The Demography of Zimbabwe: Some Research Findings

University of Zimbabwe Demographic Unit

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Chapter 3

Socio-economic and cultural differentials in fertility in Zimbabwe

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Introduction

Studies of fertility differentials attempt to investigate why fertility varies within populations and population sub-groups sharing diverse or common socio-economic and physical environments. This study seeks to show the existence of fertility differentials in Zimbabwe using a micro-scale case study that focuses on socio-economic and cultural factors which generate differing levels of fertility among population sub-groups in Chitungwiza.

Chitungwiza, one of Zimbabwe's major cities, is a good research area because it is experiencing rapid urbanization, an aspect regarded by many as a catalyst for rapid social and economic change. Since urbanization has globally been observed to affect fertility in many ways, this study attempts to investigate and highlight the nature of fertility differentials in the specific urban area of Chitungwiza.

Statement of the problem

There are fertility differences among various sub-groups within national populations. This study seeks to determine the extent to which these differences are the result of various socio-economic and cultural factors amongst sub-groups within national populations and the extent to which they are indicators of weakening traditional factors. Through this analysis it should be possible to identify factors responsible for the current high levels of fertility and, subsequently, to indicate a possible path for fertility decline in sub-Saharan Africa.

Objectives

- To examine socio-economic and cultural factors in fertility differentials among women in Chitungwiza. The study will attempt to determine which groups of women exhibit high fertility levels and to offer reasons for the observed fertility patterns.
- To provide policy makers and programme administrators, in fields such as family planning, with a better understanding of fertility differentials that are relevant to policy formulation in this area. The information can be used to develop special group educational strategies, if need be, so that the fertility

levels and differentials can be reduced in order to realise national family planning objectives. Furthermore, knowledge of socio-economic differentials in fertility enables policy makers to accurately predict fertility and, subsequently, trends in population growth.

To achieve these objectives, this study will relate the number of children ever born (CEB) to socio-economic and cultural characteristics of women using a bivariate approach. To establish more meaningful findings, this study will also relate the number of children ever born to these characteristics using multiple regression analysis.

Justification

A great deal has been written on fertility differentials in many parts of the world. These studies have focused on both national and sub-national populations with a view to understanding reasons behind the various socio-economic fertility differentials. In Zimbabwe a few studies of fertility differentials have been carried out on a national scale (for example, Mazur and Mhloyi, 1988; Mhloyi, 1988; Zanamwe, 1988a, 1988b). These studies have not been fully complemented with in-depth micro-scale studies. It is primarily because of this paucity in small-scale studies that Chitungwiza, which had readily available data, was selected for this study.

Since the best way to understand the demography of a country is to adopt a hierarchical approach, whereby researchers investigate population variables and other factors (for example, levels of socio-economic development) at national, provincial, and district levels, this paper will investigate one urban area in Zimbabwe as an attempt to overcome the lack of data on the lower levels of the hierarchy.

Data source

The study utilizes data from the Chitungwiza Socio-Demographic Survey, conducted in 1990 by the Demographic Unit of the University of Zimbabwe. A total of 2 500 women were interviewed in this survey.

The questionnaire was divided into two broad parts: the household schedule and the woman schedule. Data on retrospective and current fertility was collected in both schedules. In addition, data was collected on the women's characteristics, for example, education, religion, ethnicity, primary activity, current age and age at first marriage.

Methods of analysis

Several analytical methods are used in this study. This paper provides a bivariate analysis of socio-economic and cultural differentials in fertility in Chitungwiza.

Such analyses give insight into the interrelationships between variables which can later be tested by rigorous statistical techniques. In order to accurately measure the effect of socio-economic factors on fertility, multiple regression analysis is used for two main reasons:

- Multiple regression analysis gives the relative contribution of each independent variable, having adjusted for the effect of other variables.
- Through a multivariate approach, it is possible to determine whether socio-economic differentials are statistically significant or not.

Bearing this in mind, the primary tool of analysis in this study is the ordinary least squares (OLS) regression technique. The method is appropriate as it allows for estimation of the relationship between the dependent variable, which is children ever born, and one independent variable, while some other variables that may affect the relationship are controlled.

Findings

Studies show that socio-economic and cultural differentials in fertility exist in many societies although the importance of each variable differs and changes through space and time. This study will attempt to show whether socio-economic and cultural variables, for example, women's education, ethnicity, religion and primary activity, account for any fertility differentials in Chitungwiza. The analysis will only focus on women currently aged 15–49 years. The major problem associated with this study is the persistence of small numbers in some categories. Wherever this problem is highlighted, the results should be treated with caution.

The study also demonstrates how proximate determinants of fertility, for example, age at first marriage and duration of breast-feeding, act as important factors between the socio-economic and cultural factors affecting fertility in Chitungwiza.

Fertility and education

Table 3.1 shows the number of children ever born by level of school completed by mother. The data generally supports the inverse relationship between fertility and education. The pattern is one of decreasing fertility with increasing education. The relatively large difference between the mean number of children ever born to respondents with secondary education and to those with no education suggests that strong fertility differentials will become evident if the education level rises beyond primary level.

However, the relationship between fertility and education is particularly problematic in Zimbabwe since a new education system evolved at independence

in 1980. Women who are currently aged 30 years and below have had more educational opportunities than the older cohorts who were subjected to a colonial education system that was generally biased against Africans and women. The situation was worsened by the attitude, prevalent in most African families, that female education was a waste of financial resources, since daughters, on marriage, would no longer contribute effectively to their parents' security in old age. Thus, the high mean parity of the older cohorts is not only a result of their older age but is also related to their low education levels.

