(-1.61)	-.189	(-.96)
D13	-.367	(-.72)	-.152	(-.98)
D8	.093	(.20)	-.160	(-1.14)
D3	-.349	(-.79)	-.184	(-1.37)
DP2	-.005	(-.01)	-.217	(-1.63)
DP7	.002	(.00)	-.420	(-2.70)
DP12	.222	(.38)	-.417	(-2.47)
DP17	.015	(.02)	-.756	(-4.06)
DP22	.354	(.42)	-.305	(-1.44)
DP27	NA	(NA)	-.388	(-1.45)
No. of OBS	26		31	
F-STATS	.64		3.44	
R^2	.4095		.7749	

Table 6.40. Adjusted Means of Current Fertility Differentials, $\frac{\partial CEB}{\partial M}$: Post-Marital Migrants by Duration of Residence and Premarital Work Experience

Duration of Residence	Pre-Marital Work Experience: Worked in incompatible jobs	Pre-Marital Work Experience: Never worked or worked in compatible jobs
-15 ∿ -19	-1.223	-.073
-10 ∿ -14	- .548	-.036
-5 ∿ - 9	- .088	-.044
-1 ∿ - 4	- .531	-.068
0 ∿ 4	- .186	-.10
5 ∿ 9	- .179	-.304
10 ∿ 14	- .041	-.301
15 ∿ 19	- .167	-.640
20 ∿ 24	.173	-.189
25 ∿ 29	NA	-.272
Sum of values for post-migration period	- .40	-1.806
Children ever born to rural stayer women aged 45-49*	5.84	6.2

* From Table A.9.2.

incompatible jobs has fluctuated rather than increased consistently over time. This is a little puzzling. Table 6.38 shows that shares of rural stayer women with pre-marital work experience in incompatible jobs have consistently increased with birth cohorts. Since the peak migration ages have been stable around 20-24 over time, recent migration cohorts should reveal substantially larger shares of women with pre-marital work experience even if rural-urban migrants are not selective in terms of pre-marital work experience. Tables 6.37 and 6.38 seem to imply that the selectivity of rural-urban migrants has not increased consistently over time, except that migrants migrating during 1970-74 are significantly more selective in terms of premarital work experience than migrants migrating during 1965-69. This sudden increase in selectivity in 1970-74 was also true for the selectivity of education, as discussed earlier.

Table 6.40 indicates that we cannot reject Hypothesis 1, that there is adaptation, regardless of selectivity. Table 6.40 shows that post-marital rural-urban migrants who never worked in child-incompatible jobs before marriage (including nonworkers) would have 1.8 fewer children upon completion of fertility than comparable rural stayers (i.e., those who never worked in incompatible jobs before marriage). The difference in completed fertility between migrants and rural stayers with pre-marital work experience in child-incompatible jobs is only -.4 children. Using the last row of Table 6.40 one can calculate that the relative depressing effect of migration on fertility for women who had pre-marital work experience of an incompatible sort and the complement group that never had such work are 7 and 29 percent, respectively. Hypothesis 2, that more selective migrants defined in terms of premarital work experience adapt more quickly, must be rejected.

6.5.d 1974 Earnings and Rates of Adaptation

We would expect that couples with more labor market opportunities would adapt faster to urban life than couples with fewer opportunities because of the high opportunity cost of having children. However, increased earnings of the husband may have different effects on adaptation than the wife's earnings. When the woman must do the childrearing, higher opportunity costs may speed her fertility adaptation; also higher earnings for the woman may mean more labor force participation and less time available for child-bearing and child-rearing. On the other hand, higher earnings of the husband may permit having more children, reducing the need for speedy adaptation. In other words, there are income and substitution effects on the speed of adaptation.

Unfortunately, we do not have data on the couple's earnings stream. We have only earnings in 1974, which may be a poor approximation to earlier earnings. It is important to point out that the analyses in this section are not exactly tests of Hypotheses 1 and 2. Earnings in 1974 are earnings in urban areas as a result of adaptation rather than reflecting the selectivity of migrants. However, analyses in this section are interesting for two reasons: First, one could assume that current earnings reflect the innate ability of an individual, which would not change with migration. Therefore, to the extent that earnings are a proxy for individual's ability, analyses of this section could be treated as tests of Hypotheses 1 and 2. Second, Hendershot (1976) argues that the reason the degree of selectiveness determines the migrant's ability to assimilate urban small family size norms is because only highly selective rural-urban migrants could adapt the late marriage pattern and/or the working wife pattern of urban society. He argues that rural-urban, migrant couples tend to have lower fertility only if they married late and the wife worked after marriage. Similarly, it is interesting to test whether or not rural-urban migrant couples tend to have lower fertility only if they achieve a high earnings after migration.

Table 6.41 shows the (Migration × 1974 Earnings) interaction coefficients for rural-urban, post-marital migrants using a rural non-migrant comparison group. This table does not suggest that earnings in 1974 has any consistent relation to adaptation. For example, in the case of (Migration x Wife's Earnings), $M \cdot W_W$, only eleven of the twenty cells were negative, two were significantly negative, and one was significantly positive. The same is true if husband's earnings, $M \cdot W_H$, and the couple's earnings, $M \cdot W_{WH}$, are used. Even when we limit ourselves to the rightmost cells in each row, where earnings in 1974 are most relevant, there is no strong pattern. Using husband's earnings, four of five cells were negative but only one was significantly negative.

Section A.6.6 of the Appendix presents regression results on the effect of 1974 earnings on fertility adaptation for different comparision groups and pre-marital migrant groups. When we define non-migration as not changing the county of residence, we see a little more consistent effect of earnings on adaptation than when non-migration is more narrowly defined. For pre-marital migrants, we observe even fewer consistent patterns of the effect of earnings on adaptation. Due to the extreme weakness of our results we do not attempt to interpret the evidence any further.

Table 6.41. Coefficients for Post-Marital, Rural-Urban Migration × Earnings in 1974 Interaction Terms: Rural Non-Migrant Comparison Controlled for Duration of Marriage Restriction

MIGRANT COHORT		BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	$M \times W_W$				-0.0052*	.0023					
					(-1.80)	(0.79)					
	$M \times W_H$				0.0053*	-.0001					
					(1.44)	(-0.03)					
	$M \times W_{WH}$				-0.0012	.0014					
					(-0.55)	(0.61)					
1965-69	"				0.0081*	-0.0060	-0.0049				
					(1.37)	(-0.99)	(-0.72)				
					-0.038	-0.0069*	-0.0038				
					(-0.86)	(-1.53)	(-0.75)				
					0.0005	0.0024	-0.0043				
					(0.13)	(0.65)	(-1.05)				
1960-64	"				-0.0066*	0.0047	-0.0023	-0.0048			
					(-1.31)	(0.90)	(0.40)	(-0.83)			
					-0.0005	0.0043	0.0011	-0.0082*			
					(-0.11)	(0.98)	(0.24)	(-1.71)			
					-0.0027	0.0040	0.0014	0.0026			
					(-0.87)	(1.25)	(0.42)	(0.74)			
1955-59	"				-0.0011	0.0022	0.0056	0.0147	-0.0050		
					(-0.11)	(0.21)	(0.55)	(1.25)	(-0.48)		
					0.0017	0.0100*	0.0034	-0.0006	0.0005		
					(0.27)	(1.52)	(0.53)	(-0.08)	(0.08)		
					0.0001	0.0082*	0.0043	0.0040	-0.0011		
					(0.18)	(1.45)	(0.77)	(0.62)	(-0.20)		
1950-54	"				-0.0050	0.0061	-0.0070	-0.0015	0.0056	0.0037	
					(-0.55)	(0.51)	(-0.63)	(-0.14)	(0.09)	(0.36)	
					-0.0177	0.0249	0.0481*	-0.0229	-0.0027	-0.0023	
					(-0.61)	(0.66)	(1.37)	(-0.67)	(-0.05)	(-0.07)	
					-0.0074	0.0094	-0.0025	-0.0041	0.0005	0.0038	
					(-0.78)	(0.75)	(-0.22)	(-.37)	(0.015)	(0.35)	

Significant at .10 level-one tail test

6.6 Urban Destination and Adaptation - Hypothesis 5

In this section we present the test results of Hypothesis 5, that the city characteristics of the destination for the rural-urban migrants determine the differential between migrant and comparable rural stayer fertility because of adaptation to city fertility norms and constraints.

Table 6.42 shows the distribution of rural-urban migrants by year of migration cohort and destination of migration in 1974. Approximately 40 percent of our migrant sample moved from rural areas to Seoul (capital city of Korea, 6.9 million people in 1975), 36 percent to Busan (another metropolitan special city, 2.5 million in 1975) or other large cities such as Taegu (1.3 million), Inchun (.8 million) and Kwangju (.6 million in 1975); and the remainder moved to medium and small cities. Table 6.42 reveals that the rural-urban migration destination has shifted significantly from Seoul to medium and small cities in 1970-74. The sharp drop in migration to Seoul (31.3 percent of total rural-urban migration) and the rise in migration to Busan and other large cities (46.4 percent) during 1950-54 are due to the refugee movements to Busan during the Korean War period.

Tables 6.43 and 6.44 report the regression results and estimates of adjusted means of current fertility differentials for each of the three city size classes. The last row of Table 6.44 reveals a striking relationship between fertility reduction due to adaptation and the city size class. Table 6.44 indicates that rural-urban migrants (including

Table 6.42. Distribution of Total Rural-Urban Migrants by Year of Migration and Destination of Migration in 1974

Year of Migration	Migration Destination			
	Seoul	Busan and Large Cities	Medium and Small Cities	Total
1970 - 74	95 (29.4%)	119 (36.8%)	109 (33.8%)	323 (100%)
1965 - 69	175 (46.2%)	126 (33.3%)	78 (20.6%)	379 (100%)
1960 - 64	86 (44.8%)	70 (36.5%)	36 (18.8%)	192 (100%)
1955 - 59	60 (44.4%)	50 (37.0%)	25 (18.5%)	135 (100%)
1950 - 54	35 (31.3%)	52 (46.4%)	25 (22.3%)	112 (100%)
1945 - 49	29 (47.5%)	20 (32.8%)	12 (19.7%)	61 (100%)
Before 1945	10 (35.7%)	10 (35.7%)	8 (28.6%)	28 (100%)
Total	490 (39.8%)	447 (36.3%)	293 (23.8%)	1230 (100%)

Table 6.43. Regression Results of Fertility Differentials on the Migration Cohort and Duration of Migration Dummy Variables by Destination of Migration

Variable Names	Destination of Migration					
	Seoul		Busan and Large Cities		Medium and Small Cities	
	b	t	b	t	b	t
YM67	-.052	(- .27)	.227	(2.24)	.018	(.11)
YM62	-.046	(- .22)	.090	(.83)	.053	(.30)
YM57	.008	(.04)	.149	(1.28)	.064	(.33)
YM52	.136	(.57)	.183	(1.47)	.208	(1.01)
YM47	.281	(1.10)	.289	(2.15)	.326	(1.46)
YM42	.204	(.74)	.354	(2.45)	.356	(1.49)
D18	-.538	(-1.90)	-.110	(- .74)	-.093	(- .38)
D13	-.093	(- .42)	-.034	(- .29)	-.420	(-2.17)
D8	-.069	(- .34)	-.332	(-3.14)	-.004	(- .03)
D3	-.186	(- .96)	-.111	(-1.09)	-.164	(- .97)
DP2	-.100	(- .52)	-.333	(-3.32)	-.243	(-1.46)
DP7	-.145	(- .65)	-.274	(-2.34)	-.039	(- .20)
DP12	-.290	(-1.21)	-.390	(-3.10)	-.280	(-1.35)
DP17	-.505	(-1.96)	-.648	(-4.77)	-.420	(-1.87)
DP22	-.783	(-2.77)	-.526	(-3.55)	-.457	(-1.86)
DP27	-.910	(-2.86)	-.623	(-3.72)	-.369	(-1.33)
DP32	-.690	(-1.75)	-.372	(-1.79)	-.375	(-1.09)
No. of OBS	35		35		35	
F-STATS	2.62		4.83		1.06	
R^2	.7125		.8203		.5012	

251

Table 6.44. Estimates of Adjusted Means of Fertility Differentials, $\frac{\partial CEB}{\partial M}$, by Destination of Migration

Duration of Migration	Destination of Migration		
	Seoul	Busan and Large Cities	Medium and Small Cities
-15 ~ -19	-.462	.075	.053
-10 ~ -14	-.017	.151	-.274
-5 ~ -9	.007	-.148	.142
-1 ~ -4	-.110	.074	-.017
0 ~ 4	-.024	-.148	-.096
5 ~ 9	-.069	-.090	.108
10 ~ 14	-.214	-.205	-.134
15 ~ 19	-.429	-.463	-.274
20 ~ 24	-.707	-.342	-.311
25 ~ 29	-.834	-.438	-.222
30 ~ 34	-.614	-.188	-.229
Sums of post-migration period values.	-2.891	-1.874	-1.158

258

pre- and post-marital migrants) to Seoul would have completed fertility of 2.9 fewer children than comparable rural stayers if they spent their 34 year childbearing period in Seoul. The migrants to Busan and other large cities would have 1.9 fewer children, and migrants to medium and small cities would have only 1.2 fewer children.

The city-specific effects of migration on fertility are of considerable importance and should be scrutinized further. One might think that results in Table 6.44 are not as conclusive as one might want because the data from this table are based upon a fertility equation that does not control for education. Our results are not affected, however, by controlling for the education levels. When we include woman's education and education-squared as variables in Equation 5.6, we obtain results very similar to those shown in Table 6.44. Rural-urban migrants to Seoul, Busan and other large cities, and medium and small cities would have 2.27, 1.52, and 1.05 fewer children, respectively. Since in this particular analysis some of the pre-marital migrants may have been misclassified into a higher educational level because of education obtained <u>after</u> migration, these results for both pre- and post-marital migrants might erroneously attribute some of the fertility adaptation dependent on education to selectivity, so it is not unreasonable to assume that the values for fertility-depressing effects of migration to Seoul, Busan, and other large cities are biased downwards.

As discussed in Section 6.7 below, Park and Park found from their study of the 1970 Korean Population Census that total (completed) fertility rates of the rural to metropolitan migrants, 3.18, were two children less (or 38 percent lower) than those of rural non-migrants, 5.13. Total fertility rates of the rural-to-other-urban areas, 3.77, were 1.4 children less (or 26 percent lower) than that of rural non-migrants. Our estimates of fertility differentials are not far different from those of Park and Park considering that metropolitan areas include two other cities in addition to Seoul. One should also keep in mind that our estimates are the hypothetical maximum of fertility differentials because most of the migrants do not spend their 34 year childbearing period in their destinations of migration. However, it seems safe to conclude that if other things were equal, a change in destination from Seoul to a medium or small city by a young rural-urban migrant would result in at least one more child over her lifetime than if she migrated to Seoul.

The evidence presented above suggests that we should not reject Hypothesis 5. As discussed later in Chapter 9, fertility levels of recent migrants do not vary much with the destination city size class. This evidence, along with evidence in Table 6.44, implies that the city size class determines the degree of adaptation more than the degree of selectivity of migrants in terms of unmeasurable preference for small family size.

Section A.6.7 of the Appendix presents additional test results on Hypothesis 5. Particularly, we tested whether or not the fertility adaptation by rural-urban migrants is significantly greater for migrants who moved to cities where environmental characteristics were least inclined to promote high fertility, i.e., higher adult education level, lower child mortality rates, and greater opportunities for women's labor force participation in child-incompatible jobs. Table A.6.15 indicates that the most powerful environmental characteristic in discouraging larger family size is the average years of schooling for adult men and women in the current residence community. However, these results should be dealt with cautiously because it is difficult to deny entirely that part of the differences in effect of the environmental variables may be due to selectivity of the migrants, with respect to education or other characteristics that may not be completely controlled in the Equation 5.6.

6.7 The Effects of Rural-Urban Migration on National Fertility Level

Before we assess the aggregate influence of rural-urban migration on Korean national fertility level, it will be useful to compare the values quantifying the fertility-depressing effect of rural-urban migration with the total fertility rates of Korean women with differing migration status. Furthermore, it will corroborate our results if the values obtained in this study are consistent with values obtained from a different data source and method. This can be done using the work of Park and Park (1976) who present age-specific and total fertility rates for Korean women (births per 1,000 women, ages 15-49) by migration status derived from the 1970 Korean population census.

The results of Park and Park, given in Table 6.45, reveal that women who moved from rural areas to metropolitan areas (i.e., Seoul, Busan and Daegu, which had more than one million inhabitants) during 1965-70 would have, on the average, total fertility rates 38 percent lower (1.95 fewer children ever born) than rural stayers. Women who moved from rural areas to other urban areas (cities having more than 50,000, but less than one million inhabitants) during 1965-70 would have, on the average, total fertility rates 26 percent lower (1.36 fewer children ever born) than rural stayers would have.

The rates shown in Table 6.45 are for women who migrated within the five years preceding the 1970 census. But the adaptation hypothesis discussed in Chapter 2 indicates that the fertility differentials between rural-urban migrants and rural stayers increase with the duration of exposure to urban lifestyle Therefore, the fertility differentials shown in Table 6.45 would underestimate the average fertility differentials for all Korean migrants because these tables exclude women who migrated before 1965 (five years before the census year). On the other hand, the values in Table 6.45 do not adjust for the selectivity of rural-urban migrants and could overestimate the true

Table 6.45. Age-Specific and Total Fertility Rates for 1965-70 Rural-Urban Migrants

Age of Woman	Residents in Areas: Nonmigrants (A)	Residents in Areas: Migrants from Rural Areas (B)	Rural Nonmigrants (C)	Differentials in Fertility Rates Between Rural-Urban Migrants and Rural Nonmigrants: Fertility Rates D = (B-C)	Differentials in Fertility Rates Between Rural-Urban Migrants and Rural Nonmigrants: As a Percent of Rural Nonmigrants E = (B-C)/C
		Metropolitan Areas* and Rural Nonmigrants			
15-19	1.1	0.8	3.5	-2.7	-77.0
20-24	48.4	44.3	100.6	-56.3	-56.0
25-29	214.4	221.4	311.7	-90.3	-29.0
30-34	203.8	205.9	278.3	-72.4	-26.0
35-39	92.0	104.8	189.2	-84.4	-44.6
40-44	35.0	46.0	107.8	-61.8	-57.3
45-49	11.6	12.7	35.5	-22.8	-64.2
Total Fertility Rate	3,031.5	3,179.5	5,133.0	-1,953.5	-38.1
		Other Urban Areas and Rural Nonmigrants			
15-19	1.2	1.5	3.5	-2.0	-57.1
20-24	51.9	68.7	100.6	-31.9	-31.7
25-29	244.5	245.0	311.7	-66.7	-21.4
30-34	277.6	231.7	278.3	-46.6	-16.7
35-39	120.0	126.4	189.2	-62.8	-33.2
40-44	55.9	63.2	107.8	-44.6	-41.4
45-49	18.1	18.1	35.5	-17.4	-49.0
Total Fertility Rate	3,596.0	3,773.0	5,133.0	-1,360.0	-26.5

SOURCE: Park and Park, 1976: Table 1.
* Metropolitan areas included Seoul, Busan, and Daegu.

fertility differentials due to adaptation to urban lifestyle. Thus, the two biases would counteract each other although their resultant is indeterminate.

From column 5 of Table 6.45 one may note that the relationship between the age of migration and the extent of fertility adaptation is U-shaped. The depressing effect of migration on migrant fertility is weakest during peak childbearing ages, 25-34, but is stronger at lower and higher ages. This seems to imply that migration to urban areas reduces the fertility of migrants mainly by shortening their lifelong childbearing period.

The policy implication of this evidence is that the younger the age of migration, the more births will be reduced because of the longer exposure to urban lifestyle during the childbearing period. However, even though a migrant might be old, the rate of her fertility adaptation (measured as reduction in births per year of urban residence) will equal that of the youngest migrant women and be even stronger than that of slightly younger migrants. Therefore, it is not necessary for a government to encourage only younger rural-urban migrants to maximize the fertility reduction effect if the younger rural-urban migration brings substantially greater economic and social costs to areas of origin and destination than does the older rural-urban migration.

The total fertility rate rows of Table 6.45 show that recent rural migrants who moved to metropolitan areas reduced the differential in total fertility rate between metropolitan non-migrants and rural non-migrants by 93 percent. Migrants to other urban areas reduce the TFR differential by 89 percent. (These figures are obtained by dividing the value in column D by the value of column A minus Column C.) This indicates that the adaptation by rural-urban migrants to urban fertility patterns are almost completed--at least as far as cross-sectional (period) fertility evidence is concerned.

The above analysis verifies that the values for the fertility depressing effects of rural-urban migration obtained in this chapter are consistent with

Table 6.46. Cumulative Reduction of Births After Migration by Age and Maximum Possible Duration of Migration

Ages	Maximum Duration of Migration Possible During Migrant's Child-bearing Period	Cumulative Reduction of Births After Migration		
		Seoul	Busan	Other Urban Areas
5-9	30-34	-2.891	-1.874	-1.158
10-14	30-34	-2.891	-1.874	-1.158
15-19	30-34	-2.891	-1.874	-1.158
20-24	25-29	-2.277	-1.686	-.929
25-29	20-24	-1.433	-1.248	-.707
30-34	15-19	-.736	-.906	-.396
35-39	10-14	-.307	-.433	-.122
40-44	5-9	-.093	-.433	+.012
45-49	0-4	-.024	-.148	-.096

SOURCE: Table 6.44.

the values obtained using a different data source and method. Therefore, we believe it is appropriate to use the values in Table 6.44 to estimate the aggregate effect on national fertility of rural-urban migration occurring during a decade of 1965-1975. Table 6.46 presents cumulative fertility reduction per woman migrant migrated during 1965-1970 by age in 1970 and maximum duration of migration possible during her childbearing period for each of three destination sizes. Table 6.47 presents total number of migrant women and aggregate fertility reduction due to adaptation by destination size.

Table 6.47 indicates that the 434,000 women who migrated from rural areas to Seoul during 1965-1970 would reduce their fertility by 843,400 births due to adaptation to urban life during their childbearing period in urban areas. This represents an average fertility reduction of 1.94 births per woman migrating to Seoul. The 108,800 women who migrated to Busan would reduce their

Table 6.47. Number of Female Rural-Urban Migrants, 1965-1970, and Aggregate Reduction in Births Due to Adaptation

Age	Seoul		Busan		Other Cities	
	a Migrant Women	b Reduction in Births	a Migrant Women	b Reduction in Births	a Migrant Women	b Reduction in Births
			(Thousands)			
5-9	36.9	106.7	10.7	20.0	42.7	49.4
10-14	46.0	133.0	11.0	20.6	50.7	58.7
15-19	104.2	301.2	21.9	41.0	82.5	95.6
20-24	83.3	189.7	21.0	35.6	65.6	60.9
25-29	56.0	80.8	16.0	20.8	50.7	35.9
30-34	33.0	24.3	9.5	8.6	32.6	12.9
35-39	20.4	6.3	5.3	2.3	22.5	2.8
40-44	13.0	1.2	3.3	.8	14.5	-0.2
45-49	10.0	0.2	2.5	0.4	10.0	0.9
50 and up	31.2	0.0	7.0	0.0	31.0	0.0
Total	434.0	843.4	108.8	150.1	402.6	316.9
Fertility Reduction Per Migrant Woman*	--	1.943	--	1.380	--	.787

SOURCE: a) Tables 3.14, 3.15, 3.16.
b) Column a x comparable cell in Table 6.46.

*Column b divided by column a.

265

fertility by 150,000 births or 1.38 births per woman. Finally, 402,600 women who migrated to other cities excluding Seoul and Busan would reduce their fertility by 316,900 births or 0.79 births per woman. Overall, from the data in Table 6.47, for all three types of destinations, 945,400 rural-urban female migrants who moved during 1965-1970 would reduce their fertility by 1.31 million births or 1.39 births per migrant woman during the rest of their childbearing years. Taking the next five-year period, 1970-75, we find (Table 3.17) that 949,000 women migrated from rural to urban areas. Therefore it is not unreasonable to assume that approximately another 1.3 million births would be averted during the remaining childbearing years of this migration cohort due to the rural-urban migration occurring during 1970-1975.

The above result indicates that approximately 1.9 million female rural-urban migrants or 3.6 million male and female migrants during the decade 1965-1975 would have avoided approximately 2.6 million births. This impact is by no means of small value. For example, in 1970 population grew annually by 690,000 or 2.2 percent. There seems no doubt that the rapid decline of Korean fertility rates during the last two decades, as shown in Table 3.19, has been due in large measure to the high volume of rural-urban migration that occurred during the decade of 1965-1975.

6.8 Summary of Chapter 6

In this chapter we have used the autoregressive model developed in Chapter 5 to test our adaptation Hypotheses 1-5. The advantage of the autoregressive model is that it controls partially for the selectivity of migration by essentially comparing rural-urban migrant incremental fertility within a given period to that of a comparable rural stayer with the same fertility level at the beginning of the period under observation. In principle, the remaining differential in fertility between rural-urban migrants and rural stayers is a measure of the rural-urban migrant's adaptation to urban norms and constraints. In technical terms, we have controlled the fertility level at the beginning of the observed period and have assumed that this is a proxy for family size preferences.

The major conclusion of this chapter is that adaptation of rural-urban migrants is a significant phenomenon. We found that incremental rural-urban migrant fertility in successive five-year post-migration periods was significantly lower than that of comparable rural non-migrants and rural-rural migrants, even after controlling for fertility at the beginning of each period. (See Tables 6.6, 6.9, 6.10, 6.21 and 6.23). We found that for most migration cohorts, the rate of adaptation to urban fertility norms and constraints (measured by the incremental fertility differential between rural-urban migrants and rural stayers) increased with time spent in the urban area up to a point. After this point rural-urban migrant and rural stayer incremental fertility converged, as shown in Figure 6.2. This adaptive behavior existed regardless of whether the woman migrated to an urban area before or after marriage. However, for pre-marital migrants we found that adaptation to the urban life style occurred more slowly after marriage than the adaptation of post-marital migrants. We also found that women who waited longer to marry after migration to the urban area adapted more quickly. The delay of marriage may reflect preferences for a small family, but we have assumed that this preference should be largely controlled for by the autoregressive model. (See Tables 6.14a and 6.14b.) Therefore, Hypothesis 3 cannot be rejected.

We had predicted that younger migrants would adapt more to the urban environment than older migrants. We found, however, that younger post-marital migrants did not adapt at a faster <u>rate</u> than older post-marital migrants;

i.e., incremental fertility differentials in a five-year period between the migrant and rural stayer were not greater. (See Table 6.25). On the other hand, there was some evidence that pre-marital migrants adapted at a faster rate when they migrated at younger ages. (See Tables 6.26a and 6.26b).

In spite of our conslusion that there was little relation between the age at migration and the rate of adaptation, we found that completed fertility was lower for women who migrated to the urban area at younger ages. Of course, if there is adaptation and the rate of adaptation is independent of the age at migration, longer exposure to the urban environment will result in greater cumulative adaptation at the completion of childbearing. We found, for example, that women who migrated before the age of 25 would have 1.5 to 1.8 fewer children at the completion of childbearing than a comparable rural stayer, while this differential fell to 0.8 fewer children for women who migrated after the age of 30. (See Table 6.29). Therefore, Hypothesis 4 cannot be rejected.

We tested whether or not the fertility adaptation of migrants varied with level of education. Since we were not concerned with the effects of adaptation to urban life on education, we concentrated on post-marital migrants, who were more likely to have completed their education before migrating. When we looked at the effect of education on incremental fertility adaptation, there was evidence that more-educated migrant couples adapted at a slightly faster rate to the urban environment than less-educated migrant couples. (See Table 6.30). There was also limited evidence that the education effect on the rate of adaptation was non-linear, especially in the period of migration itself, education increased the speed of adaptation, but at a decreasing rate. (See Table 6.31).

When we looked at the effect of education on cumulative adaptation, (completed fertility differentials between rural-urban migrants and rural stayers), we found a non-linear, negative relation. For example, we found that completed fertility of migrant women with less than four years of school was 1.6 children less than that of comparable rural stayers, 1.0 child less for migrant women with four to six years of school, and 1.2 children less for migrant women with at least six years of school. (See Table 6.36). In relative terms, fertility declines are 24, 16, and 26 percent for these educational levels, respectively. This contradicts our conclusion from the investigation of the effect of education on incremental adaptation; i.e., that education increases the rate of adaptation. On the one hand, the test of the cumulative adaptation effect is much cruder than the test of incremental adaptation. This implies that it is prudent to conclude that education has a positive effect on adaptation. On the other hand, it is not inconceivable that women with the lowest education level might reveal little adaptation in terms of incremental fertility but experience substantial adaptation in terms of completed fertility. (For example, if the major effect of adaptation for women with the lowest education level is to shorten their childbearing periods, this statement can be defended.) This implies that Hypothesis 2 should be rejected. Consideration of these two points leads us to conclude that there is no strong support for Hypothesis 2. However, Hypothesis 1 has strong support from both tests of incremental and cumulative adaptation effects.

We tested whether post-marital, rural-urban migrants who had premarital work experience in jobs incompatible with childbearing and childrearing activities adapt more than women who never worked before marriage in such jobs. Surprisingly, Hypothesis 2 is rejected whereas Hypothesis 1 cannot be rejected.

-141

Post-marital, rural-urban migrants with no pre-marital work experience in child incompatible jobs (including non-workers) would have 1.8 fewer children at the completion of fertility than comparable rural stayers, while this differential fell to 0.4 for women with pre-marital work experience in child incompatible jobs. (See Table 6.40). In relative terms, these fertility declines are 29 and 7 percent for these work experience statuses, respectively.

Although we could observe only 1974 earnings, we tested whether earnings had an effect on adaptation. When rural non-migrants were defined as rural women who never changed their place of residence, we found no consistent relation between 1974 earnings of the wife or husband and the rate of adaptation. However, when we defined rural non-migrants more broadly, as rural women who never left their county of origin, we found that higher 1974 earnings by the husband slowed the rate of urban adaptation of post-marital migrants (i.e., income effect). However, these test results on the effect of earnings on adaptation are too weak to warrant any serious interpretation of our findings.

Finally, we found that cumulative adaptation varied across urban areas. Migrants to larger cities were found to adapt more over their lifetime than migrants to smaller cities. For example, migrants to Seoul would have 2.9 fewer children over a 34-year childbearing period spent in Seoul than comparable rural stayers, while migrants to Busan and other large cities would have 1.9 fewer children and migrants to medium and small cities would have only 1.2 fewer children than rural stayers over a comparable period. (See Table 6.44).

In the last section of the chapter we have compared our results from the autoregressive analysis with those derived from the 1970 Korean census of population by other researchers. Examination of their results (see Table 6.45) allows us to compare the results of this study with results from a different data base and method of computation. The 1970 data indicate that migrants to metropolitan areas during 1965-70 had a total fertility rate of 3.2 children per woman, about 38 percent below the 5.1 children per woman of rural stayers. Similarly, data for rural-migrants to non-metropolitan urban areas showed their total fertility rate as 3.8 children per woman, 26 percent below the level for rural stayers. These changes represent the differences occurring in each birth cohort during a five-year period that included migration for one group. Note, however, that hypotheses about adaptation presume that fertility differences will increase with duration of urban residence, which is limited to five years or less in these data. On the other hand, these changes do not adjust for the selectivity of rural-urban migrants and could overstate the true fertility differential due to adaptation.

The overall evidence seems to contradict a part of theories that the stage of urbanization of a country determines the degree to which migration is selective, and it is selectivity that determines the migrants' ability to adapt to urban norms. However, our results suggest that selectivity, as measured here, has only minor effects on adaptation. In fact, we found some evidence that highly selected migrants may adapt less than other migrants.

There may be some behavioral reasons why less selected migrants might adapt at least as well as highly selected migrants. Migrants with higher education and better occupational experience may not face cultural shocks after migration to urban areas because they were well prepared before migration. Conversely, migrants with lower education and occupational experience may face a completely unexpected lifestyle and be forced to change their ways of thinking and lifestyle even though the required changes are much harder to make for these lower class migrants. Also, migrants with lower socioeconomic backgrounds may be more heavily influenced by their environment and are more affected by other people's behavior in their current residence communities.

For Korea, the overall effects on national fertility are estimated to represent a reduction of 1.39 births per woman or 1.31 million births among 945,000 rural-urban women migrants of the period 1965-70 during the remainder of their childbearing years. For the 1970-75 period a similar number of births are expected to be averted bringing the total births that would be averted during the remainder of their childbearing years for migrants during one decade to 2.6 million. This number may be compared to the 690,000 person natural increase of the Korean population during 1970 and would, on an annual basis, be a significant fraction of that increase.

272

CHAPTER 7: TEST OF THE SELECTIVITY HYPOTHESES

7.1 Introduction

In Chapter 6 we presented a large body of analytic results from tests of hypotheses about adaptation. Now, in this chapter, we develop tests of certain hypotheses about selectivity.

One of the approaches taken in explaining rural-urban migrant behavior emphasizes that the migrants are intrinsically different because they are self-selected and thus represent a non-random sample of the population from which they are drawn.

The major hypotheses that may be tested within this context are:

Hypothesis 6: Rural-urban migrants are selected from the rural population in terms of socioeconomic characteristics such as education and premarital occupational status.

Hypothesis 7: Rural-urban migration becomes less selective over time for a given destination. In other words, earlier migration cohorts to a destination are more highly selected than recent migration cohorts.

Hypothesis 8: At a given point in time, city size is positively related to the selectivity of rural-urban migration.*

Hypothesis 9: At a given point in time and for a given size class of city, new destinations are expected to attract rural-urban migrants more selectively than old popular destinations.

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*The policy relevance of this hypothesis is in identifying the threshold city size class for the preferred types of destinations for the inevitable migrants.

The above hypotheses have been selected from the literature because they all have significant bearing on policy formulation for population control and for rural-urban migration policies. (Hypotheses 6 through 9 are similar to hypotheses 1 through 4 in our research proposal.) In the following section we shall present the results of testing the above hypotheses.

7.2 The Empirical Evidence on Tests of Selectivity Hypotheses

For each observation:

$$Z_i = \beta o + \beta_1 A_i + \beta_2 A_i^2 + \alpha_1 M_{ij} + \varepsilon_i \qquad (7.1)$$

where Z_i is the personal attribute of a woman (educational level, or premarital work experience); A_i is age in 1974, M_{ij} is the migration dummy variable with the value of 1 if the woman migrated during the jth period and zero otherwise. Now, j = 1, 2, 3, 4, 5, 6, 7 for the years 1970-74, 1965-69, 1960-64, 1955-59, 1950-54, 1945-49 and before 1945.

A woman's personal characteristics are assumed to be a nonlinear function of age. The migration dummy (M_{ij}) is expected to capture the relationship between the migration period and the migrant's personal attributes. Few women in Korea continue education after they get married. So, if we consider only post-marital migrants, we can assume that their educational levels and premarital work experience are not influenced by rural-urban migration or the urban environment. The tables presented here show only the coefficients M_{ij} (in Equation 7.1) for each regression with the data relevant to the period of migration being considered. Thus, a separate regression is estimated for each migration period comparing the rural-urban migrants in that period to the total rural-stayers sample.

Column 1, Table 7.1, gives the coefficient of M_{ij} in Equation 7.1 when the dependent variable is educational attainment (years of schooling). The

Table 7.1. Coefficients of the Rural-Urban Migration Cohort Variable in Regressions Explaining the Education and Premarital Work Status of Post-Marital Migrants and Rural Stayers With the Same Minimum Duration of Marriage[a]

Year of Migration	Education b	Education t	Premarital Work Status b	Premarital Work Status t	Number of Observations
1970-74	2.007	(9.41)	0.071	(3.50)	1761
1965-69	1.758	(7.54)	0.022	(1.24)	1485
1960-64	2.264	(6.96)	0.124	(4.92)	1129
1955-59	2.823	(6.37)	0.027	(0.84)	771
1950-54	2.659	(5.19)	0.047	(1.15)	474
1945-49	2.956	(3.21)	-0.047	(-0.58)	239
-44	NA		NA		36

[a]Education: women's years of schooling.
Premarital work status: a dummy dependent variable reflecting whether women worked in jobs incompatible with childbearing and child rearing activity before marriage.

Table 7.2. Coefficients of the Rural-Urban Migration Cohort Variable in Regressions Explaining the Education Level of Post-Marital Migrants and Rural Stayers With the Same Minimum Duration of Marriage, by Destination

Year of Migration	Destination of Migration: Seoul b	Seoul t	Busan and other Large Cities b	Busan and other Large Cities t	Medium and Small Cities b	Medium and Small Cities t
1970-74	2.254	(5.97)	1.420	(4.06)	2.315	(6.94)
1965-69	2.440	(7.52)	1.121	(2.97)	1.199	(2.49)
1960-64	2.670	(5.35)	1.238	(2.39)	3.191	(5.07)
1955-59	4.440	(6.77)	1.349	(1.88)	2.041	(2.19)
1950-54	3.330	(3.16)	2.328	(3.45)	2.801	(2.85)
1945-49	3.918	(3.26)	1.622	(1.18)	NA	NA
-44	NA	NA	NA	NA	NA	NA

coefficients represent the incremental effect of rural-urban migration during various periods on the premigration education level of migrants compared to the rural stayers. The comparison is restricted to post-marital rural-urban migrants and rural stayers with the same minimum duration of marriage. The results show that all migrants have higher educational levels than rural stayers. However, the difference generally has diminished from 1945 to 1969 and has risen since 1970. The evidence lends support to the hypothesis that rural-urban migrants are self-selected from rural populations in terms of their educational levels. Hypothesis 6 cannot be rejected. Considering the period between 1945 and 1969, earlier migrants were more self-selected than the recent cohorts, thus Hypothesis 7 should not be rejected.

Next we want to compare the <u>pre-marital work experience</u> of the rural-urban migrants with that of the rural stayers. We will consider experience in occupations not compatible with raising children (e.g., nonagricultural work excluding work for family members). Column 2 in Table 7.1 compares post-marital rural-urban migrants with rural stayers with the same minimum duration of marriage. The results indicate that since 1950 all migrants had greater pre-marital experience in occupations not compatible with raising children. However, only for two migration periods, 1960-64 and 1970-74, the coefficients are significantly different from zero and so Hypothesis 6 should be rejected except for these two periods.

Table 7.2 compares the <u>educational level</u> of rural-urban migrants to that of the rural stayers <u>for various city-size classes</u> of destination. The underlying equation is the same as Equation 7.1 except that the example of rural-urban migrants is further partitioned according to the city-size class of the destination. Taking coefficients that are statistically significant, the migrants to Busan and large cities have become less selective with respect to their education levels from 1950 to 1969. They have become more selective in the subsequent period. In the case of Seoul, ignoring the period 1950-54 during the Korean War, the migrants were increasingly selective until 1959 and decreasingly selective from then on. Overall evidence appears to indicate that one should not reject Hypothesis 7. In general, the education differential between rural-urban migrants and rural stayers was the highest for the migrants to Seoul followed by that of the migrants to medium and small cities. Busan and large cities seemed to attract the least selective migrants. This counters Hypothesis 8 that there is a direct relationship between the size of the city and the degree of selectiveness for the rural-urban migrants it attracts.

The decline in selectivity of migrants over time started earlier (beginning 1955) for both Seoul and Busan and large cities, whereas this decline has started more recently (beginning 1965) for medium and small cities.

Table 7.3 compares the difference between educational level of rural stayers and post-marital rural-urban migrants at old and new destinations, controlling for the minimum duration of marriage. New destinations (actually newly ascending cities) are cities with net migration rates of more than ten percent during 1970-75 and with this being more than twice their rates in 1966-70. As may be noted from Table 3.7 in Chapter 3, only six medium- and small-size cities could satisfy both conditions. In order to control for size classes of cities in this comparison, old destinations are defined as all other medium and small cities.

