An Event History Analysis of Factors Influencing Entry into Parenthood In Nairobi

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Abstract

In this study, we use data from the Urban Integration Survey conducted in 2001 in Nairobi, following the standard that has been adapted in several cities in Africa (Dakar, 1989; Bamako, 1992; Yaounde, 1996 and Antananarivo, 1998), to examine the underlying factors influencing entry into parenthood for men and women during the period of economic crisis. The analysis uses event history methods, specifically the Cox Proportional Hazards Regression model, stratified by generational age and run separately by sex. The results show that the majority of the migrants to Nairobi began childbearing in Nairobi, with migration status having no effect on entry into parenthood when other factors are controlled for. What seems important in delaying entry into union is some form of economic security, while social and economic contexts appeared weak for both men and women. One intriguing result was that there is an almost monotonic increase on the likelihood of entry into motherhood with increase in the level of education.

Introduction

It is generally accepted that fertility transition is occurring in sub-Saharan Africa, yet the dimensions and factors accounting for the change are not well understood particularly in the urban areas (National Research Council, 1993). Part of the problem is due to either scarce or poor quality data. Although national-level demographic measures are available in the Demographic and Health Surveys (DHS) and other national-level surveys, the samples are not generally of the size that permit cities to be characterized neither are the data gathered useful for analysis of cause-effect relationships. One of the key questions that need to be understood in fertility change in urban areas of sub-Saharan Africa is whether the transition occurring in the cities stems from economic crises (National Research Council, 1993) or from the various developmental strategies/activities that the African governments put in place. For example, the economic slowdown that Kenya experienced in the past

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decade is paralleled by a dramatic expansion of schooling that may have affected men and women in various ways. Expansion of schooling and shrinking labour market may have influenced entry into parenthood for both men and women. The National Research Council (1993) pointed out that there were possibilities that the timing of first marriage, and of first and second births, may have responded to changes in the economic situations in sub-Saharan African countries but concluded from the analysis of data derived from the first round of Demographic and Health Survey (DHS) that the effects appeared marginal in Kenya although expected to have greater effects in the urban areas.

In more than a decade ago, there were speculations that urban residence and occupational status were not important correlates of fertility in Africa (Cochrane and Farid, 1988). Van de Walle and Foster (1990) later noted that the effect of women's schooling and urbanization process was at least ambiguous. It is also evident that a number of studies of determinants of fertility have failed to take into account the interaction between urbanization and other variables in determining the fertility outcomes (Kravdal, 2000). Fertility is usually measured at the place of residence at the time of the survey and does not take into consideration that some or all births might occur in other places. Therefore, it may be that the fertility in urban areas, where most migrants go to, may be biased towards the level prevailing where they come from. To understand and explain fertility prevailing in the urban setting, we must combine information from the fertility history and the migration history of respondents.

This paper therefore examines the evolution of changes in entry to parenthood in Nairobi during the period of economic crisis, while accounting for the effect of migration following standard that has already been adapted in several cities in Africa - Dakar, Bamako, Yaounde, Antananarivo (Antoine *et al*., 1995; Ouedraogo and Piché, 1995; Antoine *et al*., 2000)

Literature and Theoretical Perspectives

A number of theoretical paradigms have been offered to explain changes in fertility dynamics in populations. However some of these explanations have been confined to explaining fertility in developed countries. But as fertility transition begins to show in a number of developing countries, the patterns may follow or not follow the experiences in developed countries. For example, Easterlin (1987) offered an explanation that rests on intergenerational taste formation with the standard of living that one is exposed to during adolescence affecting one's adult preferences for children. It proposed that the consumption experiences during adolescence determine the weights individuals place in material goods as sources of satisfaction. Individuals from high-income families therefore have strong in built preferences for material goods that will eventually influence their fertility decisions. Although Easterlin proposed the hypothesis

for developed countries, more recently Macunovich (2000) has indicated that it applies to developing countries as well. The deterioration in a cohort's prospects relative to those of its parents may induce demographic adjustments among the younger generation by delaying marriages and first births, reducing fertility and through more participating in the labour force in order to maintain their relative economic status.

The above arguments are also encompassed within the rational actor models where the central tenet is that individuals take decisions of becoming a parent when they can rely not only on a solid social partnership relation but also on economic basis. A certain degree of stability in the labour market provides men and women with some degree of medium or long term security that enables them to enter into family formation since parenthood demands long term behavioural commitments (Carles *et al.*, 2002). However, much of these explanations have been postulated on female reports rather than male. In particular, there is a long standing argument that men, especially in sub-Saharan Africa, are more pronatalist because a large proportion of the costs (economic or physical) of childbearing is borne by women (Greene and Biddlecom, 2000). Nevertheless, it is expected that entry into parenthood and subsequent family building should depend on the position in the life course, the individual's socio-economic position, educational status and family background. The urban configurations of benefits and costs of having children may influence later entry into parenthood. This is because the perceptions that net economic returns to schooling are high, but the full costs of child-rearing strategies supportive of schooling are also high, yet schooling is an important requirement for entry and advancement in the urban workplace.