Table 3.1: Mean number of children ever born by level of school completed by mother

Level of school completed	Number of women	Total number of children ever born	Mean number of children ever born
Never attended	61	251	4.11
Primary	648	2 262	3.49
Secondary	453	878	1.94
Total	1 162	3 391	2.92

Education/age at first marriage

The level of education attained by women is also known to negatively affect fertility by raising the age at first marriage. Before exploring this relationship for the Chitungwiza sample, it is important to note that the relationship between age at first marriage and fertility is among those most commonly cited in the literature. This is because the earlier a woman marries, the longer the period she will be exposed to the risk of getting pregnant. Conversely, late marriage carries a shorter pregnancy exposure risk. Apart from reducing a woman's chances of getting pregnant, higher age at marriage may also result in greater risk of subfecundity before desired child-bearing is completed.

Table 3.2 shows the median ages at marriage by level of school completed for women in Chitungwiza. The results show that the attainment of higher levels of education is associated with higher ages at first marriage. This increase is most marked when secondary-educated women are compared to non-educated women. Therefore, the lower mean parity for educated women may be attributed to higher ages at first marriage.

Table 3.3 shows that differentials in fertility also exist between the various education levels even when one controls for age at first marriage. For ages 15–19 and 20–24 at first marriage, non-educated women have high mean parities compared with primary- or secondary-educated women. However, for those women married between 20 and 24 years of age, women with primary education

have a lower mean parity than those with secondary education. This result could be an effect of small numbers. In the 25-29 year cohort, the secondary educated have a lower mean parity than the primary-educated women. The higher levels of education attained by these women can explain their low mean parity.

Table 3.2: Median age at first marriage and level of school completed by mother

Level of school completed	Number of women	Median age at first marriage (years)
Never attended	38	18.50
Primary	566	18.95
Secondary	378	21.92
Total	982	19.79

Table 3.3: Mean number of children ever born by level of school completed by mother, controlling for age at first marriage

Age at first marriage	Level of school completed		
	Never attended	Primary	Secondary
10-14 years	–	(12) 6.50	–
15-19 years	(25) 5.20	(55) 5.02	(17) 4.00
20-24 years	(12) 6.00	(33) 4.15	(13) 5.23
> 25 years	–	(13) 5.50	(14) 1.75

Note: The number in parenthesis shows the number of women in each category.

Education/current age of mother

Table 3.4 shows the number of children ever born by the level of school completed by the mother, controlling for age. The data also supports the inverse relationship between fertility and education. The pattern is one of decreasing fertility with increasing education, except for women aged 10–19 years and 40–49 years. For those women currently aged 40–49 years, differences in the mean parities are very small across the educational categories. In this age group, primary-educated women have a similar number of children to non-educated women while secondary-educated women have a slightly lower mean parity. However, very few women in this age group attended secondary school as shown by the number of respondents in this category. Although achieved lifetime fertility cannot be fully estimated from women below 40 years of age, these age

groups can provide interesting insights into the effect of education on fertility at younger ages. For example, for the 20–39 age groups, the mean parities decrease as education increases.

Table 3.4: Mean number of children ever born by level of school completed by mother, controlling for age

	Current level of school completed by mother		
Age	**Never attended**	**Primary**	**Secondary**
10-19 years	–	(18) 0.56	(46) 0.63
20-29 years	(12) 3.00	(269) 2.64	(300) 1.62
30-39 years	(15) 4.73	(228) 4.12	(76) 3.51
40-49 years	(11) 5.27	(71) 5.28	(9) 5.22

Note: The number in parenthesis shows the number of women in each category.

Education/breast-feeding

Education can also have an impact on fertility by affecting the duration of breast-feeding. Although this is not the best index to measure the impact of breast-feeding on fertility, compared to intensity (or number of times a child is breast-fed per day), this study utilises the duration index since data pertaining to the intensity index was not collected in the field. Table 3.5 shows the median duration of breast-feeding the penultimate child by level of education completed by mother. The median duration of breast-feeding was preferred to the mean duration largely because it is a measure that is not affected by the skewness of the distribution and digit preferences in the reported durations.

Table 3.5: Median duration of breast-feeding penultimate child by level of school completed by mother

Level of school completed	Median duration of breast-feeding (months)	Mean children ever born
No education	28.2	4.11
Primary	17.8	3.49
Secondary	17.0	1.94

The data shows that there is marked variation in the duration of breast-feeding. Women with secondary education wean their children an average of 0.8 months earlier than those educated to primary level and 11.2 months earlier than non-educated women. Secondary education is associated with lower durations of breast-feeding as the life-styles practised by educated women are often incompatible with prolonged breast-feeding practices. Furthermore, the adoption of shorter breast-feeding durations may reflect an attempt to move from traditional culture (longer breast-feeding durations) to modern culture (supplementary feeding). Primary-educated women can have longer breast-feeding durations than secondary-educated women because the acquisition of primary education does not necessarily enable women to work away from home and therefore reduce breast-feeding durations. The effect of secondary-educated women shortening the breast-feeding period by 11.2 months may have been adequately compensated for by the use of other methods of fertility regulation. Although non-educated women have longer breast-feeding durations, they display a very high mean parity. This might be accounted for by a low breast-feeding intensity.