Taking only significant coefficients, we see in Table 7.3 that the selec-

Table 7.3. Coefficients of Rural-Urban Migration Cohort Variable, in Regressions Explaining the Education Level of Post-Marital Migrants and Rural Stayers, With the Same Minimum Duration of Marriage by Recency of Destination[a]

Year of Migration	Recency of Destination			
	Old		New	
	b	t	b	t
1970-74	2.385	(6.39)	2.055	(2.94)
1965-69	0.773	(1.34)	2.121	(2.51)
1960-64	3.884	(5.41)	0.940	(0.73)
1955-59	1.487	(1.51)	6.433	(2.34)
1950-54	1.822	(1.75)	9.575	(3.51)
1945-49	NA		NA	
-44				

[a]New destinations are cities with net migration rate of more than ten percent during 1970-75 and with that being more than twice the rate in 1966-70. From Table 3.5 of Chapter 3 the following six cities are classified as new: Masan, Cheongju, Jinju, Gunsan, Iri and Phoang. Old destinations are all other medium and small cities.

tivity of migrants to the new destinations decreased over time. Their initial selectivity was greater than that of migrants to older destinations but by 1970-74 the selectivity of migrants to older destinations was higher. The selectivity of migrants to older destinations increased with recency of migration until 1950 and then declined. The evidence of 1970-74 contradicts Hypothesis 9 that new destinations attract migrants more selectively than old destinations. Therefore, when we define the new destinations of migration as cities with recent rapid increase in net migration rates, we should reject Hypothesis 9, but with the understanding that the data have yielded a rather ambiguous picture.

7.3 Summary of Chapter 7

The evidence supports Hypothesis 6 that rural urban migrants are selected from rural population in terms of their education and premarital occupational status. Migrants have more years of schooling and more experience in occupations not compatible with raising children than comparable rural stayers. There is some support for Hypothesis 7 that migration becomes less selective over time for a given destination. However, an exception to this result is the recent increase of selectivity since 1970, probably due to the improvement of rural living standards after the successful implementation of "New Village Movement". There is no support for Hypothesis 8 that the degree of selectiveness is positively related to the size of the destination. Busan and large cities seem to attract the least selected migrants. There is no consistent support for Hypothesis 9 that new destinations attract migrants more selectively than old destinations. However, this test is based on one special definition of new destination of migration.

It is important to note here that the tests of the selectivity hypotheses presented in this chapter are, of necessity, rather crude.

First, the basic Equation 7.1 estimated in this chapter is far from ideal. Pre-marital education levels and pre-marital work experience are also functions of other socioeconomic and demographic variables. Equation 7.1 assumes that education levels and pre-marital work experience are a function of age and migration status variables only. If the omitted socioeconomic variables were correlated with the migration status variables, then coefficient estimates for the migration status dummy variable in the regressions for Equation 7.1 would be biased.

Second, by investigating the differences in the coefficient estimates of migration dummy variables among different migration periods, we make an inference that the selectivity of the rural-urban migrants is declining or increasing over time. However, since we control for age of women in 1974, the coefficients estimated for migration dummy variables for different periods should reflect the effect of age at migration as well as the effect of the migration cohort.

Even though we recognize the above-mentioned serious defects of our hypotheses tests, we presented test results in this chapter without any further refinement for the following reasons. First, we are not aware of the availability of any better tests of the selectivity hypothesis. Second, as we emphasized in previous chapters, the importance of testing the selectivity hypotheses has been substantially reduced during the course of this research. When we wrote the research proposal for this study, we proposed to test whether the selectivity or adaptation hypothesis was dominant in explaining the lower fertility of rural-urban migrants compared with that of rural stayers. Therefore, at that stage, the tests of the selectivity hypotheses were crucial for this study. However, in developing our analysis we realized that by employing the autoregressive model we could quantify the effect of the adaptation on the fertility of the rural-urban migrant while controlling for the selectivity of migrants. Accordingly, policy makers do not have to choose between the selectivity or adaptation hypotheses. The only thing they need to know is whether adaptation has any significant effect on the fertility of rural-urban migrants and how large that effect is when the selectivity of migrants is controlled. This implies that accurate tests of the selectivity hypotheses are no longer a prerequisite for making rational policy decisions.

Chapter 8: COMPARISON OF THE AUTOREGRESSIVE MODEL WITH ALTERNATIVE MODELS OF MIGRANT FERTILITY

8.1 Introduction

We are gratified with the findings obtained in Chapters 5, 6, and 7 indicating that adaptation to the urban lifestyle by rural-urban migrants is a significant factor in explaining the lower fertility of rural-urban migrants compared with that of rural stayers. We are further convinced that the application of the autoregressive model to our problem has contributed significantly to enhancing our ability to quantify the influence of rural-urban migration on the fertility behavior of migrants when controlling for their selectivity. However, the question investigated in this study is too crucial for policy purposes to be answered simply by applying a model to a data source.

To verify our findings, we shall compare (in Section 8.2) the model used in Chapters 5, 6, and 7 with models used in previous studies. Next, in Sections 8.3 and 8.4, we will apply an alternative model suggested by Ribe and Schultz (1980) to the 1974 KWFS data. Then, in Chapter 9, we shall analyze the descriptive statistics obtained using the 1970 Korean Population Census data.

8.2 Comparison with Previous Studies Using the Time of Migration Data

Data for many previous studies do not provide information on the time of migration. To our knowledge only two currently available studies, Goldstein and Tirasawat (1977) and Ribe and Schultz (1980), used data on the year of migration. However, in neither study did the data give place of previous residence. Therefore, both had to define rural-urban migrants as those persons currently living in urban areas but born in rural areas. Both studies will underestimate the duration of exposure to urban lifestyle for migrants who were born in rural areas but whose previous residences were other urban areas different from the current residences. In the current study those migrants are defined as urban-urban migrants. As is well known, in less-developed countries those urban-urban migrants who are born in rural areas are not a negligible number. As shown in Table 8.1, 339 women were urban-urban migrants with a rural birthplace in our Korean sample whereas 1,230 rural-urban migrants had both previous residence and birthplace in rural areas.

It is true by definition that the multistage rural-urban migrants would have spent less time in the current residence than the rural-urban migrants who left rural areas at the same time as the former but came to the current residence directly. This understatement of the duration of multistage rural-urban migration could be partially responsible for Goldstein and Tirasawat's (1977) observation that recent migrants have lower fertility than earlier migrants for a given age and destination.

To our knowledge, none of the previous studies has utilized data on both migration history and pregnancy history. As discussed shortly, this has caused well-known confusion and conflicting results in analyzing the influence of rural-urban migration on the fertility of migrants. We will concentrate here on four previous studies: Ro (1976) and Park and Park (1976), in addition to the above-mentioned two studies that utilize duration of migration data. (Comparison of our results with those of Ribe and Schultz (1980) will be further discussed in the following two sections.) Ro's study is very similar to that of Ribe and Schultz (1980) in terms of controlling all other socio-economic variables in a regression to ascertain the effect of recent Korean migration on migrant fertility. The work of Park and Park (1976) is interesting because it analyzes both the age-specific fertility rates five years prior to the census year and completed fertility (or total fertility rates) to

Table 8.1. Distribution of Korean Currently Married Women by Place of Birth, Previous Residence and Current Residence

Birth	Previous Residence	Current Residence	Number of Women
Rural	Rural	Rural (Rural Stayer)	1641
Rural	Rural	Urban (Rural-Urban Migrants)	1230
Rural	Urban	Urban	339
Urban	Urban	Urban	655
Others			578
Total			4443

SOURCE: KWFS data tapes.

assess the effect of recent Korean migration on migrant's fertility. Park and Park's approach, which is similar to Goldstein and Tirasawat's analysis, is close to the approach used in the current study.

In order to compare our results with those of Goldstein and Tirasawat (1977) we replicated their Table 9 using our Korean data (Tables 8.2 and 8.3). Their table and our table cross-tabulate current age and the length of current residence in order to test the effects of duration of migration on fertility levels of migrants. Their data, reproduced in Table 8.4, show clearly a direct relation between duration of residence and fertility for younger women; i.e., those under age 40 in Bangkok and under 35 in provincial urban places. Goldstein and Tirasawat (1977) suggest two main reasons for this positive relationship.

> "First, the migration process itself may be disruptive of fertility, but the resulting delay in childbearing may be compensated for after long periods of settlement in the urban place. An alternative explanation..., is that more recent migration in Thailand may be more innovative in character than earlier migration, which was more conservative. That is, earlier migrants may have responded to changes in their environment by conforming more closely to older behavioral patterns, including high fertility levels. In contrast, more recent migrants, motivated by improved communications, more education, and high levels of modernization, may be leaving their old environments in order to achieve new goals, and therefore may be willing to forego the old in favor of new behavioral patterns, including lower fertility than that of couples at place of origin and even non-migrants in place of destination."

Tables 8.2 and 8.3 depict an inverse (rather than direct) relation between duration of residence and fertility of younger Korean women. Only for the age group 25-29 does the recent migrant (0-4 years of duration of residence) show a lower fertility than the earlier migrant who stayed in urban areas between five and nine years.

Table 8.2. Average Number of Children Ever Born, by Migration Status and Age Group of Women in 1974

Age Group	Duration of Residence in 1974 (in years) 0-4	5-9	10-14	15-19	20-24	25-29	30 and more	Rural Stayers
	Rural-Urban Migrants to Seoul							
20-24	1.63	1.42	*	*	*	NA	NA	1.50
25-29	1.76	2.15	1.95	*	*	*	NA	2.58
30-34	3.46	3.31	3.33	2.64	*	*	*	4.06
35-39	3.92	3.83	3.61	4.04	3.77	4.1	*	5.25
40-44	*	4.46	*	4.9	4.5	*	*	6.24
45-49	*	*	*	*	*	*	*	7.06
	Rural-Urban Migrants to Busan and Large Cities							
20-24	1.27	*	*	*	*	NA	NA	
25-29	1.96	2.57	2.07	*	*	*	NA	
30-34	3.5	3.15	3.57	*	*	*	*	
35-39	*	4.72	4.0	4.0	4.19	*	*	
40-44	4.42	5.82	4.27	*	4.5	*	*	
45-49	*	*	*	*	*	*	*	
	Rural-Urban Migrants to Medium and Small Cities							
20-24	1.33	*	*	*	*	NA	NA	
25-29	2.06	2.56	*	*	*	*	NA	
30-34	3.21	3.5	3.85	*	*	*	*	
35-39	4.92	*	*	4.54	*	*	*	
40-44	3.64	*	*	*	4.9	*	*	
45-49	*	*	*	*	*	*	*	

* Fewer than 10 observations in the cell.

SOURCE: KWFS data tapes.

The contradictory findings from Thai and Korean data might be reconciled if recent migrants are more selectively drawn than earlier migrants in both countries but the adaptive effect of exposure to urban lifestyle is stronger in Korea than in Thailand. The disruptive effect of the migration process on fertility seems to be strong in both countries. However, in Korea the delayed

Table 8.3. Average Number of Current Births During Five Years Before or in the Survey Year 1974 by Migration Status and Age Group of Women in 1974

Age Group	Duration of Residence in 1974 (in years)							Rural Stayers
	0-4	5-9	10-14	15-19	20-24	25-29	30 and more	
	Rural-Urban Migrants to Seoul							
20-24	1.5	1.37	*	*	*	NA	NA	1.43
25-29	1.52	1.58	1.5	*	*	*	NA	1.70
30-34	1.13	1.44	1.22	1.09	*	*	*	1.38
35-39	.67	.39	.43	.38	.69	.4	*	.89
40-44	*	.23	*	.3	.0	*	*	.46
45-49	*	*	*	*	*	*	*	.19
Total								6.05
	Rural-Urban Migrants to Busan and Large Cities							
20-24	1.27	*	*	*	*	NA	NA	
25-29	1.56	1.69	1.5	*	*	*	NA	
30-34	1.06	1.29	1.52	*	*	*	*	
35-39	*	.44	.32	.26	.38	*	*	
40-44	.08	.09	.09	*	.11	*	*	
45-49	*	*	*	*	*	*	*	
Total								
	Rural-Urban Migrants to Medium and Small Cities							
20-24	1.33	*	*	*	*	NA	NA	
25-29	1.68	1.75	*	*	*	*	NA	
30-34	1.11	1.35	1.23	*	*	*	*	
35-39	.58	*	*	.77	*	*	*	
40-44	.09	*	*	*	.2	*	*	
45-49	*	*	*	*	*	*	*	
Total								

* Fewer than 10 observations in the cell.

SOURCE: KWFS data tapes.

childbearing seems to be compensated more promptly, possibly within 5-9 years after migration, than in Thailand.

From Table 8.3, one can compute the total fertility rates of rural stayers, 6.05 children, by summing up the last column across age groups. By summing along the diagonal, starting from the first column for rural-urban migrants and adding rural stayer's age specific fertility rates for ages before migration, one can obtain the total fertility rates for rural-urban migrants by destination of migration and age at migration, as reported in Table 8.5. Table 8.5 reveals that, depending on age at migration, rural-urban migrants to Seoul would have .64 (6.05 - 5.41) to 1.37 fewer children over their lifetimes than rural stayers; rural-urban migrants to Busan and large cities would have 1.01 to 1.35 fewer children than rural stayers; and rural-urban migrants to medium and small cities would have .72 to .77 fewer children

Table 8.4. Average Number of Children Ever Born, by Selected Duration of Residence, Type of Place and Age of Woman in Thailand

Current Residence and Age	Duration of Residence in Current Place			
	Under 5 years	5-9 years	10-14 years	15-19 years
Bangkok				
25-29	2.0	2.4	3.5	*
30-34	2.5	3.2	4.2	*
35-39	3.1	3.7	4.3	5.1
Provincial Urban Places				
25-29	1.8	2.7	*	*
30-34	3.6	3.8	3.9	*

SOURCE: Goldstein and Tirasawat (1977), Table 9.

than rural stayers. It is interesting to note that migration to medium and small cities or migration at older ages is less effective in reducing the fertility rates of migrants. However, it is important to note that rates in Table 8.5 could underestimate the impact of the adaptation to urban lifestyle on fertility because we assumed that the younger migrant cohorts would adapt to urban fertility norms at the same rate at which the older migrant cohort is currently adapting.

A problem with the work of Goldstein and Tirasawat (1977) is that it does not separate the effects of adaptation and selectivity. As mentioned earlier, a most important question for the policy decision makers is whether the rural-urban migrants would have had lower fertility if they had remained in rural

Table 8.5. Total Fertility Rates by Destination of Migration and Ages at Migration for Korean Women

Migration Status	Total Fertility Rates
Rural Stayers	6.05
Rural-Urban Migrants to Seoul at Ages of	
20-24	4.68
25-29	5.12
30-34	4.95
35-39	5.41
Rural-Urban Migrants to Busan and Large Cities at Ages of	
20-24	4.85
25-29	4.70
30-34	4.72
35-39	5.04
Rural-Urban Migrants to Medium and Small Cities at Ages of	
20-24	5.28
25-29	5.33

SOURCE: Table 8.3.

areas--the effect of adaptation controlling for the selectivity of migrants. In this respect, Ro (1976) and Ribe and Schultz (1980) offer a significant improvement because they control for all the socioeconomic characteristics of women to ascertain the effect of migration status or the duration of migration on the children ever born. However, as pointed out by Ribe and Schultz (1980), even after one controls for socioeconomic characteristics of women, the coefficient estimates of the duration of migration dummy variables in the fertility equation are not free of the selectivity effect due to unmeasurable preferences.

Multivariate regression results similar to those used by Ro (1976) and Ribe and Schultz (1980) are reported in Table 8.6, which compares the fertility of rural-urban migrants with that of rural stayers. Their regressions compare the fertility of rural-urban migrants with that of urban natives. Table 8.6 suggests that, except for the youngest age group, 20-24, the duration of residence reduces the fertility of migrants compared to that of rural stayers. This result may arise from several causes. First, the earlier migrants could be more selective than recent migrants in terms of unmeasurable preferences. Second, lengthening exposure to the urban lifestyle could have induced migrants to reduce their fertility rates. Finally, rural-urban fertility differentials could have declined substantially over time.* If the latter were true, a given level of adaptation to the lower fertility norm of urban areas by early migration cohort may result in a more significant deviation of its fertility relative to rural stayers. The same level of adaptation by the recent migrants would not make as significant a deviation in their fertility relative to rural stayers.

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*Table 3.19 in Chapter 3 shows that this is the case for Korea. Rural-urban fertility differentials in Korea have diminished substantially from about two births during the 1960's to 0.43 births per woman in 1980.

Table 8.6. Regression Results of Children Ever Born to Women by Age of Women

Variable	20-24 b	20-24 t	25-29 b	25-29 t	30-34 b	30-34 t	35-39 b	35-39 t	40-4 b	40-4 t	45-49 b	45-49 t
Intercept	-1.273	(-1.77)	-3.952	(-5.92)	-4.411	(-4.67)	1.583	(1.29)	.743	(.36)	1.250	(.39)
AGEC	.120	(3.77)	.242	(9.83)	.266	(9.00)	.112	(3.38)	.118	(2.42)	.098	(1.43)
WEDZ	.218	(1.62)	.302	(2.60)	.318	(3.07)	.096	(.82)	.288	(1.83)	.129	(.47)
WED79	- .297	(-2.64)	- .234	(-2.44)	- .380	(-2.99)	- .156	(- .82)	.001	(.00)	.253	(.34)
WED10U	- .312	(-1.18)	- .410	(-2.88)	- .310	(-1.51)	- .314	(-1.24)	-.479	(-1.50)	-.787	(-1.44)
HEDZ	.583	(3.26)	.025	(.16)	.196	(1.31)	.114	(.77)	.195	(1.08)	.409	(1.74)
HED79	.318	(3.18)	- .065	(- .70)	- .023	(- .21)	- .237	(-1.57)	.014	(.06)	-.311	(- .59)
HED10U	.173	(1.43)	- .206	(-2.01)	- .097	(- .85)	- .426	(-3.16)	.012	(.06)	.298	(.93)
NDEA	.290	(1.80)	.962	(10.58)	.847	(11.36)	.823	(12.59)	.797	(11.44)	.810	(11.49)
SHSN	- .035	(- .40)	- .126	(-1.39)	- .707	(-4.79)	-1.503	(-7.87)	-.621	(-2.29)	-.338	(- .78)
DWRKBM	- .246	(-2.67)	- .173	(-2.18)	- .278	(-2.42)	- .547	(-3.25)	-.426	(-1.74)	-.078	(- .23)
M1	- .062	(- .65)	- .300	(-3.24)	- .300	(-2.14)	- .432	(-1.93)	-1.752	(-5.97)	-.924	(-2.02)
M2	.099	(.76)	- .060	(- .68)	- .459	(-4.11)	- .553	(-3.03)	-.968	(-3.41)	-.689	(-1.44)
M3	.011	(.03)	- .332	(-2.21)	- .387	(-2.82)	- .873	(-4.73)	-.960	(-3.09)	-.909	(-2.17)
M4	.192	(.63)	- .396	(-1.76)	- .620	(-2.70)	- .534	(-3.07)	-1.160	(-3.67)	-.369	(- .78)
M5	- .070	(- .11)	- .028	(- .11)	- .300	(-1.00)	- .370	(-1.67)	-1.031	(-4.07)	-.797	(-1.69)
M6	NA	( )	NA	( )	- .722	(-2.48)	- .955	(-2.85)	-.621	(-1.66)	-1.316	(-2.78)
M7	NA	( )	NA	( )	- .097	(- .10)	-1.267	(-1.74)	-.395	(- .79)	-.746	(-1.61)
# of OBS	229		614		585		635		487		325	
F-Stat	4.28		24.96		26.05		27.77		20.44		12.94	
R^2	.2335		.3858		.4385		.4335		.4256		.4175	

Notes: WEDZ, WED79, WED10U, HEDZ, HED79 and HED10U are dummy variables for women and their husbands' level of schooling with suffixes reflecting the years of schooling, such as 0-3, 7-9 and more than 9 years of schooling, respectively. NDEA is the number of own child deaths. SHSN is the share of surviving sons out of surviving children. DWRKBM is the dummy variable reflecting whether the woman worked before marriage. If she worked as self-employed or employees for someone else, then it takes the value 1, otherwise 0.

The last factor can be partially removed by using fertility rates for the current period instead of children ever born as the dependent variable. Such a regression is reported in Table 8.7, which reveals that migration status makes a significant difference in current fertility rate differentials between migrants and rural stayers only for women aged 35-44. It seems that current fertility rates of different birth cohorts may still be most strongly influenced by the cohort-specific preference for family size. This may be very important in a dynamic, developing country, such as Korea. In order to remove this factor completely, it would be necessary to use the longitudinal fertility and migration data for the same individual women. Nonetheless, estimates of the coefficient for duration of migration still partially reflect the unmeasurable selectivity of the rural-urban migrants such as preference for the lower fertility. As pointed out by Wolowyna (1979), the best proxy reflecting these unmeasurable preferences for family size should be the fertility rate at migration. These two reasons have led us to use the Ashenfelter autoregressive model, as reported in Table 5.4 of Chapter 5.

It is interesting to assess how the autoregressive model in Table 5.4 for 1974 is different from the multivariate regressions used in Tables 8.6 and 8.7 when the latter are estimated for the total sample for all age groups. Table 8.8 reports the regression results for the same equations used in Tables 8.6 and 8.7 with the addition of an age-squared term to take account of the non-linear influence of the birth-cohort effect. The sample includes total rural-urban migrants and rural stayers. As expected, the coefficient estimates for the year of migration dummy variables in the first column of Table 8.8 are consistently larger in absolute values than those estimated in Table 5.4 for 1974. This is due to the fact that the equation used for Table 8.8 could not control for the selectivity of migrants with respect to the unobserved prefer-

Table 8.7. Regression on Current Fertility Rates During the Five Years Before the Survey Year 1974 by Age of Women

	Age of Women											
	20-24		25-29		30-34		35-39		40-44		45-49	
Variable	b	t	b	t	b	t	b	t	b	t	b	t
Intercept	-.710	(-1.10)	1.663	(3.17)	4.438	(6.28)	5.254	(6.90)	3.069	(3.96)	3.093	(3.96)
AGEC	.095	(3.32)	.008	(.41)	-.094	(-4.25)	-.114	(-5.54)	-.059	(-3.22)	-.062	(-3.69)
WEDZ	.118	(.98)	-.104	(-1.15)	.002	(.02)	.115	(1.59)	.018	(.30)	.060	(.90)
WED79	-.298	(-2.95)	-.048	(- .63)	-.092	(- .97)	-.128	(-1.08)	-.002	(- .01)	.051	(.28)
WED10U	-.308	(-1.29)	-.181	(-1.62)	.122	(.79)	-.048	(- .32)	-.073	(- .61)	-.037	(- .27)
HEDZ	.355	(2.21)	-.191	(-1.57)	.227	(2.01)	-.034	(- .37)	.144	(2.12)	-.048	(- .84)
HED79	.242	(2.69)	-.134	(-1.82)	.093	(1.12)	-.166	(-1.77)	.017	(.19)	-.071	(- .55)
HED10U	.172	(1.58)	-.153	(-1.89)	.013	(.16)	.032	(.38)	-.054	(- .75)	-.134	(-1.70)
NDEA	.272	(1.88)	.449	(6.29)	.346	(6.21)	.207	(5.11)	.081	(3.07)	.057	(3.33)
SHSN	-.082	(-1.03)	-.231	(-3.25)	-.364	(-3.30)	-.589	(-4.96)	-.473	(-4.63)	-.169	(-1.61)
DWRKBM	-.203	(-2.44)	.021	(.34)	.203	(2.36)	-.001	(- .01)	-.014	(- .16)	.061	(.73)
M1	-.041	(- .47)	-.060	(- .84)	-.153	(-1.46)	-.186	(-1.34)	-.316	(-2.85)	-.022	(- .20)
M2	.041	(.35)	-.011	(- .16)	-.028	(- .34)	-.382	(-3.37)	-.238	(-2.22)	-.055	(- .47)
M3	.035	(.11)	-.119	(-1.01)	-.079	(- .77)	-.298	(-2.61)	-.194	(-1.66)	-.136	(-1.33)
M4	.242	(.88)	-.200	(-1.14)	-.281	(-1.63)	-.331	(-3.07)	-.120	(-1.01)	-.031	(- .27)
M5	-.065	(- .11)	-.062	(- .33)	-.366	(-1.64)	-.156	(-1.13)	-.250	(2.62)	-.062	(- .53)
M6	-0-	(-0-)	-0-	(-0-)	-.129	(- .60)	-.552	(-2.66)	-.004	(- .03)	-.122	(-1.05)
M7	-0-	(-0-)	-0-	(-0-)	.148	(.21)	-.147	(- .33)	-.043	(- .23)	-.120	(-1.06)
No.'s of OBS	229		614		585		635		487		325	
F-Stats	3.31		5.07		5.48		7.89		4.65		2.43	
R^2	.190		.113		.141		.179		.144		.118	

NOTE: Variables are defined in Table 8.6.

Table 8.8. Regression Results of Children Ever Born to Women and Current Fertility Rates for Total Rural-Urban Migrants and Rural Stayers Sample.

Independent Variables	Dependent Variable: Children Ever Born b	t	Current Fertility Rates During the Past Five Years b	t
Intercept	-6.083	(-12.14)	1.598	(5.64)
AGEC	.446	(15.30)	.058	(3.51)
AGEC2	-.004	(-9.77)	-.002	(-8.38)
WEDZ	.277	(4.68)	.005	(.15)
WED79	-.229	(-2.97)	-.073	(-1.68)
WED10U	-.452	(-4.22)	-.043	(- .71)
HEDZ	.231	(3.24)	.092	(2.28)
HED79	-.010	(- .15)	-.023	(- .62)
HED10U	-.101	(-1.56)	-.046	(-1.25)
NDEA	.819	(28.23)	.154	(9.37)
SHSN	-.491	(-6.69)	-.331	(-7.98)
DWRKBM	-.228	(-3.62)	.061	(1.71)
M1	-.551	(-7.30)	-.122	(-2.85)
M2	-.431	(-6.14)	-.033	(- .83)
M3	-.655	(-7.14)	-.131	(-2.53)
M4	-.575	(-5.34)	-.245	(-4.02)
M5	-.565	(-4.80)	-.201	(-3.01)
M6	-.754	(-4.76)	-.149	(-1.66)
M7	-.649	(-2.85)	-.034	(- .27)
# of OBS	2871		2871	
F-STAT	389.9		112.6	
R^2	.711		.415	

NOTE: Variables are defined in Table 8.6.

ence and yields the downward-biased coefficient estimates for the year of migration dummy variables. Also, Table 8.8 measures a cumulative effect of length of urban residence on fertility, while Table 5.4 measures only the incremental effect in a five-year period.

Column 2 of Table 8.8 shows the regression of additional births during the five-year period preceding 1974 on socioeconomic variables as well as the dummy variables for year of migration. The autoregressive model, Equation 5.6, controls successfully for the previous fertility level but does not control for the influence of socioeconomic variables on the additional births occurring during the past five years in assessing the influence of migration on fertility differentials. Current fertility rates may be a function of socioeconomic characteristics for both migrants and rural stayers independently of migration status. A comparison of columns 1 and 2 of Table 8.8 indicates that estimates of coefficients for education dummy variables for women and their husbands become less significant in column 2 than in column 1. The pre-marital work experience variable changes from a significant negative coefficient in column 1 to a positive one in column 2. Number of child deaths of women and share-of-son variables remain significant in column 2. However, as shown in Lee and Schultz (1980), coefficients of these two variables could be biased due to spurious correlation. It is also important to recall that earlier statistical tests of the coefficient for the previous fertility variable in Table 5.4 rejected the null hypothesis for 1974 that the coefficient of previous fertility variable is equal to 1. Therefore, the dependent variable used for column 2 in Table 8.8 could have yielded the biased coefficients for the year of migration variables. The above discussion implies that the specification of our autoregression, Equation 5.6, is correct and superior to the equation used in Table 8.8.

8.3 Further Comparison of Our Model with that of Ribe and Schultz (1980)

In an interesting paper by Ribe and Schultz (1980), the relative importance of the selectivity and adaptation hypotheses is tested on 860,000 Colombian women. They define the adaptation hypothesis and selectivity hypothesis as follows:

> The adaptation hypothesis assumes that fertility differences are in part due to different relative wages received by men, women, and children, and different price and income constraints confronting different families. These constraints vary systematically between rural and urban areas and partly explain fertility differences between them. With sufficient time to discern how these relative wages, prices, and incomes differ among residential areas, migrant fertility should eventually converge toward that of native, controlling for their stage in the life cycle (i.e., wife's age) and the resources and price of time of the couple (i.e., education of the women and income of the man). (p. 9)
>
> Another approach to migrant behavior elaborated in this paper (the selectivity hypothesis) emphasizes the heterogeneity of populations and the distinctive preferences of migrants. Even when migrants are compared with "similar" nonmigrants, according to age, education and income, etc., migrants remain intrinsically different, if for no other reason than that they are self-selected and thus represent a non-random sample of the population at origin from which they are drawn. (p. 10)

As may be noted from the underlined part of the definition of selectivity, the selectivity that is tested in Ribe and Schultz is very different from, and much narrower than, the selectivity hypothesis that was tested in the previous chapters.

The major differences between the two models is that our definition of individual characteristics distinguishes migrants from non-migrants according to constraints, such as education and occupational skills, as well as according to unquantifiable preferences. Their individual characteristics are confined to the unquantifiable preferences. Similar differences in the definition of selectivity can be noted between Ro (1976) and Hendershot (1976). While Ro employed the same definition as Ribe and Schultz, Hendershot used the same definition as we did.

In terms of policy relevance, we prefer our definition to that of Ribe and Schultz. Policy makers are interested in testing the adaptation and selectivity hypotheses because they need to find out if rural-urban migrants tend to have lower fertility than "rural stayers" because of personal characteristics (selectivity) or because of the influence of the urban environment on their fertility behavior (adaptation). If we accept the narrow definition of selectivity, then we could not explain to what extent the fertility differentials between rural-urban migrants and rural stayers are due to the differences between migrants and others in the rural population in terms of education and occupational skills. However, we decided to attempt in this chapter to replicate the results of Ribe and Schultz using Korean data because a test of the dominance of selectivity relative to adaptation based on their approach could serve as an ultimate test. If their results reveal that selectivity based on their definitions is a dominant factor in accounting for the fertility differentials between migrants and non-migrants, this implies that tests based on our approach will lead to the same result. However, if their test results reveal that adaptation is the dominant factor, then it is still possible that our selectivity hypothesis will be proven.

Ribe and Schultz suggest that by comparing the fertility of migrants of a given age and education to that of natives at a destination, one can test whether their form of selectivity is, in net, more important than adaptation. They argue that migration to urban areas may be selective against migrants who prefer large families because urban marginal family costs are greater than those in rural areas. However, it is important to distinguish various implications of their selectivity hypothesis; we are told (p. 10) that "migrants from rural to urban areas would, on the average, assign less importance to having a large family than would nonmigrants who remain in rural areas." This suggests that rural-urban migrants would have lower fertility rates than rural natives. Then, we are told (p. 11) that "in otherwise similar groups, rural born migrants in the city would have lower fertility than city born natives." The second implication does not necessarily follow from the first. If we also consider that migration is costly, it may be that rural-urban migrants do not have the same preferences as urban stayers, on average. In fact, rural-urban migrants may have a lower preference for children than urban non-migrants since some urban individuals with marginally higher-than-average preference for large families will not surmount the urban-rural migration costs. This may be the logic connecting the two implications of the selectivity hypothesis. It does suggest, however, that even though the fertility of rural-urban migrants may be lower than all urban residents combined, it is not necessarily lower than that of urban-urban migrants, unless there is greater psychic cost to rural-urban migration than to inter-urban migration.

Regarding rural-rural migrants we are first told (p. 10) that "when individuals born in rural areas decide to move, the decision on whether to migrate to an urban area or remain in the rural sector is assumed to be influenced by their preferences for family size. Those preferring a larger family are more inclined to relocate in another (rural) area, and those preferring a smaller family are more inclined to move to an urban area." However, we are then told (p. 11) that "migrants from rural areas that decide to relocate in the rural sector are likely to have unusually strong preferences for a larger family, and their fertility may exceed that of the rural native nonmigrant."

The Ribe-Schultz selectivity hypothesis states that observed locational preferences reveal something about fertility preferences because locations differ with respect to price and income constraints. Observing two individuals who move to locations with different constraints reveals preferences. Ribe and Schultz expect that rural-rural migrants would have a higher preference for large families than rural nonmigrants; rural-urban migrants would have lower preference for large families than rural-rural migrants; and, perhaps, rural-urban migrants would have lower preferences for large families than urban non-migrants.

Figure 8.1 illustrates the <u>selectivity hypothesis.</u> The extreme interpretation of selectivity is illustrated by relative fertility levels RR and RU for rural-rural migrants and rural-urban migrants, respectively, after 0 years of residence at the destination. These compare to fertility norms R and U for rural and urban nonmigrant natives, respectively. This is the situation Ribe and Schultz considered when stating that (pp. 10-11) "the migrant selectivity hypothesis implies that rural-urban differences in fertility . . . would be exaggerated among migrants compared with natives."

Migration to urban areas could also be adaptive in the sense that migrants respond to a new set of wages and prices at the destination. This adjustment occurs during the period of residence at the destination. If adaptation occurs, migrant fertility would eventually converge to that of the native. Figure 8.2 illustrates two different fertility <u>adaptation patterns</u> among rural-urban migrants. Pure adaptation implies an initial fertility rate for rural-urban migrants between that of rural and urban natives, but not below that of urban natives. If there is no initial adaptation,

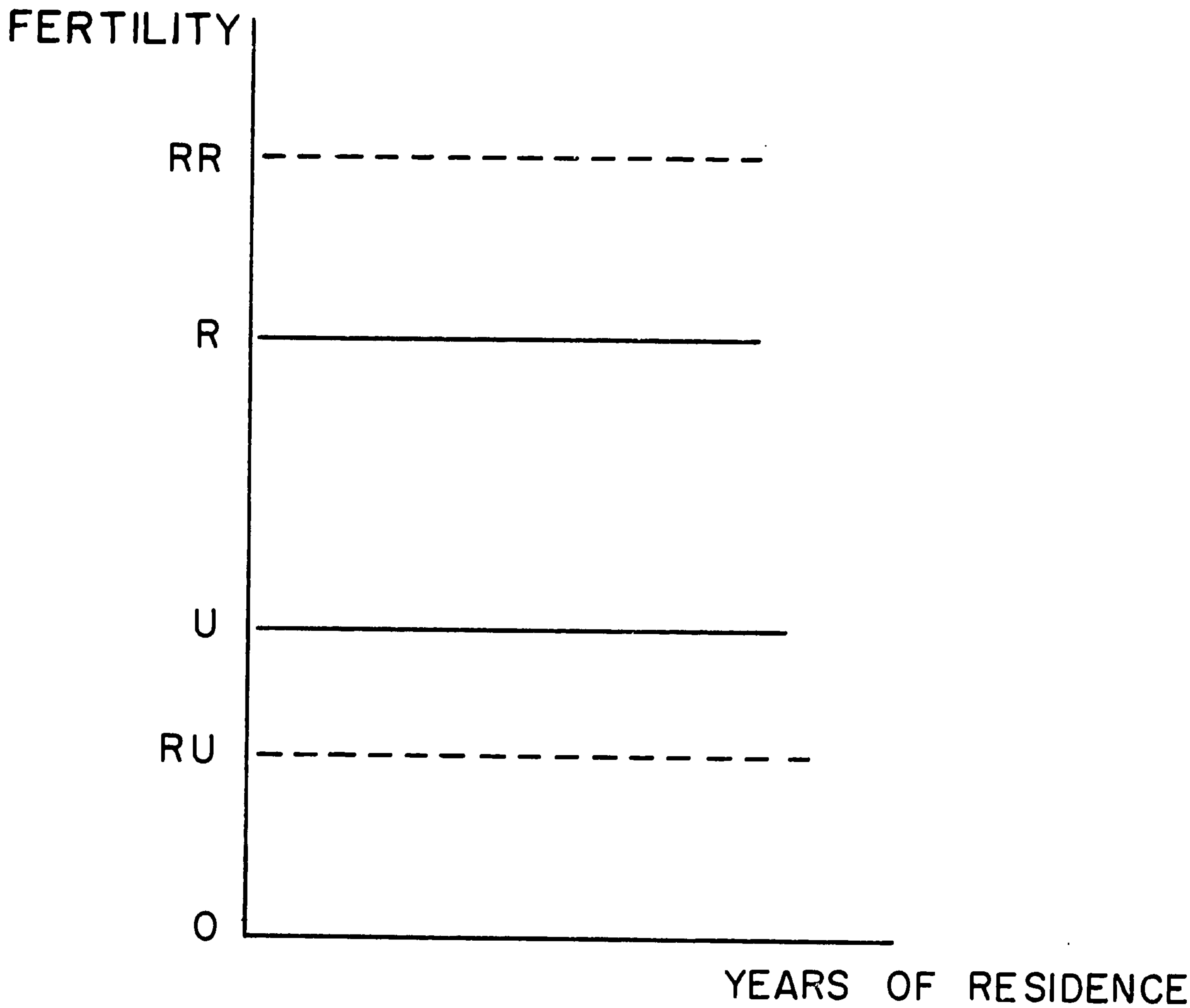

Figure 8.1. Comparative Levels of Fertility Due to Selectivity by Duration of Residence

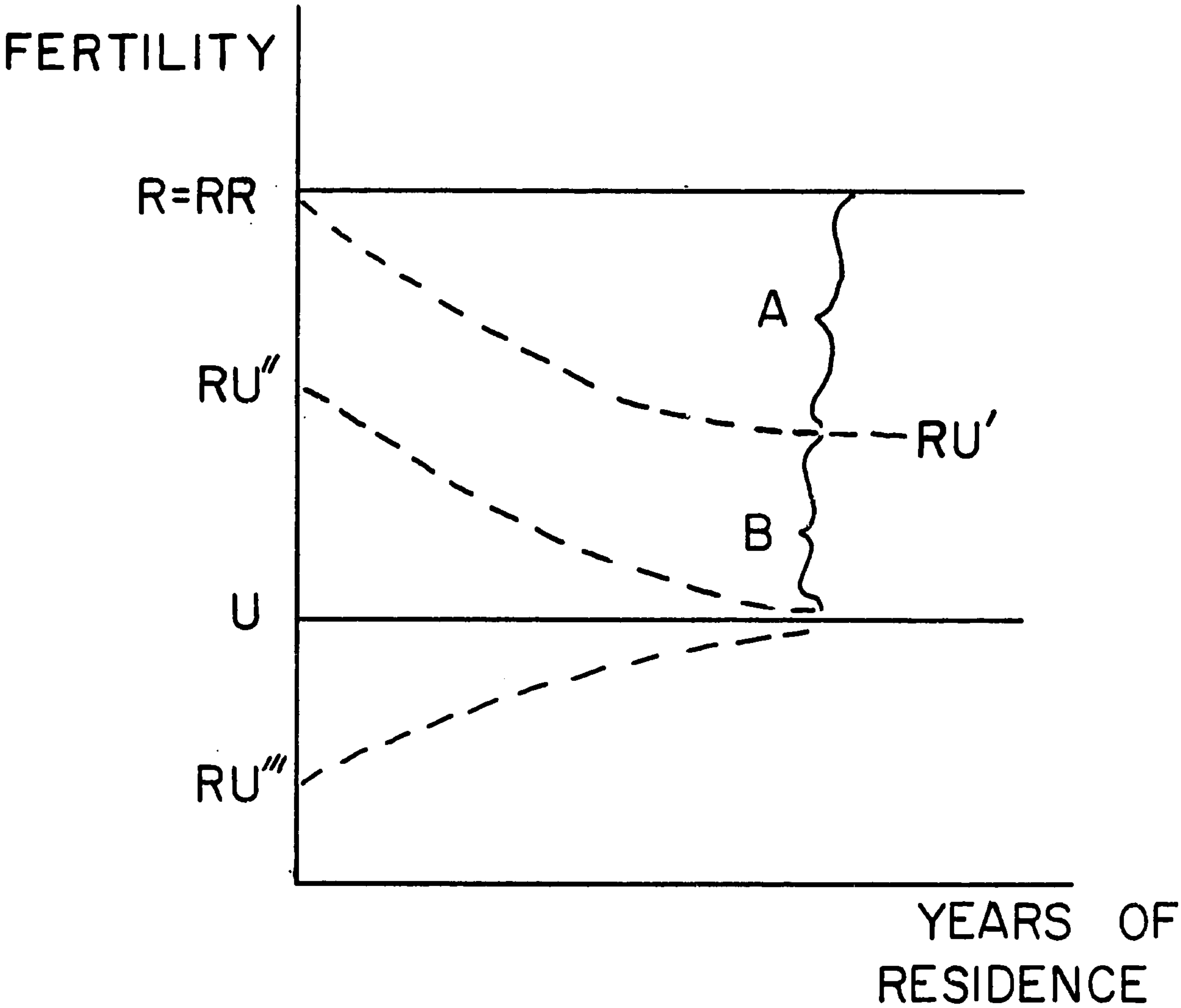

Figure 8.2. Comparative Levels of Fertility Due to Adaptation and/or Selectivity, by Duration of Residence

fertility RU' results. If there is some initial adaptation, such as a "shock effect," fertility RU" results. Furthur adaptation causes fertility to vary with years of residence in the destination. Assuming no adaptation is necessary for rural-rural migrants remaining in rural areas and their fertility is RR, we can see why Ribe and Schultz (p. 12) suggest that "the fertility of rural and urban natives (will be) further apart than the fertility of migrants currently residing in rural and urban areas."

