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Social and Economic factors affecting Ethnic Fertility differentials in Malawi

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Abstract

This paper examines the ethnic differentials in fertility in Malawi using data from the 2000 Malawi Demographic and Health survey. Fertility was estimated for each ethnic group using various procedures and multiple regressions were employed in order to understand factors responsible for ethnic differentials in fertility in the country. Although all ethnic groups in Malawi exhibit high fertility (TFR in excess of 5) the existing differentials are such that the *Chewa* and *Sena* (TFR in excess of 7) could be said to exhibit high fertility whereas the *Nkonde*, *Tumbuka*, *Tonga* and *Lomwe* could be categorized as having low fertility and the rest of the ethnic groups in Malawi could be categorized as moderate. The results of regression analyses are consistent with cultural hypothesis since significant fertility differentials remain even after controlling for socioeconomic and demographic variables. Policy implications and recommendations for future directions in fertility research and family planning programme in Malawi are discussed.

Keywords: Ethnic groups; fertility, socio-economic; demographic and health surveys; regression; cultural hypothesis

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1. Introduction

Malawi is at the take-off stage of major demographic revolution. Relative to other countries in the region, Malawi has always had high fertility and mortality rates. For example, although the infant mortality rate has declined from 176s per 1000 in 1976 to 151 per 1000 in 1987 and to 135 per 1000 live births in 1998, Malawi has the highest infant mortality rate in the SADC region (Malawi Government, 1994c, 2002, 2006). Moreover, the risk of Malawian women dying due to pregnancy and related factors is very high and worsening. Maternal mortality ratio has increased from 620 per 100,000 live births to 1120 per 100000 live births (Malawi Government, 1994c, 2002, 2006). Similarly, expectation of life at birth estimated to be 48 years in 1998 is believed to have decline to 40 years and is among the lowest in the world (Malawi Government, 1994a, 1994b, 2002). The decline in expectation of life at birth is largely attributed to HID/AIDS epidemic. It is estimated that HIV/AIDS prevalence rate is 14%. Total Fertility Rate in Malawi is still high though it has declined somewhat over the past few decades. TFR has declined from 7.6 children per woman in 1977 to 7.4 children per woman in 1987 to 6.4 children per woman in 1998 (Malawi Government, 1994a, 2002, 2006). The decline in fertility could be attributed to an increase in contraceptive prevalence rate. Contraceptive prevalence rate has increased from 7 per cent in 1992 to 26% in 2000 (Malawi Government, 1994c, 2002, 2006). However, although much is known about the demography of Malawi at national level, little is known about the demographic characteristics of each individual ethnic group in the country.

There has been an increase in the number of scholars and policy makers that are interested in ethnic differences in demographic/reproductive outcomes (Dubuc, 2009; Garenne and Zwang, 2006; Zaidi and Reichenbach, 2009; Bauni, Gichuhi and Wasao, nd). A number of factors are responsible for this. First, this stems from the fact that ethnicity is a powerful factor in Africa that affects all aspects of life for the individual. Ethnicity plays a role in school participation (whether or not one will attend school and which school one attends), employment status and promotion and political participation. Ethnicity also has an influence on spouse selection and recruitment (there is a tendency to marry from the same ethnic group), attitude towards number of children and contraception. As such, for most Africans, ethnic belonging is definitely a more powerful reference than the wider national identity.

Second, ethnicity is deeply embedded in the social structure of a society i.e. the networks or statuses or positions that people occupy in relation to each other as individuals or groups. The individual's cultural attachment and identity to the collective to which s/he belongs in a non-trivial way, determines his or her behaviour including reproduction. In societies where ethnic identities are very strong like in Africa, access to, and distribution of resources also tend to be done along ethnic considerations, implying that the socio-economic status of individuals or groups therefore tends to be closely associated with ethnicity (Brockerhoff and Hewett, 1998, 2000).

2. Theoretical background

Available literature indicates that ethnic differences in demographic behaviour (fertility, mortality, migration, nuptiality) have been interpreted in terms of three hypotheses: the "characteristics hypothesis" and the "norms/cultural hypothesis" and the "minority hypothesis" (Goldscheider, 1971; Addai, 1999a, 1999b; Addai and Trovato, 1999). A number of scholars have used these hypotheses to explain ethnic differences in fertility, contraceptive use, the duration of postpartum sexual abstinence, marriage patterns (Kollehlon, 1989; Addai and Trovato, 1999; Addai, 1999a; Zulu, 2001).

The first hypothesis, the characteristics hypothesis assigns ethnic differences in demographic behaviour to differing socio-economic characteristics of individual members of different ethnic groups. Inherent in this hypothesis is the assumption that people of different ethnic background become assimilated into the socio-economic structure of the larger society (within the nation) as their socio-economic status improves through increased education, urban residence and modern occupations (Addai and Trovato, 1999). Ethnic affiliation can, therefore, be treated as an indicator of socio-economic status, degree of urbanisation and social mobility of the groups in a particular society (Goldscheider, 1971). Marriage pattern differences among ethnic groups that may exist at one point in time are considered temporary phenomena, representing a social or cultural lag, which is often indicative of social and economic backwardness or deprivation (Goldscheider, 1971). Thus, irrespective of their ethnic background, women who possess the same socio-economic characteristics are expected to have similar marriage patterns. Therefore, once differences in socio-economic characteristics are controlled for, ethnic variations in age at marriage, and the propensity to enter polygynous marriages and to experience a marital dissolution should disappear.