These results seem to confirm other studies which indicate that an increase in female education levels leads to a decline in fertility. The findings show that education raises women's age at first marriage and that an increase in education is associated with a marked decline in mean parities. Increased educational levels are also known to expose women to modern life-styles and to improve women's socio-economic status although this is not demonstrated in this study.

Fertility and ethnicity

Zimbabwe has a number of ethnic groups associated with clearly defined geographical regions. The major ethnic groups in the country are Karanga, Zezuru, Manyika, Ndebele and Korekore while the Shangaan, Kalanga, Shangwe, Tonga, Venda, and Buja are regarded as minority ethnic groups. For the purposes of this study, these ethnic groups have been placed into six categories, as shown in Table 3.6. The "others" category embraces all the minority ethnic groups encountered in Chitungwiza, namely Kalanga, Shangwe, Tonga, Venda and Buja.

Ethnic differentials in fertility were found in Chitungwiza, as shown in Table 3.6. The "others" category exhibits the highest mean parity (3.32) followed by the Ndebele (3.31). These can be considered high-fertility ethnic groups, while the Karanga can be considered a low-fertility ethnic group, since it has the lowest mean parity (2.64). The relatively low fertility among the Karanga suggests that, while they are subject to similar environmental and socio-economic influences as other ethnic groups in Chitungwiza, there are factors other than ethnicity which are depressing their fertility.

Table 3.6: Mean number of children ever born by ethnic group of mother

Ethnic group	Number of women	Total CEB*	Mean CEB*
Zezuru	544	1 539	2.83
Karanga	146	385	2.64
Korekore	101	298	2.95
Manyika	124	348	2.81
Ndebele	32	106	3.31
Others	78	259	3.32
Total	1 025	2 935	2.86

* children ever born

Ethnicity/age at first marriage

Table 3.7 shows the median ages at first marriage for the various ethnic groups in Chitungwiza. The findings show a difference of 4.75 years in age at first marriage between those with the highest mean age at marriage, the Karanga, and the Manyika who have the lowest mean age at marriage. Of those groups identified as having high mean parities, the Ndebele exhibit the lowest mean age at first marriage. This may explain the high mean parity of this ethnic group.

Table 3.7: Median age at first marriage by ethnicity of mother

Ethnic group	Number of women	Median age at first marriage
Zezuru	452	19.26
Karanga	119	21.75
Korekore	83	17.50
Manyika	108	17.00
Ndebele	32	17.50
Others	78	18.86
Total	872	18.65

A more refined pattern of fertility among these ethnic groups may be obtained by controlling for age at first marriage and educational level of mother. Table 3.8 shows the mean parities by ethnic group of mother, controlling for mother's age at first marriage. In order to overcome the problem of small numbers, age at first marriage has been split into two groups. A few observations can be drawn from this table. For those women who were first married below the age of 20 years, the Ndebele display the highest mean parity (3.92) followed by the residual group "others" with a mean parity of 3.84. The Manyika and Karanga display the lowest mean parities (2.87 and 2.75 respectively). However, for women first married after the age of 20 years, the highest mean parity is displayed by the Manyika who previously displayed one of the lowest mean parities. Karanga women also experience a slight increase in mean parity as the age at first marriage increases. A possible reason for the low mean parities for first-married women under 20 years old may be that most of these women are now older and may have underreported their number of children ever born due to memory lapse. The other reason could be that these women might have experienced higher pregnancy wastage due to their younger age at marriage.

Table 3.8: Mean number of children ever born by ethnicity of mother, controlling for age at first marriage

Age at marriage	Ethnic group					
	Zezuru	Karanga	Korekore	Manyika	Ndebele	Others
< 20 years	(276) 3.50	(14) 2.75	(48) 3.29	(53) 2.87	(25) 3.92	(38) 3.84
> 20 years	(176) 2.61	(64) 2.81	(35) 2.49	(53) 3.43	(3)* 2.00	(23) 2.39

* small numbers — results not very dependable.
Note: The number in parenthesis shows the number of women in each category.

Ethnicity/current age of mother

The pattern of differentials changes when controlling for current age of mother (Table 3.9). Of the women within the 40–49 age group, who are about to reach or have passed menopause, the Ndebele exhibit the highest mean parity followed by the Karanga (who had the lowest mean parity in Table 3.6). Although the Karanga exhibit lower mean parities in most of the younger age groups, they have the second highest mean parity in the highest age group (40–49 years). This may be because the Karanga practise wider child spacing at younger ages which does not affect their desired lifetime fertility.

Table 3.9: Mean number of children ever born by ethnic group of mother, controlling for current age

Current age	Ethnic group					
	Zezuru	Karanga	Korekore	Manyika	Ndebele	Others
10-19 years	(19) 1.11	(3)* 0.33	(2)* 1.00	(2)* 1.00	(1)* 1.00	(3)* 1.67
20-29 years	(238) 2.21	(65) 2.06	(44) 2.18	(58) 1.91	(15) 2.80	(27) 2.44
30-39 years	(135) 4.36	(35) 3.80	(26) 4.50	(32) 4.22	(6)* 5.17	(28) 4.39
40-49 years	(30) 5.80	(16) 6.06	(6) 5.67	(12) 5.08	(11) 7.00	(15) 4.80

* small numbers — results not very dependable
Note: The number in parenthesis shows the number of women in each category.

Ethnicity/education

The existence of differentials in fertility by ethnic group of mother exist even when controlling for education (Table 3.10). For women who never attended school, "others" display the highest mean parity (4.22) compared to the Manyika who have the lowest mean parity of 2.67. In the primary education category, there are no marked differentials in fertility between ethnic groups, except for the Ndebele. For secondary-educated women, the "others" had the highest mean parity (2.43) in contrast with the Karanga who had a mean parity of 1.67.

