Stall of the Fertility Decline and the Newly Passed Reproductive Health Law in the Philippines

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ABSTRACT

This study aims to expand discussion in comprehending the stall in fertility decline in the Philippines in the past 20 years. Using the 1993 to 2013 National Demographic and Health Survey data, fertility models were created using the Bongaarts' (1982) framework. The decomposition method by Casterline, Domingo and Zablan (1988) was employed to evaluate which proximate determinants: marriage, contraception, postpartum infecundability facilitated or hampered the fertility decline in the country. The analysis was done at the national level and across type of residence & education.

Findings show that contraception remained as major factor that explained fertility decline at the national level. The combined effect of at least two or all three factors - marriage, contraception, postpartum infecundability – contributed to the declining fertility trajectories across type of residence and education. How these results will complement the plans based on the newly passed Reproductive Health Law will be explored in this paper.

INTRODUCTION

Fertility has been the focus of extensive empirical research in the last few decades because of the unique fertility experiences of countries and societies. Researchers were preoccupied in identifying and analyzing the major factors that affects these distinct fertility scenarios. Given the different cultures and conditions of countries, there is no single factor or group factors, which can wholly explain these fertility trends. Brown and Norville (2001) argued that fertility would continue to be a demographic force difficult to explain because of the many complicated factors associated with it.

As early as the 1940s population experts have espoused theories to help understand fertility and the factors that affect it. One of the popular ones is the demographic transition theory posited by Notestein (1953) who hypothesized that industrialization and urbanization are the ultimate driving forces of the fertility conditions of a given society. Modernization sets a socio-economic environment, which results to lower fertility. This theory has been tested by researchers with contrasting results, some established that an improved socio-economic condition can lead to a lower fertility performance (Potter, Schmertmann and Cavenaghi, 2002) while others saw a weak or even the absence of a relationship between these two

variables (Bongaarts, 2005; Bongaarts and Watkins, 1996; Cleland and Wilson, 1987).

Other researchers and demographers searched for other factors that will help comprehend the fertility differentials among nations and its corresponding sub-national groups. Davis and Blake (1956) identified and grouped proximate variables, which they claimed to have a direct effect on fertility, putting the socio-economic factors at the extreme end of a framework, declaring them to have an indirect influence to fertility. The three categories identified are intercourse variables, conception variables and gestation variables. The factors under these categories may either have a negative or positive relationship with fertility.

Another improvement to the quest of finding factors that will aid in determining fertility performance is the proximate determinants model by Bongaarts (1978). He originally identified intermediate variables - marriage, contraception, abortion, lactational infecundability, frequency of intercourse, sterility, spontaneous intrauterine mortality, and duration of fertile period - which have a direct impact on fertility. But Bongaarts (1982) demonstrated further that the variations in only four of these eight intermediate variables can largely account to the differences in fertility among populations – marriage, contraception, induced abortion and postpartum infecundability.

Lastly, other factors were excluded in the analysis like coital frequency, sterility, duration of fertile period and spontaneous intrauterine mortality, which are also identified found to be proximate determinants of fertility. Their exclusion from the analysis is due to the reason that they only have a meager contribution in explaining the fertility of populations and its effect can only be observed during extreme conditions, like in the case of sterility, which can only be felt in the presence of venereal diseases.

The lack of available date for induced abortion across the selected background characteristics and the findings of Cabigon that induced abortion contributed the least in the fertility change in the more recent periods in the Philippines yielded to the assumption that it can be absent and the index of induced abortion is equal to 1.0.

There were three modifications of the Bongaarts' model which was identified and reviewed by Cabigon (2008) that were not incorporated in this analysis due to data limitations and it is beyond the scope of this study. Firstly, in the 1984 version, Bongaarts added a fifth element, pathological sterility. He also came up with an age-specific version that calculates the effects separately for each five-year age group from 15-19 to 45-49. Lastly, Stover (1997) suggested how new data which were not available when Bongaarts first developed the model could be integrated.

The Bongaarts' model can be utilized to help understand the unique fertility experience of the Philippines, which has stalled its decline over the past decades

causing social scientists, specifically demographers in search for possible explanation. Casterline, Domingo and Zablan (1988) pioneered the estimation of the Bongaarts' model at the national level for the Philippines, for the period 1963 to 1983. Cabigon (2008) updated it until 2003 at the national and regional levels and Cruz (2008) across socio-economic variables until 2008.