Davis (1963) observed that before understanding national patterns of fertility decline, we must take into account the interconnection between nuptiality, fertility and migration. The migrants who come to the city as mature adults are socialized elsewhere hence their reproductive behaviour preferences may be shaped by the social contexts of their place of origin. Since the reproductive taste preferences in the rural areas may be more pronatalist, one would expect that migration is likely to have a significant effect on fertility outcome following Easterlin's (1987) hypothesis. But Lindstrom *et al.* (2002) argue that although preferences may be strongly influenced by norms and values learned during childhood and reinforced during early adulthood, migrants moving to culturally distinct destinations slowly adapt to norms and values prevalent in the destination including those governing family formation and reproduction. The process is however gradual and linear thereby taking several generations to complete, hence weaker among the older generations moving into urban centres. The gradual assimilation hypothesis is consistent with the cultural theories of fertility where the role of values and ideational systems shape up fertility practices.

The other perspective emanating from the study of rural fertility transitions in Kenya (Brass and Jolly, 1993) indicates that rural parents may be investing in their children so as to better prepare them for urban livelihoods. The urban environment provides distant reference for rural populations through migration and relatives living in urban areas become role models, hence there would be less differences between the migrants and non-migrants to cities. Also, the migrants being a select group, with desires for upward social mobility, and more educated than those members who remain behind in the places of origin, have characteristics that predispose them to a later age at parenthood and hence low fertility after migration (Brockehoff, 1998; Brockerhoff and Yang 1994; Lindstrom *et al.*, 2002). Such individuals may undergo changes in their attitudes and behaviour towards family formation and building after migration as they gradually adapt to the new social, economic and cultural environment. The adjustment and adaptation to the new environment may make them have similar fertility pattern as those born in the urban centres (Brockehoff, 1998; Lindstrom *et al.*, 2002). Migration involves change in economic as well as cultural environments, thus migrants adjust their fertility behaviour in response to economic opportunities and constraints present in the destination. In moving to more economically developed areas, migrants encounter a relative increase in family maintenance costs, educational opportunities and higher male and female wage rates. The economic conditions in the new environment are felt from the time of arrival, and therefore adaptation is expected to influence fertility behaviour within a short time (Lindstrom *et al.*, 2002).

It is, therefore, evident from above that entry into parenthood should depend on the position in the life cycle, the individual's socio-economic position, educational status and family background**.** Entry in the labour force offers a basis for making the decision to become a parent and consequently, the subsequent family building being a long term process and self binding, requires a stable position in the labour market as a form of economic security. If the fortunes decline then entry into parenthood may be greatly delayed because of uncertain future. As a result of the decline in the economic fortunes experienced in Kenya in the 1980s, we expect later entry into parenthood for men and women for the younger generations as well as strong period effects on entry parenthood.

Methods and Materials

The data come from Nairobi Urban Integration Project (NUrIP) whose main purpose was to measure the medium or long-term effects of the macro-economic changes on the job market, on access to housing and on demographic behaviour. Urban Integration Surveys usually compare the paths of life followed by three generations, aged 45-54, 35-44 and 25-34 at the moment of data collection (Antoine *et al.*, 1995; Ouedraogo and Piché, 1995; Antoine *et al.*, 1998; Antoine *et*

al., 1999a, 1999b; Antoine *et al.*, 2000). Each of these generations lived their residential, professional and family lives in different economic and social contexts.

The main tool for data collection, the biographical questionnaire, was inspired from the so-called tri-biographies questionnaires (first perfected at INED, Paris, in 1983; Antoine *et al.*, 1999a, 1999b; Antoine *et al.*, 2000). The rationale of this questionnaire is to collect the aspects of individual lives that change over time and that can be well remembered and dated. In each part (module) of the questionnaire relevant to residential, professional and family events, one column is filled for each period lived by the respondent. A change in period corresponds to a change of status (either marital, professional or residential) or of location (of residence or of job):

The bibliographical questionnaire of the Nairobi Urban Integration Project (NUrIP) was adapted to the context of Nairobi. Before it is filled, an "Age and Event Recording Form" was used to help the interviewer sketch the biography. It is used to better locate the time of occurrence of events experienced by the interviewee. Family events such as births, marriage, deaths, etc., are first recorded on this form as they are usually the best remembered and also because they are usually officially recorded. Then residential and professional events are recorded and placed along a time-scale, where main historical events are also mentioned. In this way, ordering is easily achieved and confirmed. Only changes separated by more than 6 months are recorded, thus the biographical questionnaire only records an event that occurs within a period of 6 months or more.