Table 3.10 also shows that besides the Karanga, Manyika and "others", who experienced an increase in mean parities with the attainment of primary education, all other ethnic groups demonstrate a negative effect of education on fertility. This could be due to primary education taking place in a traditional environment which is insufficient to change traditional values and norms towards reproduction.

Ethnicity/breast-feeding

The duration of breast-feeding by ethnic group of mother is shown in Table 3.11. The data shows that those women with the highest mean parity ("others") have the shortest median duration of breast-feeding while the Zezuru, who have the longest breast-feeding duration, do not have the lowest mean parity. The data generally shows that there is no clear-cut relationship between fertility and duration of breast-feeding.

Table 3.10: Mean number of children ever born by ethnicity of mother, controlling for level of school

Level of school	Ethnic group					
	Zezuru	Karanga	Korekore	Manyika	Ndebele	Others
Never attended	(18) 3.61	(3)* 3.33	(9)* 3.78	(3)* 2.67	—	(9)* 4 22
Primary	(280) 3.26	(79) 3.38	(65) 3.23	(71) 3.44	(19) 4.21	(38) 3.76
Secondary	(231) 1.93	(61) 1.67	(67) 2.04	(46) 2.00	(8)* 1.88	(21) 2.43

* small numbers — results not very dependable.
Note: The number in parenthesis shows the number of women in each category.

Table 3.11: Median duration of breast-feeding penultimate child by ethnicity of mother

Ethnic group	Median duration of breast-feeding (months)	Mean number of children ever born
Zezuru	20.95	2.83
Karanga	18.15	2.64
Korekore	19.43	2.95
Manyika	18.08	2.81
Ndebele	18.29	3.39
Others	18.00	3.44

Fertility and primary activity

Interpreting the Chitungwiza data so as to establish fertility differentials by women's occupation was difficult since the occupation classification categories were broad, and therefore masked possible differences. Grouping all occupations into three categories necessarily involved placing significantly different socio-economic groups into one class, but solved the problem of having small numbers in narrower categories.

Table 3.12 shows the mean number of children ever born by the primary activity of women in Chitungwiza. Of the 1 154 women who indicated their primary activities, 1 064 or 92% worked in the sales, crafts and services category which incorporates teaching and nursing. Very few of the women who were interviewed were found to be in other primary activity categories, as is

shown in Table 3.12. The male-dominated nature of Zimbabwe's urban labour market may explain why women are not highly represented in the professional, technical and managerial category.

It is interesting that women in the professional, technical and managerial category exhibit higher fertility than women in the sales, crafts and services category. This is unexpected as employment in the professional, technical and managerial sector is highly incompatible with continuous child-bearing. A possible reason for this is that women currently employed in professional, technical and managerial positions achieved their desired family sizes before they entered their current employment. However, of the three primary activity categories, it is the women in the "other" category who have the highest mean parity.

The findings presented in Table 3.12 show that there is no support for the work/fertility-incompatibility relationship that was expected to exist among urban working women in Chitungwiza. The numerous child-care services (kindergartens) in Chitungwiza and nearby Harare, where the majority of Chitungwiza residents work, can be seen as one of the major absorbers of child-care responsibilities. The existence of such "substitute mothers" may weaken the work/fertility-incompatibility hypothesis.

Table 3.12: Mean number of children ever born by primary activity of mother

Primary activity	Number of women	Total CEB*	Mean CEB*
Professional, technical & managerial	44	133	3.02
Sales, crafts & services	1 064	3 074	2.89
Other	46	148	3.22
Total	1 154	3 355	2.91

* children ever born

Primary activity/age at first marriage

Women engaged in sales, crafts and services have the lowest median age at marriage (19.08) while those engaged in professional, technical and managerial activities have the highest (21.25), as demonstrated in Table 3.13. Although Table 3.12 shows that women in the sales, crafts and services sector have the lowest mean parity (2.89), Table 3.13 shows that these women have the lowest median age at first marriage. Thus, the low mean parity of these women cannot be attributed to a high age at first marriage.

Table 3.13: Median age at first marriage by primary activity of mother

Primary activity	Number of women	Median age at first marriage (years)
Professional, technical & managerial	37	21.25
Sales, crafts & services	893	19.08
Other	35	21.43
Total	965	20.58

The existence of fertility differentials between the three primary activity sectors, even after controlling for age at first marriage, is further shown in Table 3.14. For women first married at 20 years and below, the highest mean parity (4.28) is displayed by those engaged in "other" primary activities, while those engaged in sales, crafts and services display the lowest (3.39). However, the fertility levels change slightly when women first married above 20 years of age are considered. Women engaged in professional, technical and managerial activities display the highest mean parity (2.87), while women engaged in the other two primary activity sectors have approximately the same mean number of children ever born.

Table 3.14: Mean number of children ever born by primary activity of mother, controlling for age at first marriage

Age at first marriage	Primary activity		
	Professional, technical & managerial	Sales, crafts & services	Other
< 20 years	(15) 3.53	(541) 3.39	(22) 4.28
> 20 years	(22) 2.87	(352) 2.80	(13) 2.79

Note: The number in parenthesis shows the number of women in each category.