According to the interpretation by Ribe and Schultz, if adaptivity is a force, then B, which represents the difference in fertility of rural-urban migrants relative to that of urban natives, declines with years of residence in the urban area. Another test of adaptivity, however, is whether A, the difference in fertility of rural-urban migrants relative to that of rural natives, increases with years of residence in the urban area. This is what we demonstrated in Chapter 6, above.

As Ribe and Schultz note (p. 12), both selectivity and adaptation could be present in reality. The observation of a fertility level for rural-urban migrants below that of urban natives like RU''' in Figure 8.2 implies that either strong selectivity is present or there is some uncontrollable "shock" effect of migration activity itself on fertility. However, observation of a fertility level of rural-urban migrants between those of rural and urban natives, like RU", implies nothing about the relative importance of selectivity and adaptation. Excluding "shock" (or disequilibrium) effects of migration, the difference between R and RU" or between RU" and U in Figure 8.2 consists of the sum of an adaptation effect and a selectivity effect.

8.4 Tests of the Ribe and Schultz Hypotheses Using Korean Data

Two major tests are undertaken by Ribe and Schultz to determine the relative importance of the selectivity and adaptivity explanations. In the first test, ratios of migrants to native fertility, measured by children ever born, are compared across destinations and education groups. They noted two tendencies in this data. First, migrant fertility relative to non-migrant fertility was higher in rural destination areas (p. 21), consistent with their migrant selectivity hypothesis. Second, relative migrant fertility rises with education among rural-urban migrants. The explanation for the second tendency is that fertility decreases among natives with education, but fertility decreases less rapidly among migrants with education than for natives (see Table 8.9).

In order to replicate this test for the 1974 KWFS, we calculated the ratios of the mean number of children ever born to ever-migrant and never-migrant, once-married, currently married, Korean women by urban and rural destination. These ratios for cells with 20 or more observations are shown in Table 8.10. Of the six age groups in which several education levels can be observed, there is a tendency in five groups for relative migrant fertility to increase with education. However, the other tendency observed by Ribe and Schultz among rural-rural migrants is not evident in these data. In seven of the nine cells for rural residents, the ratio of migrant to non-migrant fertility is less than one. Only for age group 25-29 is there evidence of the tendency for urban destination migrants to be relatively less fertile than urban natives. In general, in five of the nine cells for urban residents, the ratio exceeds one. Due to the small sample size, this is not a very strong test of their hypotheses. However, a comparison of Table 8.10 with Table 8.9 clearly indicates that the selectivity hypothesis suggested by Ribe and Schultz cannot be confirmed for Korean data, whereas it was strongly confirmed for Colombian data.

Table 8.9. Ratios (Migrant to Non-Migrant) of Children Ever Born to Colombian Women by Age, Education and Destination

		Current Residence	
Age Group	Education	Large City [a]	Rural[b]
20-24	Zero	.91	1.15
	Primary	.81	1.30
	Secondary	1.13	1.41
	Higher	.65	-
25-29	Zero	.75	1.08
	Primary	.92	1.11
	Secondary	1.00	1.08
	Higher	1.10	-
30-34	Zero	1.01	1.11
	Primary	.92	1.25
	Secondary	1.06	1.06
	Higher	1.05	-
35-39	Zero	1.01	1.14
	Primary	.95	1.07
	Secondary	1.02	.73
	Higher	.84	-
40-44	Zero	.88	1.12
	Primary	1.0	1.08
	Secondary	1.11	.91
	Higher	1.13	-
45-49	Zero	.82	1.09
	Primary	1.01	1.08
	Secondary	1.01	1.23
	Higher	1.49	-

Source: Ribe and Schultz (1980): a: Table 4, Col. 8; b: Table 2.1, Col 4.

Table 8.10. Ratios (Migrant to Non-Migrant) of Children Ever Born to Korean Women by Age, Education and Destination

Age Group	Education	Current Residence	
		Urban	Rural
20-24	Zero	---	---
	Primary	---	.97
	Middle	---	---
	Higher	---	---
25-29	Zero	---	---
	Primary	.83	1.02
	Middle	.92	---
	Higher	.99	---
30-34	Zero	---	.87
	Primary	1.02	.90
	Middle	1.20	---
	Higher	.98	---
35-39	Zero	---	.97
	Primary	1.05	1.02
	Middle	---	---
	Higher	1.12	---
40-44	Zero	---	.99
	Primary	1.07	.95
	Middle	---	---
	Higher	---	---
45-49	Zero	---	.97
	Primary	---	---
	Middle	---	---
	Higher	---	---

One of the interesting observations common in both Colombian and Korean data is the relationship between education and fertility. The ratio of the fertility of rural-urban migrants relative to that of urban natives for women with less education is lower than the ratio for women with higher education. Ribe and Schultz interpret this result as indicating a stronger selectivity in terms of unquantifiable preferences among less educated rural-urban migrants than among higher educated migrants. We would prefer to interpret this result as supporting our earlier finding in Chapter 6. We found that exposure to urban lifestyle makes a greater difference for rural-urban migrants with less education than for migrants with higher education. No matter which interpretation one accepts, the above observation casts a serious doubt on the validity of Hendershot's theory that rural-urban migrants who are highly selected in terms of education or occupational experience adapt better to the urban small-family size norms.

The second test by Ribe and Schultz is more interesting for the Korean fertility study. It utilizes the duration of current residence as a crucial variable in testing the relative effects of adaptivity and selectivity. As Ribe and Schultz note (pp. 33-34), "the adaptation hypothesis also implies that the fertility of migrants should converge with duration of residence at destination toward the level of native fertility. Moreover, in approaching parity with native fertility at destination, migrant fertility should initially deviate from native fertility in the direction of the fertility level at the origin of the migrant. Namely, one anticipates that rural-urban migrants would, with duration of residence, experience a decline in their migrant-native fertility ratio toward unity . . . If, on the other hand, from the moment they arrive, rural-urban migrants exhibit similar or lower levels of fertility than do long term rural-urban migrants and urban natives, the evidence would suggest migrants are selectively drawn toward their destinations and accept the fertility goals of the destination natives upon arrival, if not before."

Using dummy variables to control for duration of current residence, they note the following:

1) Recent rural-urban migrants under the age of 30 have lower fertility, measured by children ever born, than long-term, rural-urban migrants or the urban natives.

2) In the older age groups (40 and more) migrants from rural areas to large cities often have higher fertility than natives in large cities.

3) The effect of duration of migration is to increase fertility for rural-urban migrants under the age of 30.

4) For rural-urban migrants older than 30 they observe no clear relationship between the duration of residence after migration and cumulative fertility.

5) Recent rural-rural migrants, at least through age 39, have lower fertility than long-term, rural-rural migrants or the rural non-migrants.

6) The effect of duration of migration is to increase fertility for rural-rural migrants at least through age 39.

Ribe and Schultz conclude from observations (1) and (3) that among younger birth cohorts, fertility of rural-urban migrants is initially lower than that of urban natives and adapts to higher urban fertility with the duration of residence in urban areas, allowing migrants to catch up with urban natives. This conclusion reflects the rural-urban migration fertility pattern, RU''' in Figure 8.2 and strongly supports their interpretation of the selectivity hypothesis. From observations (1) and (2), they also conclude that rural-urban migrant selectivity defined in terms of their lower fertility relative to urban natives within an educational stratum has increased over time.

Ribe and Schultz attribute observations (2) and (4) to the fact that many older rural-urban migrants began childbearing before migrating and had already had most of their children at the time of migration. They note that, contrary to the evidence from Table 8.9, regression results for Colombian rural-rural migrants support the adaptation hypothesis rather than the selectivity hypothesis.

We would suggest that their results supporting the selectivity hypothesis are weakened, if not eliminated, when fertility is controlled for marital duration. In the KWFS sample, there is a significant positive correlation between duration of current residence and duration of marriage (as shown in Chapter 4). The lower fertility observed for recent compared with long-term migrants and for migrants compared with non-migrants may be due to a shorter duration of marriage for recent migrants than for longer-term migrants and non-migrants. Not controlling for duration of marriage may bias upward the estimate of the effect of duration of residence on children ever born.*

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*Sally Findley, one of the reviewers of an earlier draft of this report stated that many female Colombian rural-urban migrants start out as domestic servants, for whom marriage and child-bearing are definitely delayed in comparison to non-migrants in rural or urban areas.

Another bias may be introduced by not controlling for the stage of life cycle in which migration occurred. Suppose migration is purely selective in the Ribe and Schultz sense, but that it is also selective with respect to both labor market and marriage market preferences. Migration of individuals primarily for labor market purposes would result in lower fertility than migration primarily for marriage opportunities, or for family-rearing purposes. It may not be unreasonable to argue that migration before marriage is relatively more for marriage and family-bearing purposes and less for labor market purposes than migration after marriage. As confirmed in Chapters 4 and 6 we might expect initial post-migration fertility to be higher for individuals migrating before marriage than for those who never migrated, or who last migrated after marriage. This difference may be greater among rural-urban migrants than among rural-rural migrants since urban areas offer both labor and marriage market opportunities superior to rural areas.

We replicated the regressions shown in Ribe and Schultz's Table 6. The coefficients and t-values for the duration of current residence dummies (0-1, 2-5, 6-10 and more than 10 years) are shown in Table 8.11. For rural residents, age group 25-29, children-ever-born exhibits a Type A pattern relative to native fertility in Figure 8.3. For older rural area groups, except age group 35-39, a Type B pattern is evident. Although it is not possible to determine the significance of the duration dummies in Ribe and Schultz's Table 6, our results coincide for ages 20-29; however, our results differ for older ages. In other words, our Korean data reveal relationships (5) and (6) for all age groups, supporting the adaptation hypothesis for rural-rural migrants, whereas their Colombian data indicate relationships (5) and (6) are true only for rural-rural migrants through age 39.

Table 8.11. Coefficients for Duration of Current Residence Dummies in Regressions Explaining Children Ever Born

Age Group	Duration of Residence	Urban Residence b	Urban Residence t	Rural Residence b	Rural Residence t
20-24	0-1	- .187	(-1.3)	- .118	(-0.9)
	2-5	.034	(0.2)	.006	(0.0)
	6-10	.204	(1.2)	.598	(3.5)
	10+	.189	(0.9)	- .010	(-0.0)
25-29	0-1	- .351	(-3.1)	- .282	(-1.7)
	2-5	- .185	(-1.8)	- .299	(-2.1)
	6-10	- .079	(-0.8)	.397	(2.8)
	10+	- .274	(-2.2)	.285	(1.4)
30-34	0-1	- .192	(-1.0)	- 1.014	(-4.2)
	2-5	.047	(0.3)	- .868	(-4.7)
	6-10	.048	(0.4)	- .658	(-4.2)
	10+	.071	(0.5)	.027	(0.2)
35-39	0-1	.412	(1.3)	- .093	(-0.2)
	2-5	.457	(2.1)	- .314	(-1.0)
	6-10	.243	(1.1)	- .393	(-1.2)
	10+	.300	(1.7)	.016	(0.1)
40-44	0-1	- .655	(-1.3)	- 1.943	(-3.4)
	2-5	- .059	(-0.2)	- .823	(-1.8)
	6-10	.020	(0.6)	- .711	(-1.9)
	10+	- .030	(-0.1)	- .035	(-0.2)
45-49	0-1	.636	(1.2)	- 2.971	(-3.2)
	2-5	.213	(0.4)	- .251	(-0.4)
	6-10	.445	(1.0)	- .163	(-0.3)
	10+	.166	(0.5)	.020	(0.7)

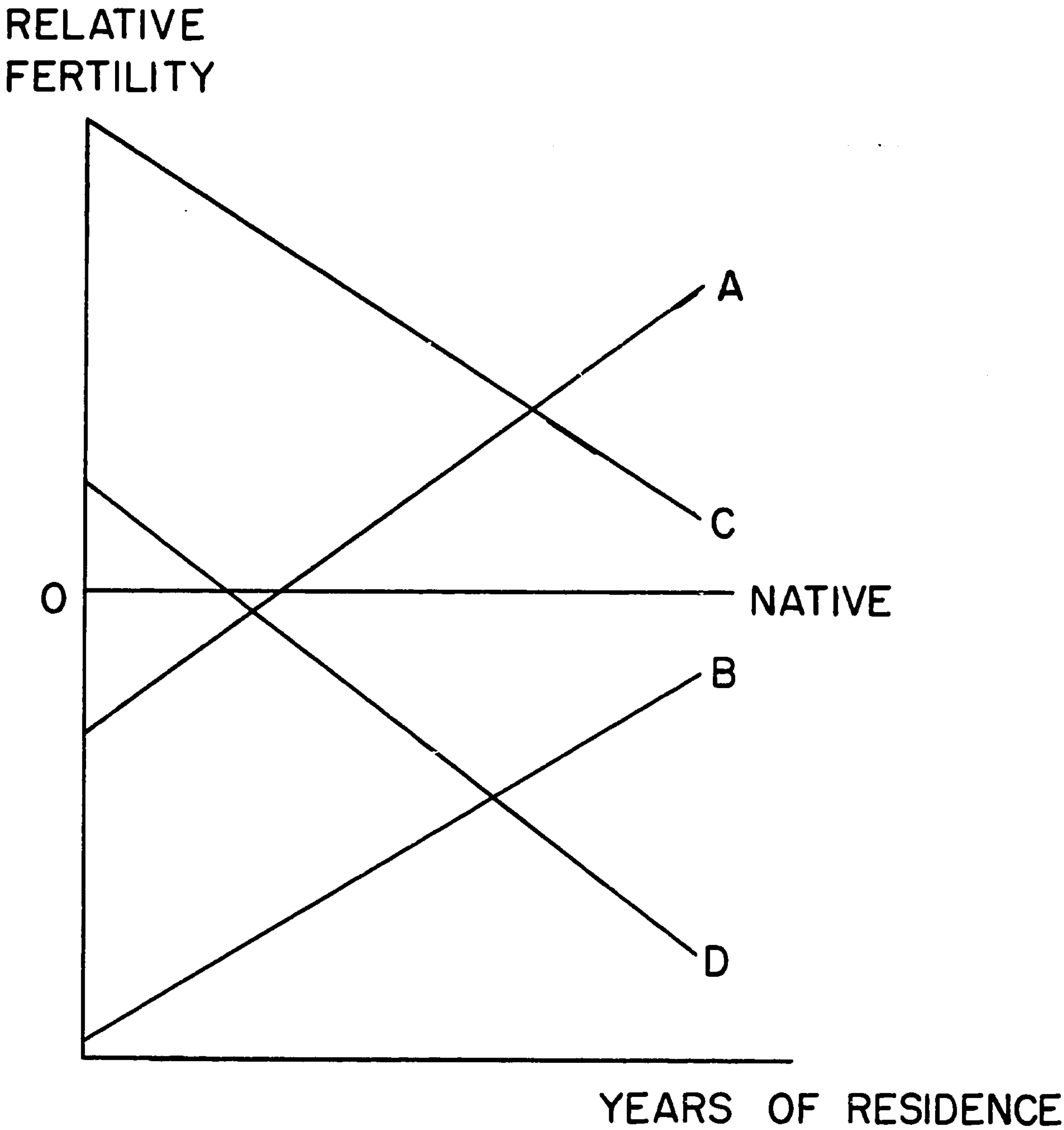

Figure 8.3. Typology of Relative Migrant/Native Fertility Level Due to Adaptation and/or Selectivity, by Duration of Residence

For urban migrants, our sample yields Type A patterns for age groups 20-24 and 30-34, although the patterns are not significant, as shown by the t-values. Age group 25-29 has a Type B pattern, or possibly non-linear. Age groups 35-39 and 45-49 have type C patterns. Age group 40-44 could be considered a Type B or Type A pattern. For age groups 20-24, 25-29, and 35-39, our patterns coincide with those of Ribe and Schultz. Only the patterns in age groups 25-29 and 35-39 show any significant coefficients for the migration dummy variables.

The Colombian data and Korean data are similar in that relationships (1) and (3) are true for rural-urban migrants under age 35 supporting their selection hypothesis and in that the adaptation hypothesis is strongly supported for rural-urban migrants of age group 35-39. However, unlike the Colombian case, our Korean data indicate that the adaptation hypothesis should be supported for age group 45-49, too.

When fertility (CEB) is adjusted for duration of marriage (DURMR) as suggested by Schultz (1977), marital fertility rates are defined as,

$$ANLBR = \frac{CEB}{DURMR}$$

and create a different set of patterns, as shown in Table 8.12. For rural residents, ages 20-34 show a Type D pattern in Figure 8.3. Ages 45-49 show a Type B pattern, as they did when the dependent variable was children ever born. For urban residents, age group 25-29 changes from a Type B pattern, when children ever born were used, to a Type C pattern, when marital fertility rate is used. Age groups 30-34 and 40-44 show Type B patterns although only the latter age group has any significant dummy variables. The remaining urban age groups do not appear to have any distinct adaptation tendencies.

Table 8.12. Coefficients for Duration of Current Residence Dummies in Regressions Explaining Marital Fertility Rate*

Age Group	Duration of Residence	Urban Residence b	Urban Residence t	Rural Residence b	Rural Residence t
20-24	0-1	.280	(1.4)	.280	(1.8)
	2-5	.220	(1.2)	.030	(0.2)
	6-10	.265	(1.1)	- .188	(-1.0)
	10+	.393	(1.4)	- .524	(-1.4)
25-29	0-1	.185	(2.3)	.131	(2.1)
	2-5	.026	(0.4)	.031	(0.6)
	6-10	.022	(0.3)	- .099	(-1.8)
	10+	.038	(0.4)	- .044	(-0.6)
30-34	0-1	- .052	(-1.2)	.013	(0.4)
	2-5	- .021	(-0.7)	- .056	(-2.4)
	6-10	- .011	(-0.4)	- .006	(-0.3)
	10+	- .012	(0.4)	- .019	(-1.0)
35-39	0-1	- .006	(-0.2)	. .011	(0.4)
	2-5	.019	(1.1)	- .001	(-0.0)
	6-10	- .020	(-1.2)	- .006	(-0.3)
	10+	- .011	(-0.8)	.016	(1.6)
40-44	0-1	- .035	(-1.5)	- .061	(-2.5)
	2-5	- .014	(-0.9)	- .001	(-0.0)
	6-10	.007	(0.4)	- .013	(-0.8)
	10+	- .008	(-0.6)	.006	(0.7)
45-49	0-1	.003	(0.2)	- 2.971	(-3.2)
	2-5	- .000	(-0.0)	- .251	(-0.4)
	6-10	.005	(0.3)	- .163	(-0.3)
	10+	- .000	(-0.0)	.020	(0.1)

$$^*\text{Marital Fertility Rate} = \frac{\text{Number of Children Ever-Born}}{\text{Duration of Marriage}}$$

Table 8.13 shows regression results for the duration of residence dummies when only women who migrated before marriage are included and marital fertility rate is the measure of fertility. All urban patterns are Type C. For ages 20-39, recent rural-urban migrants have higher marital fertility than urban natives and this gap declines with duration of residence. Among the rural residents, a Type D pattern is evident for ages 20-29. For ages 30-34 and 40-44, a Type C pattern is evident. For age group 35-39, a Type A pattern appears. However, when the duration dummy intervals are changed to 0-5, 6-10, 11-20, and 21+, a Type C pattern is evident for this age group, but there is no change in other age group patterns.*

Table 8.13 yields the distinct impression that marital fertility is initially higher for both rural and urban migrants compared to rural and urban non-migrants. Also, there is fertility adaptation, or overadaptation for younger rural-rural migrants, and for all rural-urban migrant groups.† This impression is quite different from that obtained by observing children ever born among all women, as shown in Table 8.10. It appears to support the hypothesis that duration of residence leads to adaptation. It also suggests that for rural-urban migrants, selectivity may not be as important relative to adaptation in determing initial post-migration fertility as Ribe and Schultz believe.

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*Both the Ribe and Schultz duration intervals and the above wider interval were tested for regressions used in Table 8.13. For children ever born, the Ribe and Schultz intervals yielded superior R^2's in five cases, inferior in 4 cases, and tied in 3. For marital fertility, the corresponding numbers were 3, 4, and 5.

†Since CEB = ANLBR × DURMR and duration of marriage and duration of current residence are positively related, the fact that the marital fertility rate for migrants falls below that of non-migrants does not imply anything about the relative number of children ever born.

Table 8.13. Coefficients for Duration of Current Residence Dummies in Regressions Explaining Marital Fertility Rate for Women Who Last Migrated Before Marriage

Age Group	Duration of Residence	Urban Residence		Rural Residence	
		b	t	b	t
20-24	0-1	.632	(2.1)	.639	(2.8)
	2-5	.311	(1.6)	.095	(0.7)
	6-10	.197	(0.8)	- .203	(-1.1)
	10+	.366	(1.2)	- .545	(-1.5)
25-29	0-1	1.334	(7.2)	1.146	(8.9)
	2-5	.157	(2.1)	.128	(2.3)
	6-10	.066	(0.9)	- .105	(-2.1)
	10+	.044	(0.5)	- .062	(-0.9)
30-34	0-1	---	---	---	---
	2-5	.290	(2.8)	.066	(0.8)
	6-10	.033	(0.7)	.032	(1.7)
	10+	.016	(0.4)	- .017	(-1.1)
35-39	0-1	---	---	---	---
	2-5	.697	(6.3)	---	---
	6-10	.158	(2.1)	- .069	(-1.0)
	10+	.010	(-0.6)	.020	(1.9)
40-44	0-1	---	---	---	---
	2-5	---	---	.227	(3.1)
	6-10	---	---	---	---
	10+	.010	(0.7)	.009	(1.0)
45-49	0-1	---	---	---	---
	2-5	---	---	---	---
	6-10	---	---	---	---
	10+	.616	(1.7)	- .002	(-0.2)

For Ribe and Schultz, fertility adaptation of a migrant is relative to the fertility behavior of non-migrants at the destination location. The regressions in Table 8.11 through 8.13 used the non-migrant group at the destination as the base group and coefficients for years of residence dummies showed fertility of migrants relative to the base group. Our research is more concerned with the change in fertility behavior of rural-urban migrants relative to rural stayers. We are concerned with measuring A in Figure 8.2. However, as is clear from the discussions in Chapters 5 and 6, the autoregressive model used by us in those chapters is much superior to the model suggested by Ribe and Schultz in comparing fertility of rural-urban migrants with that of rural stayers, which they did not intend to do.

8.5 Summary of Chapter 8

A number of models in previous studies have been used to analyze the effects of rural-urban migration on migrant's fertility. Four studies mentioned here have produced conflicting results. Our discussion of these studies has outlined various problems encountered in their use. Finally, the comparison of these alternative models with our own autoregressive model has suggested that the latter is the most accurate and useful model for this study.

In their study of Colombian women, Ribe and Schultz found that young rural-urban migrants had lower fertility initially than did urban natives at the destination. However, migrant fertility coverged to the higher urban native level with time spent in the urban area. Among older rural-urban migrants, migrant fertility initially exceeded urban fertility, but there was no evidence of convergence to the urban native level with time spent at the destination.

The Ribe and Schultz study defined fertility as children-ever-born. In attempting to replicate their tests using Korean data, we also found younger rural-urban migrants having lower initial fertility and through time adapting upward to the urban native norm. We also found that older migrants had higher initial fertility than urban natives, but within this group we observed some convergence downward toward urban levels.

We suggested that these results, using children-ever-born as a measure of fertility, could be due to the shorter duration of marriage among rural-urban migrants than among urban natives. When we use marital fertility, defined as children-ever-born divided by duration of marriage, as our measure of fertility, we do not obtain the same relation between fertility and duration of residence as found by Ribe and Schultz. For young migrants, aged 25-29, we found this measure of fertility higher for rural-urban migrants than for urban natives. Also, children ever born per year of marriage converged downward to the urban level with time spent at the destination. This pattern was significant statistically and was opposite to the pattern found by Ribe and Schultz using total children ever born. We also found one older group, aged 40-44, in which the pattern was one of lower initial fertility for rural-urban migrants and convergence upward to the urban level. This was also opposite to the pattern found by Ribe and Schultz using their fertility definition.

When we looked only at rural-urban migrants who migrated to urban areas before marriage, we found a common pattern for all age groups: rural-urban migrant fertility was initially higher than urban native fertility, and it converged downward to the urban fertility level with time spent at the destination.

316

Ribe and Schultz had concluded that rural-urban fertility differentials were attributable primarily to selectivity, since rural-urban migrants initially had lower fertility than urban natives; hence, exhibiting a preference for small families. When fertility is adjusted for marital duration we find intially higher marital fertility among rural-urban migrants. These migrants may have been married for a shorter time than the urban natives. This may be a selectivity factor, in the Ribe and Schultz sense, if migrants have preferences for later marriages than non-migrants. However, our replication of their study suggests adaptation away from the rural norms toward the urban norms. The results of the autoregressive analysis also suggested this sort of adaptation, even though we measure adaptation as the divergence of rural-urban migrant fertility from that of rural stayers rather than toward that of urban natives.

Chapter 9: ANALYSIS OF MIGRATION AND FERTILITY DATA IN 1970 KOREAN POPULATION CENSUS

9.1 Introduction

The main objective of this study is to analyze the 1974 Korean World Fertility Survey data tape to assess the influence of rural-urban migration on the fertility of migrants. Up to this point, only 1974 KWFS data have been analyzed. But the KWFS sample (approximately 5000 women) does not provide enough observations when the sample is cross classified by many different factors. This is not a serious problem when using multivariate regression analysis. Nevertheless, we strongly believe that we should supplement and cross check the multivariate regression analyses with the descriptive statistics to avoid misleading inferences that could result from using either of the two alone. Thus one of the reasons we analyze the 1970 census data here is to supplement and cross check the results obtained using the substantially richer data and the more rigorous analytical techniques in previous chapters.

A secondary objective of this study is to develop a model capable of assessing the influence of rural-urban migration on the fertility of migrants and usable with the data of other developing countries. It is unreasonable to expect that many other developing countries would have such a rich source of fertility survey data as the 1974 KWFS. However, we can be quite sure that for many developing countries population census data such as those used in this chapter will be available. Therefore, the analyses in this chapter would provide insight as to how well the model developed here might be applied in other developing countries.

In this chapter the following issues will be investigated specifically to extract further evidence on the adaptation and selectivity hypotheses:

1. Whether long term rural-urban migrants (who migrated at least five years ago) have higher fertility than urban non-migrants, or lower fertility than recent rural-urban migrants (who migrated within 5 years) and lower fertility than rural stayers.

2. Whether there are any significant differences in the fertility of rural-urban migrants moving to cities of different sizes.

3. Whether rural-urban migrants are selected in terms of educational attainment and whether there is any significant difference in the educational selectivity of rural-urban migrants moving to cities of different sizes.

4. Whether recent rural-rur... ..igrants have lower fertility than do long-term, rural-rural migrants and rural non-migrants.

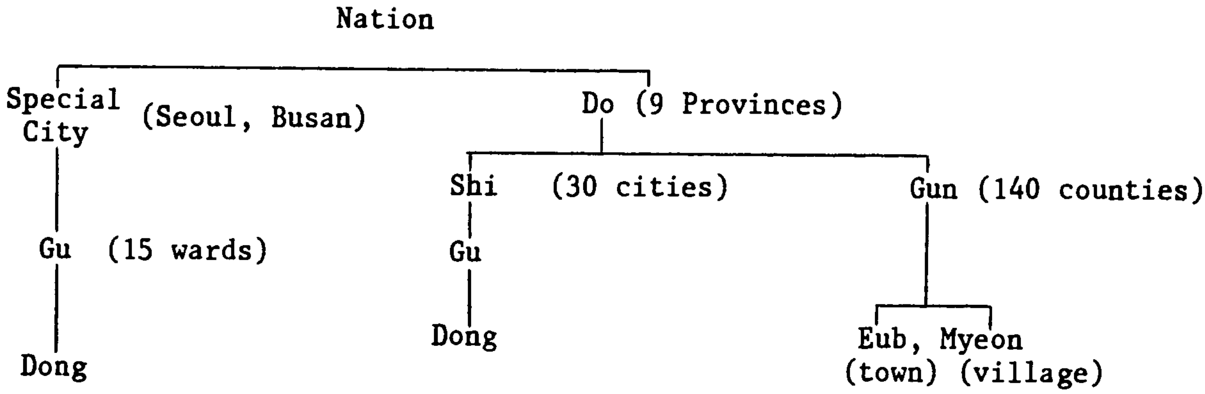
5. Whether the proportion married among long-term, rural-urban migrants is greater than that of recent rural-urban migrants or rural stayers.

It is important to emphasize at the outset that the findings in this chapter are tentative because the census does not provide information on the following variables crucial in our analysis: the year of migration (except the distinction between moving within or before the past 5 years), age at marriage, and pregnancy history (except ages of surviving children living in the same household).

9.2 The 1970 Korean Population Census 10 Percent Sample Survey

The Korean Census of Population and Housing was taken on 1 October 1970. A detailed questionnaire was prepared to elicit information on population, housing and other socioeconomic aspects of the Korean society. The information required was collected by house-to-house canvass. The main topics in the questionnaire were enumerated on a complete basis, covering 80,000 Enumeration Districts. Items covered by a complete count were name, relationship to head of household, sex, age, date of birth, marital status, school attendance, educational attainment and literacy. Items asked only of a 10 percent sample included place of birth, place of residence during the last 5 years, number of children ever born, economic activity status, employment status, industry, occupation, class of worker (self-employed or working for someone else, etc.) and the number of months worked last year.

Here we shall analyze the individual data in the one percent sample public use data tape extracted from the 10 percent sample survey in the 1970 population census. The distribution of 312,900 individuals included in the one percent sample data by sex, age and residence area is shown in Table 9.1. The administrative hierarchy of Korea, by which the census districts were defined, is given below:



The communities analyzed in this chapter include 45 urban areas (15 wards in Seoul and Busan, and 30 other cities) and 140 rural areas (140 counties).

9.3 Comparison of Rural-Urban Migrants with Rural Stayers

9.3a Fertility--Recency of Migration

Table 9.2 depicts children ever born to all currently married women by age group, current residence, migration status and place of origin. Table 9.3 shows the distribution of these women by education level, age, current residence and migration status. The definitions of the terms used in these tables, such as city size, recent migrants, long-term migrants, non-migrants and stayers are presented in the notes of Table 9.2.

In Table 9.2 the cells, with a few exceptions, show that long-term rural-urban migrants have higher fertility than urban non-migrants. This underscores

Table 9.1. Population by Sex, Age and Residence Area in 1970 Korean Population Census 1% Sample Data Tape

Age \ Sex / Area	Both Sexes			Male			Female		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
Total	312,900	128,959	183,941	156,758	64,529	92,229	156,142	64,430	91,712
0-14	131,823	48,936	82,887	68,156	25,316	42,840	63,367	23,620	40,047
15-19	30,610	15,815	14,795	15,535	7,908	7,627	15,075	7,907	7,168
20-24	24,905	12,695	12,210	12,782	6,104	6,678	12,123	6,591	5,532
25-29	21,789	11,268	10,521	10,888	5,609	5,279	10,901	5,659	5,242
30-34	21,709	10,149	11,560	10,979	5,305	5,674	10,730	4,844	5,886
35-39	18,545	8,054	10,491	9,080	4,020	5,060	9,465	4,034	5,431
40-44	14,619	6,071	8,054	6,872	2,962	3,910	7,747	3,109	4,638
45-49	12,765	4,873	7,892	6,233	2,511	3,722	6,532	2,362	4,170
50-	36,135	11,098	25,037	16,233	4,794	11,439	19,902	6,304	13,598
Unallocated	74								

SOURCE: "File of Sample of 1970 Population Census of Korea" prepared by Statistical Division of United Nations Economic Commission for Asia and the Far East, February 1976.

Table 9.2. Children Ever Born to All Currently Married Women, by Age Group, Current Residence, Migration Status and Place of Origin

Current Residence, Migration Status and Place of Origin	Age Group 20-24	25-29	30-34	35-39	40-44	45-49	50-54
Seoul							
Nonmigrants	.92	1.69	2.74	3.63	4.32	4.83	5.35
Long Term Migrants							
From medium cities		1.94	3.08	3.68			
small cities		1.60	3.00	3.87			
rural areas	1.00	1.91	3.06	3.85	4.65	5.46	5.86
Recent migrants							
From rural areas	.83	1.72	3.18	4.17	4.99	5.46	5.16
Busan							
Nonmigrants	.82	1.83	3.07	4.09	4.40	4.98	
Long Term Migrants							
From rural areas	1.14	2.06	3.40	4.29	5.03	5.81	5.90
Recent migrants							
From rural areas	.76	1.87	3.03	4.21			
Large Cities							
Stayers	.83	1.85	3.20	3.83	4.80	5.26	5.91
Long Term Migrants							
From rural areas	.86	2.04	3.37	4.23	5.22	5.98	6.27
Recent migrants							
From rural areas	.90	1.84	3.19	4.55	5.83	5.13	
Medium Cities							
Stayers	.94	2.18	3.52	4.84	5.54		
Long Term Migrants							
From rural areas	1.03	2.28	3.50	4.79	5.51	6.09	6.32
Recent migrants							
From rural areas	.94	1.81	3.27	4.67	4.81		
Small Cities							
Stayers	1.11	2.16	3.20	4.53	5.34	6.17	6.88
Long Term Migrants							
From rural areas	1.20	2.37	3.60	4.79	5.68	6.13	5.43
Recent Migrants							
From rural areas	.89	1.87	3.56				
Rural Areas							
Stayers	1.13	2.54	4.02	5.11	5.97	6.33	6.33
Long Term Migrants							
From Seoul		2.08	3.09	4.73			
medium cities		2.47	3.54	5.06	5.00		
small cities		2.39	3.69	4.83	5.24	6.31	5.56
Recent Migrants							
From Seoul		1.17					
small cities		1.37					
Return Migrants							
From Seoul	.95	1.44	2.02				

Table 9.2. Continued--Children Ever Born to All Currently Married Women, by Age Group, Current Residence, Migration Status and Place of Origin

Notes:

a) Exclude cells that have less than 30 observations. All the observations for which any of three places, namely, current residence, residence of 5 years ago and place of birth, is not identified are deleted.

b) Size of communities are as follows: (Refer to Table 2.5 of Chapter 2).
Seoul: Capital city and special city of Korea. The 1970 population was 5.54 million
Busan: Special city and the population in 1970 was 1.88 million people.
Large cities: Four cities excluding Seoul and Busan for which the population in 1970 was greater than 400,000 people.
Medium cities: 12 cities with the 1970 population between 100,000 and 300,000 people.
Small Cities: 14 cities with the 1970 population between 50,000 and 100,000 people.
Rural areas: Includes both town (Eub) and village (Myeon) - rural areas.

c) Definitions of migration status are as follows:
Native Born: Nonmigrants in Seoul or Busan. This status includes a small number of return-migrants who returned to Seoul or Busan before 1965.
Stayer: All three places, namely, current residence, residence of 5 years ago and place of birth relate to communities of identical size. However, this group includes migrants who migrated within communities of identical size or return migrants who returned before 1965.
Long term migrant: Migrants whose current residence and previous residence of 5 years ago relate to communities of identical size but whose place of birth relates to a community of different size from that of current residence.
Recent migrants: Migrants whose place of birth and previous residence of 5 years ago belong to the identical size of community, but whose current residence belongs to the different size of community from that of previous residence 5 years ago.

SOURCE: "File of Sample of 1970 Population Census of Korea" prepared by Statistical Division of United Nations Economic Commission for Asia and the Far East, February 1976.

the importance of residential background. Selectivity of rural-urban migrants favoring smaller family size is not strong enough to remove the influence of rural origin favoring larger family size.

In almost all cases the long-term rural-urban migrants have lower fertility than rural stayers. This phenomenon could be due either to selectivity of migrants, their adaptation to urban fertility norms, or both. For age groups 30-34, 35-39 and 40-44 in Seoul and age groups 35-39 and 40-44 in large cities, recent rural-urban migrants have higher fertility than long-term rural-urban migrants. This could be due either to the greater adaptation to urban fertility patterns among long-term migrants than among recent migrants, to the greater selectiveness of the earlier migration cohorts compared to the recent migration cohort, or to both. We also observe that recent migrants aged 20-29 have lower fertility than do long-term migrants or urban non-migrants. This indicates a greater selectivity of recent migrants among the younger age groups. It contradicts the suggestion above that earlier migration cohorts may be more selective than recent ones, unless we assume that migrants above age 29 behave differently from those below it. A more satisfactory explanation would be that the lower fertility of recent young migrants does not represent their lifetime fertility. The young migrants might eventually make up the difference.

9.3b Fertility--Size of Destination City

Ritchey and Stokes (1972) have proposed that the inverse relationship between size of urban place and fertility disappears when inmigrants of rural background are excluded. Their reasoning is based on the dynamics of internal migration, called "step migration," which says that instead of moving directly from rural places to metropolitan areas, for example, rural migrants often move to smaller urban places first, and then to metropolitan areas. Therefore, less selective migrants will move into smaller cities whereas highly selective persons will outmigrate from them to metropolises. Because of the concentration of rural-urban migrants, small or intermediate size cities might have higher fertility for their total population than metropolitan areas with a lower proportion of rural-urban migrants. This proposition is not supported in Table 9.2. The inverse relationship between size of urban place and fertility remains intact even when we compare only the fertility of non-migrants or stayers, among cities of different sizes. This result reduces the importance of selectivity in explaining the fertility pattern of rural-urban migrants.

Continuing to compare fertility differentials by city size, one observes that such differences across city size tend to be largest among non-migrants, smaller among long-term migrants, and smallest among recent migrants. This implies that selectivity (for example, in terms of education) of rural-urban migrants according to size of destination city is not strong enough to differentiate fertility behavior among rural-urban migrants, all of whom have a rural residential background. Our evidence indicates that non-migrants potentially contribute more to the inverse relationship between fertility and city size than migrants do. Rural-urban migrants, especially recent ones, seem to be homogeneous in terms of fertility levels regardless of the size of their destination city size.

It is noteworthy that for medium-size cities with populations between 100,000 and 400,000 in 1970, recent rural-urban migrants have lower fertility than stayers in medium cities for all age groups. Among the long-term migrants the fertility is somewhat lower than that of the urban non-migrants for ages 30-44. These findings are interesting because the Korean government tries to divert migration from metropolises to other large or medium-size cities.