Sampling

The sampling objective was to get a representative sample of three generations (aged 45-54, 35-44 and 25-34 at the time of data collection), which lived their residential, professional and family lives in different economic and social contexts over the past 30 years. In order to obtain better results for comparison between generations and sex, about 400 respondents for each category were expected to total about 2,400 biographies. Previous experience of Urban Integration Surveys indicated that information might not be robust enough with less than 200 biographies per age/sex group.

A multistage sampling procedure, proportional to population size (PPS), was adopted for the study. The first stage consisted of stratification of the main administrative areas (8 Divisions). Stratification was necessary to get a representative sample of the diverse population of Nairobi in terms of socio-economic status and density. The selection of enumeration areas (EAs) from

each division was proportionate to the number of households in each division. The second stage was to randomly select the EAs in each division from the 1999 Census list of EAs. In the third stage, a household list is established for each EA identified with the help of the maps. The fourth stage was to sample the biographies (individuals) drawn from the sampled households. Generally in African countries, where Urban Integration Surveys have been conducted, as many households as possible were drawn in order to get the necessary number of individuals in the older generations (45-54). This is because the age structure usually forms a pyramid in most African cities (Antoine *et al.*, 1999a, 1999b; Antoine *et al.*, 2000). However, the age structure of Nairobi, according to previous censuses, showed greater disparity than in most other African cities. The pyramid is highly skewed implying fewer females compared to males in each generation. In particular, there were unusually fewer women in the age range 45–54. Because the females in age group 45-54 were too few, according to the 1999 Census, we had to use the males in the same age group 45-54 as a benchmark. Taking all women aged 45-54, we sampled half of the men of the same age group and then we deduced the criteria to draw males and females in the other age groups.

Table 1: Actual and Relative Age Percentage Distribution of Targeted Age Groups (Nairobi, 1999 Census)

Generation	Actual distribution		Criteria used for selection on the field	
	Males	**Females**	**Males**	**Females**
45-54	3.4	1.7	1 out of 2	1 out of 1
35-44	6.8	4.0	1 out of 4	1 out of 2
25-34	14.0	9.9	1 out of 8	1 out of 6

On the field, each supervisor was given 6 lists corresponding to the 6 age-sex groups. In each of those lists, the supervisors wrote down the details of eligible individuals as household questionnaires randomly came from the field. The lists were designed so that lines are shaded every 2, 4, 5 or 8 individuals (depending on the age-sex group) to indicate the individuals to select for the biographical questionnaires. Only females aged 45-54 were all selected.

Data Collection

The survey was undertaken in January 2001. Out of the 3787 households surveyed, 1535 biographies were collected (as against 2145 targeted biographies). The sample was considered large enough to undertake analysis along the same lines as in other Urban Integration Surveys elsewhere in Africa (Antoine *et al.*, 1999a, 1999b; Antoine *et al.*, 2000).

Table 2: Expected and Actual Number of Biographies Collected by Sex and Age Group

	Expected		Actual	
Generation	**Males**	**Females**	**Males**	**Females**
45-54	365	271	221	317
35-44	391	354	224	261
25-34	396	367	216	296
Total	1152	992	661	874

Methodology of Analysis

With the biographical data collected, it is relatively easy to analyse changes over time. The retrospective type of data go beyond the usual cross-sectional analyses by taking into consideration the different steps experienced by individuals over their lifetime. Three time-dimensions are taken into account in the analyses. The first refers to the three generational groups (or cohort) who form three strata in our sample. The three generations (referred to as the "older", the "intermediate" and the "younger" generations) experienced different historical periods when entering adulthood. The second time-dimension of our analyses was age. In our sample the generation aged 45-54 at the time of the survey had reached age 20 in the years 1966 to 1975 included; the youngest generation (25-34) reached age 20 in the years 1986 to 1995. Lastly, the last time-dimension is the historical period. Each set of events can be grouped according to a calendar date and show the evolution of an aggregate in Nairobi.

Descriptive Survival Analysis

The first descriptive step in event history analysis is to compute the median time of occurrence of each type of event and to compare those times over generation and sex. This can also be represented by curves that are referred to as the literature the "Kaplan-Meier" curves (Kalbfeisch & Prentice, 1980). The principle is to take into consideration the time from a starting point (chosen to be the same for all individuals who can possibly experience the event) until the occurrence of the event, or until the end of observation. The survival table or curve is the best analytical tool to explore the data.