Primary activity/current age of mother

Differentials in fertility exist even when controlling for current age of mother (Table 3.15). For women currently aged 30-39 years, those engaged in sales, crafts and services activities have the highest mean parity (4.03), while those engaged in "other" activities have the lowest mean parity (3.47). However, in the oldest cohort (40-49 years), women engaged in "other" activities have the highest

mean parity (6.00) while those engaged in sales, crafts and services have the lowest (3.93). This observation shows that the work/fertility-incompatibility relationship, which was assumed to exist among urban working women in Chitungwiza, is not overwhelmingly supported by the findings for the older ages. This finding may be weakened by the fact, mentioned above, that women among the older cohorts are not well represented in lucrative positions because of Zimbabwe's once highly male-dominated urban labour market.

Table 3.15: Mean number of children ever born by primary activity of mother, controlling for age

Current age of mother	Primary activity		
	Professional, technical & managerial	Sales, crafts & services	Other
10-19 years	–	(60) 0.62	(1)* 1.00
20-29 years	(20) 2.10	(531) 2.12	(17) 2.72
30-39 years	(16) 3.69	(325) 4.03	(17) 3.47
40-49 years	(4)* 5.75	(80) 3.93	(7)* 6.00

* small numbers – results not very dependable.
Note: The number in parenthesis shows the number of women in each category.

Primary activity/education

Table 3.16 shows interesting results when controlling for level of education completed. The mean parities for all the primary activity categories drop as the education of women increases. For example, non-educated women engaged in the sales, crafts and services sector have a mean parity of 4.12, while their secondary-educated counterparts have a mean parity of 1.93. However, when the mean parities in each educational category are compared, those for different primary activity sectors are quite similar.

Primary activity/breast-feeding

Variations in breast-feeding practice exist according to the mother's primary activity status (Table 3.17). Like education, primary activity may reflect the value of time. The more the value of time is in competition with breast-feeding, the shorter the breast-feeding duration. However, in situations where breast milk is highly regarded for its nutritional value, some women may breast-feed for longer durations even though they may resort to lower intensities. The results in Table 3.17 show that women engaged in the professional, technical and managerial sector have the shortest breast-feeding duration (17.63 months)

compared with women in the sales, crafts and services sector who breast-feed for 21 months. This could be due to a number of factors. For example, professional, technical and managerial women may not be able to breast-feed for long durations because of their work status or because they are able to buy supplementary feeds. When the median duration of breast-feeding is compared with the mean number of children ever born (Table 3.17), it is apparent that the women who breast-feed for the longest durations, that is, those engaged in the sales, crafts and services sectors, have the lowest mean parity. This indicates the importance of post-partum amenorrhea. Women engaged in "other" primary activities have the highest mean parity despite the fact that they breast-feed for a longer duration than women engaged in professional, technical and managerial activities.

Table 3.16: Children ever born by primary activity of mother, controlling for level of school completed

Level of school completed	Primary activity		
	Professional, technical & managerial	Sales, crafts & services	Other
Never attended	–	(49) 4.12	(4) 4.00
Primary	(22) 3.76	(581) 3.45	(25) 3.72
Secondary	(21) 2.10	(405) 1.93	(15) 2.60

Note: The number in parenthesis shows the number of women in each category.

Table 3.17: Median breast-feeding duration by primary activity of mother

Primary activity	Median breast-feeding duration (months)	Mean number of children ever born
Professional, technical & managerial	17.63	3.02
Sales, crafts & services	21.00	2.89
Other	19.35	3.22

Fertility and religion

An attempt to study the relationship between fertility and religion is highly problematic because of the variations in the degree of commitment to religious principles. For example, the Catholic Church is opposed to artificial birth control

methods, but in reality many Catholics practise artificial contraception. Similarly, Islam encourages large families but some Muslim families are small by design. The analysis in Table 3.18 shows the extent to which religion plays a part in influencing the achieved fertility of women in Chitungwiza.

Although Muslims appear as a separate religious group in this study, it is important to note that very few were interviewed and this has adversely affected the drawing of meaningful conclusions pertaining to Muslim women.

Table 3.18 shows the existence of differentials in fertility by religion of mother. Muslim women in Chitungwiza have the highest mean parity (4.12) followed by "others" (3.29) and traditional religions (3.15). Apart from the Muslim, "others" and traditional religions, the various religious groups do not exhibit wide differences in their mean parities.

Table 3.18: Mean number of children ever born by religion of mother

Religion	Number of women	Total CEB*	Mean CEB*
Muslim	17	70	4.12
Catholic	289	764	2.64
Protestant	429	1 262	2.94
Apostolic	246	710	2.89
Traditional	39	123	3.15
Others	125	411	3.29
Total	1 145	3 340	2.92

* children ever born

Religion/age at first marriage

The median ages at first marriage by religion of mother is shown in Table 3.19. The findings show that Muslim women and those practising traditional religions have the lowest median ages at first marriage. This probably explains their high mean parities in Table 3.17. Although Catholics have the third lowest median age at first marriage, they have the lowest mean parity among the religious groups under consideration. This shows that having a low age at first marriage is not automatically associated with a high mean parity.

Fertility differentials among the various religious groups in Chitungwiza persist after controlling for age at first marriage (Table 3.20). Of the women married at 20 years of age or below, Catholics have the highest mean parity (4.07) and Muslims the lowest (3.16). However, of the women who married

above 20 years of age, Catholics have the lowest mean parity (2.23), while Apostolics have a mean parity of 4.09. Although Muslims display a very high mean parity (9.50) in this category, the results cannot be relied upon because of the very small number involved.