The second hypothesis, the cultural hypothesis, offers an alternative explanation of ethnic differences in demographic behaviour. It postulates that ethnic group differentials in reproductive-related behavior may be due to differences in norms, values, and attitudes toward fertility related behavior among ethnic/ groups. Distinctive aspects of cultures or norms about fertility and fertility control may produce distinct patterns of fertility outcomes among different ethnic/religious groups. Hill (1985), in his study in Mali, also noted that the very different lifestyles of different ethnic groups in many African countries may lead to different patterns of fertility behavior even though they live in comparable physical settings. This hypothesis assigns similar importance to the role of ethnicity/culture in explaining ethnic differences in marriage patterns (Addai, 1999a; Addai and Trovato, 1999). Group norms, ideals and beliefs are assumed to be important factors in determining age at marriage, propensity to enter polygyny and experience of marital dissolution.

The third hypothesis, the minority-group status hypothesis, admits the relevance of socioeconomic and demographic factors in explaining differences in reproductive-related outcomes between the majority and minority groups, but asserts that minority-group status exerts an independent influence on fertility behaviour (Kollehlon, 1989; Dudley et. al., 2006). This hypothesis states that the fertility of the minority group will be lower (or the use of contraceptives will be higher) than that of the majority group if certain conditions are met. These conditions include: the minority group must have similar socioeconomic and demographic attributes as the majority group; the group must not have pronatalist norms, instead desiring to acculturate the values of the majority group; and the minority group must have aspirations for upward mobility with no feelings of insecurity and marginality. When these conditions are not met, the minority group will have higher fertility (or lower contraceptive use) than the majority group.

In trying to explain the ethnic differences in fertility in Malawi, these three schools of thought have been put into consideration but with greater emphasis the first school of thought. If this is the case, then controlling for socioeconomic determinants should render insignificant any differences in fertility.

3. Data sources

The study is based on the analysis of data obtained from the 2000 Malawi Demographic and Health survey (Malawi Government, 2002). The 2000 MDHS involved the use of three basic questionnaires. First, a household questionnaire that was used to list all of the usual members and visitors in the selected households. Basic information on each person listed was collected, including age, sex, education, and relationship to the head of the household. In addition, the household questionnaire collected information about such characteristics of the household as the source of water, type of toilet facilities, materials used to construct the household's dwelling, and ownership of various consumer goods as well as data on child labour practices, use of bed nets (mosquito nets), and nutritional status of children and women. The main purpose of the Household Questionnaire was to identify all of the eligible women (age 15-49) and men (age 15-54) for individual interviews. Second, a questionnaire on individual women that recorded detailed information on eligible women who were identified from the household questionnaires. The 2000 MDHS collected data from 13220 women aged 15-49 years. The questionnaires on individuals collected information on the background characteristics of the respondents (age, education, religion, etc.), reproductive history, knowledge and use of family planning methods, antenatal and delivery care, infant feeding practices, including patterns of breastfeeding, childhood vaccinations, recent episodes of childhood illness and responses to illness, especially recent fevers, marriage and sexual activity, fertility preferences, woman's status and decision making, mortality of adults, including maternal mortality, AIDS-related knowledge, attitudes, and behaviour, as well as on her husband's background characteristics. Third, a questionnaire for individual men aged 15-54 years was administered and a total of 3092 men were interviewed in 2000. The male questionnaire was similar to that of the individual women questionnaire but excluded the detailed reproductive history and sections dealing with maternal and child health and adult and maternal mortality. The analyses in this paper will use data from the individual women questionnaire only.

4. Methods of analyses

The study involved two major analyses. Firstly, the analyses involved the estimation of fertility for each of the ethnic groups. Most of the commonly used estimation procedures such as reported current fertility, mean parities, P/F ratio method, Gompertz relational model and Parity Progression Ratios were used to derive estimates of fertility for each ethnic group. In addition Brass and Coale formulae for estimating mean parities were also used (United Nations, 1967; Palamuleni, 1993). The main purpose of carrying out this exercise was to determine which ethnic groups in Malawi could be categorized as exhibiting high or low fertility.

Secondly, multiple regression analysis was used in order to determine the relationship between fertility and ethnicity and to determine the relationship between fertility and social, economic and demographic factors for each ethnic group in Malawi. The first set of multiple regression analyses involved regressing fertility on selected social, demographic and economic variables for each ethnic group separately in order to determine whether the effect of the background variables on fertility differs for each ethnic group as the theoretical framework implies. For each ethnic group the following regression analyses were performed.

$$CEB = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 \qquad \text{Model (I)}$$

where, CEB is total number of children ever born for each ethnic group, α is the constant, β_i are the regression coefficients and X_i are the independent variables.

The second set of regression analyses were conducted to study whether or not ethnic fertility differentials exist in Malawi, after controlling for selected socio-economic variables. The assumption for doing this exercise was that if ethnic fertility differentials exist after controlling for selected socio-economic variables then this means that there are some cultural factors that are responsible for the observed differences. In other words, this will provide some basis for accepting the cultural hypothesis. On the other hand, if ethnic fertility differentials disappear after controlling for selected socio-economic variables then this will provide some basis for accepting the characteristics hypothesis. For this exercise the following models were utilized:

$$CEB = \alpha + \beta_1X_1 \qquad \text{Model (II)}$$

$$CEB = \alpha + \beta_1X_1 + \beta_2X_2 \qquad \text{Model (III)}$$

$$CEB = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 \qquad \text{Model (IV)}$$

$$CEB = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 \qquad \text{Model (V)}$$

$$CEB = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 \qquad \text{Model (VI)}$$

where, CEB is total number of children ever born, α is the constant, β_1 are the regression coefficients and X_1 are the independent variables. The description of variables used in models III to VII is the same as that of model II.