9.3c Education

Turning now to the matter of educational selectivity, it is easy to note from Table 9.3 that the proportion of currently married women with less than middle schooling is significantly larger (or negatively selective) for rural stayers compared to rural-urban migrants. Of course, some of the longer education of migrants might have been obtained after migration. However, Table 9.3 shows that the proportions with less than middle schooling are still larger for rural stayers aged 30 and older than for recent rural-urban migrants of corresponding ages. It is unlikely that recent migrants at these older ages increase their schooling after migration.

Table 9.3 shows that proportions of currently married women with less than middle schooling are much larger for recent rural-urban migrants than for long-term migrants. However, this evidence does not necessarily imply greater selectiveness of earlier migration cohorts compared to that of recent ones, because most of longer education obtained by long-term migrants could have occurred after migration.

Table 9.3 also shows that proportions of recent (within five years) rural-urban migrant women with less than middle schooling are inversely related with size of destination city. Considering that few recent rural-urban migrants currently older than 25 and with only primary schooling or less before migration would be able to increase their education after migration, this evidence strongly suggests that larger cities attract migrants who are highly selected in terms of education.

9.4 Fertility Comparison of Rural-Rural Migrants with Rural Non-Migrants

The fertility of rural-rural migrants is compared with that of rural non-migrants in Table 9.4; both the origin and destination of the migrants are rural. Therefore, we do not consider adaptation by migrants to a smaller

Table 9.3. Distribution of All Currently Married Women by Education Level, within Age and Current Residence and Migration Status Groups

Current Residence, Migration Status and Place of Origin	Age Group 20-24 None	Primary	Middle	High	College	25-29 None	Primary	Middle	High	College	30-34 None	Primary	Middle	High	College	35-39 None	Primary	Middle	High	College
Seoul																				
Nonmigrants	.000	.211	.282	.390	.117	.012	.252	.226	.301	.204	.014	.291	.246	.287	.159	.035	.383	.212	.260	.109
Long term migrants																				
From medium cities						.000	.360	.200	.200	.240	.050	.375	.225	.100	.250	.088	.353	.265	.235	.059
small cities						.000	.222	.311	.311	.156	.035	.456	.246	.158	.105	.022	.435	.196	.261	.087
rural areas	.015	.513	.287	.140	.045	.021	.493	.276	.164	.046	.045	.538	.235	.143	.039	.086	.527	.199	.151	.035
Recent migrants																				
From rural areas	.030	.545	.302	.102	.021	.024	.529	.294	.120	.033	.073	.588	.192	.114	.033	.058	.708	.149	.078	.006
Busan																				
Nonmigrants	.021	.412	.392	.124	.052	.048	.460	.253	.217	.042	.052	.504	.252	.148	.044	.098	.554	.179	.152	.018
Long term migrants																				
From rural areas	.011	.533	.311	.144	.011	.034	.336	.299	.105	.025	.077	.599	.219	.091	.015	.165	.592	.170	.073	.000
Recent migrants																				
From rural areas	.036	.571	.293	.100	.000	.038	.682	.227	.038	.015	.088	.738	.125	.050	.000	.229	.646	.042	.063	.021
Large Cities																				
Stayers	.029	.476	.233	.204	.058	.034	.444	.224	.239	.059	.046	.556	.230	.117	.051	.119	.597	.126	.138	.019
Long term migrants																				
From rural areas	.011	.441	.290	.215	.043	.053	.554	.235	.126	.032	.076	.599	.228	.081	.016	.118	.631	.181	.063	.006
Recent migrants																				
From rural areas	.017	.663	.262	.058	.000	.054	.621	.202	.094	.030	.104	.656	.144	.088	.008	.191	.551	135	.112	.011
Medium Cities																				
Stayers	.083	.444	.194	.250	.028	.036	.583	.179	.167	.036	.091	.621	.136	.152	.000	.238	.587	.111	.063	.000
Long term migrants																				
From rural areas	.031	.615	.231	.123	.000	.059	.518	.282	.118	.024	.082	.623	.208	.082	.005	.222	.575	.145	.050	.009
Recent migrants																				
From rural areas	.032	.579	.274	.116	.000	.083	.652	.227	.023	.015	.101	.722	.101	.054	.025	.192	.635	.154	.019	.000
Small Cities																				
Stayers	.018	.561	.316	.088	.018	.047	.588	.212	.118	.035	.187	.549	.209	.044	.011	.225	.588	.075	.113	.000
Long term migrants																				
From rural areas	.067	.600	.233	.100	.000	.062	.611	.239	.088	.000	.155	.628	.149	.068	.000	.209	.656	.098	.031	.006
Recent migrants																				
From rural areas	.049	.634	.232	.085	.000	.099	.538	.209	.077	.077	.125	.604	.167	.104	.000					
Rural Areas																				
Stayers	.090	.772	.103	.032	.003	.151	.726	.092	.026	.004	.263	.663	.058	.016	.001	.418	.540	.031	.010	.001
Long term migrants																				
From Seoul						.054	.324	.270	.324	.027	.089	.511	.222	.133	.044	.135	.486	.270	.081	.027
Medium cities						.075	.475	.325	.125	.000	.108	.568	.162	.081	.081	.250	.625	.063	.063	.000
Small cities						.102	.644	.169	.068	.017	.093	.698	.140	.058	.012	.242	.606	.076	.076	.000
Recent migrants																				
From Seoul						.028	.306	.139	.472	.056										
Small cities						.067	.300	.233	.167	.033										
Return migrants																				
From Seoul	.000	.421	.368	.105	.105	.042	.583	.167	.167	.042	.095	.381	.333	.190	.000					

Note: a) Exclude cells which have less than 30 observations. b) Definitions of education levels are as follows: None: women with no exposure to primary school. No education. Primary: women with one or more years of primary schooling but no exposure to middle school. Middle: women with schooling of more than 6 years but less than 10 years. Includes dropouts, attendants and graduates of middle school. High: women with schooling of more 9 years but less than 13 years. Includes dropouts, attendants and graduates of high school. College: women with some exposure to college education. Includes dropouts, attendants and graduates of junior or regular colleges.

Table 9.3. Continued--Distribution of All Currently Married Women by Education Level, within Age and Current Residence and Migration Status Groups

Current Residence, Migration Status and Place of Origin	Age Group 40-44					45-49					50-54				
	None	Primary	Middle	High	College	None	Primary	Middle	High	College	None	Primary	Middle	High	College
Seoul															
Nonmigrants	.072	.407	.240	.172	.104	.132	.530	.166	.106	.066	.229	.518	.133	.084	.036
Long term migrants															
From medium cities															
small cities															
rural areas	.116	.561	.190	.097	.036	.197	.551	.161	.083	.008	.314	.516	.059	.072	.039
Recent migrants															
From rural areas	.226	.643	.131	.000	.000	.339	.559	.085	.017	.000	.297	.649	.027	.027	.000
Busan															
Nonmigrants	.198	.568	.123	.099	.012	.232	.607	.071	.089	.000					
Long term migrants															
From rural areas	.214	.621	.104	.038	.022	.373	.492	.048	.087	.000	.525	.441	.017	.017	.000
Recent migrants															
From rural areas															
Large Cities															
Stayers	.235	.608	.098	.059	.000	.365	.494	.071	.071	.000	.352	.519	.093	.019	.019
Long term migrants															
From rural areas	.244	.631	.102	.018	.004	.300	.580	.113	.007	.000	.509	.377	.088	.018	.009
Recent migrants															
From rural areas	.261	.587	.065	.087	.000	.516	.484	.000	.000	.000					
Medium Cities															
Nonmigrants	.288	.558	.077	.077	.000										
Long term migrants															
From rural areas	.347	.494	.112	.047	.000	.391	.516	.063	.031	.000	.559	.409	.032	.000	.000
Recent migrants															
From rural areas	.375	.563	.031	.031	.000										
Small Cities															
Stayers	.361	.557	.066	.016	.000	.500	.452	.024	.024	.000	.563	.375	.063	.000	.000
Long term migrants															
From rural areas	.377	.562	.046	.008	.008	.470	.494	.024	.012	.000	.653	.327	.000	.020	.000
Recent migrants															
From rural areas															
Rural Areas															
Stayers	.627	.349	.016	.006	.001	.764	.226	.007	.002	.000	.852	.145	.002	.001	.000
Long term migrants															
From Seoul															
medium cities	.528	.333	.083	.056	.000	.641	.333	.000	.000	.026	.735	.235	.029	.000	.000
small cities	.517	.448	.017	.017	.000	.641	.333	.000	.000	.026	.735	.235	.029	.000	.000
Recent migrants															
From Seoul															
small cities															
Return migrants															
From Seoul															

328

Table 9.4. Numbers and Children Ever Born (CEB) of Currently Married Rural Women

	Age													
	20-24		25-29		30-34		35-39		40-44		45-49		50-54	
Migration status	Women	CEB	Women	CEB	Women	CEB	Women	CEB	Women	CEB	Women	CEB	Women	CEB
Non-migrants in rural areas	1639	1.15	2921	2.58	3618	4.07	3384	5.13	2628	5.98	2163	6.36	1654	6.35
Long term rural-rural migrants	293	1.48	929	2.67	1172	4.0	1071	5.13	975	6.03	806	6.32	567	6.31
Recent rural-rural migrants	392	.75	339	1.86	156	3.51	106	4.75	53	5.21	47	5.21		
Two stage rural-rural migrants	60	1.35	116	2.55	132	3.49	67	4.73	39	5.10				

Note

a) Exclude cells which have less than 30 observations.
b) Definitions of Migration Statuses are as follow:
Nonmigrants: Names of communities for all three places, namely, current residence, residence of 5 years ago and place of birth are identical and rural.
Long term rural-rural migrants: All of the above three places are rural areas, and names of communities for both current residence and residence of 5 years ago are identical, but the name of place of birth is different from that of the other two places.
Two stages rural-rural migrants: All of the above three places are rural areas, the name of current residence is different from that of residence of 5 years ago and the name of the residence of 5 years ago is different from that of place of birth. This group includes the migrants returning from other rural areas.

SOURCE: "File of Sample of 1970 Population Census of Korea" prepared by Statistical Division of United Nations Economic Commission for Asia and the Far East, February 1976.

(urban) family size norm. Even though we are mainly concerned with rural-urban migration effects, this comparison is interesting because of its bearing on selectivity.

Ribe and Schultz (1980) hypothesized that rural-rural migrants should have higher fertility than rural non-migrants. They emphasize the negative selectiveness of rural-rural migrants favoring larger family size because such migrants have chosen the rural destination over the urban destination. They suggest that adaptation, if it occurs, is from their larger to the smaller family size norms of rural natives.

On the other hand, Ritchey and Stokes (1972) consider the fertility differential between rural non-migrants and rural-rural migrants as an indicator of the independent effect of migration on fertility. Ritchey and Stokes define this effect as the fertility differential between migrants and non-migrants at point of origin, when size of destination is controlled. This would indicate an expectation of positive selectivity of rural-rural migrants, favoring lower initial fertility.

Researchers of the Korean Institute for Family Planning in Seoul, Korea, stated that a large part of rural-rural migrants are either employees in rural government agencies or poor landless farm workers. Both of these migrant groups will have lower fertility than rural non-migrants. The education level of the former group would be higher than that of rural nonmigrants whereas the latter migrant group might be too poor to afford a larger family. The evidence in Table 9.4 clearly will not support the hypothesis of Ribe and Schultz and does support the Ritchey-Stokes hypothesis. The fertility of recent rural-rural migrants is substantially lower than that of rural non-migrants. The fertility of long-term rural-rural migrants is roughly equivalent to that of non-migrants.

This indicates that the initial fertility of rural-rural migrants is lower than that of rural non-migrants but may become adapted to the higher fertility norm of rural non-migrants. It can be argued that the fertility of recent rural-rural migrants is lower than that of rural non-migrants because migrants temporarily postpone child bearing immediately after migration and make up these delayed births in a later period. However, this argument is difficult to defend because substantially lower fertility of recent migrants in older age groups (35-39, 40-44, and 45-49) cannot be explained by the postponing of births by migrants.

This leaves the possibility that the higher fertility of long-term migrants compared with that of recent migrants is due to greater selectiveness of the recent migration cohort. This point needs to be investigated further in later studies.

Comparison of the fertility of rural-rural migrants with that of rural non-migrants leads us to conclude that rural-rural migrants adapt to the higher fertility norms of rural non-migrants even though the migrants were initially positively self-selected. The result again emphasizes the importance of the adaptation hypothesis over the selectivity hypothesis.

The educational distributions shown in Table 9.5 clearly indicate that recent rural-rural migrants have obtained significantly higher education levels than rural non-migrants have. On the other hand, the educational levels of long-term rural-rural migrants are very close to those of rural non-migrants, which indicates that recent rural-rural migrants are much more selective than the earlier migration cohorts.

9.5 Influence of Migration Status on the Probability of a Migrant Being Married at a Certain Age

Fertility is clearly a function of age at marriage, among other factors. Since we have based our major analysis only upon a sample of currently, once-married women, it is useful to expand our view here to consider the relations between migration, age, and marriage.

The proportion of ever-married women, as shown in Table 9.6, is largest among recent rural-urban migrants; it is smaller among long-term migrants, and smallest among urban non-migrants. These results imply that age of marriage is heavily influenced by residential background and that rural-urban migrants adapt to the late marriage pattern of urban natives. However, it is important to note that some recent rural-urban migrants (e.g., in Busan, medium-size cities and small cities for age group 20-24) have a larger proportion of ever married women than rural stayers. (Moreover, as can be seen in Table 9.7, in age group 20-24, for example, rural-rural migrants have a significantly larger proporation of ever married women than rural non-migrants.) It is also important to note from Table 9.6 that, unlike fertility behavior, there is not a single case where recent rural-urban migrants reveal the late marriage pattern of urban non-migrants. These findings suggest that rural-urban migration either improves marriage opportunities, or is selective of married women, especially if anticipation of migration might encourage earlier marriage. On the other hand, a main purpose of migration could be to marry at earlier ages or to find better marriage opportunities.

Table 9.5. Numbers, Children Ever Born and Educational Distribution of Currently Married Women who Never Outmigrated from Rural Areas*

Rural-Rural Migration Status and Levles of Education	20-24			25-29			30-34		
	Number of Women	CEB	Educational Distribution (%)	Number of Women	CEB	Educational Distribution (%)	Number of Women	CEB	Educational Distribution (%)
Nonmigrants in rural areas									
None	145	1.59	8.8	490	2.99	16.8	997	4.38	27.6
Primary	1313	1.15	80.1	2172	2.57	74.4	2424	4.00	67.0
Middle	129	0.84	7.9	202	1.88	6.9	148	3.43	4.1
High	47	0.79	2.9	48	1.81	1.6	48	2.96	1.3
College	6		0.4	9		0.3	2		0.1
Long term rural-rural migrants									
None	43	1.93	14.7	132	2.98	14.2	287	4.38	24.5
Primary	212	1.48	72.4	672	2.69	72.3	773	3.93	66.0
Middle	29	1.03	9.9	96	2.25	10.3	92	3.60	7.8
High	8		2.7	27	2.15	2.9	18		1.5
College	1		0.3	2		0.2	2		0.2
Recent rural-rural migrants									
None	24	0.75	6.1	19		5.6	28	3.75	17.9
Primary	273	0.81	69.6	213	1.98	62.8	95	3.58	60.9
Middle	75	0.59	19.1	73	1.62	21.5	26	3.15	16.7
High	20	0.60	5.1	30	1.37	8.8	6		3.8
College	0		0.0	4		1.2	1		0.6
Two stages rural-rural migrants									
None	2		3.3	10		8.6	22	4.41	16.7
Primary	43	1.35	71.7	68	2.68	58.6	75	3.39	56.8
Middle	13		21.7	27	2.63	23.3	27	3.11	20.5
High	2		3.3	9		7.8	8		6.1
College	0		0.0	2		1.7	0		.2

*CEB's are not shown for cells which have less than 20 observations.

SOURCE: "File of Sample of 1970 Population Census of Korea" prepared by Statistical Division of United Nations Economic Commission for Asia and the Far East, February 1976.

Table 9.5. Continued--Numbers, Children Ever Born and Educational Distribution of Currently Married Women who Never Outmigrated from Rural Areas*

Rural-Rural Migration Status and Levles of Education	35-39			40-44			45-49			50-54		
	Number of Women	CEB	Educational Distribution (%)	Number of Women	CEB	Educational Distribution (%)	Number of Women	CEB	Educational Distribution (%)	Number of Women	CEB	Educational Distribution (%)
Nonmigrants in rural areas												
None	1449	5.32	42.8	1678	6.12	63.9	1678	6.49	77.6	1410	6.35	85.2
Primary	1825	5.03	53.9	902	5.77	34.3	472	6.9	21.8	241	6.37	14.6
Middle	85	4.46	2.5	32	5.28	1.2	12		0.6	3		0.2
High	22	3.36	0.7	14		0.5	2		0.1	0		0.0
College	3		0.1	2		0.1	0		0.0	0		0.0
Long term rural-rural migrants												
None	440	5.41	41.1	593	6.28	60.8	594	6.40	73.7	484	6.28	85.4
Primary	572	5.0	53.4	351	5.68	36.0	199	6.11	24.7	81	6.51	14.3
Middle	39	4.56	3.6	22	5.45	2.3	10		1.2	0		0.0
High	17		1.6	8		0.8	3		0.4	2		0.4
College	3		0.3	1		0.1	0		0.0	0		0.0
Recent rural-rural migrants												
None	28	5.18	26.4	29	5.21	54.7	34	5.26	72.3	25	5.32	92.6
Primary	63	4.68	59.4	21	5.38	39.6	11		23.4	2		7.4
Middle	13		12.3	2		3.8	0		0.0	0		0.0
High	2		1.9	1		1.9	2		4.3	0		0.0
College	0		0.0	0		0.0	0		0.0	0		0.0
Two stages rural-rural migrants												
None	18		26.9	18		46.2	20	5.85	74.1	10		62.5
Primary	40	4.58	59.7	17		43.6	7		25.9	4		25.0
Middle	5		7.5	3		7.7	0		0.0	1		6.3
High	4		6.0	1		2.6	0		0.0	1		6.3
College	0		0.0	0		0.0	0		0.0	0		0.0

*CEB's are not shown for cells which have less than 20 observations.

Table 9.6. Proportion of Ever Married Women by Age Group, Current Residence Migration Status, and Place of Origin*

	Age Group				
	15-19	20-24	25-29	30-34	35-39
Seoul					
Nonmigrants	.006	.245	.812	.962	.989
Longterm migrants from:					
Busan	.012				
Medium cities	.019	.289	.878	.978	
Small cities	.013	.333	.852	1.000	
Rural areas	.022	.372	.850	.982	.994
Recent migrants from:					
Busan		.200			
Medium cities	0.000	.371	.757		
Small cities	.045	.271	.788		
Rural areas	.023	.426	.879	.966	1.000
Busan					
Nonmigrants	.005	.302	.879	.987	
Longterm migrants from:					
Small cities				.969	
Rural areas	.014	.429	.928	.990	1.000
Recent migrants from:					
Rural areas	.025	.656	.971	.988	
Large Cities					
Stayers **	.011	.276	.802	.986	.949
Longterm migrants from:					
Small cities				.938	
Rural areas	.019	.295	.906	.985	1.000
Recent migrants from:					
Rural areas	.027	.482	.953	.985	
Medium Cities					
Stayers **	.012	.269	.802	1.000	
Longterm migrants from:					
Rural areas	.047	.465	.888	.991	1.000
Recent migrants from:					
Rural areas	.030	.642	.911	.988	
Small Cities					
Stayers **	.019	.324	.864	.990	
Longterm migrants from:					
Rural areas	.034	.366	.942	1.000	1.000
Recent migrants from:					
Rural areas	.061	.732	.948	.981	
Rural Areas					
Stayers **	.039	.485	.953	.995	.997
Longterm migrants from:					
Seoul	.033	.267	.848	.911	
Medium cities	.065		1.000	1.000	
Small cities		.677	.952	1.000	
Recent migrants from:					
Seoul	.152	.442	.771		
Small cities		.769	.968		
Return migrants from Seoul		.576	.885	.957	

*Excludes cells which have less than 30 observations

**Includes movers from same city size.

SOURCE: "File of Sample of 1970 Population Census of Korea" prepared by Statistical Division of United Nations Economic Commission for Asia and the Far East, February 1976.

Table 9.7. Proportion of Rural Women Ever Married by Age Group, Education Level, Current Residence and Migration Status*

Rural-Rural Migration Status Levels of Education	AGE GROUP			
	20-24	25-29	30-34	35-39
Non-migrants in Rural Areas				
None	.740	.979	.995	.999
Primary	.467	.957	.997	.999
Middle	.232	.820	.987	1.000
High	.155	.658	.980	
College	.158			
Long Term Rural-Rural Migrants				
None	.915	.985	.997	.998
Primary	.759	.988	.995	1.000
Middle	.455	.942	.989	.955
High	.216	.900		
College				
Recent Rural-Rural Migrants				
None				1.000
Primary	.867	.991	.990	1.000
Middle	.714	.937		
High	.465	.912		
College				
Two Stage Rural-Rural Migrants				
None				
Primary	.860	.986	1.000	1.000
Middle				
High				
College				

SOURCE: "File of Sample of 1970 Population Census of Korea" prepared by Statistical Division of United Nations Economic Commission for Asia and the Far East, February 1976.

The adaptation aspect of migrants' marriage patterns leads us to decompose the effects of urban residence duration on the fertility of migrants into the age-at-marriage effect and the marital-fertility effect. The argument that marriage opportunities are improved by migration implies that marital fertility differentials between rural-urban migrants and rural stayers might be larger than the observed total fertility differentials.

The fertility and marriage patterns of rural-urban migrants discussed above are further investigated in other tables (Appendix to Chapter 9) controlling for education level, age and labor force participation. The major conclusions derived above are strengthened by these analyses. The multiple regression results controlling for all other variables again support our major conclusions. Tables in the Appendix to Chapter 9 report numbers of children ever born and proportion married for women and men classified by education level, age and current labor force participation status. This appendix also provides regression results on the fertility and proportion married as a function of education, migration status, occupation, age, number of children dead, etc. obtained from the 1970 census data.

9.6 Summary of Chapter 9

This chapter presents an analysis of the influence of migration and other personal attributes on fertility and marriage using the 1970 Korean Census data as a means of corroborating results of analyzing Korean World Fertility Survey data. The sample of women from census data is classified by age group, current residence, migration status, place of origin and educational level.

Within almost all classifications long-term, rural-urban migrants have higher fertility than urban non-migrants and lower fertility than rural stayers. For many of the age groups in the larger cities, long-term migrants have lower fertility than recent migrants. This could be attributed to either selectiveness, adaptation or both. Rural-urban migrants are selected in terms of educational attainment. Furthermore, compared to smaller cities, larger cities attract rural-urban migrants who are more highly selected for educational level. In general, there is no significant difference by city size in the fertility of rural-urban migrants.

In the countryside, there is evidence that the rural-rural migrants initially have fertility lower than that of rural non-migrants by eventually adapt to higher fertility norms. Only the recent rural-rural migrants are selected in terms of their educational attainment.

The proportion married at a given age declines from that of recent to that of long-term rural-urban migrants and then to that of urban non-migrants. In many cases the proportion married among migrants is greater than that among the rural stayers. This could be both because migration is selective of married women and because the marriage market is improved for migrants. If the latter is true then the differential in marital fertility between rural-urban migrants and the rural stayers is greater than observed lifetime patterns.

Chapter 10: SUMMARY AND POLICY IMPLICATIONS

In this study we have investigated the impact of migration from rural to urban areas on the fertility of women migrants. We have endeavored to clarify the nature of this impact, which has been subject to debate in the research literature; we have adapted and applied an autoregressive (lagged variable) model to this research topic; we have exploited some of the potential of the wealth of data available from the Korean World Fertility Survey of 1974. All of this has been done for the case of Korea but with the understanding that many issues of development policy relate to rapid urbanization fed by rural-urban migration--both in Korea and in other developing countries. In this chapter we shall draw together the conclusions derived from each of the preceding chapters and then point out the implications of those conclusions for certain policy areas as governments in developing countries move to make better lives possible for their citizens in the face of rapid urbanization and, frequently, high levels of natural increase.

10.1 Summary--The Setting

For this study, the key issue in the literature reviewed in Chapter 2 is whether the overall level of fertility in a country is affected by rural-urban migration. It is commonly observed that migrants have lower fertility than non-migrants. Some researchers argue that such migrants are selected from the total population and would, inherently, have lower fertility--even if they did not migrate. If this were true, migration would affect the level of fertility observed in urban versus rural areas, but it would not change the overall level of fertility for the entire country. If, on the other hand, the migrants are basically the same (of the same age, sex, education, etc.) as the persons who stay behind and nevertheless demonstrate a different level of fertility from such a comparison group, then one may appropriately claim that the migrants have adapted to their new, urban environment and that the act, or process, of migration has somehow altered their fertility behavior, in effect putting it on a new path. Furthermore, it is possible that the rural-urban migration stream is selected, but that a process of fertility adaptation occurs for such migrants--in addition to the difference in fertility behavior attributable to selection. These are the issues addressed in the literature that we have endeavored to clarify through this study.

Among the set of developing countries, Korea is one of the more urbanized as a consequence of some 20 years during which labor has shifted out of the rural, agricultural sector into the industrial, urban sector (see Chapter 3). Although the rates of change have been rapid, they have by no means been unprecedented. And stages of similar processes may be observed in other developing countries at this time. Thus, the rural-urban migration experience examined in Korea is relevant to the condition of many other developing countries. Moreover, Korea offers the investigator an excellent set of data for study: the Korean World Fertility Survey of 1974. This survey provides carefully constructed histories of marriage, fertility, and migration for each of the women sampled. It is this combination of data that makes this source so useful. Accordingly, we have analyzed these data both for the significance they have for Korea and for the implications of our results for planners and policy makers in other countries at various stages of development.

A preliminary, descriptive analysis of data from the Korean World Fertility Survey was carried out and reported in Chapter 4. Considering only once-married, currently married women, one finds that about one-third had been born in a rural area but were living in an urban one at the time of the survey; these constituted the set of rural-urban migrants whose fertility behavior we analyzed. A woman's level of education and probability of labor force participation prior to marriage were found to increase with increasing extent of urban background. But the percentage of women working at least once after marriage declined with the extent of urban background, contrary to expectation. Both family size preference and actual children ever born decreased with extent of urban background. Finally, about one-third of the migrants married within one year before or after their last migration, suggesting a close relationship between these events, but without showing the direction of causality.

The theoretical model underlying this investigation is that of consumer utility: we assume an individual wishes to maximize utility by choosing some combination of children and competing material goods under the constraint of a given household income and particular relative prices of children and goods (see Chapter 5). Thus, for an individual with given preferences, rises in the relative price of children would reduce family size preferences, and vice versa. It is assumed that rural-urban migration has the effect of raising the price of children relative to other goods. Consequently, one expects to observe lower fertility among such migrants than among an appropriate control group. One such group may be defined as rural stayers (rural non-migrants and rural-rural migrants) in similar circumstances (age, duration of marriage, income, and children ever born). Under these conditions, prior fertility is assumed to be a proxy for family size preferences that are both difficult to measure and susceptible to change over the course of the child-bearing years.

An analytic tool with which to implement the above theory may be found in an autoregressive (or lagged variable) model in which fertility behavior at one time is a function of fertility at previous times and several other variables (age, duration of marriage, timing of migration, etc.). In Chapter 5 we have described this model and developed various forms of it both to provide rigorous tests and to calculate results that would be meaningful to policy makers. Unfortunately, the same estimating equation does not necessarily supply both needs in this particular analysis. Parallel analyses of our adaptation hypotheses are made using two different models: Equations 5.5 and 5.6. Equation 5.5, used to assess the incremental effect of the rural-urban migration on the fertility of migrants, is estimated separately for each of the five-year migration cohorts by the year of observation. On the other hand, Equation 5.6, used to assess the cumulative effect of the rural-urban migration on the completed fertility of the migrants, is estimated by pooling observations for different migration cohorts by year of observation. Both of these forms permit us to compare the behavior of a cohort of women migrating in one period with a cohort migrating in a different period. Moreover, these comparisons can be made at various times both before and after the period of migration. Finally, since the persons who did not migrate to urban areas may differ among themselves, we compared rural-urban migrants with rural non-migrants, (defined both as not changing community and as not changing county of residence), with rural-rural migrants, and with rural stayers comprised of both the preceding groups.

10.2 Summary--The Results

Adaptation

Our major conclusion is that adaptation to urban life is a significant phenomenon in explaining lower fertility of rural-urban migrants compared with that of rural stayers. Incremental fertility during a (five-year) post-migration period was lower for rural-urban migrants than for comparable rural stayers (either rural non-migrants or rural-rural migrants) when controlled for fertility at the beginning of the period. Although one could argue that this result is consistent with selectivity, since rural-urban migrants have a preference for lower rates of fertility in any period, one would have to explain why this was true when fertility at the beginning of the period has been taken into account (controlled) in the analytic model. With only one exception, there was also no evidence that the premigration fertility differed between rural-urban migrants and rural stayers.

We associate a major reduction in national fertility with the high volume of rural-urban migration that occurred during 1965-75. Estimates of these effects on overall national fertility in Korea were presented in Section 6.7 of Chapter 6. Recapitulating: we estimated that 945,000 women migrating from rural to urban areas during the years 1965-70 would reduce their fertility during the rest of their childbearing years by 1.31 million births (1.39 births per woman), or by 27 percent compared to the total fertility rate of 5.1 children that would have been expected for each rural stayer woman during the rest of her childbearing years. During the next five years, 1970-75, another 949,000 women migrated from rural to urban areas. Assuming fertility adaptation similar to that of the previous group, it is reasonable to estimate that another 1.3 million births would be averted by this migration. Thus, the effect of rural-urban migration during a decade is estimated to have the ultimate effect of averting some 2.6 million births among these migrants to the end of their childbearing years. This impact is by no means of small value. For example, in 1970 population grew annually by 690,000 or 2.2 percent.

Duration of Urban Residence

We found that the rate of adaptation, measured by the incremental fertility differential, increased with duration of current urban residence for several five-year periods, then fell. This adaptation seemed to proceed at the greatest rate among women who migrated after they married. Contrary to our anticipation, adaptation among women who migrated before they married was much slower; but women who waited longer to marry after migration adapted at a faster rate than those who married soon after migrating.

Age of Migrant

We had anticipated that adaptation would occur at a faster rate among women who migrated at younger ages. We did not find this to be true for women who migrated after they married, and there was only limited evidence that this was true among women who migrated before they married. Of course, even if young and old migrants adapt at equal rates, the simple fact that the young migrant has adapted to the urban environment for a greater number of childbearing years means the cumulative (or completed) fertility of a young migrant would be less than that of an individual who migrated at an older age. We found that women who migrated before age 25 would have 1.5 to 1.8 fewer children at completion of childbearing than a comparable rural stayer; but this differential fell to 0.8 fewer children for women who migrated after age 30.

Education of Migrant

Because of greater efficiency in assimilating information and greater flexibility, we expected more-educated migrants to adapt more quickly to the urban environment than less-educated migrants. We found this to be partially true. There is evidence of adaptation occurring for the least-educated migrants. In some cases, we found that education increased adaptation, but at a decreasing rate. This non-linearity in incremental fertility could be so great as to account for our apparently contradictory conclusion regarding cumulative fertility. We found that completed fertility of women with less than six years of school was 1.6 children less than that among comparable rural stayers; for women with four to six years of school, 1.0 children less; and for women with more than six years of school, 1.2 children less. These declines are 25, 16, and 26 percent, respectively, in relative terms against fertility levels of rural stayer women with equivalent levels of schooling.

We found that employment prior to migration in jobs that were incompatible with childbearing and childrearing actually reduced the cumulative effect of adaptation on completed fertility. Perhaps this could be explained by women in child-incompatible jobs having such low fertility already that there is little latitude for adaptation.

Destination Size

We also found that cumulative adaptation increased with the urban destination size. Migrants to Seoul would have 2.9 fewer children than comparable rural stayers, while migrants to Busan and other large cities would have 1.9 fewer children, and migrants to medium and small cities would have 1.2 fewer children. We did not have sufficient information to determine whether this result was due to the city size alone or to the fact that only certain types of migrants would choose one city in preference to another. Our autoregressive model is designed to control for the selectivity of family size preferences; but it is possible that it does not control completely for that selectivity and that individual migrants to larger cities have stronger preferences for smaller families than those who migrate to smaller cities. However, as discussed shortly, evidence shows that the relationship between city size and the fertility-preference selectivity of rural-urban migrants attracted to that city does not appear to be positive. Therefore, it is quite safe to infer that cumulative adaptation increased with the urban destination size. The fertility differentials among rural migrants to Seoul, Busan, and large cities, and medium and small cities, respectively, are mostly due to the adaptation effect of city size.

Alternative Measure of Adaptation

Our autoregressive tests of the adaptation hypotheses were designed to test whether the fertility differential between rural-urban migrants and rural stayers widened with duration of current urban residence. An alternative test of adaptation is that the fertility differential between rural-urban migrants and urban natives narrows with duration of current urban residence. This is the test proposed by Ribe and Schultz (see Chapter 8). In a study of Colombian women without controlling for duration of marriage, they concluded that young rural-urban migrants had lower fertility initially than urban natives, but that this fertility converged upward to urban native levels with time spent at the destination. We found only weak support for this pattern in the Korean sample. However, we did find a pattern of adaptation the exact opposite of the Ribe and Schultz pattern when we controlled for duration of marriage. Using marital fertility rates, defined as children-ever-born per year of marital duration, we found young rural-urban migrants having initially higher marital fertility rates than urban natives, and a convergence downward to the urban levels with time spent in the urban area. The pattern of higher initial marital duration-specific fertility and a convergence downward to urban levels held for all age groups when migrants were limited to women who married after they migrated.

Additional Data and Tests

To provide independent validation of our conclusions from using the rich, but small, data base of the 1974 Korean World Fertility Survey we turned to the 1970 Korean Census of Population and Housing with its larger samples but more limited set of questions. As expected, we found that long-term rural-urban migrants had fertility higher than that of urban non-migrants, but lower than that of rural stayers. For most age groups, long-term, rural-urban migrant fertility was lower than that of recent rural-urban migrants (i.e., migrants within five years). These data support our adaptation results, but it is imposssible to determine, given the shallowness of the Census data, whether these results are due to adaptation or selectivity. We cannot separate the migration-cohort effect from the duration-of-residence effect.

In the KWFS data we observed that cumulative fertility declines with city size. We noted that we could not distinguish the city-size effect from the migrant-selectivity effect; i.e., migrants who want smaller families move to larger cities. The Census data, however, provide support for a city-size effect that is independent of the selectivity effect. We found an inverse relation between city size and urban non-migrant fertility; whereas among recent rural-urban migrants the size classes of destinations did not make any significant difference for their fertility. Note that this is not so for long-term migrants.

Selectivity

In the proposal, we stated that we would test several "pure" selectivity hypotheses. As expected, rural-urban migrants are selected with respect to the rural population in education and premarital work experience. We also found limited evidence that this selectivity has diminished over time for a given destination. But there was no evidence that selectivity was positively related to city size or that new destinations attracted migrants more selectively than old destinations.

The above selectivity tests were based on selectivity with respect to observable characteristics and not un-measurable family-size preferences. These data do not permit a test of these selectivity hypotheses with respect to such preferences. However, such tests have receded in importance with our adoption of the autoregressive model, which allows estimation of fertility adaptation after controlling for selectivity statistically. This implies that accurate tests of the selectivity hypothesis are no longer a prerequisite for making national policy decisions. The crucial issue for policy makers is whether adaptation has any significant effect on the fertility of rural-urban migrants and how large that effect is when the selectivity of migrants is controlled.

The overall results of this study suggest that selectivity, as measured here, has only minor effects on adaptation. In fact, we found some evidence that highly selected migrants may adapt less than other migrants.

There may be some behavioral reasons why less-selected migrants might adapt at least as well as highly selected migrants. Migrants with higher education and better occupational experience may not face cultural shocks after migration to urban areas because they were well prepared before migration. Conversely, migrants with lower education and occupational experience may face a completely unexpected life style and be forced to change their ways of thinking and life style even though the required changes are much harder to make for these lower status migrants. Also, migrants with lower socioeconomic background may be more heavily influenced by their environments and more affected by other people's behavior in their communities of current residence.

10.3 Policy Implications

We argued, in Section 3.2 of Chapter 3, that the large volume of rural-urban migration has been necessary to achieve rapid industrialization in Korea and will continue up to at least the year 2000. Therefore, the findings of this study about the effect of the migration process upon the fertility behavior of migrants have important implications for policies with respect to urbanization and migration in many developing countries.

For Korea this study indicates:

- total: that rural-urban migrants reduce their fertility substantially after their arrival at urban areas (i.e., approximately two fewer births than the fertility level of their corresponding rural stayers if migrants spend their entire childbearing period in urban areas).

- city size: that rural-urban migrants to Seoul reduce their fertility by 2.9 births, those to Busan and other large cities by 1.9 births, and those to medium and small cities by 1.2 births;

- education: that completed fertility of rural-urban migrant women with less than four years of school was 1.6 children less than comparable rural stayers; for women with four to six years of school, 1.0 less; and for women with more than six years of school, 1.2 less; and

- age: that women who migrated before age 25 would have 1.5 to 1.8 fewer children at completion of childbearing than comparable rural stayers; but this differential fell to 0.8 fewer children for women who migrated after age 30.

From these findings we conclude that adaptation to urban life is a significant cause of lower fertility of rural-urban migrants compared with that of rural stayers, that the adaptation effect on cumulative fertility increases with the urban destination size and the selectivity of migrants measured by pre-migration education or job experience has only minor effects on adaptation.

Moreover, since these reductions in children born are due to adaptation to urban residence, they would not have occurred in the absence of rural-urban migration. There seems no doubt that the rapid decline of Korean fertility rates during the last two decades has been due in large measure to the high volume of rural-urban migration that occurred during the decade 1965-75. Fertility reductions of this magnitude would significantly shorten the period of demographic transition. Indeed, it is reasonable to conclude that rural-urban migration may be a necessary component of that transition. Rather than being a process to minimize or defer, it may be one to accept and guide.

One policy implication of this evidence is that the younger the age of migration, the more births will be reduced because of the longer exposure to urban lifestyle during the childbearing period. However, even though a migrant might be older, the rate of her fertility adaptation (measured as reduction in births per year of urban residence) will equal that of the youngest migrant women and be even stronger than that of slightly younger migrants.

Thus, to achieve a given reduction in births per woman year of urban residence, there is little justification for a migration policy based on age of woman. Choices arising from the above situation involve not only the fertility of women as affected by their age, but also the costs that migration creates at both origin and destination. These, too, may be related to age. For example, migration of younger women from rural areas may remove scarce labor from the agricultural labor force--at least this is currently a concern in Korea; the outmigration of older rural women may have less impact on the rural labor force. Costs at the destination may include a period of unemployment or underemployment as well as a demand for housing. The former are likely to be related to the education and skills of the migrant. The latter would be related to marital status and size of family. All of these are in turn related to age or to duration of marriage. Thus, a migration policy cannot be simply a function of the fertility impact of migration.

In this chapter we have summarized the results of our analysis of the relations between fertility and rural-urban migration in the Korean context. These results have the following implications for development of government policy, not only for migration and urbanization, but for agriculture, industrialization, and trade, for example. The results of this study must be fitted into planning and policy development for all of economic and social development.

First, we noted that our conclusion on the importance of adaptation contrasts with that of previous studies reported in the literature: we find adaptation of the migrant to urban living is a significant phenomenon in explaining the lower fertility of rural-urban migrants compared with that of rural stayers. We associated major reductions in the Korean national fertility level and in rural-urban fertility differentials with the high volume of rural-urban migration that occurred during the period 1965-1975. Thus observed differences in fertility between rural-urban migrants and the comparison group of women remaining in rural areas are due significantly to changes in the fertility behavior of migrants even after selectivity has been controlled statistically.