Table 3.19: Median age at first marriage by religion of mother

Religion	Number of women	Median age at first marriage (years)
Muslim	17	18.75
Catholic	236	18.82
Protestant	366	20.60
Apostolic	208	20.00
Traditional	34	17.50
Others	105	19.00
Total	966	19.11

Table 3.20: Mean number of children ever born by religion of mother, controlling for age at first marriage

Age at marriage	Religion					
	Muslim	Catholic	Protestant	Apostolic	Traditional	Others
< 20 years	(12) 3.16	(140) 4.07	(216) 3.44	(115) 3.33	(22) 3.55	(75) 3.17
> 20 years	(2)* 9.50	(99) 2.23	(150) 2.61	(93) 4.09	(12) 3.42	(29) 2.88

* small numbers — results not very dependable.
Note: The number in parenthesis shows the number of women in each category.

Religion/current age of mother

In order to refine the results, it is necessary to control for various factors. Table 3.21 shows that the fertility differentials between the religious groups in Chitungwiza continue to exist after controlling for age. For women who are currently below 19 years of age, the pattern is not clear, but a number of observations can be made for older women. Of the women currently aged 20–29 years, Muslims display the highest mean parity (4.67) while Catholics have the lowest mean parity of 1.82. The remaining religious groups have approximately

two children. In the 30-39 years cohort, all the religious groups have approximately four children, with the Apostolics having the highest mean parity of 4.14 and the Catholics having the lowest of 3.67. The most meaningful religious differentials in fertility are obtained by considering women currently aged 40-49 years, since these women are about to complete, or have already completed, child-bearing. In this age group, the existence of religious differentials in fertility are shown by the mean parities. Catholic women have the lowest mean parity (4.72) and those in the "others" category have the highest (7.33). Although Muslims are widely regarded as being pronatalist, in this cohort they rate fourth in terms of mean parities, after "others", traditional and Protestant.

Table 3.21: Mean number of children ever born by religion of mother, controlling for age

Current age	Religion					
	Muslim	Catholic	Protestant	Apostolic	Traditional	Others
10-19 years	–	(21) 0.33	(22) 0.77	(14) 0.71	–	(7)* 0.71
20-29 years	(6)* 4.67	(133) 1.82	(204) 2.10	(130) 2.15	(22) 2.12	(65) 2.20
30-39 years	(7)* 3.86	(88) 3.67	(146) 3.99	(73) 4.14	(13) 4.08	(34) 4.06
40-49 years	(3)* 5.00	(25) 4.72	(31) 5.19	(18) 4.94	(2)* 7.00	(12) 7.33

* small numbers – results not very dependable.
Note: The number in parenthesis shows the number of women in each category.

Religion/education

The differentials in fertility between religious groups in Chitungwiza continue after controlling for level of school completed (Table 3.22). In the non-educated category, Protestants have approximately five children compared to approximately four children of the remaining religious groups. In the primary-educated category, Muslims confirm their high fertility status with an average of six children compared with mean parities of 3.04-3.56 in the other religious groups. For secondary-educated women, only Muslims have an average of 0.80 children, while the averages of the other religious groups range from 1.71-2.31 children. The findings shown in Table 3.22 further enhance the importance of education as an effective fertility depressant. An increase in education is associated with a marked decrease in mean parities. For example, primary-educated Muslims have an average of six children but their secondary-educated counterparts have an average of 0.80 children.

Table 3.22: Mean number of children ever born by religion of mother, controlling for level of school completed

Level of school completed	Religion					
	Muslim	Catholic	Protestant	Apostolic	Traditional	Others
Never attended	–	(16) 3.69	(16) 4.56	(12) 3.92	(5) 4.00	(10) 4.40
Primary	(11) 6.00	(146) 3.16	(206) 3.54	(156) 3.04	(22) 3.55	(78) 3.56
Secondary	(5) 0.80	(117) 1.71	(196) 2.06	(74) 1.81	(12) 2.08	(36) 2.31

Note: The number in parenthesis shows the number of women in each category.

Religion/breast-feeding

Table 3.23 shows the median duration of breast-feeding by religion of mother. Although the Muslims and "others" breast-feed for longer durations than other religious groups, they have higher mean parities (4.12 and 3.29). This indicates that breast-feeding as a form of contraception is not effective among these two groups. If it were effective, the mean parities of these religious groups would be lower than the groups with shorter breast-feeding durations.

Table 3.23: Median duration of breast-feeding by religion of mother

Religious group	Median duration of breast-feeding (months)	Mean number of children ever born
Muslim	21.60	4.12
Catholic	18.27	2.64
Protestant	17.93	2.94
Apostolic	18.23	2.89
Traditional	18.50	3.15
Others	18.52	3.29

Analysis of observations

It was observed that socio-economic and cultural factors influence the fertility behaviour of women in Chitungwiza. Contrary to the work/fertility-incompatibility hypothesis, working women (professional, managerial and technical) in the 30–49 years age groups showed higher fertility levels than women in less prestigious jobs.

On the other hand, the negative relationship between fertility and education seems to confirm expectations. The importance of education was highlighted even when mean parities by ethnicity, religion, age at first marriage and occupation were analyzed while controlling for level of school completed.

Religious differentials also exist. Islam, traditional religions and "others" are associated with high-fertility levels, while Catholics and Protestants can be regarded as low-fertility religions. These differentials persist after controlling for factors such as current age and education.