In model II we examined the relationship between children ever born and ethnicity. In model III we examined this relationship while controlling for basic demographic indicators (age, age at first marriage, marital status, number of other wives). In model IV through model VI, we progressively added control variables for residential characteristics (rural-urban residence and region: model III), social and economic factors (education, Purchasing power, religion, occupation: Model IV) and behavior characteristics (knowledge of FP, Ever use of FP, Desire of children, Approval of FP, Discussion of FP).

5. Results

5.1. Characteristics of the ethnic groups in Malawi

Table 1 presents social, demographic and economic characteristics of each ethnic group in Malawi. There are a number of similarities between the various ethnic group in Malawi. The mean age of women interviewed for each ethnic group was around 28 years, mean age at first intercourse was around 16 years, mean age at marriage was around 17 years and mean age at birth of the first child was 18 years. Marriage among all the ethnic groups can be described as universal and it can safely be assumed that the main purpose of getting married is to have children. The ethnic groups in Malawi also show some differences. In terms of descent system, the *Chewa, Yao, Lomwe, Anyanja* are matrilineal whereas the *Tumbuka, Tonga, Nkonde, Ngoni* and *Sena* are patrilineal. The *Tumbuka, Tonga* and *Nkonde* (who traditionally come from the Northern Region) are the most educated and urbanised and can be categorised as wealthy. The *Sena* and *Yao* are the least educated and the *Lomwe, Chewa* and *Yao* are the least urbanised. There are also ethnic differences in religious affiliation. Most ethnic groups in Malawi are Christians with the exception of the *Yao* who are predominately Muslim.

5.2. Estimates of fertility for ethic groups in Malawi

One of the objectives of the study was to determine which ethnic group in Malawi has high fertility. The results of the various demographic techniques used to estimate fertility for each ethnic group in Malawi are presented in Table 2. The estimates of fertility in Table 2 and illustrated in Figure 1 indicate that by Malawian standard the *Chewa and Sena* exhibit very high fertility (TFR in excess of 7) whereas the *Tonga* and *Lomwe* could be categorized as having low fertility (TFR less than 6) and the rest of the ethnic groups in Malawi could be categorized as moderate (TFR between 6 and 7).

Table 1. Selected characteristics of ethnic groups in Malawi, 2000

	Chewa	***Tumbuka***	***Lomwe***	***Tonga***	***Yao***	***Sena***	***Nkonde***	***Ngoni***	***Anyanja***	**Other**	**Total**
Demographic											
Age	28.2	28.1	28.6	28.1	28.7	28.5	28.0	28.5	28.6	28.5	28.4
Age at Marriage	17.8	17.5	17.0	17.5	17.3	17.5	17.2	17.6	17.1	17.0	17.4
Marital Status											
Never married	19.5	19.8	14.6	18.9	16.0	14.1	15.3	19.8	14.6	14.3	17.3
Currently married	72.3	69.7	67.8	70.3	71.9	76.7	71.6	68.4	72.2	73.4	70.8
Formerly married	8.2	10.5	17.6	10.8	12.1	9.2	13.0	11.8	13.2	12.2	11.9
Number of wives											
Monogamy	84.0	75.7	88.8	79.6	80.2	81.4	71.2	88.1	87.0	73.9	83.1
Polygamy	16.0	24.3	11.2	20.4	19.8	18.6	28.8	11.9	13.0	26.1	16.9
Geographical											
North	2.8	72.1	0.2	65.7	1.0	0.7	92.9	8.5	0.4	84.4	16.6
Central	79.8	19.5	4.1	18.2	18.4	6.6	4.6	57.0	1.7	4.8	34.1
South	17.4	8.4	95.7	16.1	80.5	92.7	2.5	34.5	97.9	10.8	49.3

	Chewa	*Tumbuka*	*Lomwe*	*Tonga*	*Yao*	*Sena*	*Nkonde*	*Ngoni*	*Anyanja*	**Other**	**Total**
Urban	20.1	30.5	17.9	29.7	23.0	12.5	29.3	25.9	18.8	14.5	21.7
Rural	79.9	69.5	82.1	70.3	77.0	87.5	70.7	74.1	81.2	85.5	78.3
Socio-Economic											
No education	24.8	8.3	26.9	11.2	39.3	49.7	15.8	20.9	28.3	17.6	25.5
Primary	63.9	70.2	62.9	65.4	52.2	43.5	70.7	62.6	62.1	70.7	62.2
Secondary +	11.2	21.5	10.2	23.4	8.5	6.8	13.5	16.5	9.5	11.6	12.3
Not working	46.2	40.4	44.6	37.9	45.4	39.6	23.9	47.0	46.3	19.1	43.2
Working	53.8	59.6	55.4	62.1	54.6	60.4	76.1	53.0	53.7	80.9	56.8
Christian	91.7	98.5	94.4	97.9	25.0	87.5	98.7	97.7	93.5	96.4	84.4
Muslim	6.2	0.9	4.2	1.7	74.7	8.6	0.5	1.2	5.0	1.5	14.3
Other	2.0	0.6	1.3	0.3	0.4	4.0	0.9	1.1	1.5	2.1	1.4
Knows FP	96.6	97.0	98.8	98.3	95.7	96.3	94.1	94.7	97.3	89.0	96.4
Ever used FP	43.3	54.9	45.9	51.4	39.6	39.3	49.9	46.2	47.5	49.0	45.4
Approves	76.0	72.6	75.3	73.1	69.1	68.4	65.8	78.0	71.1	65.0	73.3
Never discussed FP	26.8	22.0	32.9	33.3	36.2	29.6	28.2	27.5	34.0	31.1	29.8
Once or twice	32.2	36.1	42.0	26.9	34.1	43.4	32.1	35.1	38.2	25.7	35.4
More often	41.0	41.9	25.2	39.8	29.7	27.0	39.7	37.4	27.8	43.2	34.8
Approves family planning	90.2	87.7	95.3	86.4	90.2	89.2	81.6	94.5	92.6	82.6	90.9
Ideal number of children	4.2	4.2	4.1	4.2	4.2	4.6	4.6	4.0	4.1	4.9	4.2
Wants more Children	58.8	60.3	61.6	64.8	62.4	73.4	68.1	55.2	59.1	69.1	61.0
Undecided	2.8	4.8	2.2	2.7	3.0	3.7	3.4	2.8	2.6	1.7	2.9
Wants no more	38.4	34.8	36.1	32.6	34.6	22.9	28.5	42.0	38.4	29.1	36.1