Second, we reviewed the relation of rural-urban migration in the context of the economic growth objectives of the Korean government, which has been seeking that growth through industrialization (i.e., nonagricultural sectors). In Korea, like Japan and many other industrialized nations, expansion of the industrial sector has occurred in urban agglomerations and has been associated with an increasing share of population living in urban areas. Whenever this process has occurred rapidly, as in Korea, it has been fed by a significant volume of rural-urban migration. So long as economic growth through industrialization remains a key economic policy in Korea, as in many other developing countries, such migration can be expected to continue, in spite of the costs to both migrants and the government.

Moreover, policy makers must recognize that rural-urban migration, where not impelled by famine or war, is not a random, unthinking action by the people. Rather, it is a conscious decision made in the hope of improving personal well-being. Rural people see migration to the cities as a way of more fully achieving their aspirations and will make such moves as long as they see a preferred set of opportunities and costs in the city relative to those available in the countryside. Accordingly, policy makers must confront the issue of whether rural-urban migration is a "fact of life" of which they should make the best--drawing development benefits from it where they can and minimizing its costs to rural and urban areas and to the migrants, or whether policies should be devised to counter and reduce such migration and, if so, what the benefits and costs of such policies might be.

Third, selectivity (by education, for example) has only a weak effect upon the rate (births per woman-year of urban residence) at which rural-urban migrants adapt their fertility to urban norms. In fact, we found some evidence that highly selected migrants may adapt less than other migrants. We found no evidence in Korean data of declining fertility adaptation as urbanization increases. These results should reassure policy makers who find that migrants are less and less highly selected from year to year: such a reduction in selectivity should not have much effect on the fertility adaptation behavior of the migrants.

Fourth, a country with the policy goals of increased industrialization and reduced fertility will find that rural-urban migration and the resulting urbanization are processes that are completely consistent with those two policy goals. But city building takes time and physical resources. The latter may place a practical constraint upon the rate at which new in-migrants can be accepted in urban areas without creating living conditions of a quality that give rise to political instability. But as far as achieving a policy objective of reduced fertility is concerned, we conclude that rural-urban migration should occur at early ages, and that size of destination city does affect fertility adaptation.

At this point a conflict between fertility and development goals may appear: Greatest fertility reductions occur among migrants to the largest cities. And economies of scale for industrial production may also be greatest in the larger cities. But physical costs (housing, water, sanitation, etc.) may also be highest in those cities. Similarly, smaller fertility reductions and lower physical costs may be associated with successively smaller cities. Should policies promote movement to larger or to smaller cities? To resolve this question each policy maker would like to have calculations of the ratios of benefits to costs and of net benefits for rural-urban migration to cities of different sizes. Such tradeoff figures might vary by city size and certainly by country. This study has supplied data that may be used, at least for Korea, in estimating the benefits in terms of reduced fertility. Next these results must be linked with data on the costs of providing basic urban services by city size. Then the policy maker will be able to evaluate the tradeoff between fertility reduction and the cost effects of rural-urban migration. In estimating the costs of basic urban services, policy makers ought to discriminate between the costs required to create an urban environment of the sort to which long-term urban residents aspire and those for the sort that represents a real, though possibly small, improvement over the conditions that rural-urban migrants have experienced in rural areas. Then, in evaluating benefits and costs, policy makers would consider the relation between length of life of various types of physical capital and its quality and cost to arrive at evaluations of which type of capital to select and when it will need replacement.

These are the policy implications we make for Korea. We believe they deserve consideration by other developing countries having similar objectives and a large rural-urban fertility rate differential. And we advocate similar analyses to develop country-specific findings for other countries in which the needed data on migration and reproductive history are available.

Such analyses would need to calculate not only the reduction in fertility or rural-urban migrants compared to rural stayers, but also the costs of urban services needed to resettle the migrants with an acceptable degree of health and safety. Since those costs may well vary by city size, data for different cities will be needed. In addition, the nature of the agricultural sector and its losses or benefits due to removal of potential labor must be considered as policy makers move toward developing a migration policy that complements their policies for fertility, urbanization, economic development, and foreign trade. Thus, analyses of the sort demonstrated in this study can contribute to the task of developing the entire set of policies that are needed to bring about economic and social advances for the people of each country.

BIBLIOGRAPHY

Ashenfelter, Orley

1978 "Estimating the Effect of Training Program on Earnings," Review of Economics and Statistics, LX(1):47-57, February.

Balan, Jorge

1969 "Migrant-Native Socioeconomic Differences in Latin America Cities: A Structural Analysis," Latin American Research Review 4(1):3-29.

Berqueo, Eliza S., Rubens M. Marques, Maria L. Milaresi, Jose S. Martins, Eunice Pinks, and Imree Simon

1968 "Levels and Variables in Fertility in Sao Paola," Milbank Memorial Fund Quarterly 46:167-185.

Berry, B. J. L.

1973 The Human Consequences of Urbanization: Divergent Paths in the Urban Experience of the Twentieth Century, New York: St. Martin's Press.

Boulier, Bryan and Mark R. Rosenzweig

1978a "Age, Biological Factors, and Socio-economic Determinants of Fertility: A New Measure of Cumulative Fertility for Use in the Socioeconomic Analysis of Family Size," Demography 15(4): 487-497.

1978b "Employment Expansion, Age at Marriage, and Fertility in the Philippines," paper presented at Population Association of America meetings, Atlanta, Georgia.

Bowen, William G. and F. Aldrich Finegan

1969 The Economies of Labor Force Participation, Princeton, New Jersey: Princeton University Press.

Browning, Harley L.

1971 "Migrant Selectivity and the Growth of Large Cities in Developing Societies," in Rapid Population Growth: Consequences and Policy Implications, Baltimore: The Johns Hopkins University Press. (Prepared by a Study Committee of the Office of the Foreign Secretary National Academy of Sciences.)

Choi, Jin-Ho and Tai-Hwan Kwon

1980 "Patterns of Migration: Some Findings from Analysis Based on Urban to Rural Return Migrants in Korea," Bulletin of the Population and Development Studies Center, VIII & IX.

Chow, Gregory C.

1960 "Tests of Equality Between Sets of Coefficients in Two Linear Regressions," Econometrica, 28:591-605, July.

354

Cooley, Thomas F., Timothy W. McGuire and Edward C. Prescott
1979 "Earnings and Employment Dynamics of Manpower Trainess: An Exploratory Econometric Analysis," In Evaluating Manpower Traning Programs, Supplement 1. Farrell E. Bloch (ed.), Greenwich, Connecticut: JAI Press Inc., pp. 119-148.

Davis, Kingsley
1963 "The Theory of Change and Response in Modern Demographic History," Population Index 29:345-366.

Economic and Social Commission for Asia and the Pacific (ESCAP)
1980 Migration, Urbanization and Development in the Republic of Korea: Comparative study of migration, urbanization in relation to development in the ESCAP region, Country Report No. 1, Bangkok.

Edmonston, Barry and Susan McGinnis
1976 "Migrant-Nonmigrant Fertility Differentials in Metropolitan Areas of Latin America," in The Dynamics of Migration: Internal Migration and Fertility, Occasional Monograph Series, No. 5, Vol 1, Interdisciplinary Communications Program, Smithsonian Instutition.

Ehrenberg, Ronald G.
1979 "An Evaluation of Two Evaluations," in Evaluating Manpower Training Programs, Supplement 1. Farrell E. Bloch (ed.), Greenwich, Connecticut: JAI Press Inc., pp. 149-158.

Elizaga, Juan C.
1966 "A Study on Immigrants to Greater Santiago (Chile)," Demography 3(2):353-377.

Findley, Sally
1977 Planning for Internal Migration: A Review of the Issues and Policies in Developing Countries. International Research Document No. 4, International Statistical Programs Center, U. S. Bureau of the Census, Washington.

1980 "Migration As A Household Innovation," prepared for the Population Association of America.

Findley, Sally and Ann C. Orr
1978 Patterns of Urban-Rural Fertility Differentials in Developing Countries: A Suggested Framework. Washington, D.C.: Office of Urban Development, Agency for International Development, Report GE 77TMP-53.

Friedlander, Don
1969 "Demographic Responses and Change," Demography 6:359-381.

Fuller, Theodore D.
1981 "Migrant-Native Socioeconomic Differentials in Thailand," Demography 18(1):55-66, February.

Goldscheider, Calvin
1971 "An Outline of the Migration System," Proceedings of the International Population Conference, 1969, Volume 4. Liege International Union for the Scientific Study of Population: 2746-2754.

Goldstein, Sidney
1973 "Interrelations Between Migration and Fertility in Thailand," Demography 10:225-240.

Goldstein, Sidney V., Prachuabmoh Visid and Alice Goldstein
1977 Urban-Rural Migration Differentials in Thailand, research report, Bangkok: Institution of Population Studies.

Goldstein, Sidney and Penporn Tirasawat
1977 "The Fertility of Migrants to Urban Places in Thailand," Honolulu: East-West Population Institute paper.

Green, Sarah D.
1978 "Migrant Adjustments in Seoul, Korea: Employment and Housing," International Migration Review 12:1.

Harnett, Donald L. and James L. Murphy
1975 Introductory Statistic Analysis, Reading, Massachusetts: Addison Wesley Publishing Company.

Hasan, Parvez and D. C. Rao (coordinating editors)
1979 Korea: Policy Issues for Long-Term Development, A World Bank Country Economic Report, Baltimore, Maryland: The Johns Hopkins University Press.

Hendershot, Gerry E.
1971 "City Migration and Urban Fertility in the Philippines," Philippines Sociological Review 19.

1976 "Social Class, Migration, and Fertility in the Philippines," in The Dynamics of Migration: Internal Migration and Fertility, Occasional Monograph Series, No. 5, Vol. 1, Interdisciplinary Communications Program, Smithsonian Institution.

Hiday, Virginia A.
1978 "Migration, Urbanization, and Fertility in the Philippines," International Migration Review 12(3):370-385.

Holmes, David N., Jr.
1976 "Introduction" in The Dynamics of Migration: Internal Migration and Fertility. Occasional Monograph Series No. 5, Vol. 1, Interdisciplinary Communications Program, The Smithsonian Institution.

276

Hong, S.
1978 Population Status Report: Korea, Seoul, Korea: Korea Development Institute.

Iutaka, S., E. W. Bock and W. G. Barnes
1971 "Factors Affecting Fertility of Natives and Migrants in Urban Brazil," Population Studies 25:1.

Johnston, J.
1972 Econometric Methods, New York: McGraw-Hill, pp. 38-41.

Kim, Hyung-Kook
1980 "Social Factors of Migration from Rural to Urban Areas with Special Reference to Developing Countries: The Case of Korea," Journal of Environmental Studies VII.

Kim, K. D. and O. J. Lee
1979 "Adaption to the City and Return Home in the Republic of Korea," International Social Science Journal 31(2): 263-272.

Korea (for references to publications of Korean government, see Republic of Korea)

Korean Institute for Family Planning
1978 Statistics on Population and Family Planning in Korea, 1(1), Seoul, Korea.

Kwon, Tai Hwan, Hae Young Lee, Yunshik Chang, and Eui-Young You
1975 The Population of Korea, Seoul, Korea: Seoul National University, The Population and Development Studies Center.

Lee, Bun Song
1980 Personal communications received during trip to Korea, December.

Lee, Bun Song, Richard E. Paddock and Beverly F. Jones
1978 Development of an Econometric Fertility Model for Less Developed Countries: The New Home Economics Approach to Female Status and Age at Marriage and Fertility, Interim report prepared for the Agency for International Development, Research Triangle Institute (21U-1536).

Lee, Bun Song and T. Paul Schultz
1980 "The Influence of Child Mortality on Fertility in Korea," unpublished monograph.

Long, Larry
1970 "Fertility of Migrants to and within North America," Milbank Memorial Fund Quarterly 48:297-316.

Macisco, John J., Jr.
1968 "Fertility of White Migrant Women, U.S. 1960: A Stream Analysis," Rural Sociology 33:474-479.

351

Macisco, John J. Jr., Leon F. Boulier and Martha J. Renzi
1969 "Migration Status, Education, and Fertility in Puerto Rico, 1960," Milbank Memorial Fund Quarterly 47:167-187.

Macisco, John J. Jr., Leon J. Boulier and Robert H. Weller
1970 "The Effect of Labor Force Participation on the Relation Between Migration Status and Fertility in San Juan, Puerto Rico," Milbank Memorial Fund Quarterly 48(1):51-70.

M _ .ai, Robert J., Amos H. Hawley and J. Richard Udry
1979 "An Evaluation of Differences in Fertility Patterns Among Migrant and Nonmigrant Populations in Bangkok and Bogota," presented at the Annual Meeting of the American Sociological Association, Boston.

Martine, George R.
1975 "Volume, Characteristics and Consequences of Internal Migration in Colombia," Demography 12(2):193-208.

Mills, Edwin S., and Byung Nok Song
1977 Korea's Urbanization and Urban Problem 1945-1975, Seoul, Korea: Korea Development Institute.

Moon, Hyun Sang and Hong Sook Kim
1979 Current Situation of Migration, Family Planning and Changes in Fertility Level, Seoul, Korea: Korean Institute for Family Planning (in Korean).

Myers, George C. and John J. Macisco, Jr.
1975 "Revised Bibliography on Migration and Fertility," International Migration Review 9:221-231.

Myers, George C. and Earl W. Morris
1966 "Migration and Fertility in Puerto Rico," Population Studies 20(1):85-96.

Park, Jae-Young and Insook H. Park
1976 "Migration and Female Labor Force Impact on Korean Fertility," in The Dyanmics of Migration: Internal Migration and Fertility, Occasional Monograph, Series No. 5, Volume a, The Smithsonian Institution: Interdisciplinary Communications Program.

Preston, Samuel H.
1979 "Urban Growth in Developing Countries: A Demographic Reappraisal," Population and Development Review 5(2):195-215, June.

Republic of Korea
1972 Population and Housing Census Report 1970, Vol. 1 Complete Enumeration, 12-1 Republic of Korea, Economic Planning Board.

1973 Population and Housing Census Report 1970, Vol. 2 10% Sample Survey, 4-3 Internal Migration, Economic Planning Board.

358

1977 Population and Housing Census Report 1975, Vol. 1 Complete Enumeration 12-1 Whole Country, Economic Planning Board: National Bureau of Statistics.

1977 Korea Statistical Yearbook, 1977, Seoul, Korea: Economic Planning Board, National Bureau of Statistics.

1978 Population and Housing Census Report 1975, Vol. 2 Five Percent Sample Survey, 3-3 Internal Migration and Housing, Economic Planning Board: National Bureau of Statistics.

Retherford, Robert D. and Naohiro Ogawa
1978 "Decomposition of the Change in the Total Fertility Rate in the Republic of Korea, 1966-1970," Social Biology, pp. 115-127, Summer.

Ribe, Helena and T. Paul Schultz
1980 "Migrant and Native Fertility at Destination in Colombia in 1973: Are Migrants Selected According to their Reproductive Preferences?" unpublished monograph.

Ritchey, Neal and C. Shannon Stokes
1972 "Residence Background, Migration, and Fertility," Demography 9(2):217-230.

Ro, Kong-Kyun
1976 "Migration and Fertility in Korea," in The Dynamics of Migration: Internal Migration and Fertility. Occasional Monograph Series Number 5, Vol. 1, The Smithsonian Institution: Interdisciplinary Communications Program.

Rogers, G. M. Hopkins and R. Wery
1978 Population, Employment and Inequality: Bachue-Philippines, Hants, England: Saxon House Press.

Schultz, Theodore W.
1975 "The Value of the Ability to Deal with Disequilibria," Journal of Economic Literature 13(12):827-946.

Schultz, T. Paul
1977 "Explanations of Taiwan Cohort Fertility in Terms of the Timing of Marriage and Marital Fertility," paper presented at the Agricultural Development Workshop on Household Studies, Singapore.

Simmons, Alan B.
1976 "Opportunity, Space, Migration and Economical Development: A Critical Assessment of Research on Migrant Characteristics and Their Impact on Rural and Urban Communities." Pages 47-67 in Alan Gilbert (ed.) Spatial Analysis of Development and Change. Sussex, England: John Wiley and Sons.

351

Song, B. N.
1976 "Industrialization, Urbanization and Population Concentration in the Capital City Area," in Kim, S. U. (editor), Korean Population Problems and Policies, Summary reports for population seminar, Seoul, Korea: Korea Development Institute (in Korean).

Thompson, Richard W.
1978 "Fertility Aspirations and Modernization in Urban Uganda: A Case of Resilient Cultural Values," Urban Anthropology 7(2).

Warren, Robert and Jennifer Marks Peck
1980 "Foreign-Born Emigration From the United States: 1960 to 1970," Demography 17(1):71-84, February.

Wolowyna, Oleh
1980 "Rural-Urban Migration and Fertility: A Simulation Model," Ph.D. dissertation at Brown University.

Zarate, Alvin and A. Unger de Zarate
1975 "On the Reconciliation of Research Findings of Migrant-Non-Migrant Fertility Differentials in Urban Areas," International Migration Review 9(2):115-156.

Zellner, Arnold
1962 "An Efficient Method of Estimating Seemingly Unrelated Regressions and Tests for Aggregation Bias," Journal of American Statistical Association 57:348-468.

APPENDIX TO CHAPTER 3

A.3.1 The estimation method of net migration for thirty-two cities during the 1970-75 period.

Net migration for each city between 1970 and 1975 presented in Table 3.7 of Chapter 3 is estimated first by "surviving" the 1970 census age-sex specific count of population in the city to 1975, and then by calculating the difference between this "expected" population and the 1975 census age-sex specific count.

In notation we have:

$$NM\ (i,j,k) = P_{75}\ (i,j,k) - P'_{70}\ (i,j,k-1) \times SURV\ (j,k) \quad \text{for} \quad k > 0$$

where i = 1, 2, ..., 32; number of cities

j = 1, 2; male or female

k = 0, 1, 2, 3, 4, ..., 13, 14, 15, 16, 17, 18; for age groups, 0-4, 5-9, 10-14, 15-19, 20-24, ..., 60-64, 65-69, 70-74, 75-79, 80-84, and 85-89.

NM represents net migration between 1970 and 1975. P_{75} (1,1,1) stands for 1975 male population aged 5-9 in the first City (Seoul), P_{70} (1,1,0) for the 1970 male population aged 0-4 in 1970 in Seoul, and SURV (1,1) for survival rate of total male population aged 0-4 in 1970 (and so aged 5-9 in 1975).

The age-sex specific survival rates for total Korean population are estimated by dividing the 1975 population count by sex for age group k by the 1970 population count of the same sex for age group k-1. The resulting survival rates for males and females between 1970 and 1975 are presented in Table A.3.1.

Survival ratios presented in Table A.3.1 reveal the ups and downs for both sexes under age 40. We do not consider that these reflect true fluctuations in mortality levels for these people. As Kwon, et al. (1975) put it, these fluctuations could result from a combination of errors related to the misstatement of age, the under- or over-count for some ages, and international migration. Assuming that the age under-count rate is more or less the same for the cities as for the nation in Korea, we decided to use the survival ratios in Table A.3.1 without further adjustments.

In applying the estimated survival rates to each city's population we are assuming that the age-sex-specific survival ratios for each of 32 cities are equal to the national survival rates. This assumption would be invalid if there are substantial differences in survival rates between urban and rural areas or among different cities.

Another problem with this census survival ratio method is that this approach does not count as net migrants persons who have migrated during the last five years but died during the same period. In order to remove this under-estimation problem we should apply the similar approach as used in estimating emigrants from the U.S. by Warren and Peck (1980). The estimated net migration to the city should be revised by dividing the initial estimate by the appropriate survival rate. This hypothetical cohort is considered to be the net migrants at risk of dying after inmigration. The number of deaths occuring to this cohort would be the difference between the revised net migrants from this step and the initial estimate of net migrants. It could be assumed that half of the deaths to the cohort described above occurred after net migration. However, in order to maintain the comparability between Kwon's estimates for previous periods and our estimates for the 1970-75 period, we did not apply this adjustment.

SURVIVAL RATIO OF POPULATION BY FIVE-YEAR AGE GROUP, OCTOBER 1970 - OCTOBER 1975

October 1, 1970		October 1, 1975		
Age	Population (in thousands)	Age	Population (in thousands)	Survival Ratio
		(Male)		
0-4	2,229	5-9	2,303	1.03312
5-9	2,349	10-14	2,349	.99983
10-14	2,274	15-19	2,124	.93398
15-19	1,573	20-24	1,612	1.02453
20-24	1,299	25-29	1,272	.97925
25-29	1,097	30-34	1,131	1.03161
30-34	1,109	35-39	1,111	1.00234
35-39	915	40-44	885	.96741
40-44	691	45-49	650	.94052
45-49	629	50-54	577	.91689
50-54	507	55-59	449	.88682
55-59	408	60-64	334	.82001
60-64	302	65-69	230	.75995
65-69	181	70-74	123	.67915
70-74	121	75-79	68	.56474
75-79	61	80-84	26	.43170
80-84	26	85-89	11	.41142
		(Female)		
0-4	2,087	5-9	2,151	1.03054
5-9	2,183	10-14	2,179	.99807
10-14	2,119	15-19	2,023	.95456
15-19	1,515	20-24	1,511	.99763
20-24	1,224	25-29	1,236	1.00917
25-29	1,107	30-34	1,093	.98671
30-34	1,084	35-39	1,078	.99379
35-39	939	40-44	915	.97420
40-44	771	45-49	749	.97148
45-49	656	50-54	621	.94665
50-54	518	55-59	490	.94594
55-59	447	60-64	403	.90143
60-64	363	65-69	313	.86264
65-69	253	70-74	202	.79750
70-74	195	75-79	136	.69908
75-79	114	80-84	65	.56438
80-84	57	85-89	33	.56556

Note: Calculated from the 1970 and 1975 Population Censuses.

As pointed out by Kwon, the above method cannot give estimates of net migration at ages below 5 years in the terminal census year, say, 1975. We applied Kwon's supplemental procedure for estimating the migration of the 0-4 (birth) cohort as follows:

$$NM\ (i,j,0) = \frac{P_{75}\ (i,j,0)}{2} \times \frac{\sum_{k=4}^{9} NM\ (i,2,k)}{\sum_{k=4}^{9} P_{75}\ (i,2,k)}$$

for j = 1,2 (male, female)

This procedure assumes that children in this age group (0-4 years) follow the migration pattern of their mothers (aged 20-49), and were born evenly over the 1970-75 intercensal period.

A.3.2 Migrants to and from Busan and other cities.

Tables A.3.2 and A.3.3 are equivalent to Tables 3.9 and 3.10, respectively, except that the former deal with migrants to and from Busan whereas the latter deal with migrants to and from Seoul. The most significant difference of migration patterns with respect to Busan from those of Seoul is that Busan absorbs migrants from neighboring provinces such as Gyeongsangnam do, Gyeongsangbug do and Jeonranam do, whereas Seoul, the capital and the largest city in Korea, absorbs migrants from all over the nation. Out-migration from Busan is also substantially more localized. Contrary to Seoul, Busan has experienced an increase in the in-migration from both urban and rural areas from 309,100 during the 1965-70 period to 376,400 during the 1970-75 period. The out-migration from Busan has also increased between these two periods. However, the increase in the out-migration was not large enough to offset the increase in the in-migration.

Table A.3.4 shows the distribution of origins among migrants to other cities excluding Seoul and Busan. It is interesting to note that total in-migration to other cities has increased substantially from 1.1 million during the 1965-70 period to 1.5 million during the 1970-75 period. The most rapid increase has occurred in the migration to other cities from Seoul (83,900 to 255,700). A large part of this is destined to satellite cities of Seoul. However, the increase in the in-migration to other cities from other cities excluding Seoul and Busan has also been substantial (from 192,100 to 316,200).

Table A.3.5 shows distributions of destinations among the out-migrants from other cities excluding Seoul and Busan. Tables A.3.4 and A.3.5 reveal that net migration to other cities has increased from 314,600 during the 1965-70 period to 476,200 during the 1970-75 period. Table A.3.5 indicates that migration among other cities excluding Seoul and Busan have increased substantially from 192,100 during the 1965-70 period to 299,800 during the 1970-75 period.

365

TABLE A.3.2

DISTRIBUTION OF ORIGINS AMONG THE INMIGRANTS TO BUSAN (5 YEARS AND OLDER)

Origin (From)	1965-1970 (1000)	1965-1970 (%)	1970-1975 (1000)	1970-1975 (%)
Total Urban	95.3	(30.8%)	141.0	(37.5%)
Seoul	22.4		40.6	
Gyeonggi do	3.2		5.0	
Gangweon do	2.5		5.5	
Chungcheongbug do	1.0		1.3	
Chungcheongnam do	2.7		4.4	
Jeonrabug do	1.9		3.0	
Jeonranam do	6.0		11.1	
Gyeongsangbug do	22.3		29.3	
Gyeongsangnam do	31.8		39.1	
Jeju do	.6		1.7	
Other	1.0			
Total Rural	213.8	(69.2%)	235.4	(62.5%)
Gyeonggi do	5.0		5.2	
Gangweon do	6.5		10.2	
Chungcheongbug do	4.9		5.9	
Chungcheongnam do	5.1		6.1	
Jeonrabug do	6.5		7.4	
Jeonranam do	13.3		26.7	
Gyeongsangbug do	39.2		45.7	
Gyeongsangnam do	131.0		126.2	
Jeju do	1.9		2.0	
Other	.4			
Total	309.1		376.4	

Source: The 10% and 5% Sample Survey Reports for the 1970 and 1975 Population Censuses, Internal Migration.

TABLE A.3.3.

DISTRIBUTION OF DESTINATIONS AMONG OUTMIGRANTS FROM BUSAN (5 YEARS AND OLDER)

Destination (To)	1965-1970		1970-1975	
	1000	(%)	1000	(%)
Total Urban	95.1	(74.7)	116.2	(68.6)
Seoul	57.2		58.2	
Gyeonggi do	4.5		8.8	
Gangweon do	1.6		1.0	
Chungcheongbug do	.5		.7	
Chungcheongnam do	2.0		1.7	
Jeonrabug do	.7		.9	
Jeonranam do	1.6		2.7	
Gyeongsangbug do	11.0		17.3	
Gyeongsangnam do	15.3		27.4	
Jeju do	.6		1.3	
Total Rural	32.3	(25.3)	53.1	(31.4,
Gyeonggi do	5.4		4.6	
Gangweon do	2.8		2.1	
Chungcheongbug do	.7		1.3	
Chungcheongnam do	1.2		2.1	
Jeonrabug do	.7		.6	
Jeonranam do	1.6		1.9	
Gyeongsangbug do	4.9		12.4	
Gyeongsangnam do	14.4		27.9	
Jeju do	.7		1.0	
Total	127.4	(100)	169.3	(100)

Source: The 10% and 5% Sample Survey Reports for the 1970 and 1975 Population Censuses, Internal Migration.

361

TABLE A.3.4

DISTRIBUTION OF MIGRANTS TO OTHER CITIES EXCLUDING SEOUL AND BUSAN BY ORIGIN*

Origin (From)	1965 - 1970		1970 - 1975	
	1000	(%)	1000	(%)
Total Urban	313.9	28.2	629.9	41.9
Seoul	83.9	(26.7)	255.7	(40.6)
Busan	37.9	(12.1)	58.0	(9.2)
Other cities	192.1	(61.2)	316.2	(50.2)
Total Rural	799.6	71.8	872.0	58.1
Different *do*	225.8	(27.6)	263.5	(30.2)
Same *do*	591.6	(72.4)	608.5	(69.8)
TOTAL	1,113.5	100	1,501.9	100

*Some numbers do not add to total.

Source: The 10% and 5% Sample Survey Reports for the 1970 and 1975 Population Censuses, *Internal Migration*.

TABLE A.3.5

DISTRIBUTION OF DESTINATIONS AMONG THE OUTMIGRANTS FROM OTHER CITIES

Destination (to)	1965 - 70 (1000)	(%)	1970 - 75 (1000)	(%)
Rural urban	585.7	73.3	748.2	72.9
Seoul	320.7	(40.1)	348.0	(33.9)
Busan	72.9	(9.1)	100.4	(9.8)
Other cities	192.1	(24.0)	299.8	(29.2)
Rural areas	213.2	26.7	277.5	27.1
Total	798.9	100	1,025.7	100

Source: The 10% and 5% Sample Survey Reports for the 1970 and 1975 Population Censuses, Internal Migration.

369

APPENDIX TO CHAPTER 5

A.5.1 Tables for Recursive Structures of Fertility Equations (5.4).

The second major column in Table A.5.1 uses year t-n = 1964 as the base year, so its estimate of $\alpha^{*}_{74,70-74} = -.437$ is an estimate of the cumulative effect over the period 1965-74 of migrating in 1970-74. It permits pre-migration fertility differences between migrants and non-migrants to be included in the cumulative migration effect. Row 2 of this column estimates $\alpha_{74,70-74} = -.443$ when only a one-period lag structure is used.

When we compare the estimated migration effects (column M) using three-period and one-period lag structures, we see very little difference in the estimated effects in Table 5.1. This is true for all migration cohorts and terminal years, t, as Tables A.5.1 through A.5.4 show.

TABLE A.5.1

RECURSIVE STRUCTURE OF FERTILITY EQUATION (5.4) FOR MIGRATION COHORT: 1970-1974

Year of Observation	Base Year t-n: 1969				1964				1959				1954			
		β				β				β				β		
t	M	1969	1964	1959	M	1964	1959	1954	M	1959	1954	1949	M	1954	1949	1944
1974	-.2599	1.0344	-.1948	.1191	-.4368	.7446	.0093	.3382	-.4751	.8398	-.0503	.3807	-.4602	.7357	-.0395	.9119
	(-4.13)	(25.57)	(-3.56)	(2.08)	(-5.29)	(13.30)	(0.10)	(3.75)	(-5.24)	(11.52)	(-0.41)	(2.33)	(-4.73)	(6.58)	(-0.22)	(1.63)
	-.2707	.9469			-.4430	.8020			-.4767	.8627			-4.4594	.7480		
	(-4.29)	(36.84)			(-5.31)	(20.12)			(-5.25)	(14.51)			(-4.72)	(8.64)		
1969					-.2008	.8039	.0507	.2279	.1976	.8967	-.0101	.3634	-.1683	.8439	-.0535	.938
					(-3.82)	(20.85)	(0.88)	(3.80)	(-3.07)	(16.99)	(-0.11)	(3.08)	(-2.26)	(9.69)	(-0.38)	(2.22)
					-.2142	.8782			-.2076	.9312			-.1680	.8503		
					(-4.08)	(36.18)			(-3.51)	(21.60)			(-2.26)	(12.17)		
1964									.0082	.9206	-.0295	.0961	.0620	.8570	-.1847	.7113
									(0.18)	(24.15)	(-0.45)	(1.12)	(1.05)	(12.47)	(-1.64)	(2.10)
									.0057	.9210			.0633	.8051		
									(0.12)	(29.88)			(1.07)	(14.74)		
1959													.4490	.8646	-.3049	.4541
													(0.36)	(18.00)	(-3.93)	(2.12)
													.0250	.7526		
													(0.61)	(20.70)		
1954																

TABLE A.5.2

RECURSIVE STRUCTURE OF FERTILITY EQUATION (5.4) FOR MIGRATION COHORT: 1965 - 1969

Year of Observation	Base Year t-n															
	1969				1964				1959				1954			
		β				β				β				β		
t	M	1969	1964	1959	M	1964	1959	1954	M	1959	1954	1949	M	1954	1949	1944
1974	-.1423 (-2.27)	.9947 (23.97)	-.2099 (-3.79)	.1757 (2.99)	-.3754 (-4.75)	.6618 (11.89)	.0778 (0.88)	.3672 (4.11)	-.4589 (-5.44)	.8152 (11.29)	-.0068 (-0.06)	.4541 (2.87)	-.4792 (-5.31)	.7469 (7.15)	.0838 (0.49)	.3900 (1.71)
	-.1396 (-2.22)	.9189 (34.24)			-.3556 (4.44)	.7648 (19.07)			-.4626 -5.45)	.8666 (14.91)			-.4824 (-5.34)	.8035 (9.77)		
1969					-.2030 (-4.02)	.7795 (20.70)	.0619 (1.08)	.2601 (4.46)	-.2306 (-3.76)	.8806 (16.90)	.0224 (0.26)	.3799 (3.33)	-.2359 (-3.34)	.8476 (10.47)	.0045 (0.03)	1.0 (2.31)
					-.2084 (-4.05)	.8694 (33.24)			-.2459 (-3.99)	.9322 (22.20)			-.2399 -3.40)	.8726 (13.29)		
1964									-.0854 (-1.96)	.9101 (23.17)	-.0173 (-0.28)	.1319 (1.50)	-.0705 (-1.28)	.8448 (13.14)	-.1207 (-1.12)	.857 (0.41)
									-.0909 (-2.09)	.9205 (30.55)			-.0714 (-1.29)	.8189 (15.75)		
1959													-.0388 (-1.03)	.8608 (19.24)	-.2596 (-3.50)	.432 (1.77)
													-.0356 (-0.94)	.7696 (22.37)		
1954																

TABLE A.5.3

RECURSIVE STRUCTURE OF FERTILITY EQUATION (5.4) FOR MIGRATION COHORT: 1960-1964

Year of Observation	Base Year t-n															
	1969				1964				1959				1954			
		β				β				β				β		
t	M	1969	1964	1959	M	1964	1959	1954	M	1959	1954	1949	M	1954	1949	1944
1974	-.2930 (-4.01)	1.1025 (26.44)	-.2202 (-3.97)	.0757 (1.28)	-.5826 (-5.79)	.7002 (11.38)	.0178 (0.19)	.4158 (4.40)	-.7032 (-6.47)	.7564 (9.54)	.1635 (1.26)	.3160 (1.87)	-.7019 (-6.09)	.8725 (7.72)	-.1100 (-0.60)	1.240 (2.28)
	-.3040 (-4.15)	.9860 (36.46)			-.5643 (-5.53)	.7958 (18.10)			-.6964 (-6.36)	.8698 (13.73)			-.6888 (-5.97)	.8785 (10.04)		
1969					-.2738 (-4.22)	.7814 (18.47)	.0536 (0.87)	.2733 (4.30)	-.3575 (-4.55)	.8206 (14.16)	.1650 (1.73)	.2590 (2.10)	-.3388 (-3.82)	.9494 (10.80)	-.1585 (-1.11)	1.160 (2.71)
					-.2720 (-4.13)	.8805 (30.11)			-.3642 (-4.59)	.9252 (20.07)			-.3269 (-3.68)	.9334 (13.37)		
1964									-.0665 (-1.18)	.8516 (19.62)	.1297 (1.86)	.0422 (0.48)	-.0041 (-0.06)	.9603 (14.00)	-.2812 (-2.49)	1.088 (3.31)
									-.0795 (-1.41)	.9202 (28.00)			.0058 (0.08)	.8925 (16.21)		
1959													.0065 (0.13)	.8868 (18.00)	-.3129 (-3.87)	.478 (2.04)
													.0096 (0.20)	.7777 (20.76)		
1954																

TABLE A.5.4

RECURSIVE STRUCTURE OF FERTILITY EQUATION (5.4) FOR MIGRATION COHORT: 1955-1959

Year of Observation	Base Year t-n: 1969				1964				1959				1954			
		β				β				β				β		
t	M	1969	1964	1959	M	1964	1959	1954	M	1959	1954	1949	M	1954	1949	1944
1974	-.3801 (-4.52)	1.1105 (24.95)	-.1990 (-3.30)	.0233 (0.38)	-.7673 (-6.67)	.8055 (12.72)	-.0799 (-0.83)	0.3455 (3.57)	-.7644 (-5.94)	.7456 (9.04)	.1317 (0.96)	.2920 (1.62)	-.8230 (-6.03)	.8065 (6.55)	-.0060 (-0.03)	.5398 (0.90)
	-.4187 (-4.98)	.9845 (35.73)			-.7627 (-6.57)	.8361 (18.69)			-.7505 (-5.81)	.8433 (12.58)			-.8185 (-6.01)	.8232 (8.81)		
1969					-.3690 (-5.03)	.8623 (20.21)	-.0061 (-0.10)	.2220 (3.47)	-.3650 (-3.90)	.8339 (13.75)	.1488 (1.46)	.2476 (1.87)	-.4245 (-3.99)	.9148 (9.45)	-.0594 (-.38)	.551 (1.18)
					-.3682 (-4.98)	.9136 (31.55)			-.3536 (-3.75)	.9290 (18.86)			-.4214 (-3.97)	.9094 (12.03)		
1964									-.0011 (-0.02)	.8674 (19.16)	.1504 (2.03)	.0088 (0.09)	-.0553 (-0.66)	.9598 (12.59)	-.2037 (-1.64)	.510 (1.38)
									-.0009 (-0.01)	.9386 (26.78)			-.0559 (-0.67)	.8945 (15.01)		
1959													-.0093 (-0.16)	.8480 (15.90)	-.2088 (-2.39)	.362 (1.40)
													-.0077 (-0.13)	.7727 (19.55)		
1954																

A.5.2 Regressions of Equation 5.6 by Yearly Observations, 1965-74.

Tables A.5.5 and A.5.6 show regression results for the Equation 5.6 by yearly observations 1965-74.

TABLE A.5.5

REGRESSION RESULTS FOR THE BASIC EQUATION 5.6 FOR KOREAN CURRENTLY MARRIED WOMEN, RURAL-URBAN MIGRANTS AND RURAL STAYERS BY YEARLY OBSERVATION, 1970-74

Variable Names	Year of Observation									
	1974		1973		1972		1971		1970	
	b	t	b	t	b	t	b	t	b	t
Intercept	1.367	(9.71)	1.313	(8.22)	1.134	(6.38)	.935	(4.86)	.904	(4.33)
CEBO5	.975	(216.42)	.973	(194.38)	.975	(175.66)	.970	(162.99)	.974	(153.33)
AGEC	-.055	(-6.62)	-.046	(-4.83)	-.036	(-3.39)	-.021	(-1.75)	-.022	(-1.69)
AGEC2	.001	(5.52)	.000	(3.48)	.000	(2.23)	.000	(.64)	.000	(.80)
YYM1	-.028	(-1.33)	-.025	(-1.03)	-.027	(-1.00)	-.045	(-1.50)	-.075	(-2.33)
YYM2	-.053	(-2.77)	-.044	(-2.04)	-.020	(-.85)	-.050	(-1.98)	-.069	(-2.57)
YYM4	-.058	(-2.25)	-.085	(-3.01)	-.030	(-.98)	-.084	(-2.60)	-.015	(- .45)
YYM6	-.065	(-2.17)	-.105	(-3.17)	-.017	(-.47)	-.118	(-3.17)	-.119	(-3.06)
YYM8	-.049	(-1.50)	-.066	(-1.84)	-.097	(-2.48)	-.125	(-3.07)	-.016	(- .39)
YYM10	-.057	(-1.31)	-.078	(-1.63)	-.033	(-.63)	-.134	(-2.53)	-.065	(-1.18)
YYM11	-.032	(- .51)	-.077	(-1.10)	-.057	(-.76)	-.056	(- .72)	-.108	(-1.36)
No of Obs	2871		2767		2663		2540		2432	
F - stat	12088.2		9824.5		8300.3		7387.6		6803.3	
R^2	.9769		.9727		.969		.9669		.9656	

TABLE A.5.6

REGRESSION RESULTS FOR THE BASIC EQUATION 5.6 FOR KOREAN CURRENTLY MARRIED WOMEN, RURAL-URBAN MIGRANTS AND RURAL STAYERS BY YEARLY OBSERVATION, 1965-69

Variable Names	Year of Observation									
	1969		1968		1967		1966		1965	
	b	t	b	t	b	t	b	t	b	t
Intercept	.681	(3.03)	.160	(.66)	.984	(3.69)	.464	(1.64)	.220	(.68)
CEBO5	.971	(145.57)	.953	(136.74)	.966	(128.10)	.961	(122.65)	.956	(111.46)
AGEC	-.007	(-.49)	.023	(1.51)	-.030	(-1.71)	.004	(.18)	.015	(.67)
AGEC2	-.000	(-.39)	-.000	(-1.75)	.000	(1.32)	-.000	(-.46)	-.000	(-.60)
YYM1	-.061	(-1.81)	-.079	(-2.15)	-.092	(-2.35)	-.085	(-2.07)	.013	(.30)
YYM2	-.003	(-.111)	-.087	(-2.83)	-.079	(-2.32)	-.063	(-1.78)	-.010	(-.26)
YYM4	-.076	(-2.17)	-.028	(-.78)	-.076	(-1.99)	-.126	(-3.28)	-.052	(-1.24)
YYM6	-.028	(-.70)	-.138	(-3.30)	-.127	(-2.92)	-.039	(-.90)	-.043	(-.94)
YYM8	-.110	(-2.59)	-.089	(-2.03)	-.096	(-2.04)	-.126	(-2.65)	-.036	(-.72)
YYM10	.084	(1.47)	-.139	(-2.39)	-.128	(-2.13)	-.142	(-2.24)	.002	(.03)
YYM11	-.030	(-.37)	-.164	(-2.01)	-.119	(-1.41)	-.180	(-2.10)	-.065	(-.73)
No of Obs	2323		2193		2074		1977		1866	
F - stat	6284.1		5664.0		4886.6		4565.4		3784.9	
R^2	.9645		.9629		.9595		.9587		.9533	

377

APPENDIX TO CHAPTER 6

A.6.1 Rural-Urban Migration Coefficients for Pre-Marital Migrants with Rural-Rural Migrants Comparison Group.