The second, more technical step when analysing retrospective data is to use the Cox proportional hazards model, also known as the semi-parametric proportional hazards model. The event is called the dependent variable and the objective of the model is to measure the effect of other variables on the occurrence of this event. The model is specified as follows:

$$h(t,X) = h_0(t)\, exp(\beta_i X_i) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots..(1)$$

where $h_0(t)$ is the baseline hazard and **β**s is a vector of the parameters to be estimated and **X**s is a vector of the covariates.

The independent variables (**X**s) can be either fixed in time (such as sex and generation, ethnicity) or time-dependent in order to capture the interference between events that are of particular interest in analysing biographical data (Kalbfeisch & Prentice, 1980; Andersen *et al.*, 1993).

In all our modelling we control through a variable crossing age group and historical period (by step of 5 years) the possible effects of unobserved economic and social changes over a period of time for certain age group. When the age-period effect is significant, it was represented in a Lexis diagram. Generally, only the significant effects are reported in tables or diagrams. The non-significant effects are mentioned and interpreted in the text but the statistical output are not reported to save space. Due to the possible effects of sample design by generation and sex, control was introduced by stratifying the regression equations by generation and undertaking the analysis separately for each sex. In particular, we estimate the stratified Cox model expressed as in equation 2:

$$h_g(t,X)= h_{0g}(t)\ exp(\beta_i X_i)\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots..(2)$$
$$g=1,2,\dots k$$

The subscript g represents the gth stratum corresponding to the k different categories of the stratification variable Z and the number of strata equals k. The variable Z is not explicitly included in the model but the Xs are. The stratified model allows for the different baseline hazard functions $h_{0g}(t)$ for each of the different strata but the coefficients (βs) are the same for each stratum; that is, the baseline hazard is different for each stratum but the effect of the covariates is expected to be the same.

The unit of analysis was person-years of observation (one person was observed several times), hence the standard errors were adjusted for clustering on the individual. Using these different techniques, optimal use of the data can be made taking into consideration all the time at risk and controlling the factors that can bias the analysis, but excluding time when the respondents were not yet in Nairobi or temporarily out of Nairobi. In this way, only the conditions prevailing in Nairobi are measured. In the table of results, only the effects of the significant variables are indicated, although controls for variables in the model that appeared non-significant in the models were listed under *notes*.

Preliminary Results

One of the greatest problems with the earlier data sets is that no information is given on whether the respondents had lived all their life in Nairobi. It is difficult to attribute the observed patterns as being influenced by stay in Nairobi. The information that is obtained, therefore, does not take into account the effect of migration. Given that many of the residents in Nairobi are migrants who lived part of their lives outside the Nairobi city, the time-space effect cannot be attributed to that of Nairobi only. Those who begin childbearing outside Nairobi are exposed to different spatial-social contexts. It is, therefore, necessary to consider fertility taking into account the time lived in Nairobi. The use of biographical data enables one to decipher the fertility at the time of migration into Nairobi.

By comparing those who migrated to Nairobi after age 15 but before age 30 (to allow direct comparison between the generations), Table 3 shows the distribution of the respondents by the number of children ever born at the time of arriving in Nairobi. The patterns for those coming having already had a birth appears to be similar across the generations, variation mainly occurring between males and females. The proportion of females coming to Nairobi having at least one child was 28 percent, 31 percent and 23 percent for the older, intermediate and younger generations respectively. For males, it was 15 percent for the older and 10 percent for the intermediate and 6 percent for younger generations. From the above information, it is evident that the majority begun their childbearing while in Nairobi.

Table 3: Percent Distribution of Respondents who first Migrated to Nairobi before age 30 by Number of Children Born (CEB)

| | Males | | | Females | | |
| | Generation | | | Generation | | |
CEB	45-54	35-44	25-34	45-54	35-44	25-34
0	83	91	94	72	69	77
1	8	4	2	14	14	11
2	5	3	2	7	8	8
3+	4	2	1	7	9	4
Number	139	148	161	201	172	215

Information on entry into parenthood is shown in Tables 4 to 6. Table 4 shows the results of the respondents irrespective of migration status. The median age to first parenthood among the males, irrespective of migration status, varied from 25.8 years among the oldest generation to 28.1 years for the youngest generation.

There appears to be minimal differences between migrants and non-migrants in the median age at parenthood for males. Using the proportions having children by age 25, differences emerge between the generations for both migrants and non-migrants showing an earlier trajectory to fatherhood for the oldest generations. However, the incidence of teen parenthood appeared to be lower for non-migrants but higher for the migrants in the oldest generation.