Table 2. Estimates of Fertility for Ethnic Groups in Malawi, 2000

Ethnic Groups	Reported	Parity	Brass formulae	P/F method	Gompertz	PPR	Average	Rank
Chewa	7.2	7.7	6.8	6.7	6.8	7.4	7.1	1
Tumbuka	6.2	7.0	5.3	5.2	6.5	6.3	6.1	6
Lomwe	6.3	6.0	5.0	5.6	5.7	6.0	5.8	9
Tonga	6.5	6.1	5.3	4.6	5.6	6.6	5.8	8
Yao	7.2	7.1	5.3	6.2	6.1	6.7	6.4	4
Sena	8.2	7.8	5.8	6.4	6.7	7.4	7.1	2
Nkonde	6.3	5.8	6.1	5.9	5.7	6.5	6.1	
Ngoni	6.2	6.9	5.9	6.0	6.6	6.9	6.4	5
Other	6.9	7.0	6.5	6.2	6.4	5.9	6.5	3

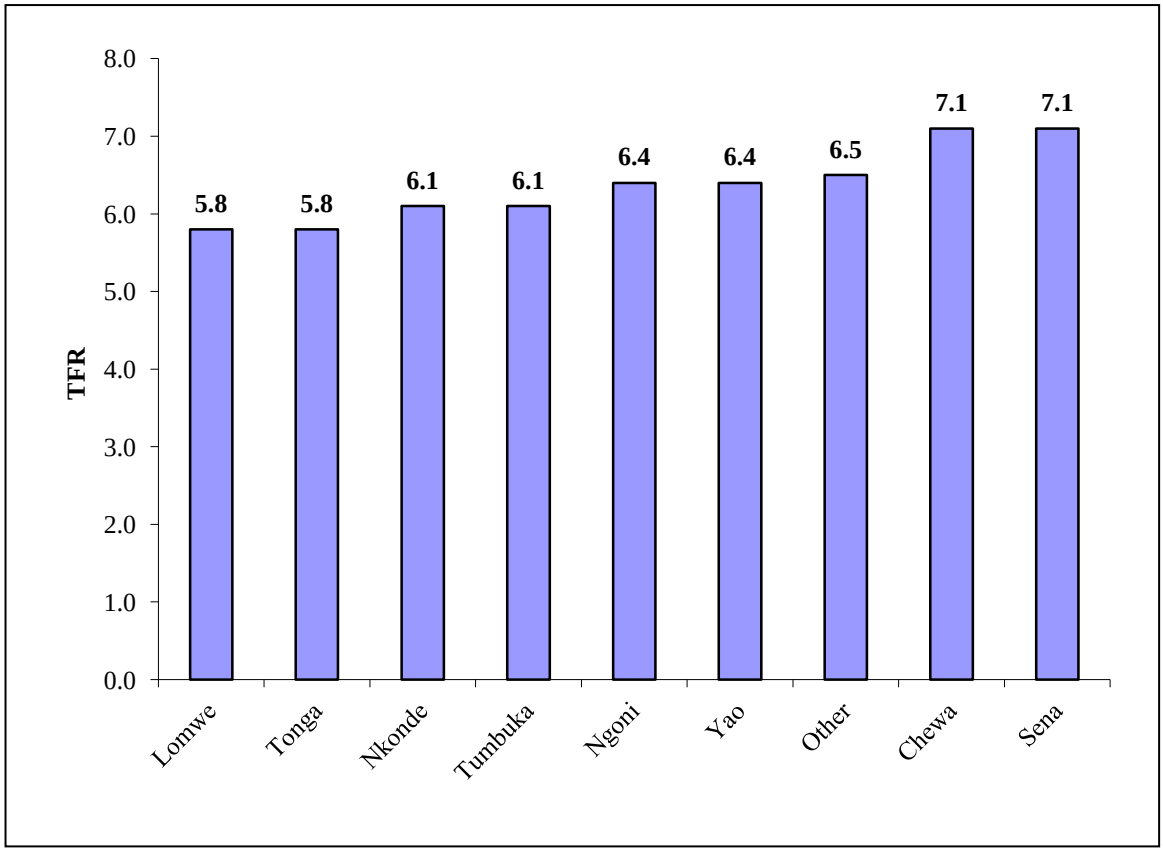

Figure 1. Estimates of fertility for ethnic groups in Malawi, 2000

5.3. Determinants of ethnic fertility differentials in Malawi

The relationship between fertility for each ethnic group and social, demographic and economic variables was further studied using multiple regression analyses. The results for this exercise are presented in Table 3.