Tables A.6.1a through A.6.1e show α coefficients for rural-urban migrants with various lengths of pre-marital urban residence compared to rural-rural migrants with the same lengths of pre-marital rural residence. There is adaptive behavior among women marrying within 0-4, 5-9, and 10-14 years of migration, as the significant α coefficients in Tables A.6.1a through A.6.1c show. For most migration cohorts and years of pre-marital residence groups, adaptation appears to increase with duration of residence.

One peculiarity of the adaptive behavior of rural-urban migrants compared to rural-rural migrants should be noted. For the migration cohort 1970-74, women who married within four years of migration to an urban area had significantly more children than comparable rural-rural migrants. There may be a trend for more recent rural-urban migrants to migrate to the city in order to marry. This is a very tenuous conclusion, however.

Tables A.6.2a through A.6.2d show α coefficients by five year marriage intervals and five year pre-marital residence intervals. Unlike the case of pre-marital migrants compared to rural non-migrants, shown in Tables 6.15a through 6.15d, when the comparison group is pre-marital rural-rural migrants there is not strong evidence of greater adaptation among women who waited longer after migration to marry.

TABLE A.6.1a

MIGRATION ~~COEFFICIENTS~~ FOR PRE-MARITAL
RURAL-URBAN MIGRANTS MARRIED IN PERIOD 0-4 YEARS
AFTER MIGRATION: RURAL-RURAL MIGRANT COMPARISON
GROUP (NO CONTROL FOR SOCIOECONOMIC VARIABLES)

MIGRANT COHORT	BEFORE MIGRATION					AFTER MIGRATION				SAMPLE SIZE N
	-4	-3	-2	-1	0	1	2	3	4	
1970-74					.2056* (2.88)	-	-	-	-	268
1965-69					-.1226* (-1.45)	.0264 (0.22)	-	-	-	254
1960-64					.0506 (0.37)	-.1386 (-0.83)	-.1319 (-0.64)	-	-	212
1955-59					-.0555 (-0.48)	-.1093 (-0.82)	-.5662* (-3.90)	-.2439* (-1.34)	-	262
1950-54					.0183 (0.09)	.1410 (0.61)	-.1389 (-0.50)	-.3271 (-1.14)	-.5452* (-1.75)	146

*Significant at .10 level- one tail test

379

TABLE A.6.1b

MIGRATION COEFFICIENTS FOR PRE-MARITAL RURAL-URBAN MIGRANTS MARRIED IN PERIOD 5-9 YEARS AFTER MIGRATION: RURAL-RURAL MIGRANT COMPARISON GROUP (NO CONTROL FOR SOCIOECONOMIC VARIABLES)

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69						.0609 (0.90)	-	-	-	277
1960-64						-.1503* (-1.59)	-.1899* (-1.50)	-	-	233
1955-59						-.1284 (-0.99)	-.2632* (-1.72)	-.4676* (-2.54)		218
1950-54						.1717 (1.23)	.0752 (0.49)	-.4363* (-2.62)	-.6541 (-3.18)	253

*Significant at .10 level- one tail test

TABLE A.6.1c

MIGRATION COEFFICIENTS FOR PRE-MARITAL RURAL-URBAN MIGRANTS MARRIED IN PERIOD 10-14 YEARS AFTER MIGRATION: RURAL-RURAL MIGRANT COMPARISON GROUP (NO CONTROL FOR SOCIOECONOMIC VARIABLES)

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69										
1960-64						-	.0657 (0.57)	-	-	205
1955-59						-	-.0492 (-0.29)	-.6401* (-2.79)	-	200
1950-54						-	.1207 (0.65)	.0706 (0.31)	-.4412* (-1.57)	203

*Signigicant at .10 level- one tail test

TABLE A.6.1d

MIGRATION COEFFICIENTS FOR PRE-MARITAL
RURAL-URBAN MIGRANTS MARRIED IN PERIOD 15-19 YEARS
AFTER MIGRATION: RURAL-RURAL MIGRANT COMPARISON GROUP
(NO CONTROL FOR SOCIOECONOMIC VARIABLES)*

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69										
1960-64										
1955-59						-	-	-.0148 (-0.10)	-	191
1950-54						-	-	.1357 (0.82)	-.2323 (-1.01)	201

*Significant at .10 level - one tail test

382

TABLE A.6.1e

MIGRATION COEFFICIENTS FOR PRE-MARITAL
RURAL-URBAN MIGRANTS MARRIED IN PERIOD 20-24 YEARS
AFTER MIGRATION: RURAL-RURAL MIGRANT COMPARISON GROUP
(NO CONTROL FOR SOCIOECONOMIC VARIABLES)*

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69										
1960-64										
1955-59										
1950-54						-	-	-	-.1285 (-0.24)	178

*Significant at .10 level - one tail test

TABLE A.6.2a

RURAL-URBAN MIGRATION COEFFICIENTS FOR PRE-MARITAL MIGRANT COHORT 1950-54 BY YEARS OF RESIDENCE BEFORE MARRIAGE IN THE URBAN AREA AND DURATION OF MARRIAGE INTERVAL: RURAL-RURAL MIGRANT COMPARISON GROUP (NO CONTROL FOR SOCIOECONOMIC VARIABLES)[a]

MARRIAGE INTERVAL	YEARS BEFORE MARRIAGE 0-4	5-9	10-14	15-19	20-24
1st Five	.0183	.1717	.1207	.1357	-.1285
2nd Five	.1410	.0752	.0706	-.2323	
3rd Five	-.1389	-.4363*	-.4412*		
4th Five	-.3271	-.6541*			

[a]From Tables A.6.1a through A.6.1e
*Significant at the .10 level - one tail test

TABLE A.6.2b

RURAL-URBAN MIGRATION COEFFICIENTS FOR PRE-MARITAL MIGRANT COHORT 1955-59 BY YEARS OF RESIDENCE BEFORE MARRIAGE IN THE URBAN AREA AND DURATION OF MARRIAGE INTERVAL: RURAL-RURAL MIGRANT COMPARISON GROUP (NO CONTROL FOR SOCIOECONOMIC VARIABLES)[a]

MARRIAGE INTERVAL	YEARS BEFORE MARRIAGE 0-4	5-9	10-14	15-19	20-24
1st Five	-.0555	-.1284	-.0492	-.0148	
2nd Five	-.1093	-.2632*	-.6401*		
3rd Five	-.5662*	-.4676*			
4th Five					

[a]From Tables A.6.1a through A.6.1e
*Significant at the .10 level - one tail test

TABLE A.6.2c

RURAL-URBAN MIGRATION COEFFICIENTS FOR PRE-MARITAL MIGRANT COHORT 1960-64 BY YEARS OF RESIDENCE BEFORE MARRIAGE IN THE URBAN AREA AND DURATION OF MARRIAGE INTERVAL: RURAL-RURAL MIGRANT COMPARISON GROUP (NO CONTROL FOR SOCIOECONOMIC VARIABLES)[a]

MARRIAGE INTERVAL	YEARS BEFORE MARRIAGE 0-4	5-9	10-14	15-19	20-24
1st Five	.0506	-.1503*	.0657		
2nd Five	-.1386	-.1899*			
3rd Five					
4th Five					

[a]From Tables A.6.1a through A.6.1e
*Significant at the .10 level -one tail test

TABLE A.6.2d

RURAL-URBAN MIGRATION COEFFICIENTS FOR PRE-MARITAL MIGRANT COHORT 1965-69 BY YEARS OF RESIDENCE BEFORE MARRIAGE IN THE URBAN AREA AND DURATION OF MARRIAGE INTERVAL: RURAL-RURAL MIGRANT COMPARISON GROUP (NO CONTROL FOR SOCIOECONOMIC VARIABLES)[a]

MARRIAGE INTERVAL	YEARS BEFORE MARRIAGE 0-4	5-9	10-14	15-19	20-24
1st Five	-.1226*	.0609			
2nd Five					
3rd Five					
4th Five					

[a]From Tables A.6.1a through A.6.1e.
*Significant at the .10 level - one tail test

387

A.6.3 Coefficients for Migration and Age at Migration Interaction Terms When the Comparison Group is Defined on the County Base.

When non-migrants as the comparison group in the regressions for post-marital migrants are defined as those who have not changed their county of residence, our conclusions about the effect of age at migration on adaptation drawn from Section 6.4a of Chapter 6 are not altered. We do not find [illegible] A.6.3 consistently positive signs for the (migration × age at migr[illegible]teraction, as the age-at-migration hypothesis suggests. However, there is a greater number of cases of significantly positive values when the county-based definition of migration is used than when the narrow definition of migration is used in Table 6.24 of Chapter 6. In Table A.6.3, four cases out of twenty have appropriate and significant signs. This is twice as many significant cases as one would expect by chance in twenty tests using a 10% significance level. When we compare rural-urban post-marital migrants with rural intercounty migrants, we see in Table A.6.4 that in only one case does age at migration have a significant effect on adaptation. This is less than the number expected by chance in twenty samples at the 10% significance level.

When non-migrants as the comparison group in the regressions for pre-marital migrants are defined as those not leaving the county of origin, we obtain no support for the age-at-migration hypothesis. In Tables A.6.5a through A.6.5d, only seven cells have significant coefficients, and five of these had the wrong sign.

TABLE A.6.3

COEFFICIENTS FOR POST-MARITAL MIGRATION X AGE AT MIGRATION INTERACTION TERMS: RURAL INTERCOUNTY NON-MIGRANT COMPARISON, CONTROLLED FOR DURATION OF MARRIAGE RESTRICTIONS

MIGRANT COHORT		BEFORE MIGRATION					AFTER MIGRATION				SAMPLE SIZE N
		-4	-3	-2	-1	0	1	2	3	4	
1970-74	M x a				.2103* (2.19)	-.0589 (-0.59)					847
	M x a^2				-.0032* (-2.28)	.0009 (0.67)					
1965-69					.1616 (0.89)	.2561* (1.38)	-.1522 (-.75)				679
					-.0029 (-1.01)	-.0042* (-1.45)	.0026 (0.82)				
1960-64					-.0311 (-0.10)	.0271 (0.08)	-.4303 (-1.19)	.5514* (1.50)			494
					.0002 (0.03)	-.0003 (-0.06)	.0070 (1.19)	-.0079* (-1.33)			
1955-59					-.2999 (-0.76)	-.0611 (-0.15	-.2445 (-0.57)	-.9263* (-1.95)	-.1689 (-0.42)		297
					.0058 (0.81)	.0013 (0.18)	.0045 (0.57)	.0161* (1.88)	.0041 (0.56)		
1950-54					-.3262 (-0.17)	-3.5843* (-1.55)	3.3784* (1.59)	-1.8983 (-0.84)	-.2345 (-0.10)	-.2303 (-0.12)	177
					.0043 (0.12)	.0705* (1.55)	-.0636* (-1.52)	.0373 (0.84)	.0040 (0.08)	.0071 (0.19)	

* Significant at .10 level-one tail test

TABLE A.6.4

COEFFICIENTS FOR POST-MARITAL MIGRATION X AGE AT MIGRATION (M x a) INTERACTION TERMS: RURAL INTERCOUNTY MIGRANT COMPARISON

MIGRANT COHORT		BEFORE MIGRATION					AFTER MIGRATION				SAMPLE SIZE N
		-4	-3	-2	-1	0	1	2	3	4	
1970-74	M x a				.1242	-.0010					913
					(1.27)	(-0.01)					
	M x a^2				-.0018	-.0000					
					(-1.26)	(-0.01)					
1965-69					.0620	.2348	-.0970				719
					(0.34)	(1.25)	(-0.49)				
					-.0012	-.0035	.0015				
					(-0.44)	(-1.19)	(0.48)				
1960-64					-.0110	.0778	-.3753	.3295			508
					(-0.03)	(0.23)	(-1.04)	(0.94)			
					-.0003	-.0008	.0064	-.0045			
					(-0.07)	(-0.14)	(1.09)	(-0.79)			
1955-59					-.4525	-.2205	-.3567	-.4728	.3314		295
					(-1.14)	(-0.51)	(-0.81)	(-0.98)	(0.83)		
					.0090	.0041	.0067	.0083	-.0044		
					(1.26)	(0.53)	(0.85)	(0.96)	(-0.62)		
1950-54					-.3702	-2.8661	3.4369*	-2.3771	-.0158	.9859	174
					(-0.19)	(-1.20)	(1.46)	(-1.06)	(-0.01)	(0.58)	
					.0058	.0576	-.0652*	.0482	-.0008	-.0172	
					(0.15)	(1.23)	(-1.40)	(1.09)	(-0.02)	(-0.51)	

* Significant at .10 level-one tail test.

TABLE A.6.5a

COEFFICIENTS FOR PRE-MARITAL, RURAL-URBAN MIGRATION x AGE AT MIGRATION: RURAL INTERCOUNTY NON-MIGRANT COMPARISON, MARRIED 0-4 YEARS AFTER MIGRATION

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74					-.3408*					216
					(-1.61)					
					.0062*					
					(1.40)					
1965-69					.2263	.2071				180
					(0.56)	(0.38)				
					-.0059	-.0044				
					(-0.63)	(-0.35)				
1960-64					1.4602	.5550	-2.2205			150
					(0.78)	(0.29)	(-0.93)			
					-.0350	-.0111	.0464			
					(-0.79)	(-0.24)	(0.83)			
1955-59					.3775	.0024	-1.4263	-1.8389		192
					(0.36)	(0.00)	(-1.13)	(-1.11)		
					-.0087	.0037	.0375	.0460		
					(-0.33)	(0.12)	(1.20)	(1.11)		
1950-54					7.8887*	-12.3422*	3.2278	5.0575	.3756	118
					(1.49)	(-2.00)	(0.51)	(0.69)	(0.05)	
					-.2070*	.3310*	-.0861	-.1319	-.0096	
					(-1.48)	(2.03)	(-.52)	(-.0.68)	(-0.05)	

* Significant at .10 level-one tail test.

TABLE A.6.5b

COEFFICIENTS FOR PRE-MARITAL, RURAL-URBAN MIGRATION x AGE AT MIGRATION: RURAL INTERCOUNTY NON-MIGRANT COMPARISON, MARRIED 5-9 YEARS AFTER MIGRATION.

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69						-.1149 (-0.56) .0025 (0.49)				225
1960-64						.3801 (1.13) -.0082 (-0.94)	.0581 (0.16) -.0013 (-0.14)			158
1955-59						.0767 (0.14) -.0019 (-0.12)	-.4473 (-0.77) .0135 (0.85)	-.0142 (-0.02) -.0017 (-0.09)		156
1950-54						-.0453 (-0.14) .0009 (0.09)	-.6454* (-1.75) .0197* (1.79)	.3792 (1.02) -.0120 (-1.08)	.0600 (0.12) -.0011 (-0.07)	184

* Significant at .10 level-one tail test.

TABLE A.6.5c

COEFFICIENTS FOR PRE-MARITAL, RURAL-URBAN MIGRATION x AGE AT MIGRATION: RURAL INTERCOUNTY NON-MIGRANT COMPARISON, MARRIED 10-14 YEARS AFTER MIGRATION

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69										
1960-64							.0687 (0.29) -.0039 (-0.53)			152
1955-59							.9005* (1.31) -.0352* (-1.30)	1.4555* (1.71) -.0577* (-1.72)		125
1950-54							.3135 (0.48) -.0113 (-0.49)	-.1502 (-0.22) .0053 (0.22)	-.4998 (-0.59) .0114 (0.38)	140

* Significant at .10 level-one tail test.

TABLE A.6.5d

COEFFICIENTS FOR PRE-MARITAL, RURAL-URBAN MIGRATION x AGE AT MIGRATION: RURAL INTERCOUNTY NON-MIGRANT COMPARISON, MARRIED 15-19 YEARS AFTER MIGRATION

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69										
1960-64										
1955-59								-.9131* (-2.80) .0399* (2.77)		140
1950-54								-.4535* (1.29) -.0214 (-1.19)	.0324 (0.07) .0014 (0.07)	125

* Significant at .10 level-one tail test.

394

A.6.4 <u>Coefficients for Post-Marital Rural-Urban Migration x Education Interaction Terms when the Comparison Group is Either Rural Intercounty Non-migrants or Rural-Rural Intercounty Migrants</u>.

When non-migration is defined in estimating coefficients for post-marital migration x education interaction terms as not changing the county of origin, we obtain the same results as when rural non-migration is more narrowly defined in Tables 6.30 and 6.31 of Chapter 6. This can be seen in Table A.6.6. For example, out of fifteen post-migration cases (Periods 0 - 4), the average of the husband's and wife's education increased adaptation in ten cases (the sign of $M \cdot ED_{WH}$ is negative); and, of these, five were significant. When we consider only the signs of the significant quadratic interaction terms ($M \cdot ED/M \cdot ED^2$) in Table A.6.7, we see that education increases adaptation in the migration period only. In the pre- and post-migration periods the effect of education on the migration coefficient is also similar to the pattern when the rural non-migrant comparison group is used.

When we compare rural-urban migrants to rural-rural migrants (who changed their county of origin) in Table A.6.8, we still observe support for the hypothesis that more educated individuals adapt more rapidly, although the support is slightly weaker than when the comparison group is rural intercounty non-migrants. For example, out of the fifteen post-migration cases (Periods 0-4) nine had the wife's education increasing the rate of adaptation (negative sign for $M \cdot ED_W$), of which three were significant. This compares to eleven correct signs, of which four were significant, when the comparison group was rural non-migrants. When the average of the wife's and the husband's education is used, nine post-migration cases in Table A.6.8 had the correct sign, of which only two were significant. This compares to ten and five, respectively, in Table A.6.6 where the comparison group is rural non-migrants. The signs of the significant quadratic cases ($M \cdot ED/M \cdot ED^2$) for the rural-rural migrant comparison group, Table A.6.9, show a similar pattern to the rural non-migrant comparison cases.

TABLE A.6.6

COEFFICIENTS FOR POST-MARITAL MIGRATION x EDUCATION INTERACTION TERMS: RURAL INTERCOUNTY NON-MIGRANT COMPARISON, CONTROLLED FOR DURATION OF MARRIAGE RESTRICTION

MIGRANT COHORT	BEFORE MIGRATION					AFTER MIGRATION				SAMPLE SIZE N
	-4	-3	-2	-1	0	1	2	3	4	
1970-74	M x Wife Education			-.0220	-.0491*					
				(-1.16)	(-2.50)					
	M x Husband Education			.0125	-.0121					
				(0.82)	(-0.79)					
	M x Wife+Husband Education			-.0005	-.0162*					
				(-0.05)	(-1.70)					
1965-69				-.0054	.0026	-.0379*				
				(-0.28)	(0.13)	(-1.73)				
				-.0202	-.0099	-.0415*				
				(-1.15)	(-0.56)	(-2.14)				
				-.0088	-.0028	-.0257*				
				(-0.84)	(-0.27)	(-2.21)				
1960-64				.0001	-.0423*	-.0205	.0124			
				(0.00)	(-1.89)	(-0.85)	(0.50)			
				.0000	-.0273*	-.0144	-.0084			
				(0.00)	(-1.35)	(-0.67)	(-0.38)			
				.0000	-.0214*	-.0108	.0006			
				(0.00)	(-1.80)	(-0.85)	(0.04)			
1955-59				.0232	.0137	.0402	-.0111	-.0570*		
				(0.71)	(0.41)	(1.14)	(-0.28)	(-1.70)		
				-.0198	.0207	.0075	.0158	-.0373		
				(-0.67)	(0.69)	(0.24)	(0.44)	(-1.23)		
				-.0003	.0113	.0143	.0024	-.0298*		
				(-0.02)	(0.67)	(0.76)	(0.11)	(-1.65)		
1950-54				.0254	-.0595	.0789*	-.0503	-.0016	-.0225	
				(0.53)	(-0.99)	(1.42)	(-0.86)	(-0.03)	(-0.44)	
				.0334	-.0104	-.0147	-.0752*	-.0042	-.0325	
				(0.84)	(-0.21)	(-0.31)	(-1.54)	(-0.08)	(-0.77)	
				.0186	-.0188	-.0148	-.0400*	-.0020	-.0175	
				(0.77)	(-0.63)	(0.52)	(-1.36)	(-0.06)	(-0.69)	

*Significant at .10 level-one tail test.

Model: $y_t = f(y_{t-1}, A_t, A_t^2, D_t, D_t^2, M, MORT, M \times S)$

TABLE A.6.7

SIGNIFICANT (AT 10%) SIGNS FOR MIGRATION x EDUCATION AND MIGRATION x EDUCATION SQUARED: RURAL INTERCOUNTY NON-MIGRANT COMPARISON, CONTROLLED FOR DURATION OF MARRIAGE RESTRICTIONS

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	Education/Education^2			(Wife) (Husband) (W + H)						
1965-69					-/+					
1960-64				+/-	-/+	+/-				
1955-59					-/+	+/-	-/+			
1950-54				+/- +/-		-/+				

* Significant at .10 level-one tail test.

Model: $y_t = f(y_{t-1}, A_t, A_t^2, D_t, D_t^2, M, MORT, M \times S, M \times S^2)$

TABLE A.6.8

COEFFICIENTS FOR POST-MARITAL MIGRATION x EDUCATION INTERACTION TERMS: RURAL-RURAL INTERCOUNTY MIGRANT COMPARISON

MIGRANT COHORT		BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	$M \cdot S_W$				-.0221	-.0401*					
					(-1.13)	(-2.10)					
	$M \cdot S_H$				.0091	-.0057					
					(0.60)	(-0.38)					
	$M \cdot S_{WH}$				-.0016	-.0115					
					(-0.17)	(-1.25)					
1965-69					-.0019	.0026	-.0317*				
					(-0.10)	(0.13)	(-1.48)				
					-.0195	-.0102	-.0323*				
					(-1.11)	(-0.56)	(-1.71)				
					-.0076	-.0029	-.0206*				
					(-0.72)	(-0.27)	(-1.81)				
1960-64					-.0037	-.0353*	-.0063	.0139			
					(-0.17)	(-1.56)	(-0.26)	(0.59)			
					-.0007	-.0250	-.0081	-.0008			
					(-0.03)	(-1.23)	(-0.37)	(-0.04)			
					-.0013	-.0186*	-.0046	.0036			
					(-0.11)	(-1.55)	(-0.36)	(0.29)			
1955-59					.0173	-.0033	.0392	-.0052	-.0417		
					(0.52)	(0.09)	(1.08)	(-0.13)	(-1.26)		
					-.0292	.0129	.0053	.0207	-.0374		
					(-0.98)	(0.40)	(0.16)	(0.58)	(-1.25)*		
					-.0053	.0055	.0132	.0058	-.0253*		
					(-0.30)	(0.29)	(0.68)	(0.27)	(-1.43)		
1950-54					.0047	-.0773	.0541	-.0138	.0272	.0005	
					(0.10)	(-1.26)	(0.88)	(-0.24)	(0.43)	(0.01)	
					.0159	-.0282	-.0312	-.0432	.0190	-.0164	
					(0.39)	(-0.55)	(-0.61)	(-0.89)	(0.35)	(-0.44)	
					.0070	-.0297	.0024	-.0191	.0137	-.0058	
					(0.29)	(-0.97)	(0.08)	(-0.66)	(0.43)	(-0.26)	

* Significant at .10 level-one tail test.

399

TABLE A.6.9

SIGNIFICANT (AT 10%) SIGNS: FOR MIGRATION x EDUCATION AND MIGRATION x EDUCATION SQUARED: RURAL-RURAL INTERCOUNTY MIGRANT COMPARISONS, CONTROLLED FOR DURATION OF MARRIAGE RESTRICTIONS

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
	S_W/S_W^2									
1970-74	S_H/S_H^2									
	S_{WH}/S_{WH}^2									
1965-69					-/+					
					-/+	+/-				
1960-64				+/-						
				+/-	-/+					
							-/+			
1955-59					-/+	+/-				
						-/+				
1950-54				+/-						
				+/-		-/+				

* Significant at .10 level-one tail test.

A.6.5 Education and Selectivity for Pre-Marital Migrants

One would expect that more-educated pre-marital migrants are slightly more adaptive to urban life than less-educated pre-marital migrants. As suggested earlier, pre-marital migrants who marry soon after migration may exhibit higher fertility immediately after migration than their rural counterparts if they are migrating in order to marry and feel compelled to make up for "lost" marital exposure. More educated women may also compress childbearing in order to reduce the opportunity cost of childbearing. These two effects may combine and cause more-educated women who marry immediately after migration to have higher fertility initially after marrying than their rural counterparts. However, for women who wait longer to marry after migration, education may result in greater adaptation. We would expect a (Migration × Education) interaction term to be more negative the longer pre-marital migrants waited after migration to marry. Tables A.6.10a through A.6.10d suggest this may be true. Table A.6.10a shows the (Migration × Education) coefficients for women married 0-4 years after migration to the urban area. Out of fifteen (Migration × Wife's Education) coefficients, $M \cdot S_W$, only seven were negative, of which one was significant; two were significantly positive. However, eight of ten cases in Table A.6.10b were negative, and two of these were significantly negative. Generally, the share of negative cases and the share of these which are significantly negative increase with the length of urban residence prior to marriage. The same principle holds when husband's education and the couple's average education are used in interaction with the migration variable.

However, it is important to warn that the evidence for pre-marital migrants in Tables A.6.10a through A.6.10d should be interpreted cautiously. As mentioned earlier, higher education levels for some pre-marital migrants could be the

TABLE A.6.10a.

COEFFICIENTS FOR PRE-MARITAL, RURAL-URBAN MIGRATION x EDUCATION INTERACTION: RURAL NON-MIGRANT COMPARISON, MARRIED 0-4 YEARS AFTER MIGRATION

MIGRANT COHORT		BEFORE MIGRATION -4	-3	-2	-1	AFTER MIGRATION 0	1	2	3	4	SAMPLE SIZE N
1970-74	$M \cdot S_W$					.0137 (0.57)					162
	$M \cdot S_H$					-.0047 (-0.26)					
	$M \cdot S_{WH}$					.0012 (0.11)					
1965-69						.0159 (0.64)	.0144 (0.41)				124
						.0169 (1.06)	.0012 (0.05)				
						.0103 (0.98)	.0032 (0.21)				
1960-64						.0964* (2.40)	.0249 (0.59)	-.0329 (-0.62)			112
						.0395 (1.24)	.0336 (1.04)	-.0439 (-1.08)			
						.0338* (1.82)	.0169 (0.88)	-.0221 (-0.92)			
1955-59						-.0107 (-0.37)	-.0143 (-0.37)	-.0985* (-2.77)	-.0191 (-0.38)		138
						-.0050 (-0.21)	-.0252 (-0.77)	-.0835* (-2.84)	.0171 (0.41)		
						-.0043 (-0.31)	-.0122 (-0.64)	-.0528* (-3.05)	.0013 (0.05)		
1950-54						.0027 (0.05)	.0011 (0.02)	.0834* (1.31)	-.0832 (-1.00)	-.0424 (-0.60)	87
						-.0498 (-0.94)	-.0601 (-0.84)	-.0751 (-1.21)	-.0364 (-0.45)	-.0579 (-0.85)	
						-.0157 (-0.51)	-.0194 (-0.47)	.0013 (0.04)	-.0360 (-0.80)	-.0315 (-0.81)	

* Significant at .10 level-one tail test

TABLE A.6.10b.

COEFFICIENTS FOR PRE-MARITAL, RURAL-URBAN MIGRATION x EDUCATION INTERACTION COEFFICIENTS: RURAL NON-MIGRANT COMPARISON, MARRIED 5-9 YEARS AFTER MIGRATION

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69	M x S_W					-.0322*				171
						(-1.54)				
	M x S_H					-.0557*				
						(-3.37)				
	M x S_{WH}					-.0285*				
						(-2.80)				
1960-64						-.0183	.0205			103
						(-0.70)	(0.56)			
						.0033	-.0149			
						(0.14)	(-0.48)			
						-.0036	.0001			
						(-0.27)	(0.00)			
1955-59						.0614	-.1022*	-.0238		118
						(1.23)	(-1.97)	(-0.37)		
						-.0076	-.1115*	-.0275		
						(-0.18)	(-2.54)	(-0.50)		
						.0148	-.0727*	-.0176		
						(0.55)	(-2.66)	(-0.51)		
1950-54						-.0000	-.0123	-.0160	-.0118	130
						(-0.0)	(-0.30)	(-0.40)	(-0.23	
						.0170	.0306	-.0309	-.0283	
						(0.61)	(0.89)	(-0.95)	(-0.66	
						.0061	.0078	-.0152	-.0130	
						(0.36)	(0.38)	(-0.77)	(-0.50	

* Significant at .10 level-one tail test

TABLE A.6.10c.

COEFFICIENTS FOR PRE-MARITAL, RURAL-URBAN MIGRATION x EDUCATION INTERACTION COEFFICIENTS: RURAL NON-MIGRANT COMPARISON, MARRIED 10-14 YEARS AFTER MIGRATION

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69										
1960-64	$Mx\,S_W$ $Mx\,S_H$ $Mx\,S_{WH}$						-.0149 (-0.46) -.0237 (-0.90) -.0113 (-0.74)			98
1955-59							-.0568* (-1.56) -.0873* (-2.05) -.0398* (-1.90)	-.0838* (-1.61) -.1103* (-1.77) -.0546* (-1.80)		70
1950-54							.0145 (0.32) -.0002 (-0.01) .0032 (0.15)	.0108 (0.23) .0110 (0.28) .0061 (0.27)	-.0389 (-0.65) -.0145 (-0.29) -.0136 (-0.48)	

* significant at .10 level-one tail test

404

TABLE A.6.10d.

COEFFICIENTS FOR PRE-MARITAL, RURAL-URBAN MIGRATION x EDUCATION INTERACTION COEFFICIENTS: RURAL NON-MIGRANT COMPARISON, MARRIED 15-19 YEARS AFTER MIGRATION

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69										
1960-64										
1955-59	$M \cdot S_W$ $M \cdot S_H$ $M \cdot S_{WH}$							-.1424* (-2.02) -.0881* (-1.44) -.0662* (-1.86)		
1950-54								.0314 (0.48) -.0099 (-0.22) .0018 (0.06)	-.0184 (-0.20) -.0050 (-0.08) -.0053 (-0.14)	

* Significant at .10 level-one tail test

1105

result of the adaptation to urban life rather than reflecting higher selectivity of migrants. Particularly, if migrants who delayed marriage waited long after migration to further their schooling in urban environments, the conclusions drawn above from Tables A.6.10a through A.6.10d could be invalid.

A.6.6 Additional Results on 1974 Earnings and Rates of Adaptation

When we define non-migration as not changing the county of residence, we see a more consistent effect of earnings on adaptation than when non-migration is more narrowly defined. Using the husband's earnings in 1974, in thirteen cases the effect of earnings was to slow the rate of adaptation, and five of these cases were significant, as Table A.6.11 shows. For the wife's earnings, thirteen cases showed higher earnings increasing the rate of adaptation, but only two were significant. This is the type of pattern we would expect. The husband's earnings, being primarily an income effect, should slow adaptation; while the wife's earnings, being a substitution effect, should speed adaptation. The average of the husband's and wife's earnings does not have a consistent effect on adaptation. Apparently the income and substitution effects cancel out.

When rural-rural intercounty migrants are used as the comparison group, Table A.6.12 shows that the effect of earnings in adaptation is the same as when the comparison group is rural intercounty non-migrants.

For pre-marital migrants, husband's earnings seem to have a greater effect on adaptation than wife's earnings. For example, in Table A.6.13a, out of fifteen cases in which the wife had waited 0-4 years after migration to marry, the husband's income had an inhibiting effect on adaptation in six cases, but only two cases were significant. However, in four cases the husband's earnings significantlly increased adaptation (the interaction term was negative). In Table A.6.13b, among women who waited to marry 5-9 years after

TABLE A.6.11.

COEFFICIENTS FOR POST-MARITAL MIGRATION x EARNINGS IN 1974 INTERACTION: RURAL INTERCOUNTY NON-MIGRANT COMPARISON, CONTROLLED FOR DURATION OF MARRIAGE RESTRICTION

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	M x W_W			-.0072*	.0001					
				(-2.64)	(0.04)					
	M x W_H			.0055*	.0009					
				(1.50)	(0.26)					
	M x W_{WH}			-.0026	.0009					
				(-1.19)	(0.19)					
1965-69				.0083*	-.0068	-.0059				
				(1.38)	(-1.10)	(-0.87)				
				-.0039	.0065*	-.0044				
				(-0.86)	(1.42)	(-0.89)				
				.0005	.0018	-.0051				
				(0.14)	(0.49)	(-1.26)				
1960-64				-.0079*	.0048	-.0012	-.0026			
				(-1.41)	(0.80)	(-0.19)	(-0.39)			
				-.0012	.0045	.0030	.0087*			
				(-0.31)	(1.02)	(0.64)	(1.81)			
				-.0031	.0040	.0013	.0041			
				(-1.01)	(1.20)	(0.38)	(1.14)			
1955-59				-.0033	.0016	.0061	.0143	-.0036		
				(-0.34)	(0.17)	(0.59)	(1.23)	(-0.37)		
				.0024	.0104*	.0033	.0006	.0006		
				(0.40)	(1.71)	(0.51)	(0.08)	(0.10)		
				.0009	.0084*	.0043	.0048	-.0006		
				(0.17)	(1.59)	(0.77)	(0.75)	(-0.11)		
1950-54				-.0058	.0056	-.0070	-.0021	-.0027	.0026	
				(-0.66)	(0.50)	(-0.67)	(-0.19)	(-0.23)	(0.28)	
				-.0163	.0236	.0510*	-.0233	-.0158	-.0029	
				(-0.58)	(0.67)	(1.55)	(-0.67)	(-0.42)	(-0.10)	
				-.0081	.0086	-.0022	-.0048	-.0077	.0026	
				(-0.88)	(0.75)	(-0.20)	(-0.42)	(-0.38)	(0.26)	

Significant at .10 level-one tail test

407

TABLE A.6.12.

COEFFICIENTS FOR POST MARITAL MIGRATION x EARNINGS IN 1974
INTERACTION: RURAL INGERCOUNTY MIGRANT COMPARISON,
CONTROLLED FOR DURATION OF MARRIAGE RESTRICTION

MIGRANT COHORT		BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74	M x W_W				-.0066*	-.0004					
					(-2.34)	(-0.14)					
	M x W_H				.0067*	.0007					
					(1.80)	(0.18)					
	M x W_{WH}				-.0017	-.0000					
					(-0.78)	(-0.00)					
1965-69					.0095*	-.0063	-.0058				
					(1.58)	(-1.00)	(-0.89)				
					-.0040	.0067*	-.0029				
					(-0.89)	(1.44)	(-0.60)				
					.0009	.0022	-.0041				
					(0.24)	(0.57)	(-1.03)				
1960-64					-.0074	.0043	-.0012	-.0023			
					(-1.26)	(0.71)	(-0.19)	(-0.36)			
					-.0011	.0040	.0016	.0081*			
					(-0.27)	(0.90)	(0.34)	(1.77)			
					-.0029	.0036	.0005	.0039			
					(-0.90)	(1.07)	(0.15)	(1.13)			
1955-59					-.0041	.0051	.0042	.0139	-.0066		
					(-0.42)	(0.48)	(0.39)	(1.18)	(-0.67)		
					.0019	.0103*	.0012	-.0002	.0011		
					(0.32)	(1.55)	(0.18)	(-0.03)	(0.18)		
					.0003	.0094*	.0022	.0040	-.0011		
					(0.05)	(1.63)	(0.37)	(0.62)	(-0.20)		
1950-54					-.0046	.0066	-.0086	-.0021	-.0013	.0022	
					(-0.51)	(0.58)	(-0.75)	(-0.19)	(-0.10)	(0.26)	
					-.0192	.0212	.0511*	-.0055	-.0183	.0005	
					(-0.67)	(0.59)	(1.40)	(-0.16)	(-0.48)	(0.02)	
					-.0071	.0096	-.0039	-.0029	-.0033	.0024	
					(-0.75)	(0.80)	(-0532)	(-0.25)	(-0.27)	(0.28)	

* Significant at .10 level-one tail test

TABLE A.6.13a.

COEFFICIENTS FOR PRE-MARITAL, RURAL-URBAN MIGRATION x EARNINGS IN 1974 INTERACTION: RURAL NON-MIGRANT COMPARISON, MARRIED 0-4 YEARS AFTER MIGRATION

MIGRANT COHORT		BEFORE MIGRATION -4	-3	-2	-1	AFTER MIGRATION 0	1	2	3	4	SAMPLE SIZE N
1970-74	$M \times W_W$					-.0023					
						(-0.55)					
	$M \times W_H$					-.0563*					
						(-1.83)					
	$M \times W_{WH}$					-.0034					
						(-0.80)					
1965-69						-.0273	-.0201				
						(-0.58)	(-0.30)				
						.0199	.0613 *				
						(0.69)	(1.47)				
						.0068	.0385				
						(0.27)	(1.09)				
1960-64						.0448	.0270	.0390			
						(0.37)	(0.22)	(0.26)			
						.0131*	.0074	-.0032			
						(1.38)	(0.77)	(-0.26)			
						.0136*	.0077	-.0030			
						(1.42)	(0.80)	(-.24)			
1955-59						.0007	-.0126	-.0043	.0134		
						(0.09)	(-1.18)	(-0.43)	(1.01)		
						-.0005	-.0088*	-.0089*	-.0027		
						(-0.11)	(-1.30)	(-1.41)	(-0.32)		
						-.0002	-.0108*	-.0083*	.0022		
						(-0.04)	(-1.87)	(-1.50)	(0.29)		
1950-54						-.0222	.2426	-.2066	-.1766	.0257	
						(-0.14)	(1.17)	(-1.15)	(-0.77)	(0.13)	
						-.2240*	.0016	-.0661	.0924	-.0889	
						(-2.45)	(0.01)	(-0.59)	(0.65)	(-0.74)	
						-.1870*	.0802	-.1154	.0204	-.0637	
						(-2.27)	(0.67)	(-1.17)	(0.16)	(-0.59)	

* Significant at .10 level-one tail test

409

TABLE A.6.13b.