Table 4: Descriptive Statistics of First Birth (Parenthood) by Generation and Sex Irrespective of Place of Original Residence

Generation		**Males**			**Females**		
		45-54	**35-44**	**25-34**	**45-54**	**35-44**	**25-34**
Proportion having a first birth by age:	20 years old	15 %	8%	4 %	44%	44 %	37 %
	25 years old	43 %	31%	22 %	84%	81%	68 %
	30 years old	82 %	69%	61 %	94%	89%	82%
Age at:	First Quartile	22.4	24.2	25.4	18.0	17.6	18.6
	Median	25.8	26.9	28.1	20.6	20.8	22.6
	Third Quartile	28.7	31.8	*	23.3	24.1	26.8
Person years at risk		1134	1701	1524	1074	1135	1410

* Means status not attained

Table 5: Descriptive Statistics of First Parenthood by Generation and Sex 'Nairobians' (Born in Nairobi or Migrated to Nairobi before age 15)

Generation		**Males**					**Females**
		45-54	**35-44**	**25-34**	**45-54**	**35-44**	**25-34**
Proportion having a first birth by age:	20 years old	9 %	12 %	2 %	24 %	40 %	27 %
	25 years old	46 %	34 %	18 %	65 %	71 %	50 %
	30 years old	87 %	68 %	34 %	80 %	83 %	69 %
Age at:	First Quartile	22.3	22.3	28.8	20.6	18.4	19.3
	Median	25.8	27.8	*	23.2	21.5	25.1
	Third quartile	28.0	32.9	*	27.0	26.8	*
Person years at risk		359	672	644	458	499	687

Unlike the males, the females enter into motherhood around age 20 but the difference is only significant among the oldest generation despite the fact that the intermediate generation has the lowest average. What is quite significant is that among the females, migrants enter into parenthood earlier than those who

were non-migrants to Nairobi. By age 25, more than 80 percent of female migrants had a child. Teen motherhood was also higher among migrants compared to non-migrants.

Table 6: Descriptive Statistics of First Parenthood by Generation and Sex (Migrants)

		Males			Females		
Generation		**45-54**	**35-44**	**25-34**	**45-54**	**35-44**	**25-34**
Proportion	20 years old	30 %	6 %	7 %	72 %	59 %	59 %
having a	25 years old	56 %	40 %	34 %	92 %	88 %	84 %
first birth	30 years old	88 %	68 %	69 %	98 %	93 %	93 %
by age:							
Age at:	First Quartile	19.1	24.8	25.2	17.5	17.5	17.0
	Median	25.3	26.5	27.3	19.2	19.8	19.3
	Third quartile	28.7	31.5	31.3	21.9	23.3	23.8
Person years at risk		774	1033	879	611	631	720

The differences in entry into parenthood as per Table 4 may have been confounded by the migration status. Does this fact confirm the hypothesis of effect of migration - that migrants exposed to a different social environment during adolescent period tend to display the reproductive patterns of the place of origin? This hypothesis is further examined in the next section when other factors are controlled for.

Multivariate Analysis

In the analysis, education was included following literature evidence that it is related with higher income and also the likelihood of being in labour force (Caldwell, 1982; Becker, 1991; Basu, 1997; Schultz, 1997). Furthermore, more highly educated women are less likely to enter into marriage early, hence postponement of entry into motherhood (Basu, 1997). Employment (labour force participation) has a similar effect as education. Migration status of the individuals is included as control but may have effects as per Easterlin's hypothesis. Respondents who migrate to Nairobi later in their lifetime compared to those who are born there, or migrated at the time of their adolescence, may have different taste formation with regard to childbearing. In addition to the economic influence, cultural contexts (ethnicity and religion) also shape individual attitudes towards childbearing. While ethnic affiliation is permanent, religious orientation may change over the life cycle, and this was captured in the survey. Residential status and marital status are included as controls. Marital status is controlled for because entry into marriage may induce the individual to have first child as soon as marriage is consummated. However,

the causality may run both directions as expecting or having a child may induce the individual to enter into marriage. Residential status is a proxy for relative independence; that is, those who are tenants are more independent than those who are housed, hence the decision to have a child may not be restricted by other persons who are influential to their lives such as parents or siblings.

The time of analysis begins with either time at first migration or age 15 for the **'*Nairobians*'.** It also takes into account times when the respondent may have been temporarily out of Nairobi. In case a temporary migrant returned with a child in Nairobi, he or she is considered out of risk for the same reason as for the migrants**.** Because the analysis time is different for all those categories of migrants and non-migrants, the age and the period effects are controlled through a variable combining the two**.**

Females

For the first pregnancy among the females, 598 individuals were considered for the analysis (excluding persons who may be at risk but were residing in places outside Nairobi) giving 3030 periods of analysis time (person-years of observation). The total number with a first pregnancy was 458, and the results are presented in Tables 7a and 7b.