Table 3. Regression of children ever born on selected background variable for ethnic groups in Malawi, 2000

	Chewa	***Tumbuka***	***Lomwe***	***Tonga***	***Yao***	***Sena***	***Nkonde***	***Ngoni***	***Anyanja***	**Others**
Constant	-3.187*	-3.365**	-2.745*	-2.055	1.123	-4.977	-2.348	-2.444	-2.978	-2.581*
Current age	0.245**	0.213**	0.180**	0.173**	0.219**	0.210**	0.191**	0.217**	0.170**	0.191**
Northern Region	-0.260		-0.170		0.062	1.997		0.234	-0.039	
Central Region		0.106	0.136	0.399	0.142	0.539	-0.242		0.751	0.413
Southern Region	-0.182	-0.027		-0.980*			-2.035*	0.021		0.030
Place of residence										
Rural	0.197*	0.275*	0.423*	0.346	0.300*	0.012	-0.225	0.313*	0.534	0.075
Urban										
Religion										

	Chewa	*Tumbuka*	*Lomwe*	*Tonga*	*Yao*	*Sena*	*Nkonde*	*Ngoni*	*Anyanja*	**Others**
Christian					0.111					
Muslim	-0.035	0.574	0.431*	0.729	0.020	0.660	-0.307	0.392	0.359	-1.253
No Religion	-0.169	-1.716	-0.455				-1.055	0.457	2.229	-1.210
Other Religion	-0.437	-0.122	-1.017	0.826			-0.674	0.059		0.062
Knowledge of FP										
Knows no FP						1.231				
Knows FP	0.139	0.013	0.492	-0.130	0.064		0.106	0.179	0.536	0.500
Ever Use of FP										
Never Used										
Ever used FP	0.488**	0.428**	0.890**	0.665*	0.640	1.095*	0.430*	0.583**	0.651	0.424*
Marital Status										
Never married	-0.241	-0.242	-0.014	-0.628	-0.266	-0.721	-0.088	-0.687*	-0.391	-0.458
Married	0.363	-0.025			1.317		0.985		1.111	0.594
Living together	0.394	0.134	-0.497	-0.420	1.007	-0.358	-1.024	-0.074	1.174	0.602
Widowed	-0.152	-0.431	0.326	-0.552	-0.734*	-1.092	0.163	-0.757*	0.304	-1.056
Divorced	-0.449	-0.412	0.078	-0.537	-0.237	-2.597	0.140	-0.843*	1.073	-0.954
No. of wives										
No other wives										
Other wives	-0.127	-0.072	-0.136	0.152	0.015	-0.990	0.161	-0.310	0.165	-0.290
Age at first marriage										
Above 20	-1.130*	-1.097**	-1.322	-1.008**	-1.356**		-1.312**	-1.043**	-1.253**	-1.444**
Below 20						1.200*				
Husbands approval of FP										
Husbands disapprove	-0.023*	0.264*	-0.028	-0.014	0.093	0.153	0.651*	0.031	-0.128	0.009
Husband approves	-0.144	-0.383								
Don't know	-0.023	0.270	-0.451	0.430	-0.189	-0.558	-0.025	-0.317	-0.439	0.056
Discussion of FP										
Never Discussed	-0.322	0.494	0.258	-0.294	-1.004	-1.651	-0.312	-0.336	-0.457	-0.577*
Discussed Once	0.215	0.617	0.767*	0.360	-1.058	-0.926	-0.014	0.081	0.154	0.035
Discussed more than one	0.257		0.971*	0.515	-0.813	-0.813	0.173	0.247	0.348	
Disapproves FP	-0.825*	-0.470	-0.155	-0.289	-4.136*	0.114	-0.305	-0.717	-0.347	0.381
Approves FP	-0.563				-4.108*		0.204	-0.706		
Don't know		-0.256	0.087	0.446	-4.482*	1.532	0.532	-1.055	0.726	0.286
Education										
No Education	-0.543	0.324		0.472		0.061				
Primary	-0.175		-0.458		-0.212		-0.513	-0.310	0.037	0.049
Secondary and over	-0.665	-0.423	-0.987	-0.180	-0.688	-0.374	-0.961	-0.828	0.030	-0.847
Work Status										
Not working	0.145	0.506*	-0.127	0.063	0.114	0.649	0.124	0.343*	0.422	-0.079

	Chewa	*Tumbuka*	*Lomwe*	*Tonga*	*Yao*	*Sena*	*Nkonde*	*Ngoni*	*Anyanja*	**Others**
Working in sales	0.079	0.374*	-0.018	-0.531	0.074	1.343	-0.095	0.219	0.584	0.182
Working in Agriculture	0.208	0.436*	-0.423	0.040	0.020	1.282	-0.030	0.295	0.456	0.334
Desire for children										
Wants more children	-0.533**	-0.718**	-0.685*	-1.320*	-0.412*	-0.975	-0.754*	-0.777**	-1.265*	-0.856*
Undecided	-0.136	-0.545	0.345	-0.817	-0.112	-0.087	-0.556	-0.460	-1.649	0.007
Wants no more Children	0.250	-0.003	0.384	0.160	0.230	0.210	0.015	0.123	-0.025	0.061
R-square	77.2	76.6	67.9	78.4	70.8	76.9	74.4	75.2	69.9	71.5

*** p<0.001 * p<0.05*

For all ethnic groups in Malawi, respondent's age has positive effect on fertility. The higher the age of the respondents the high fertility is expected to be. These results are similar to those found in Nigeria (Kollehlon, 2003).

Residing in the Central Region has a positive effect on fertility. All ethnic groups in the Central Region, with the exception of the *Nkonde,* are positively associated with fertility. The *Nkonde* residing in the Central Region are the only ethnic group whose regression coefficient is negative. All ethnic groups in the Southern Region, with exception of *the Lomwe, Yao, Sena, Anyanja* and other ethnic group are, negatively associated with fertility.

For all ethnic groups (exception the *Nkonde*) indicate that residing in rural areas is positively associated with high fertility. This scenario is what is expected in view of the high literacy rates, better socio-economic conditions and the exposure and access to family planning that urban women enjoy more than their rural counterparts. The observation of low fertility among the *Nkonde* in rural areas could be indicative of the fact that the *Nkonde* generally have low fertility.