This study therefore is aimed to enrich these earlier studies by establishing trends across socio-economic factors (type of residence and highest educational attainment) using the 2013 National Demographic and Health Survey (NDHS) data. The fertility performance of the Philippines will be evaluated within the context of an indefinite pattern of relationship between fertility, intermediate variables and socio-economic factors. It examined data from 1993 to 2013 by various characteristics and considered proximate or intermediate variables other than contraception that will help explain the fertility trends and patterns across socio-economic factors. This paper also decomposed fertility change into the effects of the three proximate determinants (marriage, contraception, and postpartum infecundability) at the national level by type of residence and highest educational attainment to identify which categories of these major characteristics exhibit patterns that explain the slow fertility decline.

This study is conducted within the context of the newly passed Reproductive Health Law, which was lobbied by advocates for more than a decade. It was signed into Law in 2012 but its implementation curtailed when the conservative Catholic Church and conservative groups opposed the law and asked the Supreme Court to nullify it, which led to the issuance of a restraining order. On April 8, 2014, the Supreme Court held the law "not unconstitutional" although it struck down some provisions which include the provision that gave minors access to contraceptives without parental consent, and another that would have penalized health officers who refuse to disseminate information on reproductive health programs. Part of this study will be a review of this law and examine its possible contribution to the fertility decline in the country.

DATA

This analysis used the 1993 National Demographic Survey (NDS), the 1998, 2003, 2008 and 2013 National Demographic and Health Survey (NDHS) data sets to establish patterns in the past 15 years and to assess the contribution of marriage, contraception and postpartum infecundability in the fertility decline in the country during these periods. These are nationwide surveys, which collected respondent information from women of reproductive ages, 15-49 years old. The 2003 NDHS also collected a baseline data from Filipino men, aged 15-54 years old.

The NDS/NDHS is a series of demographic surveys in the Philippines taken at five-year intervals since 1968. The NDS/NDHS surveys aim to provide policy makers and program managers with detailed information on fertility, family planning,

childhood and adult mortality, maternal and child health, and knowledge and attitudes related to HIV/AIDS, and other sexually transmitted infections. These surveys were undertaken by National Statistics Office, United States Agency for International Development (USAID) with the technical assistance of ORC Macro.

METHODOLOGY

In this analysis, fertility was measured in terms of Total Fertility Rate, which refers to the number of births a woman would have on average at the end of her reproductive life if she were subject to the current age-specific fertility rates (ASFRs) throughout her reproductive years from 15 to 49. Estimation of the Age-Specific variables was carried out to serve as an input in the calculation of the Total Fertility Rate. Each ASFR will then be multiplied by five with the resulting output representing the number of children a woman would have for each five-year period. The resulting birth rates for all categories will be added up to yield the number of children a woman can have by age 49, which is the total fertility rate.

Type of residence is the residential classification of the respondent according to the definition of the NDHS urban/rural classification (Urban, Rural). Highest educational attainment was operationally defined as the highest level of education completed by the respondent until the survey date with these categories - No Education, Elementary, High School, College and higher.

Marriage represents the proportion of women of reproductive age, 15-49 years old, who engages in sexual intercourse regularly. All women living in sexual unions should theoretically be included, but to circumvent difficult measurement problems, this study will deal only with the childbearing of living in stable sexual unions, such as legal/formal unions and consensual (cohabitation/live-in) unions. The age-specific proportion of single women was generated to serve as an input in the computation of this marriage indicator. On the other hand, as an input to the computation of the marriage index, the age specific proportion of married women (15-49 years old) was also generated. For this study, married women are defined as those who were either formally married or are living in with someone.

Contraception is the extent of use and the effectiveness of any deliberate parity-dependent practice, including abstention and sterilization, undertaken to reduce the risk of conception. The Contraceptive Prevalence Rate (CPR) for all methods controlling for all the background variables were calculated to provide for contraception levels and trends for the periods being studied. Contraceptive Prevalence Rate is defined as the proportion of married women age 15-49, who was using some method of family planning at the survey date (NSO and ORC Macro, 2004). As an input to the computation of the contraception index, two contraception variables were generated – the method-specific contraceptive effectiveness and the proportion of married women currently using contraception. The all-method contraceptive effectiveness rates employed were lifted from the computation of

Laing (1978) as follows: ligation (1.000), sterilization (1.000), pill (0.902), IUD (0.947), condoms (0.810) and others (0.700).