COEFFICIENTS FOR PRE-MARITAL, RURAL-URBAN MIGRATION x EARNINGS IN 1974
INTERACTION: RURAL NON-MIGRANT COMPARISON, MARRIED
5-9 YEARS AFTER MIGRATION

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69	M x W_W					-.0069				
						(-0.99)				
	M x W_H					.0087*				
						(2.04)				
	M x W_{WH}					.0045				
						(1.21)				
1960-64						-.0541	.0334			
						(-1.23)	(0.54)			
						.0105*	.0085			
						(2.04)	(1.16)			
						.0096*	.0089			
						(1.88)	(1.22)			
1955-59						.0949*	-.0406	-.1356*		
						(1.52)	(-0.61)	(-1.74)		
						.1471*	-.0492	.0628		
						(2.71)	(-0.81)	(0.89)		
						.1804*	-.0711*	-.0370		
						(3.80)	(-1.28)	(-0.58)		
1950-54						.0333	-.1170	.0601	.0623	
						(0.40)	(-1.15)	(0.62)	(0.49)	
						.0168	.0172	.0011	-.0016	
						(0.47)	(0.40)	(0.02)	(-0.03)	
						.0234	-.0037	.0131	.0097	
						(0.65)	(-0.08)	(0.30)	(0.18)	

* Significant at .10 level-one tail test

TABLE A.6.13c.

COEFFICIENTS FOR PRE-MARITAL, RURAL-URBAN MIGRATION x EARNINGS IN 1974 INTERACTION: RURAL NON-MIGRANT COMPARISON, MARRIED 10-14 YEARS AFTER MIGRATION *

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69										
1960-64	M x W_W M x W_H M x W_{WH}						-.0389 (-0.71) .0016 (0.03) -.0241 (-0.55)			
1955-59							-.0143 (-0.43) .0028 (0.38) .0022 (0.29)	-.0286 (-0.61) .0091 (0.87) .0079 (0.74)		
1950-54							.0345 (0.23) .0037 (0.10) .0073 (0.17)	-.0670 (-0.43) -.0190 (-0.48) -.0287 (-0.65)	-.0991 (-0.50) -.0383 (-0.76) -.0551 (-0.99)	

* Significant at .10 level-one tail test

TABLE A.6.13d.

COEFFICIENTS FOR PRE-MARITAL, RURAL-URBAN MIGRATION x EARNINGS IN 1974 INTERACTION: RURAL NON-MIGRANT COMPARISON, MARRIED 15-19 YEARS AFTER MIGRATION

MIGRANT COHORT	BEFORE MIGRATION -4	-3	-2	-1	0	AFTER MIGRATION 1	2	3	4	SAMPLE SIZE N
1970-74										
1965-69										
1960-64										
1955-59	M x W_W M x W_H M x W_{WH}							-.0826* (-2.72) -.0030 (-0.41) -.0073 (-1.01)		
1950-54								.1828* (1.33) -.0297 (-0.49) .0049 (0.08)	.3010* (1.57) -.1266* (-1.51) -.0637 (-0.78)	

* Significant at .10 level-one tail test

migration, the husband's earnings had an inhibiting effect on adaptation in eight of ten cases; and in three of these cases the effect was significant. In none of these tables could we find a consistent effect of wife's earnings on adaptation.

When we used the intercounty definition of migration, we observed even fewer consistent patterns of the effect of earnings on adaptation of pre-marital migrants. Due to the weak results using this definition, we do not include the results from these regressions.

A.6.7 Additional Test Results on Hypothesis 5

Table A.6.14 presents the average values of city environmental variables for our three city size classes in the first three columns. These environmental variables derived from the one percent data tape of the 1970 Population Census Ten-Percent Sample Survey include average years of schooling for adult men and women, average child mortality rates, average teenager school enrollment rates, average share of teenagers working in non-agricultural sectors, women's labor force participation rates, average months per year worked by women, and the share of women working in jobs incompatible with childbearing and childrearing activities in the current (urban) residence of migrants. The last three columns of Table A.6.14 present the average values of environmental variables for each of three one-third groupings. The rural-urban migrant sample was divided into three groups of equal size according to each city characteristic variable. The top one-third included women who migrated to cities where environmental characteristics were least inclined to promote high fertility (for example, lowest child morality rates) and the lowest one-third included women who migrated to cities that least discouraged high fertility (for example, highest child mortality rate).*

*It should be noted here that migrants to Seoul (40 percent of total migrants) were somewhat arbitrarily distributed into two adjoining one-third groups.

TABLE A.6.14.

AVERAGE VALUES OF CITY CHARACTERISTICS VARIABLES
FOR THE CURRENT RESIDENCE COMMUNITIES

City Characteristics of Current Residence Community	Seoul	Busan and Large Cities	Medium and Small Cities	Segmentation of Total Rural-Urban Migrants (1230 Women) According to City Characteristics		
				Top one-third	Mid one-third	Lower one-third
Average years of schooling for adult men and women (AYED)	9.43	8.13	7.69	9.43	8.44	7.76
Average child mortality rates (MICR)	.089	.090	.10	.084	.09	.101
Average teenagers school enrollment rates (PSA)	.453	.410	.459	.486	.441	.389
Average fraction of teenagers working in nonagricultural jobs (NAG)	.344	.362	.301	.386	.346	.288
Women's labor force participation rates (LF)	.189	.241	.287	.303	.215	.174
Average months worked by women per year (DURF)	1.96	2.34	2.77	2.96	2.13	1.78
Fraction of women working in incompatible jobs (NCF)	.157	.187	.180	.221	.162	.136
Nos. of rural-urban migrants women	490	447	293	410	410	410

Table A.6.15 reports the sums of the adjusted means of differentials in additional fertility for the post-migration periods by the city characteristics of migration destinations. This table is generated in the following way: First, the regression of Equation 5.6 was estimated using the sample of rural stayers and a one-third group of rural-urban migrants (including pre- and post-migrants) according to one of six environmental characteristics for their migration destination. Second, the estimated coefficients on the migratio dummy variables in Equation 5.6 for all migration cohorts are regressed on the year of migration and the duration of migration dummy variables in Equation 6.7, the total number of regressions being 18 (6 city characteristics × 3 one-third groups). Finally, the adjusted means of fertility differentials adjusted for the duration of migration are obtained using the regression results of Equation 6.7. The sums of these adjusted means for the post migration period are reported in Table A.6.15.

Table A.6.15 indicates that the most powerful environmental characteristic in discouraging large family size is the average years of schooling for adult men and women in the current residence community (AYED). The women who migrated from rural to urban areas where the average schooling for the adult population is 9.4 years would have 2.7 fewer children in their completed fertility over a 34 year childbearing period than would comparable rural stayers. The migrants to cities whose average schooling is 8.1 years would have 2.0 fewer children, and migrants to cities with an average schooling of 7.7 years would have 1.6 fewer children.

Except for the average schooling variable (AYED) the middle one-third group always exhibits the most adaptation to urban family size norms and constraints. The reason for this unexpected result needs to be explored further.

TABLE A.6.15.

THE SUM OF THE ADJUSTED MEANS FOR DIFFERENTIALS IN ADDITIONAL FERTILITIES FOR THE POSTMIGRATION PERIOD OF ALL RURAL-URBAN MIGRANTS BY THE CITY CHARACTERISTICS OF MIGRATION DESTINATIONS

City Characteristics Variables	Segmentation of Rural-Urban Migrants			Difference Between Top and Lower One-Third Groups
	Top One-Third	Mid One-Third	Lower One-Third	
AYED	-2.737	-2.04	-1.564	- 1.173
MICR	-2.105	-2.374	-1.562	- .543
PSA	-1.848	-2.242	-1.894	+ .046
NAG	-1.758	-2.566	-1.698	- .06
LF	-1.784	-2.92	-1.362	- .422
DURF	-1.95	-2.55	-1.436	- .514
NCF	-1.907	-2.779	-1.257	- .65

However, the last column of Table A.6.15, reporting the differences in the sums of the adjusted means of fertility differentials between top and lower one-third groups, indicates that cities with higher adult education levels, lower child mortality rates, and greater opportunities for women's labor force participation in child incompatible jobs would encourage migrants to have smaller family sizes. The differences in values between top and lower one-third groups for these characteristics variables are -1.2, -.5, -.4, -.5 and -.7 children for AYED, MICR, LF, DURF and NCF, respectively.

A comparison of the first three columns and the last three columns of Table A.6.14 reveals that for only one environmental variable, average schooling of adult population (AYED), the size class of cities is directly related to the characteristics encouraging small family size. Environmental variables related to women's job opportunities, such as LF and DURF, reveal an inverse relationship between city size class and characteristics encouraging small family size.

APPENDIX TO CHAPTER 9

Tables A.9.1 - A.9.12 give the data on the children ever born and the proportions of married persons among men and women classified by age, education level, current residence, migration status, place of origin and labor force participation status. Tables A.9.13 - A.9.25 give the results of regressing fertility and proportion of marriage on such factors as age, education level, occupational status, migration status, number of child deaths experienced, etc. The meanings of variables used in equations for Tables A.9.13 - A.9.25 follow. Each of the dummy variables has a value of one when the condition it represents is fulfilled; it is zero otherwise.

Dummy Variable	Meaning
N1	Dummy variable representing less than one year of schooling.
N2	Represents 1-6 years of schooling. This variable is suppressed in the regression equation to avoid singularity of the X matrix.
N3	7-9 years of schooling
N4	10-12 years of schooling
N5	More than 12 years of schooling
COMP	Dummy variable representing participation in occupations compatible with childbearing and childrearing. This includes all agricultural workers and family workers in all occupational sectors except the following three sectors: professional, and technical workers; Administrative and managerial workers; and clerical and related workers
NC	Participation in an incompatible occupation
NOLAB	Represents no participation in labor force. This variable is suppressed for the statistical reasons stated earlier.

RMIG (tables A.9.13 - A.9.19)	Dummy variable representing migration from rural to urban areas within the last five years.
LMIG (tables A.9.13 - A.9.19)	Long term migration, representing migration from rural to urban areas more than 5 years ago.
Urban Native	The variable suppressed in tables A.9.13 - A.9.17; Urban natives for Seoul and Busan are non-migrants only, but urban natives for Large, Medium and Small cities include non-migrants and migrants within the size class of cities.
Rural Stayers	The variable suppressed in tables A.9.18 and A.9.19; rural stayers include rural-rural migrants and rural non-migrants
RM1, RM2, RM3, RM4, RM5	Recent migrants from rural areas to Seoul, Busan, Large, Medium, and Small cities, respectively
LM1, LM2, LM3, LM4, LM5	Long-term migrants from rural areas to Seoul, Busan, Large, Medium, and Small cities, respectively
Rural Stayers:	Suppressed in tables A.9.20, A.9.22, A.9.23
RMIG (tables A.9.21, A.9.24 and A.9.25)	Recent rural-rural migrants
LMIG (tables A.9.21, A.9.24, and A.9.25)	Long-term rural-rural migrants
Rural nonmigrants	Suppressed in tables A.9.21, A.9.24 and A.9.25.

Continuous Variable	Meaning
AGE	Continuous variable representing age of woman
AGE2	Age squared
NDEA	Numbers of child deaths experienced

Tables A.9.1 - A.9.12 exclude all data that have less than 20 observations per classification. Tables A.9.13 - A.9.25 give the t-statistics associated with each coefficient, together with other standard statistics associated with each regression equation.

TABLE A.9.1.

CHILDREN EVER BORN OF ALL CURRENTLY MARRIED WOMEN BY AGE GROUP, EDUCATION, CURRENT RESIDENCE AND MIGRATION STATUS*

Current Residence, Migration Status and Place of Origin	20-24					25-29					30-34					35-39				
	None	Primary	Middle	High	College	None	Primary	Middle	High	College	None	Primary	Middle	High	College	None	Primary	Middle	High	College
Seoul																				
Nonmigrants		1.36	.87	.84	.56		2.01	1.86	1.54	1.29		2.93	2.99	2.55	2.28		3.93	3.76	3.56	2.18
Long term migrants																				
From rural areas		1.09	.95	.84			2.11	1.82	1.52	1.39	3.88	3.25	2.88	2.64	2.21	4.19	3.92	3.77	3.63	3.32
Recent migrants																				
From rural areas		.98	.58	.68			1.95	1.55	1.22			3.19	3.17	2.86			4.28	3.57		
Busan																				
Nonmigrants		.78	.89				2.03	2.05	1.31			3.15	3.26	2.40			3.97	4.65		
Long term migrants																				
From rural areas		1.23	1.00				2.18	1.85	1.88			3.54	3.18	2.92		4.42	4.40	4.00		
Recent migrants																				
From rural areas		.81	.76				2.07	1.27				3.03					4.55			
Large Cities																				
Stayers		.78	1.00	.57			2.03	1.93	1.59			3.35	3.09	3.13			3.78	4.05	3.55	
Long term migrants																				
From rural areas		.95	.78	.70			2.06	2.06	1.83		3.29	3.57	3.07	3.07		4.72	4.28	3.87	4.00	
Recent migrants																				
From rural areas		.93	.73				1.99	1.68				3.22					4.67			
Medium Cities																				
Stayers							2.29					3.59					4.70			
Long term migrants																				
From rural areas		1.0					2.39	2.13	2.00			3.75	3.26			5.51	4.80	4.31		
Recent migrants																				
From rural areas		.96	.85				1.90	1.63				3.25					4.42			
Small Cities																				
Stayers		1.13					2.32					3.32					4.60			
Long term migrants																				
From rural areas							2.57	1.81			3.48	3.57				5.06	4.90			
Recent migrants																				
From rural areas		1.08					2.06					3.52								
Rural Areas																				
Stayers	1.57	1.14	.81	.73		2.98	2.56	1.97	1.75		4.37	3.96	3.43	3.04		5.34	5.00	4.49	3.49	
Long term migrants																				
From medium cities												3.71					5.65			
small cities							2.47					3.77					4.85			

*Exclude cells which have less than 20 observations.

TABLE A.9.1. (Continued)

CHILDREN EVER BORN OF ALL CURRENTLY MARRIED WOMEN
BY AGE GROUP, EDUCATION, CURRENT RESIDENCE AND MIGRATION STATUS

Current Residence, Migration Status and Place of Origin	40-44				45-49			50-54	
	None	Primary	Middle	High	None	Primary	Middle	None	Primary
Seoul									
Nonmigrants		4.63	4.43	3.82	4.95	5.01	4.52		5.12
Long term migrants									
From rural areas	5.47	4.71	4.40	4.22	5.86	5.46	5.32	6.04	5.77
Recent migrants									
From rural areas		5.37			5.65	5.55			
Busan									
Nonmigrants		4.33				4.91			
Long term migrants									
From rural areas	5.08	5.12			5.70	5.90		6.32	5.38
Recent migrants									
From rural areas						5.67			
Large Cities									
Stayers	5.04	4.98			5.48	5.31			5.71
Long term migrants									
From rural areas	5.44	5.29	5.57		5.62	6.17		6.24	6.26
Recent migrants									
From rural areas		5.48							
Medium Cities									
Stayers		5.55							
Long term migrants									
From rural areas	5.68	5.46			6.44	5.91		6.38	6.34
Recent migrants									
From rural areas									
Small Cities									
Stayers	5.45	5.47			6.48				
Long term migrants									
From rural areas	6.00	5.55			6.36	5.98		5.63	
Recent migrants									
From rural areas									
Rural Areas									
Stayers	6.14	5.72	5.37		6.42	6.08	4.64	6.32	6.39
Long term migrants									
From medium cities small cities	5.27	5.42			6.40			5.88	

TABLE A.9.2.

CHILDREN EVER BORN OF CURRENTLY MARRIED WOMEN BY LABOR FORCE PARTICIPATION, AGE GROUP, CURRENT RESIDENCE, AND MIGRATION STATUS*

Current Residence, Migration Status, and Place of Origin	20-24				25-29				30-34			
	Labor Force non-Participants	Labor Force Total Participants	Participation In Compatible Occupation	Participation In Incompatible Occupation	Labor Force non-Participants	Labor Force Total Participants	Participation In Compatible Occupation	Participation In Incompatible Occupation	Labor Force non-Participants	Labor Force Total Participants	Participation In Compatible Occupation	Participation In Incompatible Occupation
Seoul												
Nonmigrants	.905	1,250			1,717	1,491	1,611	1.429	2.743	2.688	3.583	2.389
Long term migrants												
From medium cities					1.977				2.973			
small cities					1.600				3.000			
rural areas	.988	1.167		.857	1,936	1.608	2,077	1.447	3.083	2.814	3.056	2.707
Recent migrants												
From rural areas	.826	.826	.900	.769	1,738	1.300		1,313	3.138	3.556		3.409
Busan												
Nonmigrants	.885	.300			1.790	2.087			3.1[illegible]	2.792	3.200	2.500
Long term migrants												
From rural areas	1.174				2.033	2,304		2,067	3.438	3.125	3.769	2.684
Recent migrants												
From rural areas	.788				1.864				2.972			
Large Cities												
Stayers	.798				1,898	1,552	2,364	1.056	3.204	3.176	3.632	2.600
Long term migrants												
From rural areas	.867	.800			2,055	1.903	2.000	1,750	3.410	3.188	3.625	2.925
Recent migrants												
From rural areas	[illegible]	.643			1,842	1,808	2,091	1,600	3.265	2.926	3.545	2.500
Medium Cities												
Stayers	1.120	.545			2.100	2,375	2,467		3.673	3.059	3.000	
Long term migrants												
From rural areas	1.000				2,296	2,091			3.578	3.118	3.733	2.632
Recent migrants												
From rural areas	.952	.833			1,845	1.636	1.364	1,909	3.406	2.667		2.500
Small Cities												
Stayers	1,085	1,200			2.138	2,250	2.438		3.183	3.250	3.400	
Long term migrants												
From rural areas	1.074				2,415	2,158	2,538		3.580	3.690	3.429	3.933
Recent migrants												
From rural areas	.851				1.743	2,412			3.487			
Rural Areas												
Stayers	1.063	1.215	1,236	.950	2.443	2,648	2.679	2.204	3.872	4.154	4.187	3.669
Long term migrants												
From Seoul					2,097				2.971	3.500		
Medium cities					2,385	2,643	2,538		3.375	3.846	3.818	
Small cities					2.545	2,192	2,167		3.528	3.939	4.269	
Recent migrants												
From Seoul					1.097							
Small cities					1.143							
Return migrants from Seoul	1.000	.800			1.465				2.029			

TABLE A.9.2. (continued)

CHILDREN EVER BORN OF CURRENTLY MARRIED WOMEN BY LABOR FORCE PARTICIPATION, AGE GROUP, CURRENT RESIDENCE, AND MIGRATION STATUS*

Current Residence, Migration Status, and Place of Origin	35-39				40-44				45-49			
	Labor Force		Participation In		Labor Force		Participation In		Labor Force		Participation In	
	non-Participants	Total Participants	Compatible Occupation	Incompatible Occupation	non-Participants	Total Participants	Compatible Occupation	Incompatible Occupation	non-Participants	Total Participants	Compatible Occupation	Incompatible Occupation
Seoul												
Nonmigrants	3.737	3.071	3.750	2.886	4.371	3.688		3.333	4.807	5.000		4.000
Long term migrants												
From medium cities	3.750											
small cities	4.054											
rural areas	3.829	3.961	4.000	3.945	4.679	4,460	4,684	4.364	5.441	5.537	5.846	5.393
Recent migrants												
From rural areas	4.179	4.100		3.765	4.985	5.000		3,700	5.296	5.933		6.000
Busan												
Nonmigrants	4.021	4.471		4.231	4,410	4,350		3.846	4.822	5.636		
Long term migrants												
From rural areas	4,187	4.833	4,900	4.808	4.958	5,282		5,200	6.082	4.857		4.700
Recent migrants												
From rural areas	4.706	3.000		3,000								
Large Cities												
Stayers	3.845	3.767	4,563	2,857	4.462	5.917	6.188		5.046	5.950	5.769	
Long term migrants												
From rural areas	4.170	4.508	4,652	4.421	5.105	5,585	5.640	5,536	6.140	5.472	6.000	4.643
Recent migrants												
From rural areas	4.571	4.474		4,333	6.200	-4,636			5.000	5.400		
Medium Cities												
Stayers	4.744	5.050	5.462		5.757	5,000						
Long term migrants												
From rural areas	4.824	4.696	4,719	4,667	5,459	5.625	6,364	5,000	5.953	6.372	6.273	6.476
Recent migrants												
From rural areas	4.884				4.720							
Small Cities												
Stayers	4.517	4.545	4,813		5.475	5,095	5.471		6.357	5.786	6.091	
Long term migrants												
From rural areas	4.683	5.162	5.474	4,833	5.417	6,174	6.350		6.156	6.053	6.539	
Recent migrants												
From rural areas												
Rural Areas												
Stayers	4.967	5.214	5,267	4.605	5,862	6,051	6,093	5.516	6.200	6.419	6.459	5.843
Long term migrants												
From Seoul	4.643											
Medium cities	4.700	5.667	5.727		4,000	5,895	6.000					
Small cities	4.743	4.935	5.036		4.960	5,455	5.643		5.636	7.176	7.176	
Recent migrants												
From Seoul												
Small cities												
Return migrants from Seoul												

*Exclude cells which have less than 30 observations for all labor force participation statuses. However, the table includes cells which have more than 9 observations in each participation category.

TABLE A.9.2. (continued)

CHILDREN EVER BORN OF CURRENTLY MARRIED WOMEN BY LABOR FORCE PARTICIPATION, AGE GROUP, CURRENT RESIDENCE, AND MIGRATION STATUS*

Current Residence, Migration Status, and Place of Origin	50-54			
	Labor Force		Participation In	
	non-Participants	Total Participants	Compatible Occupation	Incompatible Occupation
Seoul				
Nonmigrants	5.280			
Long term migrants				
From medium citied				
small cities				
rural cities	5.830	6.111		5.900
Recent migrants				
From rural areas	5.516			
Busan				
Nonmigrants				
Long term migrants				
From rural areas	5.714	6.800	7.667	5,500
Recent migrants				
From rural areas				
Large Cities				
Stayers	5.913			
Long term migrants				
From urual areas	6.375	5,722		
Recent migrants				
From urual areas				
Medium Cities				
Stayers				
Long term migrants				
From rural areas	6.443	5.957	5,571	
Recent migrants				
From rural areas				
Small Cities				
Stayers	6.619	7,364		
Long term migrants				
From rural areas	5.647	4.933	4.727	
Recent migrants				
From rural areas				
Rural Areas				
Stayers	6.212	6.416	6,449	5,642
Long term migrants				
From Seoul				
Medium cities				
Small cities	5,385	5.667	5.700	
Recent migrants				
From Seoul				
Small cities				
Return migrants form Seoul				

*Exclude cells which have less than 30 observations for all labor force participation statuses. However, the table includes cells which have more than 9 observations in each participation category.

TABLE A.9.3.

DISTRIBUTION OF ALL CURRENTLY MARRIED WOMEN IN 1% SAMPLE BY AGE GROUP, CURRENT RESIDENCE, MIGRATION STATUS, AND PLACE OF ORIGIN*

Current Residence Migration Status and Place of Origin	Age Groups						
	20-24	25-29	30-34	35-39	40-44	45-49	50-54
Seoul	1058	2202	1943	1551	1059	694	419
Nonmigrants	213	491	422	310	221	151	83
Longterm Migrants from Medium Cities		50	40	34			
Small Cities		45	57	46			
Rural Areas	265	677	736	602	421	254	153
Recent Migrants from Rural Areas	334	425	245	154	84	59	37
Busan	404	710	677	522	385	266	129
Nonmigrants	97	166	135	112	81	56	
Longterm Migrants from Rural Areas	90	237	274	218	182	126	59
Recent Migrants from Rural Areas	140	132	80	48			
Large Cities	461	890	909	749	471	353	220
Stayers	103	205	196	159	102	85	54
Longterm Migrants from Rural Areas	93	285	369	331	225	150	114
Recent Migrants from Rural Areas	172	203	125	89	46	31	
Medium Cities	278	519	498	446	345	219	158
Stayers	36	84	66	63	52		
Longterm Migrants from Rural Areas	65	170	207	221	170	128	93
Recent Migrants from Rural Areas	95	132	79	52	32		
Small Cities	200	356	381	318	245	168	102
Stayers	57	85	91	80	61	42	32
Longterm Migrants from Rural Areas	30	113	148	163	130	83	49
Recent Migrants from Rural Areas	82	91	48				
Rural Areas	2695	4880	5649	5081	4025	3287	2443
Stayers	2384	4305	5078	4628	3695	3043	2264
Longterm Migrants from Seoul		37	45	37			
Medium Cities		40	37	32	36		
Small Cities		59	86	66	58	39	34
Recent Migrants from Seoul		36					
Small Cities		30					
Return Migrants from Seoul	38	48	42				
Grand Total	5096	9557	10057	8667	6530	4987	3471

*Exclude cells which have less than 30 observations. All the observations for which any of three places, namely, current residence, residence of 5 years ago, and place of birth is not identified are deleted from our computation. However, totals for current residence categories by age groups include all observations except those which do not identify current residence.

TABLE A.9.4.

PROPORTION OF EVER MARRIED WOMEN BY AGE (18-28),
CURRENT RESIDENCE, MIGRATION STATUS, AND PLACE OF ORIGIN*

Current Residence Migration Status and Place of Origin	Ages										
	18	19	20	21	22	23	24	25	26	27	28
Seoul											
Nonmigrants	.016	.023	.087	.157	.171	.399	.459	.652	.744	.847	.879
Longterm Migrants from Rural Areas	.024	.084	.101	.245	.292	.537	.612	.705	.838	.831	.910
Recent Migrants from Rural Areas	.028	.093	.112	.295	.500	.613	.705	.755	.902	.861	.953
Busan											
Nonmigrants	.019	.0	.103	.164	.348	.438	.636	.769	.854	.884	.950
Longterm Migrants from Rural Areas	.021	.039	.147	.273	.333	.640	.70	.951	.804	.956	.984
Recent Migrants from Rural Areas	.043	.094	.297	.406	.689	.808	.885	.909			
Large Cities											
Stayers	.015	.033	.096	.197	.208	.434	.540	.737	.720	.830	.815
Longterm Migrants from Rural Areas	.012	.069	.103	.153	.235	.556	.456	.818	.900	.903	.903
Recent Migrants from Rural Areas	.025	.104	.087	.243	.578	.720	.765	.920	.929	.973	.979
Medium Cities											
Stayers	.019			.188							
Longterm Migrants from Rural Areas		.097		.323		.658		.771	.750	.923	.972
Recent Migrants from Rural Areas	.049	.061				.750	.806	.889		.917	.933
Small Cities											
Stayers	.015	.152	.105	.171	.281	.419	.677				
Longterm Migrants from Rural Areas											
Recent Migrants from Rural Areas						.861					
Rural Areas											
Stayers	.071	.134	.202	.356	.486	.631	.785	.879	.933	.951	.992

*Exclude cells which have less than 30 observations. Proportions of ever married women for Seoul nonmigrant women younger than 18 years and older than 28 years are less than 1 percent and larger than 90 percent, respectively.

NUMBER OF CURRENTLY MARRIED WOMEN IN THE 1% 1970 CENSUS SAMPLE
BY AGE, EDUCATION, CURRENT RESIDENCE AND MIGRATION STATUS*

Current Residence, Migration Status and Place of Origin	20-24					25-29					30-34				
	None	Primary	Middle	High	College	None	Primary	Middle	High	College	None	Primary	Middle	High	College
Seoul															
Nonmigrants	0	45	60	83	25	6	126	111	148	100	6	123	104	121	68
Long term migrants															
From medium cities						0	18	10	10	12	2	15	9	4	10
small cities						0	10	14	14	7	2	26	14	9	6
rural areas	4	136	76	37	12	14	334	187	111	31	33	396	173	105	29
Recent migrants															
From rural areas	10	182	101	34	7	10	225	125	51	14	18	144	47	28	8
Busan															
Nonmigrants	2	40	38	12	5	8	73	42	36	7	7	68	34	20	6
Long term migrants															
from rural areas	1	48	28	13	1	8	127	71	25	6	21	164	60	25	4
Recent Migrants															
From Rural areas	5	80	41	14	0	5	90	30	5	2	7	59	10	4	0
Large Cities															
Stayers	3	49	24	21	6	7	91	46	49	12	9	109	45	23	10
Long term migrants															
From rural areas	1	41	27	20	4	15	158	67	36	9	28	221	84	30	6
Recent Migrants															
From rural areas	3	114	45	10	0	11	126	41	19	6	13	82	18	11	1
Medium Cities															
Stayers	3	16	7	9	1	3	49	15	14	3	6	41	9	10	0
Long term migrants															
From rural areas	2	40	15	8	0	10	88	48	20	4	17	129	43	17	1
Recent Migrants															
From rural areas	3	55	26	11	0	11	86	30	3	2	8	57	8	4	2
Small Cities															
Stayers	1	32	18	5	1	4	50	18	10	3	17	50	19	4	1
Long term migrants															
From rural areas	2	18	7	3	0	7	69	27	10	0	23	93	22	10	0
Recent Migrants															
From rural areas	4	52	19	7	0	9	49	19	7	7	6	29	8	5	0
Rural Areas															
Stayers	214	1841	246	77	7	651	3125	398	114	17	1334	3367	293	80	5
Long term migrants															
From Seoul						2	12	10	12	1	4	[illegible]	10	6	2
Medium Cities						3	19	13	5	0	4	21	6	3	3
Small Cities						6	38	10	4	1	8	60	12	5	1
Recent Migrants															
From Seoul						1	11	5	17	2					
Small cities						2	15	7	5	1					
Return Migrants	0	16	14	4	4	2	28	8	8	2	4	16	14	8	0

*Exclude cells which have less than 30 observations for all levels of education.

TABLE A.9.5. (continued)

NUMBER OF CURRENTLY MARRIED WOMEN IN THE 1% 1970 CENSUS SAMPLE BY AGE, EDUCATION, CURRENT RESIDENCE AND MIGRATION STATUS*

Current Residence, Migration Status and Place of Origin	35-39					40-44					45-49					50-54				
	None	Primary	Middle	High	College	None	Primary	Middle	High	College	None	Primary	Middle	High	College	None	Primary	Middle	High	College
Seoul																				
Nonmigrants	11	119	66	81	34	16	90	53	38	24	20	80	25	16	10	19	43	11	7	3
Long term migrants																				
From medium cities	3	12	9	8	2															
small cities	1	20	9	12	4															
rural areas	52	317	120	91	22	49	236	80	41	15	50	140	41	21	2	48	79	9	11	6
Recent migrants																				
From rural areas	9	109	23	12	1	19	54	11	0	0	20	33	5	1	0	11	24	1	1	0
Busan																				
Nonmigrants	11	62	20	17	2	16	46	10	8	1	13	34	4	5	0					
Long term migrants																				
From rural areas	36	129	37	16	0	39	113	19	7	4	47	62	6	11	0	31	26	1	1	0
Recent migrants																				
From rural areas	11	31	2	3	1															
Large Cities																				
Stayers	19	95	20	22	3	24	62	10	6	0	31	42	6	6	0	19	28	5	1	1
Long term migrants																				
From rural areas	39	209	60	21	2	55	142	23	4	1	45	87	17	1	0	58	43	10	2	1
Recent migrants																				
From rural areas	17	49	12	10	1	12	27	3	4	0	16	15	0	0	0					
Medium Cities																				
Stayers	15	37	7	4	0	15	29	4	4	0										
Long term migrants																				
From rural areas	49	127	32	11	2	59	84	19	8	0	50	66	6	4	0	52	38	3	0	0
Recent migrants																				
From rural areas	10	33	8	1	0	12	18	1	1	0										
Small Cities																				
Stayers	18	47	6	9	0	22	34	4	1	0	21	19	1	1	0	18	12	2	0	0
Long term migrants																				
From rural areas	34	107	16	5	1	49	73	6	1	1	39	41	2	1	0	32	16	0	1	0
Recent Migrants																				
From rural areas																				
Rural Areas																				
Stayers	1935	2500	142	45	6	2318	1291	59	24	3	2326	689	22	7	0	1929	328	4	3	0
Long term migrants																				
From Seoul	5	18	10	3	1															
medium cities	8	20	2	2	0	19	12	3	2	0										
small cities	16	40	5	5	0	30	26	1	1	0	22	13	0	0	6	25	8	1	0	0
Recent migrants																				
From Seoul																				
small cities																				
Return migrants																				

TABLE A.9.6.

PROPORTION OF EVER MARRIED WOMEN BY AGE GROUP, EDUCATION LEVEL, CURRENT RESIDENCE, AND PLACE OF ORIGIN*

Current Residence, Migration States and Place of Origin	15-19					20-24					25-29					30-34				
	None	Primary	Middle	High	College	None	Primary	Middle	High	College	None	Primary	Middle	High	College	None	Primary	Middle	High	College
Seoul																				
Nonmigrants		.006	.010	.004	.019		.409	.349	.243	.103		.891	.836	.774	.752		.978	.964	.970	.911
Long term migrants																				
From rural areas		.027	.034	.005			.517	.407	.208	.152		.939	.816	.765	.596	.974	.990	.978	.964	.967
Recent migrants																				
From rural areas	.0	.025	.028	.011			.468	.415	.312			.891	.908	.757			.974	.925	.968	
Busan																				
Nonmigrants		.006	.009	.0			.408	.427	.126	.146		.927	.849	.881			1.000	.974		
Long term migrants																				
From rural areas		.019	.019	.0			.505	.467	.342			.963	.926	.788			1.000	.984		
Recent migrants																				
From rural areas		.016	.058				.664	.652				.968	1.000				1.000			
Large Cities																				
Stayers		.026	.0	.004			.368	.276	.218	.118		.920	.767	.742			.991	1.000		
Long term migrants																				
From rural areas		.033	.012	.0			.299	.380	.308	.103		.936	.895	.818		1.000	.987	1.000	.912	
Recent migrants																				
From rural areas		.043	.0	.016			.548	.459	.250			.970	.953				1.000			
Medium Cities																				
Stayers		.036	.0	.0			.390		.167			.925					1.000			
Long term migrants																				
From rural areas		.097	.035	.0			.631	.455				.968	.889	.667			1.000	1.000		
Recent migrants																				
From rural areas		.020	.043	.0			.733	.722	.367			.915	.912				.983			
Small Cities																				
Stayers		.026	.020	.010			.429	.353	.119			.885					1.000			
Long term migrants																				
From rural areas		.061					.500					.986					1.000			
Recent migrants																				
From rural areas		.083					.800					.962					1.000			
Rural Areas																				
Stayers	.161	.050	.010	.006		.789	.532	.332	.197	.123	.980	.966	.876	.782		.995	.997	.990	.988	

*Exclude cells which have less than 30 observations. All the observations for which any of three places, namely, current residence, residence of 5 years ago, and place of birth is not identified are deleted from our computation.

TABLE A.9.7.

PROPORTION OF EVER MARRIED MEN BY AGE GROUP, EDUCATION LEVEL, CURRENT RESIDENCE AND MIGRATION STATUS*

Current Residence, Migration Status and Place of Origin	20-25						25-29						30-34					
	Average	None	Primary	Middle	High	College	Average	None	Primary	Middle	High	College	Average	None	Primary	Middle	High	College
Seoul																		
Nonmigrants	.053		.098	.075	.050	.033	.420		.538	.509	.360	.402	.881		.914	.911	.907	.843
Longterm migrants																		
From rural areas	.062		.099	.082	.055	.022	.501		.541	.569	.533	.386	.914		.929	.916	.941	.874
Recent migrants																		
From rural areas	.071		.090	.084	.053	.043	.599		.543	.663	.621	.467	.949		.958	.972	.954	.875
Busan																		
Nonmigrants	.054		.073	.040	.062	.048	.443		.425	.565	.477	.182	.870		.879	.912	.863	.824
Longterm migrants																		
From rural areas	.034		.022	.014	.060	.029	.551		.571	.585	.608	.364	.973		.952	.961	.988	1.000
Recent migrants																		
From rural areas	.102		.081	.154	.077		.643		.760	.651	.50		.986		.978	.976	1.000	
Large Cities																		
Stayers	.043		.055	.053	.048	.012	.483		.557	.521	.414	.473	.904		.917	.880	.907	.959
Long term migrants																		
From rural areas	.060		.043	.103	.094	.014	.551		.476	.578	.613	.508	.965		.988	.986	.971	.908
Recent migrants																		
From rural areas	.083		.103	.128	.070		.640		.712	.628	.667		.959		.966	.982	.933	
Medium Cities																		
Stayers	.057			.079	.028	.081	.550				.647		.944				.943	
Long term migrants																		
From rural areas	.10			.105	.103		.667		.600	.737	.700		.918		.925	.882	1.000	.850
Recent migrants																		
From rural areas	.096				.094		.771		.838	.733	.833		.958		.977		.909	
Small Cities																		
Stayers	.043		.036	.016	.035		.504			.500	.500		.915		.925		.905	
Long term migrants																		
From rural areas	.057				.0		.632						.959		.946		.977	
Recent migrants																		
From rural areas	.110				.1		.750						.957					
Rural areas																		
Stayers	.090	.087	.110	.089	.067	.063	.588	.55	.615	.593	.531	.498	.957	.918	.960	.969	.960	.942

*Exclude cells which have less than 30 observations.

4-70

TABLE A.9.8.

PROPORTION OF EVER MARRIED MEN BY AGE (20-30), CURRENT RESIDENCE, MIGRATION STATUS, AND PLACE OF ORIGIN*

Current Residence Migration Status and Place of Origin	Ages										
	20	21	22	23	24	25	26	27	28	29	30
Seoul											
Nonmigrants	.017	.022	.061	.070	.093	.176	.235	.419	.597	.712	.734
Long term migrants											
From rural areas	.007	.029	.086	.090	.105	.184	.340	.510	.651	.717	.842
Recent migrants											
From rural areas	.007	.018	.082	.098	.219	.310	.463	.552	.758	.841	.946
Busan											
Nonmigrants	.025	.029	.043	.048	.151	.218	.327	.449	.590	.717	.786
Long term migrants											
From rural areas	.000	.000	.032	.040	.087	.250	.372	.655	.636	.700	.966
Recent migrants											
From rural areas	.000						.361		.882	.839	
Large Cities											
Stayers	.000	.024	.040	.028	.169	.203	.373	.523	.548	.738	.784
Long term migrants											
From rural areas	.029	.017	.000	.068	.233	.190	.492	.565	.554	.828	.900
Recent migrants											
From rural areas	.024	.089	.025	.116		.333	.449	.627	.810	.843	.972
Medium Cities											
Stayers	.000	.026	.097	.071	.091						
Long term migrants											
From rural areas		.030	.083	.184							.844
Recent migrants											
From rural areas									.882	.906	.967
Small Cities											
Stayers	.020	.043	.053	.038	.038	.065					
Long term migrants											
From rural areas										.839	
Recent migrants											
From rural areas											
Rural Areas											
Stayers	.033	.055	.082	.112	.165	.279	.436	.624	.732	.807	.900

*Exclude cells which have less than 30 observations. Proportions of ever married men for Seoul nonmigrant men younger than 20 years and older than 31 years are less than 1 percent and larger than 90 percent, respectively.

TABLE A.9.9.

PROPORTION OF EVER MARRIED WOMEN WHO NEVER OUTMIGRATED FROM RURAL AREAS BY AGE (19-26), EDUCATION LEVEL, CURRENT RESIDENCE, AND MIGRATION STATUS*

Rural-Rural Migration Status and Levels of Education	AGES							
	19	20	21	22	23	24	25	26
Nonmigrants in Rural Areas								
Average	.098	.164	.284	.411	.579	.751	.857	.918
None		.516	.568	.738	.810	.942	.970	.932
Primary	.121	.186	.336	.474	.633	.779	.895	.944
Middle	.025	.070	.077	.173	.424	.586	.656	.723
High	.012	.025	.069	.109	.269	.471		
College								
Long Term Rural-Rural Migrants								
Average	.172	.377	.639	.636	.718	.842	.944	.961
None								
Primary	.273	.500	.776	.765	.763	.882	.965	.983
Middle								
High								
College								
Recent Rural-Rural Migrants								
Average	.500	.491	.677	.835	.870	.925	.943	1.000
None								
Primary	.592		.833	.897	.836	.933	1.000	1.000
Middle								
High								
College								

***Exclude cells which have less than 30 observations.**

TABLE A.9.10.