Table 3 indicates that for each ethnic group residing in rural areas is positively related to fertility. However, among the *Nkonde*, rural residence has a negative effect on fertility. With the exception of the *Sena*, Table 3 indicates that women with no education are positively related to fertility. On the other hand, women with secondary and higher education have lower fertility than women who have no education and primary education.

For all ethnic having primary education is positively associated with high fertility whereas having secondary education is negatively associated with fertility. This is in line with expectation. Several studies have shown the inverse relationship between education and fertility. For instance a study by Martin (1995) using DHS data of 26 countries, (including sub-Saharan Africa), also found higher education to be consistently associated with lower fertility.

With the exception of the *Nkonde* and other ethnic groups, being a Muslim is positively associated with fertility. The finding that being a Muslim is associated with high fertility is consistent with findings from

other studies that show that Muslims tend to have more children than their non-Muslim counterparts (Dharmalingam and Morgan, 2004; Westoff and Frejka, 2007).

For all ethnic groups knowledge of family planning and ever use of contraception are both positively associated with high fertility. This may be not be surprising given that it is women with high fertility who have the urge to use family planning. Moreover, women with high fertility are more likely to visit a health center thereby introduced to family planning. In the early stages of family planning service provision in Malawi, family planning services were provided as part of the maternal and child health programme.

For all ethnic groups, being never married is negatively related to fertility. The same is the case with women who are divorced and widowhood (except among the *Tonga*). Being married is positively related to fertility with exception of *Tumbuka, Lomwe* and *Sena*. Living together is negatively related to fertility except for the *Chewa* and *Yao*. Age at first marriage above 20 is negatively related to fertility for most ethnic groups in Malawi. It is often argued that the higher the age at first marriage the lower fertility is expected to be.

For most ethnic group being in polygamous marriage is associated with lower fertility. The only exception to this rule is the *Yao, Sena and Nkonde*. The effect of polygamy on fertility has to date baffled demographers and they are still divided on this issue. For instance, while some studies show that polygamy has a depressing effect on fertility (Borgerho-Mulder, 1989), other studies found no difference between the fertility of polygamously and monogamously married women (Adetunji and Moore, (1999). A few of the studies were inconclusive because of the small sample sizes and the lack of control variables in the analysis. A recent study based on data obtained from DHSs conducted in twelve countries (Nigeria, Senegal, Ivory Coast, Cameroon, Rwanda, Tanzania, Uganda, Zimbabwe, Benin, Ghana, Malawi and Madagascar) in Africa has demonstrated that in ten countries polygamy is negatively associated with fertility whereas in the remain two countries (Ivory Coast and Uganda) the opposite is true (Cahu et. al., 2011).

Several hypotheses have been advanced; notable among them is the selection bias argument. This argument posits that polygamously married women are usually less fertile than monogamously married women. Thus, a monogamously married man will take a second wife only if the first wife is childless. Another argument is that polygamously married women tend to have older husbands than monogamously married women. Furthermore, since polygamously married women share their husbands, this may result in lower frequency of coitus.

Respondents who wants to have another child (be it within 2 years, after 2 years or unsure of time) or has been declared infecund are negatively related to fertility. This means that respondents who want to have another child tend to have lower fertility. Respondent who are undecided, wants no more children or sterilized are positively related to fertility.

All ethnic groups indicate that women who are never married are negatively related to fertility. This is expected given the presumes low exposure to sexual activity and risk of childbearing. This is also encouraged by the fact that most Malawian communities frown upon childbearing outside marriage. For instance, among the *Chewa*, children born out of wedlock are referred as *mwana wa kunthengo* (literally meaning a child from the bush). Furthermore, for all ethnic groups, not working is negatively related to fertility. Contrary to popular belief, working in agriculture sector is also negatively related to fertility (except among the *Nkonde*).

In addition, For all ethnic groups, having discussed family planning more than once is positively related to fertility (except for the *Yao)*.

A possible explanation for this is that women who have many children are encouraged to discuss family planning issues with their spouses. The encouragement may stem from the fact that most of these women visit ante natal clinics where they are taught about family planning and encouraged to discuss with their spouses.

Many studies have found that women who are working experience lower fertility than their counterparts who are not working. 'Role conflict' theory is often advanced as the basis for the differences in fertility of women who are in the work force and those who are not. Working women, especially those engaged in non-domestic enterprises, have a conflict between work and reproduction. They find the care of children more difficult than those women who are not working and hence tend to have fewer children than the latter group. Even among the employed group there are substantial differentials by occupational groups. From the experience of contemporary rich nations, women engaged in agricultural pursuits tend to have higher fertility than those engaged in non-farm enterprise.

5.4. Relationship between fertility and ethnicity

The next set of multiple regression analyses were designed to establish whether or not ethnic fertility differentials exists in Malawi after controlling for social, demographic and economic variables. The basis for this set was that if ethnic fertility differentials exist after controlling for background variables that will provide support for the cultural hypothesis. However, the disappearance of ethnic fertility differentials after controlling for background variables will provide support for the characteristics hypothesis. The results of this set of multiple regression analyses are presented in Table 4 below.

Model 1 presents the relationship between fertility and ethnicity without introducing any controls. In model 1, the Chewa has been excluded from analysis. The *Anyanja* are positively related to fertility whereas the remaining ethnic groups are negatively related to fertility.

In model 2, the relationship between fertility and ethnicity is considered after controlling for demographic variables (age, age at first marriage, marital status, number of other wives). Contrary to model 1, for all ethnic groups, model 2 suggests that fertility and ethnicity are negatively related.