The results show that there are no significant differences in entry into childbearing in Nairobi irrespective of place of origin, all things being equal. This confirms the selectivity effect of migration: those who ever migrate to Nairobi are a select group belonging to different social class from the majority in their place of origin having the similar aspirations as those who already live in Nairobi. But it could also confirm the hypothesis that the environment at each point in time is more important than the environment at the origin (be it birth, in infancy or at adolescence). This, added to the fact that a majority of the migrants begin childbearing in Nairobi, shows that migration has little effect on entry into parenthood in Nairobi when other factors are controlled for.

Muslims and Christians of the Methodists and Presbyterian Church of East Africa (PCEA) denominations are about 2 times less likely to have an earlier first pregnancy compared to the Catholics (the reference category). The other category that appears different is the group of 'other religions' apart from Christianity, Islam or the African traditional groups. It may be difficult to explain why Muslims in Nairobi appear to have a later time to entry in childbearing. According to information derived from the Demographic and Health Surveys (DHS), Muslims, who predominantly originated from the Coastal and North Eastern part of Kenya, tend to start childbearing earlier than Christians. In contrast to religion, the ethnic origin of the respondent does not influence entry into motherhood. There remains to explain why cultural values as transmitted through ethnic group are less important than the cultural values

transmitted through religion as far as entry into parenthood is concerned. It might be that in the multiethnic context of Nairobi, values and attitudes towards sex and children are better captured through religious groups (of whom many are typically urban) than through the transmission of traditions of the social group of geographical and ethnic origin.

Those who were studying are 1.7 times less likely to have a first pregnancy as compared to those employed in the upper tier job market (fixed salaried with payslip). Persons studying may not aspire to have a child before concluding their studies. We can therefore conclude that entry into motherhood does not depend on activity. However, some aspects of revenue could have been captured well by the level of education rather than by labour participation. There is an almost monotonic increase on the likelihood of entering into motherhood with increase in the level of education. Those with no education are 2.8 times less likely to have a first pregnancy compared to women with primary education, the reference category. There are no significant differences between women with primary, secondary or high school level of education in the time to first pregnancy. Since raising a family in Nairobi is expensive relative to rural areas in Kenya, those with no education would not choose to have children within Nairobi, whereas those with higher education are more likely to have higher income hence more likely to start a family. The results may not contradict the established facts in the literature. What seems important in delaying entry is actually studying, which implies that having some form of economic security may be a determining factor for women to start family formation.

Marriage and beginning of motherhood are interrelated since marriage still remains the social institution for entry into childbearing. However, results show that marital union is a strong incentive to begin motherhood as indicated by the high hazard rates and level of significance.

Table 7a: Cox Proportional Hazard Regression on the Probability to First Pregnancy (Females)

Characteristic	Person Years	Hazard Ratio	Standard Error	95 Percent Confidence Interval hazard ratio	
Religion					
Muslim	397	0.45**	0.15	0.24	0.85
Catholic (ref)	1186				
Anglican	443	0.85	0.16	0.59	1.23
African Inland Church	138	0.63	0.19	0.36	1.12
Evangelical	190	0.83	0.18	0.54	1.29
SDA	92	0.80	0.22	0.47	1.36
Other Christian	415	0.81	0.13	0.58	1.11
Other religion	154	0.49*	0.19	0.23	1.03
Methodist/PCEA	341	0.61***	0.13	0.39	0.93
Residential status					
Housed (ref)	2958				
Tenant	401	1.59**	0.30	1.10	2.31
Landlord	54	0.96	0.43	0.40	2.30
Employment status					
Study	819	0.58***	0.12	0.39	0.87
Inactivity	92	1.02	0.43	0.45	2.34
Homemaker	641	0.99	0.19	0.67	1.46
Unemployed	341	0.98	0.23	0.62	1.54
Apprentice	65	1.51	0.49	0.80	2.85
Family business	128	0.68	0.25	0.34	1.38
Own business formal	180	1.16	0.32	0.67	1.99
Own business informal	163	1.01	0.40	0.47	2.17
Fixed salaried (pay slip) (ref)	632				
Fixed salaried record	129	1.16	0.30	0.70	1.92
Fixed salaried no record	140	0.97	0.32	0.51	1.85
No fixed salaried record@	48	0.82	0.32	0.38	1.76
No fixed salaried no record@	21	1.26	0.84	0.34	4.63
Level of education reached					
None	223	0.36***	0.15	0.16	0.79
Primary (ref)	930				
Secondary	1187	1.16	0.17	0.87	1.53
High school	72	1.34	0.43	0.72	2.52
Post secondary training	881	1.20	0.23	0.83	1.74
University	121	1.31	0.34	0.78	2.19
Matrimonial status					
Single (ref)	2580				
Mono informal	529	10.22***	1.53	7.61	13.71
Mono formal	230	17.34***	2.93	12.47	24.15
Separated	50	1.91	2.49	0.15	24.57
Widowed@	24	-	-	-	-