Lastly, postpartum/lactational infecundability is the duration a woman remains infecundable (i.e. unable to conceive) following a pregnancy until the normal pattern of ovulation and menstruation is restored. The median duration of breastfeeding in months was used to present the levels and trends of postpartum infecundability and as an input to the computation of the index.

These indices can only take values between 0 and 1, with extreme value of zero implying that the fertility inhibition of the variable is complete while an index value of one means that there is no fertility-inhibiting effect of a given proximate determinant. Hence a marriage index of one means that all the women are married and are exposed to the risk of pregnancy while value of zero means that none of the women is married and therefore not exposed to the risk of pregnancy. This is on the assumption that the onset of fertility occurs within the context of marriage. The index of contraception will be equal to one if there is absolutely no contraceptive use among the married women and it equals zero if all of them are using some method of contraception. The index of postpartum infecundability equals one in the absence of breastfeeding while it equals zero if the duration of infecundability is infinite. A model estimate of TFR was computed by multiplying all the indices with the total fecundity rate (the level of fertility in the absence of the inhibiting effects of celibacy, contraception, induced abortion, breastfeeding and postpartum amenorrhea), which is assumed to equal the average of 15.3 children as suggested by Bongaarts (1982).

Bongaarts (1982) noted that the purpose of this equation is not to provide a new estimation method but instead it gives an approximate breakdown of the contributions made by the different proximate determinants to the fertility levels. Therefore it is not unusual to see differences exceeding 0.5 births per woman between the fertility model estimates and the observed total fertility rates. Bongaarts (1982) further indicated that the variance in fertility that is not explained by the four principal proximate determinants may possibly be due to several factors such as errors in the measurement of deviations from the total fecundity rate of 15.3, errors in the observed total fertility rates, assuming that induced abortion is absent and all births are legitimate including those from live-in arrangements. Please refer to Bongaarts (1982) for a more detailed discussion of the impact of these factors to the variance between observed and model estimate fertility.

Lastly, postpartum infecundability is defined as the period a woman is unable to conceive following a pregnancy until the normal pattern of ovulation and

menstruation is restored. This proximate determinant of fertility can be directly measured by calculating the median duration in months of postpartum amenorrhea. It was observed that longer duration of postpartum infecundability leads to longer birth intervals, hence resulting to lower fertility (NSO and ORC Macro, 2004). Jain, et al. (1970), Rosa (1976) as cited by Raymundo (1980) claimed that normally, postpartum amenorrhea, due to anovulation, would provide some contraceptive effect for the first four months after birth.

On the other hand, breastfeeding have been studied because of the importance of its fertility inhibiting mechanism. Pioneer studies established the positive relationship of breastfeeding and postpartum amenorrhea, wherein in societies where contraception is low, the level of breastfeeding activity may significantly contribute to prolonged inter-pregnancy levels, case in point is Bombay which demonstrated that the mean inter-pregnancy interval is significantly longer when the infant is nursed than when it is either not breastfed or born dead (Potter, et al., 1976; Chen, et al., 1974; Baxi 1957 cited in Raymundo, 1980). It was also suggested by Bongaarts (1982) that in the absence of a direct measure of postpartum amenorrhea, it could be approximated from the average duration of breastfeeding. Hence, with the availability of this data, this study used the average duration of breastfeeding in estimating the model as suggested by Bongaarts (1982).

While there was an attempt to include economic status (poor, non-poor) as a background variable it was not pushed as the available statistic for this background factor is for the 2003 NDHS only hence trending of the contribution of the proximate determinants in the fertility behavior between poor and non-poor women will also not be established. There was also an initial attempt to extend the period backwards to 1983 but the structure of the data and its non-comparability to the more recent NDS/NDHS data sets limited its use in the analysis hence its exclusion was decided.

Certain assumptions were made in estimating the model as suggested by Bongaarts (1978, 1982) like the Total Fecundity Rate, which is pegged at 15.3 where it usually falls in the range 13 to 17. As such, this may in some ways have an effect to the model estimates.