As expected, current age is positively related to fertility. Age at first marriage above 20 and polygamy (other wives) is negatively related to fertility. In terms of current marital status, those who are married and those living together are positive related to fertility where as those who are never married, widowed and divorced are negatively related to fertility.

In model 3, the relationship between fertility and ethnicity is considered after controlling for demographic variables (age, age at first marriage, marital status, number of other wives) and residence (rural-urban and region). In terms of the relationship between fertility and ethnicity the results of this model are similar to those obtained in model 2 in that the *Chewa* has been excluded from analysis whereas the all the other

groups are negatively related to fertility. Central and Northern Regions and rural dwellers are positively related to fertility.

In model 4 the relationship between fertility and ethnicity is further examined after controlling for demographic variables (age, age at first marriage, marital status, number of other wives), residence (rural-urban and region) and socio-economic variables education, place of residence, region of residence, Purchasing power, religion, occupation) and behavioral factors (knowledge of FP, Ever use of FP, Desire of children, Approval of FP, Discussion of FP).

In terms of the relationship between fertility and ethnicity the results of model 4 are similar to those obtained in models 1 and 3 in that the *Chewa* has been excluded from analysis whereas the *Sena* and *Anyanja* are positively related to fertility and the remaining ethnic groups are negatively related to fertility.

Model 5 represents a full model in which the relationship between fertility and ethnicity is further examined after controlling for all the variables. Model 5 reveals that there are ethnic fertility differentials in Malawi. The observed differences in fertility are similar to those in model 1 in that the *Sena* and *Anyanja* have higher fertility than other ethnic groups whereas the remaining ethnic groups in the country have lower fertility.

As expected, current age is positively related to fertility. Age at first marriage above 20 and polygamy (other wives) is negatively related to fertility. In terms of current marital status, those who are married and those living together are positive related to fertility where as those who are never married, widowed and divorced are negatively related to fertility.

Table 4. Regression of children ever born on ethnic groups in Malawi, controlling for on selected background variable, 2000

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Constant	3.259**	-3.353**	-3.601**	-3.665**	-2.453**
Ethnic Groups					
Chewa					
Tumbuka	-0.247*	-0.259*	-0.174*	-0.112	-0.107
Lomwe	-0.093	-0.371*	-0.192*	-0.198*	-0.174*
Tonga	-0.363	-0.349*	-0.261*	-0.195	-0.148
Yao	-0.125	-0.240*	-0.082	-0.076	-0.048
Sena	-0.422	-0.444**	-0.287	-0.291	-0.181
Nkonde	-0.317*	-0.312*	-0.208*	-0.179	-0.042
Ngoni	-0.066	-0.176*	-0.144	-0.122*	-0.128
Anyanja	0.029	-0.278**	-0.062	-0.057	0.018*
Others	-0.275	-0.423*	-0.367*	-0.322	-0.195
Current age		0.245**	0.244**	0.243**	0.218*
Marital Status					
Never married		-0.671**	-0.631**	-0.595**	-0.293**
Married		0.378**	0.394**	0.355**	0.191**
Living together		0.168	0.195	0.179	0.048
Widowed		-0.567**	-0.529**	-0.533**	-0.450**
Divorced		-0.397**	-0.383**	-0.420**	-0.385**

	Model 1	Model 2	Model 3	Model 4	Model 5
Number of wives					
No other wives					
Other wives		-0.062	-0.094	-0.102	-0.073
Age at First Marriage					
Above 20		-1.423**	-1.405**	-1.332**	-1.194**
Below 20					
Region					
Northern Region			-0.082	0.095**	0.141
Central Region				0.200**	0.187**
Southern Region			-0.212*		
Place of Residence					
Rural			0.310**	0.182**	0.252**
Urban					
Maternal Education					
No Education					
Primary				-0.096**	-0.230**
Secondary and over				-0.476**	-0.689**
Work Status					
Not working				0.149*	0.202*
Working in Sale				0.164*	0.138
Working in agriculture				0.156*	0.187*
Religion					
Christian					
Muslim				-0.068	0.040
No Religion				-0.197	-0.177
Other Religion				-0.389	-0.184
Knowledge of FP					
Knows no FP					
Knows FP					0.191*
Ever used FP					
Never Used					
Ever used FP					0.571*
Spouses approval of FP					
Husbands disapproves					0.608
Husband approves					0.444
Don't know					0.345
Discussion of FP					
Never Discussed					-0.545
Discussed Once					-0.164
Discussed more than one					-0.045
Respondents approval of FP					
Disapproves FP					-1.046
Approves FP					-0.851
Don’t know					-0.850
Desire for more children					
Wants more children					-0.611**
Undecided					-0.280**
Wants no more children					0.194**
R-square	2.0	69.7	69.6	70.2	73.4

An examination of the goodness of fit of the models (R-square) presented in Table 4 indicate that belonging to a particular ethnic group has little effect on the overall fertility. In fact less than one percent of the variations are in fertility are explained by ethnicity. The introduction of demographic variables increases r-square to 68% (model 2). Adding residence (model 3) and socio-economic variables (model 4) to the model has negligible impact on fertility. Behavioral variables (model 5) increases r-square to 73%. This indicates that demographic variables followed by behavioral variables accounts for most of the explained variations in fertility in Malawi.

6. Discussion and conclusion

The purpose of this study is to determine whether or not there are significant fertility differentials by ethnic group in Malawi and if they exists to establish the social, demographic and economic factors that may be responsible for the observed differences. In order to address these objectives four research questions were postulated. First, are there significant fertility differentials by ethnic groups in Malawi? Second, are there significant social, demographic and economic differences between women from the various ethnic groups in Malawi? Third, if there are social, demographic and economic differences between women belonging to various ethnic groups, are these differences responsible for the observed ethnic differences in fertility? Third, if there are ethnic differences in fertility, do these differences arise from the way the ethnic groups value children, their beliefs or customs, or do the differences arise most from social, economic and demographic differences between the ethnic groups?