PROPORTION OF EVER MARRIED MEN WHO NEVER OUTMIGRATED FROM RURAL AREAS BY AGE GROUP, EDUCATION LEVEL, CURRENT RESIDENCE AND MIGRATION STATUS*

Rural-Rural Migration Status and Levels of Education	Age Groups			
	20-24	25-29	30-34	35-39
Nonmigrants in Rural Areas				
Average	.089	.575	.962	.994
None	.088	.564	.924	.988
Primary	.110	.609	.965	.994
Middle	.086	.568	.972	1.000
High	.064	.504	.960	.990
College	.063	.422	.960	
Long Term Rural-Rural Migrants				
Average	.075	.589	.946	.991
None			.878	
Primary	.071	.623	.940	.984
Middle	.107	.624	.945	
High	.070	.552	.981	
College			.972	
Recent Rural-Rural Migrants				
Average	.143	.683	.920	.959
None				
Primary	.179	.669	.902	
Middle	.145	.754	1.000	
High	.121	.647	.934	
College		.727	.838	
Two Stages Rural-Rural Migrants				
Average	.102	.764	.926	
None				
Primary		.761	.949	
Middle		.800		
High		.733	.938	
College				

*Exclude cells which have less than 30 observations

TABLE A.9.11.

PROPORTION OF EVER MARRIED MEN WHO NEVER OUTMIGRATED FROM RURAL AREAS BY AGE (20-30), EDUCATION LEVEL, CURRENT RESIDENCE, AND MIGRATION STATUS*

Rural-rural Migration status, and Levels of Education	Age										
	20	21	22	23	24	25	26	27	28	29	30
Nonmigrants in rural areas											
Average	.033	.051	.084	.108	.166	.268	.419	.613	.728	.806	.902
None	.042	.034	.136	.034	.159	.300	.370	.594	.696	.705	.836
Primary	.048	.067	.115	.145	.182	.315	.452	.639	.744	.818	.909
Middle	.027	.042	.074	.109	.160	.236	.390	.613	.731	.856	.927
High	.016	.035	.061	.066	.163	.196	.389	.571	.695	.766	.872
College	.000	.043	.033	.091	.108	.178	.344	.433	.633	.655	.897
Long term migrants											
Average	.029	.037	.044	.176	.106	.242	.492	.586	.691	.787	.897
None											
Primary	.030	.000	.029	.231	.129	.3	.462	.640	.690	.805	.878
Middle				.238				.667		.773	
High									.792		
College											
Recent rural-rural migrants											
Average	.000	.190	.125	.122	.261	.434	.560	.736	.772	.824	.892
None											
Primary						.4		.652	.781	.813	.920
Middle			.000						.905		
High											.810
College											

*Exclude cells which have less than 20 observations.

TABLE A.9.12.

DISTRIBUTION OF CURRENTLY MARRIED WOMEN BY LABOR FORCE PARTICIPATION STATUS WITHIN AGE, CURRENT RESIDENCE, AND MIGRATION STATUS GROUPS

Current Residence Migration Status, and Place of Origin	20-24				25-29			
	Labor Force Total Participants		Percentage Of Participants In		Labor Force Total Participants		Percentage Of Participants In	
	Number	Percentage	Compatible Occupation	Incompatible Occupation	Number	Percentage	Compatible Occupation	Incompatible Occupation
Seoul								
Nonmigrants	12	5.6	2.3	3.3	53	10.8	3.7	7.1
Long term migrants								
From Medium cities					6	12.0	4.0	8.0
Small cities					5	11.1	4.4	6.7
Rural areas	18	6.8	1.5	5.3	51	7.5	1.9	5.6
Recent Migrants								
From Rural areas	23	6.9	3.0	3.9	20	4.7	.9	3.8
Busan								
Nonmigrants	10	10.3	3.1	7.2	23	13.9	3.0	10.8
Long term migrants								
From Rural areas	5	5.6	2.2	3.3	23	9.8	3.4	6.3
Recent Migrants								
From Rural areas	8	5.7	1.4	4.3	7	5.3	1.5	3.8
Large Cities								
Stayers	9	8.7	4.9	3.9	29	14.1	5.4	8.8
Long term migrants								
From Rural areas	10	10.8	6.5	4.3	31	10.9	6.7	4.2
Recent Migrants								
From Rural areas	14	8.1	4.7	3.5	26	12.8	5.4	7.4
Medium Cities								
Stayers	11	30.6	22.2	8.3	24	28.6	17.9	10.7
Long term migrants								
From Rural areas	4	6.2	3.1	3.1	11	6.5	4.1	2.4
Recent Migrants								
From Rural areas	12	12.6	6.3	6.3	22	16.7	8.3	8.3
Small Cities								
Stayers	10	17.5	8.8	8.8	20	23.5	18.8	4.7
Long term migrants								
From Rural areas	3	10.0	10.0	.0	17	16.8	11.5	5.3
Recent Migrants								
From Rural areas	8	9.8	8.5	1.2		18.7	9.9	8.8
Rural Areas								
Stayers	1076	54.9	41.8	3.4	2057	47.8	44.6	3.2
Long term migrants								
From Seoul					6	16.2	10.8	5.4
Medium Cities					14	35.0	32.5	2.5
Small Cities					26	44.1	40.7	3.4
Recent Migrants								
From Seoul					5	13.9	8.3	5.6
Small Cities					9	30.0	16.7	13.3
Return Migrants from Seoul	10	26.3	18.4	7.9	5	10.4	8.3	2.1

TABLE A.9.12. (continued)

DISTRIBUTION OF CURRENTLY MARRIED WOMEN BY LABOR FORCE PARTICIPATION STATUS WITHIN AGE, CURRENT RESIDENCE, AND MIGRATION STATUS GROUPS

Current Residence Migration Status, and Place of Origin	30-34				35-39			
	Labor Force Total Participants		Percentage Of Participants In		Labor Force Total Participants		Percentage Of Participants In	
	Number	Percentage	Compatible Occupation	Incompatible Occupation	Number	Percentage	Compatible Occupation	Incompatible Occupation
Seoul								
Nonmigrants	48	11.4	2.8	8.5	56	18.1	3.9	14.2
Long term migrants								
From medium cities	3	7.5	2.5	5.0	6	17.6	2.9	14.7
small cities	4	7.0	1.8	5.3	9	19.6	4.3	15.3
rural areas	59	8.0	2.4	5.6	77	12.8	3.7	9.1
Recent Migrants								
From rural areas	27	11.0	2.0	9.0	20	13.0	1.9	11.0
Busan								
Nonmigrants	24	17.8	7.4	10.4	17	15.2	3.6	11.6
Long term migrants								
From rural areas	32	11.7	4.7	6.9	36	16.5	4.6	11.9
Recent Migrants								
From rural areas	9	11.3	3.8	7.5	14	29.2	4.2	25.0
Large Cities								
Stayers	34	17.3	9.7	7.7	30	18.9	10.1	8.8
Long term migrants								
From rural areas	64	17.3	6.5	10.8	61	18.4	6.9	11.5
Recent Migrants								
From rural areas	27	21.6	8.8	12.8	19	21.3	7.9	13.5
Medium Cities								
Stayers	17	25.8	18.2	7.6	20	31.7	20.6	11.1
Long term migrants								
From rural areas	34	16.4	18.2	18.2	56	25.3	14.5	10.9
Recent Migrants								
From Rural areas	15	19.0	7.2	9.2	9	17.3	7.7	9.6
Small Cities								
Stayers	20	22.0	6.3	12.7	22	27.5	20.0	7.5
Long term migrants								
From rural areas	29	19.6	16.5	5.5	37	22.7	11.7	11.0
Recent Migrants								
From rural areas	9	18.8	9.5	10.1				
Rural Areas								
Stayers	2698	53.1	49.7	3.4	2700	58.3	53.7	4.6
Long term migrants								
From Seoul	10	22.2	17.8	4.4	9	24.3	16.2	8.1
medium cities	13	35.1	27.7	5.4	12	37.5	34.4	3.1
small cities	33	38.4	30.2	8.1	31	47.0	42.4	4.5
Recent Migrants								
From Seoul								
small cities								
Return Migrants from Seoul	7	16.7	9.5	7.1				

DISTRIBUTION OF CURRENTLY MARRIED WOMEN BY LABOR FORCE PARTICIPATION STATUS WITHIN AGE, CURRENT RESIDENCE, AND MIGRATION STATUS GROUPS

Current Residence Migration Status, and Place of Origin	40-44				45-49			
	Labor Force Total Participants		Percentage Of Participants In		Labor Force Total Participants		Percentage Of Participants In	
	Number	Percentage	Compatible Occupation	Incompatible Occupation	Number	Percentage	Compatible Occupation	Incompatible Occupation
Seoul								
Nonmigrants	16	7.2	1.8	5.4	16	10.6	4.0	6.7
Long term migrants								
From Medium cities								
Small cities								
Rural areas	63	14.9	4.5	10.5	41	16.1	5.1	11.0
Recent Migrations								
From Rural areas	16	19.0	7.1	11.9	15	25.4	8.5	16.9
Busan								
Nonmigrants	20	24.7	8.6	16.0	11	19.6	3.6	16.1
Long term migrants								
From Rural areas	39	21.4	4.9	16.5	28	22.2	6.3	15.9
Recent Migrants								
From Rural areas								
Large Cities								
Stayers	24	23.5	15.7	7.8	20	23.5	15.3	8.2
Long term migrants								
From Rural areas	53	23.6	11.1	12.4	36	24.0	14.7	9.3
Recent Migrants								
From Rural areas	11	23.9	8.7	15.2	10	32.3	16.1	16.1
Medium Cities								
Stayers	15	28.8	13.5	15.4				
Long term migrants								
From Rural areas	48	28.2	12.9	15.3	43	33.6	17.2	16.4
Recent Migrants								
From Rural areas	7	21.9	15.6	6.3				
Small Cities								
Stayers	21	34.4	27.9	6.6	14	33.3	26.2	7.1
Long term migrants								
From Rural areas	46	35.4	30.8	4.6	19	22.9	15.7	7.2
Recent Migrants								
From Rural areas								
Rural Areas								
Stayers	2186	59.2	54.9	4.3	1760	57.8	54.1	3.8
Long term migrants								
From Seoul								
Medium cities	19	52.8	44.4	[illegible]				
Small cities	33	56.9	48.3	46.2	17	43.6	43.6	.0
Recent Migrants								
From Seoul								
Small cities								
Return Migrants from Seoul								

TABLE A.9.12. (continued)

DISTRIBUTION OF CURRENTLY MARRIED WOMEN BY LABOR FORCE PARTICIPATION STATUS WITHIN AGE, CURRENT RESIDENCE, AND MIGRATION STATUS GROUPS

Current Residence Migration Status, and Place of Origin	50-54			
	Labor Force Total Participants		Percentage Of Participants In	
	Number	Percentage	Compatible Occupation	Incompatible Occupation
Seoul				
Nonmigrants	8	9.6	4.8	4.8
Long term migrants				
From Medium cities				
Small cities				
Rural areas	18	11.8	5.2	6.5
Recent Migrants				
From Rural areas	6	16.2	5.4	10.8
Busan				
Nonmigrants				
Long term migrants				
From Rural areas	10	16.9	10.2	6.8
Recent Migrants				
From Rural areas				
Large Cities				
Stayers	8	14.8	7.4	7.4
Long term migrants				
From Rural areas	18	15.8	7.9	7.9
Recent Migrants				
From Rural areas				
Medium Cities				
Stayers				
Long term migrants				
From Rural areas	23	24.7	15.1	9.7
Recent Migrants				
From Rural areas				
Small Cities				
Stayers	11	34.4	21.9	12.5
Long term migrants				
From Rural areas	15	30.6	22.4	8.2
Recent Migrants				
From Rural areas				
Rural Areas				
Stayers	1316	58.1	55.8	2.3
Long term migrants				
From Seoul				
Medium cities				
Small cities	21	61.8	58.8	2.9
Recent Migrants				
From Seoul				
Small cities				
Return Migrants From Seoul				

TABLE A.9.13.

REGRESSION RESULTS OF THE CHILDREN EVER BORN EQUATION
FOR THE CURRENTLY MARRIED WOMEN IN SEOUL

Variable	20-24		25-29		30-34		35-39		40-44		45-49	
	b	t	b	t	b	t	b	t	b	t	b	t
Intercept	9.503	(1.00)	14.817	(1.39)	5.867	(.31)	18.879	(.53)	181.196	(2.92)	68.634	(.58)
N1	.227	(1.06)	.359	(2.01)	.554	(3.41)	.043	(.24)	.129	(.68)	-.066	(- .28)
N3	-.323	(-4.89)	-.220	(-3.69)	-.120	(-1.50)	-.110	(-.95)	-.242	(-1.56)	-.221	(- .86)
N4	-.384	(-4.76)	-.426	(-6.25)	-.336	(-3.74)	-.215	(-1.74)	-.331	(-1.66)	.054	(.16)
N5	-.639	(-4.92)	- 0.613	(-6.58)	-.579	(-4.50)	-1.116	(-5.48)	-.995	(-3.69)	-.716	(-1.26)
COMP	.381	(2.09)	.072	(.44)	.357	(1.77)	.105	(.44)	.569	(1.90)	.247	(.61)
NC	-.074	(- .54)	-.291	(-2.74)	-.216	(-1.76)	-.144	(-1.01)	-.567	(-2.76)	-.055	(- .19)
RMIG	-.270	(-3.64)	-.133	(-1.98)	.222	(2.27)	.245	(1.69)	.192	(.92)	.345	(1.15)
LMIG	-.073	(- .96)	.027	(.44)	.088	(1.16)	.259	(.25)	.067	(.50)	.250	(1.24)
AGE	-.889	(-1.05)	-1.197	(-1.52)	-.418	(- .35)	-.922	(- .48)	-8.451	(-2.85)	-2.670	(- .53)
AGE2	.023	(1.21)	.027	(1.82)	.010	(.54)	.014	(.53)	.101	(2.85)	.028	(.51)
NDEA	1.127	(8.61)	.951	(13.43)	.912	(14.22)	.827	(12.74)	.974	(15.54)	.805	(12.09)
# of OBS	811		1592		1402		1065		725		463	
R^2	.176		.258		.240		.188		.304		.274	
F-STAT	15.48		49.89		39.95		22.15		28.33		15.52	

TABLE A.9.14.

REGRESSION RESULTS OF THE CHILDREN EVER BORN EQUATION
FOR CURRENTLY MARRIED WOMEN LIVING IN BUSAN

Variable	20-24		25-29		30-34		35-39		40-44		45-49	
	b	t	b	t	b	t	b	t	b	t	b	t
Intercept	3.397	(.25)	-2.564	(- .13)	5.858	(.18)	-81.633	(-1.24)	-113.489	(-1.01)	328.803	(1.82)
N1	-.219	(- .79)	- .009	(- .04)	.278	(1.32)	- .160	(- .69)	.014	(.05)	-.133	(- .42)
N3	-.074	(- .79)	- .301	(-2.76)	-.018	(- .14)	- .176	(- .77)	.089	(.27)	.925	(1.51)
N4	-.082	(- .60)	- .481	(-3.24)	-0.580	(-3.16)	- .554	(-1.96)	-.324	(- .69)	-.454	(- .92)
N5	-.408	(-1.15)	- .707	(-2.49)	-.580	(-1.50)	- .506	(- .56)	-1.795	(-2.27)	-0-	(-0-)
COMP	-.263	(- .89)	.510	(1.83)	.191	(.80)	.369	(.93)	.402	(.91)	-.428	(- .74)
NC	-.626	(-3.22)	.053	(.29)	-.537	(-2.71)	- .138	(- .58)	-.164	(- .59)	-.746	(-1.98)
RMIG	-.119	(-1.16)	- .072	(- .56)	-.222	(-1.31)	.200	(.74)	1.602	(3.72)	1.565	(2.68)
LMIG	.257	(2.27)	.128	(1.17)	.163	(1.31)	.107	(.59)	.550	(2.36)	.464	(1.53)
AGE	-.296	(- .24)	.125	(.08)	-.410	(- .20)	4.512	(1.26)	5.473	(1.03)	-13.900	(-1.80)
AGE2	.008	(.30)	.002	(.06)	.010	(.31)	- .059	(-1.23)	-.064	(-1.00)	.149	(1.81)
NDEA	-.006	(- .02)	1.003	(6.85)	.988	(8.97)	.797	(7.49)	.635	(5.95)	.974	(8.85)
Mean of Dep Var												
# of OBS	326		534		488		377		283		194	
R^2	.097		.200		.266		.167		.217		.355	
F-STAT	3.06		11.87		15.71		6.69		6.83		10.07	

TABLE A.9.15.

REGRESSION RESULTS OF THE CHILDREN EVER BORN EQUATION
OF THE CURRENTLY MARRIED WOMEN IN LARGE CITIES

Variable	20-24		25-29		30-34		35-39		40-44		45-49	
	b	t	b	t	b	t	b	t	b	t	b	t
Intercept	18.278	(1.35)	-7.383	(- .43)	-36.386	(-1.25)	80.592	(1.64)	81.238	(.89)	-117.704	(- .67)
N1	.826	(2.77)	- .016	(- .08)	- .165	(- .91)	.277	(1.52)	.069	(.33)	- .265	(- .97)
N3	-.096	(-1.02)	- .086	(- .88)	- .359	(-3.06)	-.218	(-1.32)	-.651	(-2.17)	.116	(.24)
N4	-.203	(-1.65)	- .338	(-2.92)	- .298	(-1.82)	-.303	(-1.45)	-.117	(- .25)	-.356	(- .44)
N5	.074	(.29)	- .364	(-1.78)	- 1.284	(-4.24)	-1.364	(-2.34)	-.840	(- .50)	-0-	(---)
COMP	-.015	(- .08)	.013	(.08)	.121	(.70)	.215	(.97)	.386	(1.41)	.510	(1.42)
NC	-.296	(-1.39)	- .452	(-2.85)	- .538	(-3.51)	-.125	(- .66)	.141	(.51)	-.202	(- .46)
RMIG	.090	(.91)	- .050	(- .49)	- .116	(- .83)	.628	(3.35)	.826	(2.75)	.324	(.73)
LMIG	.071	(.65)	.063	(.67)	.085	(.78)	.409	(2.98)	.313	(1.56)	.337	(1.17)
AGE	-1.711	(-1.40)	.401	(.32)	2.328	(1.28)	-4.323	(-1.62)	-3.693	(- .85)	5.124	(.68)
AGE^2	.041	(1.51)	- .002	(- .09)	- .034	(-1.19)	.061	(1.68)	.044	(.85)	-.054	(- .67)
NDEA	.865	(4.15)	.665	(4.98)	.897	(10.18)	.972	(11.40)	.857	(9.83)	1.073	(10.12)
# of OBS	367		692		689		578		372		266	
R^2	.138		.210		.221		.261		.261		.316	
F-STAT	5.18		16.50		17.52		18.23		11.59		11.80	

TABLE A.9.16.

REGRESSION RESULTS OF THE CHILDREN EVER BORN EQUATION FOR THE CURRENTLY MARRIED WOMEN IN MEDIUM CITIES

Variable	20-24		25-29		30-34		35-39		40-45		45-49	
	b	t	b	t	b	t	b	t	b	t	b	t
Intercept	-3.457	(- .19)	-2.898	(- .13)	-4.718	(- .11)	-65.914	(- .92)	-53.239	(- .43)	273.311	(1.25)
N1	.472	(1.74)	.105	(.50)	- .287	(-1.16)	.606	(2.84)	- .260	(-1.00)	- .442	(-1.22)
N3	- .050	(- .40)	- .176	(-1.44)	- .141	(- .75)	- .305	(-1.22)	.111	(.27)	.490	(.72)
N4	- .157	(-1.01)	- .557	(-3.14)	- .467	(-1.85)	- .749	(-1.86)	- .620	(-1.14)	-1.013	(-1.11)
N5	- .542	(- .70)	- .285	(- .85)	-1.005	(-1.32)	- 2.639	(-2.41)	.0	(.0)	.0	(.0)
COMP	- .151	(- .77)	- .053	(- .29)	- .278	(-1.14)	- .303	(-1.23)	.0	(.0)	- .002	(- .0)
NC	- .094	(- .39)	- .156	(- .74)	- .918	(-3.86)	- .451	(-1.63)	- .197	(- .57)	- .519	(-1.17)
RMIG	.031	(.20)	- .330	(-2.33)	- .431	(-1.96)	- .085	(- .29)	- .648	(-1.56)	.252	(.33)
LMIG	.160	(.98)	.044	(.32)	- .153	(- .83)	- .018	(- .08)	- .026	(- .09)	.565	(1.26)
AGE	.217	(.14)	.132	(.08)	.343	(.13)	3.650	(.94)	2.602	(.44)	-11.404	(-1.22)
AGE2	- .001	(- .03)	.002	(.07)	- .003	(- .06)	- .047	(- .90)	- .029	(- .41)	.121	(1.22)
NDEA	1.521	(2.88)	.832	(5.01)	.872	(7.76)	.937	(10.03)	.914	(9.44)	1.017	(8.74)
# of OBS	195		385		351		335		254		168	
R^2	.156		.223		.244		.318		.301		.342	
F-STATS	3.08		9.76		9.99		13.70		10.44		8.15	

TABLE A.9.17.

REGRESSION RESULTS OF THE CHILDREN EVER BORN EQUATION
FOR THE CURRENTLY MARRIED WOMEN IN SMALL CITIES

Variable	20-24		25-29		30-34		35-39		40-44		45-49	
	b	t	b	t	b	t	b	t	b	t	b	t
Intercept	34.348	(1.85)	-11.018	(- .40)	-8.173	(- .19)	8.263	(.12)	30.174	(.23)	242.286	(.98)
N1	- .302	(- .99)	.426	(1.72)	- .025	(- .12)	- .107	(- .48)	.117	(.43)	.233	(.63)
N3	- .152	(-1.08)	-.432	(-2.81)	.088	(.45)	- .520	(-1.77)	-.683	(-1.18)	.679	(.72)
N4	- .445	(-2.07)	-.548	(-2.51)	- .537	(-1.85)	- .714	(-1.74)	-.034	(- .04)	-2.498	(-1.63)
N5	-1.069	(-1.38)	-.746	(-2.08)	- .229	(- .19)	-1.815	(-1.24)	.295	(.16)	-0-	(-0-)
COMP	.129	(.59)	.298	(1.58)	- .281	(-1.26)	.349	(1.31)	.435	(1.52)	.280	(.60)
NC	.478	(1.46)	-.469	(-1.77)	- .147	(- .56)	- .558	(-1.86)	-.914	(-1.52)	-1.167	(-1.82)
RMIG	- .226	(-1.66)	-.298	(-1.87)	.203	(.94)	.032	(.10)	-.800	(-1.61)	- .834	(-1.27)
LMIG	.200	(1.12)	.107	(.71)	.271	(1.68)	.026	(.13)	-.068	(- .24)	- .338	(- .83)
AGE	-3.129	(-1.86)	.733	(.36)	.374	(.14)	- .351	(- .09)	-1.417	(- .23)	-9.996	(- .95)
AGE ^{2}	.073	(1.92)	-.009	(- .24)	- .001	(- .01)	.007	(.13)	.091	(.26)	.105	(.94)
NDEA	1.923	(5.41)	.830	(5.46)	1.011	(7.18)	.871	(8.76)	.848	(6.64)	.874	(6.01)
# of OBS	2323		288		286		271		208		141	
R^2	.218		.289		.320		.292		.271		.268	
F-STAT	58.70		10.22		11.78		9.72		6.64		4.77	

TABLE A.9.18.

REGRESSION RESULTS OF THE PROPORTIONS OF THE EVER MARRIED WOMEN AGED 20-24 WHO EITHER MADE RURAL-URBAN MIGRATION OR STAYED IN RURAL AREAS

	Destination of Rural-Urban Migrations									
	Seoul		Busan		Large Cities		Medium Cities		Small Cities	
Variables	b	t	b	t	b	t	b	t	b	t
Intercept	.253	(.11)	-1.489	(- .39)	-1.066	(- .33)	-9.240	(- 1.70)	.523	(.09)
N1	-.027	(- .46)	.009	(.08)	.077	(.81)	.060	(.54)	.144	(1.11)
N3	-.045	(- 2.25)	- .025	(- .77)	- .034	(- 1.20)	- .070	(- 1.47)	-.091	(-1.93)
N4	-.172	(- 8.19)	- .189	(- 5.19)	- .162	(- 5.30)	- .262	(- 5.68)	-.225	(-4.18)
N5	-.357	(-13.79)	- .325	(- 6.07)	- .339	(- 8.21)	- .397	(- 4.78)	-.226	(-1.82)
NC	-.469	(-28.60)	- .489	(-16.88)	- .492	(-20.16)	- .452	(-10.97)	-.440	(-9.51)
COMP	-.302	(- 7.55)	- .237	(- 3.23)	- .252	(- 5.28)	- .063	(- .88)	.029	(.36)
RMIG	.134	(6.60)	.227	(6.80)	.162	(5.84)	.192	(4.12)	.306	(6.56)
LMIG	.053	(2.77)	.081	(2.50)	.038	(1.38)	.065	(1.40)	.029	(.57)
AGE	-.066	(.33)	.084	(.24)	.049	(.17)	.791	(1.60)	-.100	(.19)
AGE 2	.004	(.80)	-0-	(.06)	.001	(.17)	- .016	(- 1.38)	.005	(.37)
# of OBS	2403		765		1052		423		372	
R^2	.409		.476		.441		.458		.440	
F-STATS	165.34		68.60		82.19		34.84		28.46	

TABLE A.9.19.

REGRESSION RESULTS OF THE PROPORTION OF
THE EVER MARRIED MEN AGED 25-29 WHO EITHER MADE RURAL-URBAN
MIGRATION OR STAYED IN RURAL AREAS

Destination of Rural-Urban Migrants

Variable	Seoul		Busan		Large Cities		Medium Cities		Small Cities	
	b	t	b	t	b	t	b	t	b	t
Intercept	-4.204	(- .97)	-8.129	(-1.03)	-6.725	(- .97)	-6.006	(- .59)	-8.639	(- .74)
N1	.001	(.10)	.064	(.44)	- .069	(- .50)	.175	(1.31)	.140	(1.00)
N3	.056	(1.77)	- .016	(- .30)	.016	(.38)	.075	(1.20)	- .015	(- .20)
N4	- .013	(- .42)	- .029	(- .57)	- .016	(- .39)	.099	(1.68)	.009	(.13)
N5	- .088	(-2.81)	- .181	(-2.92)	- .021	(- .43)	- .161	(-2.14)	- .049	(- .50)
NC	.217	(7.82)	.297	(5.29)	.341	(6,44)	.176	(2.44)	.169	(1.77)
COMP	.067	(1.54)	.057	(.77)	.176	(2.57)	.126	(1.35)	.146	(1.39)
RMIG	.088	(3.30)	.116	(2.46)	.112	(2.84)	.139	(2.32)	.203	(3.03)
LMIG	.014	(.61)	.058	(1.40)	.034	(.89)	.065	(1.13)	.082	(1.26)
AGE	.210	(.65)	.522	(.89)	.400	(.78)	.352	(.47)	.556	(.65)
AGE 2	- .002	(- .26)	- .008	(- .72)	- .005	(- .56)	- .004	(- .31)	- .008	(- .52)
# of OBS	2013		625		830		349		291	
R^2	.213		.223		.197		.239		.185	
F-STATS	54.26		17.63		20.07		10.63		6.38	

TABLE A.9.20.

REGRESSION RESULTS OF THE CHILDREN EVER BORN EQUATION
FOR THE CURRENTLY MARRIED WOMEN WHO EITHER MADE
RURAL-URBAN MIGRATION OR STAYED IN RURAL AREAS

Variable	20-24		25-29		30-34		35-39		40-44		45-49	
	b	t	b	t	b	t	b	t	b	t	b	t
Intercept	11.415	(2.61)	2.088	(.38)	-5.384	(-.62)	6.974	(.47)	6.892	(.26)	-13.785	(-.33)
N1	.304	(5.54)	.283	(6.89)	.209	(5.65)	.147	(3.56)	.107	(1.94)	-.009	(-.11)
N3	-.279	(-7.37)	-.370	(-10.07)	-.251	(-5.10)	-.343	(-4.55)	-.202	(-1.59)	-.149	(-.72)
N4	-.303	(-5.26)	-.543	(-9.78)	-.435	(-5.97)	-.511	(-4.78)	-.366	(-1.90)	-.423	(-1.38)
N5	-.278	(-1.79)	-.593	(-5.53)	-.811	(-4.85)	-.894	(-3.58)	-1.106	(-3.01)	-1.165	(-.82)
COMP	.101	(3.05)	.115	(3.71)	.192	(5.70)	.205	(4.83)	.172	(3.05)	.121	(1.72)
NC	-.084	(-1.16)	-.275	(-4.21)	-.278	(-4.15)	-.201	(-2.65)	-.312	(-2.94)	-.320	(-2.26)
RM1	-.170	(-3.37)	-.481	(-8.78)	-.441	(-5.36)	-.540	(-4.37)	-.657	(-3.32)	-.534	(-2.01)
LM1	.007	(.12)	-.320	(-6.99)	-.573	(-10.87)	-.752	(-10.60)	-.807	(-7.91)	-.612	(-4.23)
RM2	-.237	(-3.25)	-.443	(-4.82)	-.679	(-4.90)	-.427	(-1.99)	.683	(1.76)	.701	(1.21)
LM2	.205	(2.29)	-.234	(-3.32)	-.285	(-3.66)	-.492	(-4.69)	-.478	(-3.43)	-.331	(-1.76)
RM3	-.117	(-1.76)	-.378	(-5.04)	-.518	(-4.64)	-.178	(-1.12)	.201	(.76)	-.362	(-1.00)
LM3	-.107	(-1.20)	-.244	(-3.78)	-.317	(-4.64)	-.432	(-4.95)	-.393	(-3.13)	-.125	(- .72)
RM4	-.059	(- .68)	-.430	(-4.69)	-.601	(-4.31)	-.162	(- .78)	-.928	(-2.95)	-.466	(- .80)
LM4	.069	(.67)	-.055	(- .67)	-.289	(-3.27)	-.127	(-1.23)	-.237	(-1.67)	-.150	(- .81)
RM5	-.164	(-1.77)	-.413	(-3.76)	-.199	(-1.11)	-.194	(- .70)	-1.005	(-2.40)	-.602	(-1.20)
LM5	.231	(1.53)	-.008	(- .08)	-.140	(-1.36)	-.189	(-1.59)	-.181	(-1.14)	-.047	(.21)
AGE	-1.105	(-2.81)	-.251	(- .61)	.319	(.59)	-.258	(- .32)	-.154	(- .12)	.830	(.46)
AGE2	.029	(3.23)	.010	(1.27)	-.001	(- .14)	.005	(.47)	.003	(.19)	-.009	(- .47)
NDEA	1.039	(17.20)	.859	(27.47)	.832	(35.66)	.821	(37.68)	.866	(39.56)	.891	(39.94)
Number of observations	3750		6770		7389		6535		5024		3914	
R^2	.174		.297		.291		.266		.290		.307	
F-STAT	41.44		149.72		159.30		124.08		107.37		90.89	

TABLE A.9.21.

REGRESSION RESULTS OF THE CHILDREN EVER BORN EQUATION
FOR THE CURRENTLY MARRIED WOMEN WHO NEVER OUTMIGRATED
FROM RURAL AREAS

Variable	20-24		25-29		30-34		35-39		40-44		45-49	
	b	t	b	t	b	t	b	t	b	t	b	t
Intercept	4.610	(.83)	3.510	(.49)	-9.815	(- .92)	13.412	(.75)	-7.681	(- .25)	-69.514	(-1.46)
AGE	-.504	(- 1.01)	-.365	(- .69)	.586	(.88)	-.603	(- .62)	.548	(.37)	3.201	(1.58)
AGE^2	.015	(1.37)	.012	(1.22)	- .005	(- .49)	.010	(.75)	- .006	(- .33)	- .034	(-1.58)
N1	.284	(4.67)	.264	(5.78)	.208	(5.16)	.136	(2.99)	.129	(2.02)	- .007	(- .08)
N3	-.305	(- 5.18)	-.488	(- 8.36)	- .294	(-3.72)	-.336	(-2.57)	- .170	(- .69)	- 1.127	(-2.62)
N4	-.348	(- 3.54)	-.517	(- 4.90)	- .599	(-4.06)	-1.170	(-5.01)	- .799	(-2.11)	- .660	(- .87)
N5	.435	(1.27)	-.779	(- 2.87)	- .317	(- .57)	-.586	(- .96)	- .808	(- .77)	-0-	(-0-)
NDEA	1.054	(15.00)	.844	(22.38)	.803	(29.53)	.809	(31.90)	.875	(34.44)	.887	(35.54)
RMIG	-.272	(-5.70)	-.417	(- 6.78)	- .391	(-3.85)	-.222	(-1.52)	- .491	(-1.96)	- 1.137	(-3.85)
LMIG	.358	(6.77)	.051	(1.28)	- .069	(-1.67)	-.033	(- .62)	- .053	(- .77)	- .103	(-1.25)
NC	-.095	(- .98)	-.266	(- 2.81)	- .171	(-1.70)	-.279	(-2.58)	- .348	(-2.28)	- .186	(- .94)
COMP	.099	(2.75)	.095	(2.80)	.181	(5.04)	.194	(4.25)	.147	(2.37)	.114	(1.53)
No. of OBS	2323		4188		4945		4560		3655		3016	
R^2	.218		.276		.252		.222		.264		.307	
F-STAT	58.70		145.01		151.21		118.20		118.83		130.84	

TABLE A.9.22.

REGRESSION RESULTS OF THE PROPORTION OF EVER MARRIED WOMEN WHO EITHER MADE RURAL-URBAN MIGRATION OR STAYED IN RURAL AREAS

	Women					
	15-20		20-24		25-30	
Variable	b	t	b	t	b	t
Intercept	1.84	(6.06)	-3.708	(- 2.80)	-4.810	(- 4.16)
N1	.08	(6.54)	.183	(8.01)	.007	(.85)
N3	-.03	(- 6.54)	- .104	(- 8.62)	- .056	(- 7.45)
N4	-.06	(-10.75)	- .215	(-14.26)	- .129	(-11.94)
N5	-.13	(- 5.89)	- .344	(-12.32)	- .105	(- 5.11)
RMI	.01	(1.37)	.106	(6.41)	- .020	(- 1.75)
LMI	-0-	(- .16)	.025	(1.43)	- .041	(- 4.33)
RM2	.01	(1.07)	.214	(7.46)	.031	(1.57)
LM2	-.01	(- .81)	.068	(2.35)	.007	(.46)
RM3	.01	(1.60)	.113	(4.92)	.035	(2.17)
LM3	-0-	(.02)	- .011	(- .45)	- .006	(- .44)
RM4	.02	(1.28)	.185	(5.39)	.001	(.07)
LM4	.03	(2.06)	.062	(1.76)	- .026	(- 1.53)
RM5	.04	(2.36)	.241	(6.14)	.044	(1.87)
LM5	.01	(.79)	- .034	(- .75)	.007	(.32)
AGE	-.24	(- 6.67)	.273	(2.26)	.403	(4.70)
AGE 2	.01	(7.49)	- .003	(- 1.27)	- .007	(- 4.39)
NC	-.06	(-13.00)	- .445	(-36.48)	- .345	(-33.15)
COMP	-.01	(- 3.12)	- .090	(- 7.69)	- .019	(- 2.94)

	15-20	20-24	25-30
# of OBS	10217	8079	7403
R^2	.080	.333	.204
F-STATS	49.33	223.23	105.30

TABLE A.9.23.

REGRESSION RESULTS OF THE PROPORTION OF EVER MARRIED MEN
WHO EITHER MADE RURAL-URBAN MIGRATION OR STAYED IN
RURAL AREAS

Variable	20-24		25-29		30-34	
	b	5	b	t	b	t
Intercept	.156	(.18)	-11.357	(-5.04)	-3.883	(-2.73)
N1	-.027	(-1.32)	- .046	(-1.79)	- .035	(-3.26)
N3	.001	(.18)	.015	(1.13)	.007	(1.32)
N4	-.005	(- .58)	- .014	(- .99)	.006	(.97)
N5	-.019	(-1.65)	- .110	(-5.65)	- .035	(-3.82)
RMI	-.026	(-2.01)	- .020	(- .92)	- .001	(- .11)
LMI	-.019	(-1.70)	- .086	(-4.59)	- .035	(-3.99)
RM2	.010	(.41)	.009	(.24)	.021	(1.15)
LM2	-.059	(-3.24)	- .060	(-1.94)	.020	(1.45)
RM3	-.010	(- .52)	.007	(.23)	.001	(.05)
LM3	-.026	(-1.50)	- .063	(-2.26)	.008	(.67)
RM4	-.004	(- .15)	.109	(2.61)	.007	(.35)
LM4	.021	(.95)	.041	(1.03)	- .039	(-2.60)
RM5	.033	(1.03)	.096	(1.91)	- .001	(- .02)
LM5	-.029	(- .98)	- .018	(- .37)	- .005	(- .26)
AGE	-.047	(- .60)	.746	(4.47)	.273	(3.07)
AGE 2	.002	(1.08)	- .012	(-3.73)	- .004	(-2.86)
NC	.087	(10.43)	.305	(17.93)	.195	(15.53)
COMP	.074	(9.79)	.253	(14.61)	.199	(15.79)

	20-24	25-29	30-34
# of OBS	8630	7435	7843
R^2	.054	.202	.060
F-STAT	27.07	104.09	27.50

TABLE A.9.24.

REGRESSION RESULTS OF THE PROPORTION OF EVER MARRIED WOMEN WHO NEVER OUTMIGRATED FROM RURAL AREAS

Variable	15-19		20-24		25-29	
	b	t	b	t	b	t
Intercept	1.898	(4.97)	-1.677	(- .96)	-4.750	(- 3.59)
Age	-.249	(-5.47)	.073	(.46)	.399	(4.07)
Age 2	.008	(6.11)	.001	(.33)	- .007	(- 3.83)
N1	.091	(6.16)	.194	(7.41)	.009	(1.09)
N3	-.032	(-5.96)	-.187	(-10.83)	- .090	(- 8.61)
N4	-.054	(-6.93)	-.025	(-10.79)	- .154	(- 8.62)
N5	-.167	(-3.08)	-.282	(- 4.94)	- .094	(- 2.02)
RMIG	.192	(16.29)	.364	(18.09)	.063	(5.46)
LMIG	.040	(4.23)	.211	(10.00)	.035	(4.65)
NC	.070	(-9.38)	-.304	(-15.05)	- .209	(-14.11)
COMP	-.001	(-1.54)	-.028	(- 2.12)	-0-	(- .06)
# OBS	6788		4884		4472	
R^2	.113		.303		.122	
F-STAT	86.57		212.21		62.11	

450

TABLE A.9.25.

REGRESSION RESULTS OF THE PROPORTION OF EVER MARRIED MEN WHO NEVER OUTMIGRATED FROM RURAL AREAS

Variable	20-24		25-29		30-34	
	b	t	b	t	b	t
Intercept	-.298	(- .29)	-11.537	(-4.07)	-7.23	(-4.33)
Age	-.006	(- .06)	.757	(3.60)	.482	(4.61)
Age 2	.001	(.44)	- .012	(-3.01)	- .007	(-4.44)
N1	-.025	(-1.15)	- .079	(-2.71)	- .036	(-3.39)
N3	-0-	(-0-)	.004	(.25)	.018	(2.30)
N4	-.005	(- .54)	- .036	(-1.89)	.011	(1.31)
N5	0.023	(-1.46)	- .084	(-2.68)	- .006	(- .41)
RMIG	.043	(2.26)	.064	(2.34)	- .038	(-3.12)
LMIG	-.018	(-1.18)	- .019	(- .77)	- .020	(-2.20)
NC	.095	(7.88)	.308	(13.56)	.199	(13.46)
COMP	.082	(9.41)	.278	(13.61)	.204	(14.43)

	20-24	25-29	30-34
# of OBS	6114	4645	5025
R^2	.048	.200	.069
F-Stats	30.89	115.96	37.22

451