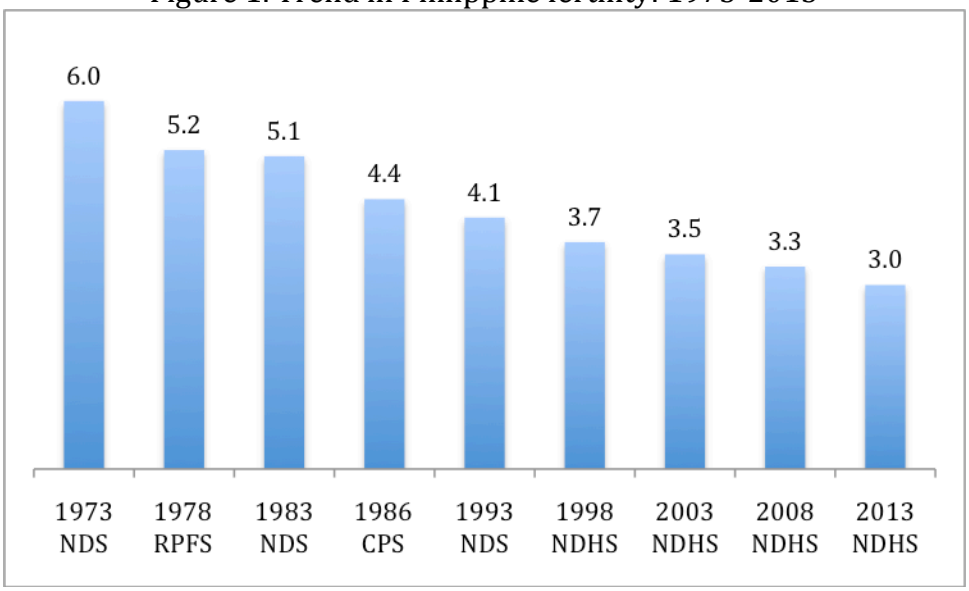
The table also includes a residual column, which accounts for the effects of factors other than the abovementioned proximate determinants such as abortion and the effects of errors in the measurements as earlier explained. The variable contribution to the fertility reduction is indicated by the sign and absolute value of the number, a large number with a negative sign signify a high fertility-inhibiting effect while a positive sign indicating a fertility-enhancing effect.

LEVELS OF FERTILITY AND PROXIMATE DETERMINANTS

It has been noted that fertility in the Philippines has experienced continuous decline from the 1950s to the present. It can be observed that the TFR fell below five births per woman in the 1980s, fell below four births per woman during the 1990s and remained this way until the turn of the new millennium. Casterline, Domingo and Zablan (1988) established that there has been a steady decline in overall fertility since the late 1960s, quickening slightly during the period immediately after the initiation of the national population program but maintaining a substantial pace into the 1980s.

Based on the 2013 National Demographic and Health Survey, the Philippines is still far from achieving replacement fertility. The Total Fertility Rate (TFR) which is the number of births a woman would have on average at the end of her reproductive life if she were subject to the current age-specific fertility rates (ASFRs) throughout her reproductive years is 3.0 in 2013, which is a nine percent decline from the 2008 TFR of 3.0 (NSO and ORC Macro, 2014). There is a slow decline in the fertility of the country in recent years, as compared to the decline in the previous decades which is relatively faster, as can be gleaned from Figure 1 which is retroactively extended up to 1973 and with the 1978 Republic of the Philippine Fertility Survey (RPFS), 1986 Contraceptive Prevalence Survey (CPS) and 1998 NDHS figures to showcase the Philippine fertility trend over four decades included.

Figure 1. Trend in Philippine fertility: 1973-2013



Data Source: National Demographic and Health Survey (NDHS) report (NSO, 2009)
Note: Rates for 1973 to 1986 are based on 5-year averages and 1993 to 2003 rates are based on 3-year averages

Looking at fertility across selected socioeconomic factors, it can be observed that rural women have more children at 3.5 children per woman compared to urban women having 2.6 children per woman (see Table 1). This observation holds for all the periods studied. It can be noted though that the gap between the urban-rural fertility levels in the country is narrowing largely due to the constantly declining rural fertility, which is a pattern consistent with what is observed globally.

On the other hand, the fertility differential by educational attainment provides a distinctive picture of the inverse relationship between education and fertility. Those with no education do not only exhibit fertility twice that of the highly educated but they also exhibited an increase in 2001 from their 1996 fertility level, and even with the decline in 2006 it remains high at 4.5 births per woman.

It can also be gleaned from Table 1 that women with elementary education also have high fertility as evidenced by a TFR of about 4.6 children per woman in 2013 while women with high school education displayed an intermediate fertility of 3.3 per woman in 2013. Lastly, from 1993 and 2013 the College-educated women registered quite a steady fertility level during the earlier period and declining over the last two surveys, down to 2.1 children per woman in 2013..