Note: The significance level of each modalities are coded as follows: *** 1%; ** 5%; * 10%. Non-significant modalities are not marked and '@ indicates that the population at risk was too small (<50 person-years at risk) for the significance to be valid. Only significant variables are mentioned here. The controlled but non-significant variables are: ethnic group, marital status. The model is also stratified by generation, the sample stratification variable.

Table 7b shows the age and period effects depicted in form of lexis diagram. The bolded numbers are significant while age periods with '*t.s.*' had person-years at risk too small (less than 50 person years). The reference category was taken as age interval 20-24 for the period 1985-1990 given that the average age first birth is around 22 years. The risk of first births is too small beyond age 30 although the sample size was small for those who ever reached age 30 before giving birth.

Table 7b: Lexis Diagram of the Age-Period Effect According to the Cox Proportional Hazard Regression on the Risk of First Pregnancy (Females)

1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-2001	Age-Group
				t.s.	**t.s.**	t.s	
			t.s.	t.s.	t.s.	0.00	35-39
		t.s.	t.s.	t.s.	t.s.	**0.45**	30-34
	t.s.	0.93	1.46	0.64	0.60	1.23	25-29
t.s.	1.79	1.46	1.57	Ref	**2.10**	**3.64**	20-24
1.57	1.53	1.21	1.19	**2.50**	**2.75**	t.s	15-19

The relative risk of entry into parenthood in age group 25-29 changed very little once other factors were accounted for. The same applies to the age group 20-24 in the period 1970-1989 and in the age group 15-19 in the period 65-84. However, one notices the period 1985-1994 for age 15-19 and 1990-2001 for age group 20-24 that the risk of entry into parenthood was significantly higher. There appears to be a correspondence with post period of economic downturn and the era of cost sharing in schools. The economic recession may have led to declines in income coupled with high costs of schooling and probably lower quality in education causing high drop out rates in schools. The net result may have led to probably high rate of premarital pregnancies.

Males

The results for the analysis for the males are presented in Tables 8a and 8b.The analysis considered 559 subjects, giving 3804 periods of analysis time (person-

years of observation). In all, 388 individuals reported that their partners had first pregnancy. We find weak social and cultural contexts in determining entry into parenthood among the males. Few differences appear to exist between the different ethnic groups or the different religious groups except that Muslims have less chance compared to the reference group (Catholics).

The results also show that males are less likely to report having a child if they are not in union. This is depicted by the high probability of having a child when in the informal union (22.3 times more) or in formal union (37.9 times more). It may also reflect that men appear to acknowledge parenthood within the expected social context.

Men in their own formal business are 1.7 times less likely to start families compared to those in the upper tier formal sector (fixed salaried with payslip). On the other hand, those in some form of formal employment, but whose wages are not fixed although there are some records, appear to have a higher probability of starting fatherhood (1.5 times more likely). It is also imperative to note that only those who reported to be inactive have extremely low chance of starting their parenthood (4 times less chance). The effect of education, however, is not linear; whereas men with primary education are 1.3 times less likely to start their parenthood compared to those with secondary education, men with some post-secondary are also 1.4 times less likely to start their family formation. Those with either high school education or university education have just the same chance as those with only secondary education.

Table 8b shows the results for age and period effects for males. Though male entry to parenthood did not significantly change in the period 1965-1984, during periods of poor economic performance the chances of entering into parenthood considerably declined in 1985-89 period. Also, this appears to have affected one particular cohort more (see the parallelogram with the underlines).