In terms of the first question various fertility estimates considered in this study reveal that there are variations in fertility by ethnic groups in Malawi. From the highest to lowest, the ethnic groups in Malawi could be ranked as follows: *Chewa, Sena, Yao, Ngoni, Tumbuka, Nkonde, Tumbuka* and *Lomwe*. In other words, the *Chewa, Sena, Yao* and *Ngoni* could be said to exhibit high fertility whereas the *Nkonde, Tumbuka*, *Tonga* and *Lomwe* could be categorized as having low fertility. The TFR estimates indicate that the difference between the *Chewa* (the ethnic group with the highest fertility) and *the Lomwe* (the ethnic group with the lowest fertility) could be around 1 child per woman.

With respect to the second question this study reveals that there are differences in terms of social, demographic and economic characteristics of the ethnic groups considered in this study. The ethnic groups that are traditionally from Northern Region (*Tumbuka, Nkonde, Tonga*) are more educated and urbanized than ethnic groups from the Central and Southern Region.

Furthermore the study indicates that the determinants of fertility for each ethnic group in Malawi are the same. In particular, the results of the regression analyses indicate that the most important determinants of fertility for each ethnic group are age, age at marriage, type of residence, ever use of contraceptive and desire for additional children. However, the different socio-economic situations that characterize the ethnic groups imply that the ethnic groups may react to these factors differently. For instance, although being rural is associated with high fertility for most ethnic groups this is not the case with the *Nkonde*.

Lastly the fact that ethnic differences in fertility remain after controlling for social and economic factors supports the importance of cultural hypothesis in understanding the differences in fertility between the various ethnic groups. Therefore there is need to determine by further studies the specific values and norms for each ethnic group that influence the fertility of each ethnic. Among the *Chewa* for example there are some popular sayings that suggest that the *Chewa* people cherish large families. Two such sayings are *kalikokha nka nyama ali awiri ndi munthu* (one who is alone is an animal where one who has a sibling is a person) *or mutu umodzi zusenza denga* (one head cannot lift a roof).

The findings of this study have some policy implications. First, the Government of Malawi should continue its efforts in investing in public health, reproductive health, education, job creation and improving the status of women. It is expected that investing in these sectors will among other things lead to an increase in age at marriage, an increase in uptake of modern and reliable contraceptives and reduce the desire for additional children. Better services will also be made available in rural areas where the majority of the population of Malawi resides.

Second, the observed high fertility combined with the fact that contraceptive prevalence rate is high, higher than some African countries that have witnessed fertility decline, implies that future decline of fertility will be possible if family planning uptake is combined with other changes in socio-economic variables as described in the preceding paragraph. It would be also nice to isolate additional variables that are likely to bring about the desired outcome. One such variable would be a reduction in infant mortality. The Demographic and Health Surveys (DHS) data sets indicate that infant mortality rate declined from 134 in 1992 to 108 in 2000 and to 76 in 2004. The fact that infant mortality rate reduced to slightly more than half in the past two decades, can be very important in convincing families that more children are surviving and they can reach their desired number of children with a lower fertility. Thus the observed decline in infant mortality creates a favourable environment for family limitation. Once Malawian women realises that infant mortality has fallen they will soon learn that there is no need for them to have more than 5 children in order to attain their desired fertility of 4 children. Interestingly, desired family size has remained unchanged at 4 children during the period under review.

The continued ethnic differences in fertility imply that future family planning programmes should have ethnic specific IEC messages.

The fertility rate in Malawi is high though it seems to be declining. If the population policy and the family planning programme continue receiving a strong support it is possible that fertility will continue to decline in future. However, despite this potential fertility decline, in the next 2-3 decades, continued rapid population growth in Malawi is inescapable because of youthful age structure of the population which is the outcome of the persistency of high fertility in the past. Beyond that point much depends on fertility trends in the coming decades. This continued population growth may exacerbate greatly problems of underemployment, while the prognosis for future fertility decline is better , hence this fact demonstrate the appeal for provision of appropriate family planning services for this population and anticipation of increasing fertility rate in coming years in order to make suitable social, economical and population planning.

Last but not the least, from research perspective, it is important to acknowledge that the analysis adopted in this study is not rigid enough considering the issues being investigated. However this study represents a good starting point in an attempt to uncover the reasons underlying ethnic fertility differentials in Malawi. More studies of this nature are needed. Future studies should attempt to study ethnic differences using qualitative and multidisciplinary approach. Another contribution in the area of fertility research is that the finding of this study suggests that the onset of fertility decline may vary from one ethnic group to another. The *Tumbuka, Nkonde*, T*onga* and *Ngoni* may experience fertility transition earlier than the other ethnic groups. This is based on the observation that these three ethnic groups are closer to the three conditions proposed by Caldwell under which fertility is likely to decline in sub-Saharan African countries: an infant mortality of not more than 70 infant deaths per 1000 live births, nearly all girls going to primary school and at least 30% of all girls attending secondary education and at least 25% of currently married women using family planning methods with 20% using modern contraception (Caldwell et. Al 1992). Using these as a yardstick, and accepting that the results of this study suggest that different ethnic groups in Malawi, like elsewhere in Africa, respond differently to social and economic transformations underway, one would be tempted to suggest that fertility transition in Malawi would proceed differently for each ethnic group in Malawi. The *Tumbuka* and *Tonga* are experiencing earlier transition than the Chewa.

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