Fertility differentials have also been observed to exist among ethnic groups in Chitungwiza. "Others" and Ndebele were identified as high-fertility ethnic groups, while the remaining ethnic groups have fertility levels that are approximately equal. In the absence of empirical findings on the causes of ethnic differentials in fertility, it may be speculated that the minority ethnic groups' fear of domination by the larger ethnic groups has led to higher fertility norms.

One major observation of this study is that the duration of breast-feeding does not have a strong impact on the fertility of women in Chitungwiza since high parities exist even though the women indicated that they breast-fed for fairly long durations.

The major age-fertility relationship found in many studies is supported by the findings of this study. Age at first marriage was observed, for most of the socio-economic and cultural groups investigated, to have a negative effect on fertility since the mean number of children ever born tends to decrease as the age at first marriage increases. However, a simple bivariate analysis of this nature does not adequately show the relationship between fertility and socio-economic and cultural factors. The impact of these factors on fertility, using the multiple regression technique, also requires analysis.

Multivariate statistical analysis

Bivariate analysis provides insight into major socio-economic and cultural factors affecting fertility. In order to refine this information, multiple regression analysis is applied to investigate the variables affecting fertility. Furthermore, most of the variables in the bivariate analysis can be associated with one another; the existence of this association or multicollinearity can complicate differentials. To solve problems of this nature, one of the highly correlated explanatory variables,

or one dummy variable from the exhaustive and mutually exclusive set, must be dropped.

The correlation between the exogenous variables included in the regression model of this study may help to determine whether multicollinearity is serious or not. The strongest significant relationships are between primary and secondary education, Apostolic and traditional religions, primary activity 1 and primary activity 2, primary activity 2 and primary activity 3. This shows that the correlation coefficients are generally high between dummy variables belonging to the same substantive category.

When considering children ever born and ethnicity, Korekore, Ndebele and "others" have positive associations, while the remaining ethnic groups show negative associations. With regard to education, non-educated women and primary-educated women have positive correlations while secondary-educated women have a negative correlation. Regarding religion, Catholics demonstrate a negative association with children ever born, while the other religious groups show a positive association. Considering primary activity, it is only those women engaged in primary activity 2 who exhibit a positive association with children ever born.

The regression model

For each woman, the number of children ever born is computed by adding the number of sons and daughters living with parents, the number of sons and daughters living elsewhere and the number of sons and daughters who are dead. This value is then used as the dependent variable in an ordinary least squares regression analysis of the form:

$$CEB = \mathcal{L} + B1\ X1i + B2\ X2i + \ldots$$

Where: CEB = the dependent variable
X1i = value of variable 1 for woman i
X2i = value of variable 2 for woman i
B1, B2 = regression coefficients
$\mathcal{L}$ = constant

The above regression equation hypothesizes that fertility is dependent on women's education, primary activity status, ethnicity and religion. These variables represent some of the factors that are thought to be important fertility differentials. Educational level of a woman is entered as a proxy for her earning ability or what economists term the "value" of her time. As children are assumed to be female time-intensive, this variable can be considered as a measure of the opportunity costs associated with having children. Therefore, it is hypothesized that a negative association between fertility and women's education does exist. Furthermore, a negative association is expected between women's primary

activity status and fertility, as child-bearing and rearing compete for time. Ethnicity and religion of women are also included as variables that might be important in explaining differentials in fertility.

The regression technique is applied so as to determine the magnitude and direction of the relationship with the dependent variable, to provide estimates of the coefficients of the independent variables and to find the significance of each coefficient based on the t-test. The definition of the variables used for regressio- purposes are as follows:

Dependent variable:
CEB = children ever born
Independent variables:
ED1 = never attended school
ED2 = primary education
ED3 = secondary education
RELIG1 = Muslim
RELIG2 = Catholic
RELIG3 = Protestant
RELIG4 = Apostolic
RELIG5 = Traditional
RELIG6 = Other religious groups
ETGRP1 = Ndebele
ETGRP2 = Zezuru
ETGRP3 = Karanga
ETGRP4 = Korekore
ETGRP5 = Manyika
ETGRP6 = Other ethnic groups
PRIMACT1 = Professional, managerial and technical
PRIMACT2 = Sales, crafts and services
PRIMACT3 = Others e.g, students, skilled and unskilled workers

Since the purpose of this study is to determine the impact of a woman's ethnic, religious, education and primary activity background on fertility, these four exogenous variables may be conceptualized as single nominal variables with numerous categories that are mutually exclusive and exhaustive.

As a first step, a 1-0 dummy variable for each of the categories was constructed in which a 1 indicated, for example, a given ethnic group and a 0 indicated the remaining ethnic groups. Children ever born were then regressed on these dummy variables which actually represent a single substantive variable. The regression coefficient for the Karanga, for example, might then indicate the increment or decrement in the mean number of children ever born achieved by Karanga women, relative to the ethnic group that will be serving as a substantive baseline or constant. The regression coefficients for each single substantive

variable therefore take on meaning relative to the missing dummy category. Positive b coefficients indicate higher fertility while negative b coefficients indicate lower fertility relative to the reference category. In other words, the b coefficients show the differences in children ever born of the women in the reference category and those in other categories. Such an interpretation of regression results was used by Berk (1983) and Feyisetan (1985). The regression equations indicate four different stages of regression with a new exogenous variable being added at each stage. The main purpose of these four regression equations is to establish how each independent variable accounts for the change in the coefficient of determination (R-squared). Therefore, the successive addition of new socio-economic and cultural variables makes it possible to monitor the changes in the explanatory power of the regression model at various stages.