Table 8a: Cox Proportional Hazard Regression on the Probability to First Parenthood (Males)

Characteristic	Person Years	Hazard Ratio	Standard Error	95 Percent Confidence Interval hazard Ratio	
Religion					
Muslim	333	0.56*	0.18	0.29	1.08
Catholic (ref)	1392				
Anglican	517	1.21	0.18	0.90	1.63
African Inland Church	231	0.95	0.21	0.62	1.46
Evangelical	230	0.88	0.21	0.54	1.41
SDA	163	1. 20	0.34	0.68	2.10
Other Christian	689	1.27	0.21	0.92	1.76
Other religion	148	0.90	0.26	0.51	1.59
Methodist/PCEA	342	1.24	0.24	0.85	1.80
Traditional/Syncritic	126	0.73	0.22	0.40	1.33
Ethnic group of the father					
Central Bantu (Ref)	2214				
Western Bantu	758	1.05	0.18	0.76	1.46
Luo	686	0.99	0.16	0.72	1.36
Hamitic	123	1.09	0.25	0.69	1.72
Other	326	0.51**	0.15	0.29	0.90
Don't Know/Not Stated	60	1.59	0.73	0.65	3.90
Employment status					
Study	788	0.60	0.20	0.31	1.14
Inactivity	93	0.25*	0.18	0.06	1.05
Homemaker	100	1.19	0.43	0.59	2.43
Unemployed	454	0.61	0.19	0.33	1.13
Apprentice	221	0.82	0.23	0.47	1.41
Family business	133	1.02	0.27	0.60	1.70
Own business formal	362	0.58***	0.12	0.39	0.87
Own business informal	92	0.98	0.23	0.62	1.56
Fixed salaried (pay slip) (ref)	1030				
Fixed salaried record	329	0.94	0.17	0.66	1.32
Fixed salaried no record	100	1.12	0.33	0.64	1.99
No fixed salaried record	230	1.48*	0.34	0.94	2.34
No fixed salaried no record	234	0.83	0.22	0.49	1.40
Level of education reached					
None	91	0.68	0.21	0.37	1.24
Primary	934	0.76*	0.12	0.56	1.03
Secondary (ref)	1943				
High school	250	0.84	0.24	0.48	1.47
Post secondary training	704	0.71*	0.13	0.50	1.02
University	245	0.78	0.16	0.52	1.17
Matrimonial status					
Single (ref)	3572				
Mono informal	457	22.26***	3.39	16.51	30.02
Mono formal	109	37.90***	6.96	26.44	54.32
Poly@	5	-	-	-	-
Separated@	21	-	-	-	-
Widowed@	4	-	-	-	-

Table 8b: Lexis Diagram of the Age-Period Effect according to the Cox proportional hazard regression on the risk of First Parenthood (Males)

1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-2001	Age-Group
						t.s	
					t.s.	t.s	45-49
				t.s.	t.s.	t.s	40-44
			t.s.	t.s.	t.s.	**0.34**	35-39
		t.s.	1.55	t.s.	**0.36**	**0.53**	30-34
	t.s.	1.50	1.83	**Ref**	**0.38**	1.25	25-29
t.s.	1.16	1.57	0.81	**0.41**	1.10	0.80	20-24
0.75	1.84	0.97	0.33	0.58	0.22	t.s	15-19

Discussion and Conclusions

This paper set out to examine the entry into family formation in Nairobi since 1970s and associated determinants while controlling for the effect of migration when three major social change agents took place in Kenya. These key social change factors were: the massive expansion of education, the period of economic downturn and the policy shift followed by investments in family planning by the government assisted by a number of bilateral and multilateral agencies.

From the results on entry into family formation, our data indicate a delayed entry of men and women into parenthood. Before controlling for other factors, female migrants appear to have entered into parenthood earlier than non-migrants for all the generations. On the other hand, the difference between male migrants and non-migrants was minimal. The majority of migrants come to Nairobi before parenthood and also at the time of their entry into the labour force. The educational differences were intriguing; there was almost a monotonic rise in the relative risk of entry into parenthood with level of

education among the females, but not so for males. It may appear that the likelihood of entry into parenthood is higher if there is some form of economic security. Those with no education, or facing little chance of securing employment, would rather delay their entry into family formation. This may be due to selection effects such that they are not able to secure a marriage partner in a highly materialistic urban society. By the same token, uneducated women find it difficult to find mates in the city, and therefore tend to have entered into parenthood before migrating to Nairobi.

The generation aged 25-34 started their childbearing in the middle of 1980s when Kenya experienced significant decline in her economy, which appeared to have gotten worse in the 1990s. The period effects, which are more pronounced in the 1990s, may be a reflection of the lag effects of the economic crisis but can also be attributed to social change as result of policy emphasis on small families, demand for fewer births as a result of cost of family formation.

In conclusion, the falling real income levels, rise in the economic and labour market uncertainty and the disruption of traditional support systems through migration may have induced couples to reduce their desired family size leading to permanent decline in overall fertility. However, notwithstanding the economic difficulties and crisis associated with the transformation process, it is also possible that there may be a convergence towards the western social and economic incentives to childbearing in Nairobi.

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