Stage 1: One exogenous variable, education, is entered in the regression equation and this yields an R-squared value of 13.9%. The coefficients of this equation show that secondary-educated women have 1.6 children less than primary-educated women, while non-educated women have 1.0 more children than primary-educated women. These results show that secondary education has a strong negative impact on fertility. These results are statistically significant at the 5% level.

Stage 2: The coefficient of determination slightly increases from 0.3% to 14.2% with the addition of ethnicity to equations. The importance of education as a fertility depressant is still significant. Taking secondary-educated women as the reference category, non-educated women have 2.6 more children than secondary-educated women, while those with primary education have 1.64 more children. Equation 2 further shows that the Ndebele have 3.14 more children than the Zezuru, who constitute the reference category, while the ethnic groups who fall in the residual group "others" have 0.07 more children than the Zezuru. The Korekore have the least number of children with 0.34 less than the Zezuru. However, these differences are not statistically significant at the 5% level.

Stage 3: Religion is added to the other two variables. Compared to secondary-educated women, women with primary education have 1.65 more children while non-educated women have 2.70 more children. However, after introducing religion, marked fertility differentials among ethnic groups are reduced. For example, in Equation 2, the Ndebele had 3.14 more children than the Zezuru but in Equation 3, the latter have 0.08 less. However, when analyzing the impact of religion on fertility, Muslim women have 1.94 more children than Protestants, who constitute the reference category. The remaining religions have fewer children than the Protestants since they have negative b coefficients. The inclusion of the religious variable in Equation 3 increases the explanatory power of the model by only 2.1% since the R-squared value is now 16%.

Stage 4: Primary activity is added to the other three exogenous variables. As expected, differentials in fertility by primary activity of mother exist in Chitungwiza. However, the results do not conform to the expected pattern since women in the professional, technical and managerial category exhibit the highest fertility, which is 1.05 more children than women engaged in sales, crafts and services, who constitute the reference category. The other primary activity category does not yield a negative b value. These primary activities need more time before they can have any meaningful negative impact on fertility. High fertility among professional, technical and managerial women could be due to these women having moved into their current positions at older ages, after achieving their desired family size. However, it is important to note that the inclusion of the primary activity variable yielded an R-squared change of only 0.00392 (or 0.39%).

The regression findings indicate that fertility differentials exist in Chitungwiza according to background factors such as women's education, ethnicity, religion and primary activity. The regression coefficients show that as the level of education of women increases, fertility declines, while the b coefficients for the other factors indicate that differences in mean parities also exist among the various religious, ethnic and primary activity groups in Chitungwiza.

These factors do not, however, have equal consideration in the variation between children ever born. The total amount of variation in children ever born explained by education, religion, ethnicity and primary activity is 17%, which is considered to be low. Fertility is often shaped by a number of proximate and indirect factors of which only a few have been considered in this paper. To improve the explanatory power of the model, it would be wise if future research could include proximate determinants in the model. In summary, it seems that women's education is the only variable which has had a strong impact on fertility in Chitungwiza since it has an R-squared value of 14%.

Summary and conclusions

This study has attempted to give empirical evidence in demonstrating fertility differentials in Chitungwiza using four socio-economic and cultural variables: mother's education, religion, ethnicity and primary activity. The relationships between the variables were examined by applying descriptive bivariate analysis and then multiple regression analysis, which is the more rigorous approach.

Education: Female education is significantly inversely related to fertility.

Primary activity status: No conclusive relationship between women's primary activity status and fertility is evident from Chitungwiza although the regression coefficients for the various primary activities do show that women's primary

activity is positively related to fertility. In the bivariate analysis, however, it was noted that differences in children ever born are apparent for women in younger age groups. It can be argued that the results appear inconclusive largely because of problems inherent in the concept and measurement of primary activity.

Ethnicity: Only women in the Ndebele and "others" categories exhibit a positive association with fertility. This relationship is statistically significant at the 5% level. The remaining ethnic groups do not have coefficients which are statistically significant at the 5% level.

Religion: The regression results show that Islam has a positive association with fertility and this association is statistically significant at the 5% level. Although there is a negative relationship between fertility and other religious categories, this is only statistically significant at the 5% level for Catholics and Apostolics.

The patterns of association between fertility and the principal explanatory variables raise some theoretical as well as policy issues:

- The observed relationship between female education and fertility suggests that education is a variable that can be manipulated to achieve lower fertility. An increase in education could initiate marked reductions in fertility. The impact of education strengthens as education increases beyond primary level.
- There is a positive relationship between primary activity and fertility although this relationship is not significant at the 5% level. Despite this observation, it is likely that an increase in level of education will be accompanied by an increase in employment opportunities in the formal sector. This could lead to smaller family sizes.

It can be argued that to reduce fertility in Chitungwiza, a direct manipulation of employment and education opportunities for women is necessary, while very little can be done to affect the variables of religion and ethnicity since these are not subject to change through intervention. Education has the potential to dismantle traditional religious or cultural values relating to age at marriage, contraception and duration of breast-feeding. Thus, policies for improved education for women, in terms of both quality and quantity, together with increased employment opportunities for women in the formal sector, could be the key determinants for reducing fertility in the long term. The differentials in fertility that are attributed to ethnicity and religion could be drastically reduced through policies that aim to improve the status of women. Policy makers and development planners should seriously consider the two variables of female education and employment opportunity as channels through which effective fertility decline can be realised in Zimbabwe.

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