Table 1. Trends in Total Fertility Rate of the Philippines and by selected background characteristics: 1993-2013

Background Characteristics	**YEAR**				
	1993	**1998**	**2003**	**2008**	**2013**
Type of Residence					
Rural	4.8	4.7	4.3	3.8	3.5
Urban	3.5	3.0	3.0	2.8	2.6
Highest Educational Attainment					
No Education	4.9	5.0	5.3	4.5	3.8
Elementary	5.5	5.0	5.0	4.5	4.6
High School	3.9	3.6	3.5	3.5	3.3
College and Higher	2.8	2.9	2.7	2.3	2.1
Philippines	**4.1**	**3.7**	**3.5**	**3.3**	**3.0**

Source: NDHS Reports (NSO and ORC Macro 1994, 1999, 2004, 2009, 2014)

Looking at the marriage patterns in the country, the percentage of never married women remained at below 40 percent and settled to about one-third of women of reproductive ages starting in 2003 as can be observed in Table 2. Interestingly,

there is an increasing percentage of women who are in a live-in arrangement, from 5.2 percent in 1993 to 14.5 percent in 2013. These women stay in live-in situations for various reasons such as high costs of weddings, incomplete documentary requirements, etc. (Kabamalan, 2009).

Table 2. Marital Status of women, aged 15-49 for the Philippines: 1993-2013

NDS/NDHS Year	Never married	Married	Living together	Widowed	Not living together	Total	N
1993	36.7	54.4	5.2	1.8	1.9	100.0	15031
1998	36.4	53.4	6.2	1.7	2.3	100.0	13983
2003	32.2	55.6	8.0	1.5	2.7	100.0	13631
2008	33.3	50.7	11.2	1.7	3.1	100.0	13594
2013	34.8	45.8	14.5	1.4	3.6	100.0	16155

Data Source: 1993 NDS data, 1998, 2003, 2008 and 2013 data sets

Meanwhile, the national contraception prevalence rate, which is the proportion of married women age 15-49 who was using some method of family planning, followed an increasing trend from 1993 to 2013, from 40 percent to 55 percent, respectively. NSO, DOH and Macro (2014) reported that in the last five years, while the overall contraceptive prevalence rate shows little increase (from 51% to 55%), there is an increase in the prevalence of modern contraceptive methods with the gaining popularity of the pill contributing the largest, from a prevalence of 13 percent in 2003 to 19 percent in 2008.

Marked contraception differential is noted across type of residence with over half of urban women using contraception starting 1998. It is worth noting though that the steady increase in CPR registered among the rural women until 2013 as contrast to the CPR of urban women during the same period resulted in a narrowing urban-rural gap in recent years, i.e. from 6.2 percentage points difference in 1993 to 2.7 percentage points difference in 2013.

As expected, the more educated the woman the higher is the level of contraceptive use. Table 3 shows that women who reached at least high school education posted high CPR at over 50 percent starting 1998. The contrast in CPR across education groups is also evident by the fact that the proportion of women with at least high school education who use any form of contraception are more than three times than

those with no education. The uneducated women in the country maintain low levels of contraception at below 30 percent.

The aforementioned fertility experience across educational attainment supports international studies where they established that women with some education had higher contraceptive use than those who had lower or no education (RAND Abstracts, 1997; Razzaque, et. al., 1998).

Table 3. Contraceptive Prevalence Rate (for all methods) of women age 15-49 and Median duration of breastfeeding (in months) by selected background variables and Philippines: 1993-2013

Background Characteristics	Contraception					Breastfeeding				
	1993	1998	2003	2008	2013	1993	1998	2003	2008	2013
Type of Residence										
Rural	36.8	42.2	47.4	48.0	53.8	15.9	15.5	16.0	17.4	18.4
Urban	43.0	50.7	50.1	53.4	56.5	9.0	5.6	9.9	7.0	11.0
Highest Educational Attainment										
No Education	10.8	15.3	18.1	18.5	29.3	19.4	15.4	20.4	24.9	*
Elementary	34.5	41.1	44.0	45.3	52.9	16.7	17.2	17.0	19.2	19.8
High School	43.8	50.2	51.9	53.2	58.2	13.8	12.6	13.9	14.0	16.7
College and Higher	47.1	50.3	51.4	53.1	53.0	5.4	4.6	6.3	5.6	8.9
Philippines	40.0	46.5	48.9	50.7	55.1	14.1	12.8	14.1	14.3	16.7

*Figure based on fewer than 25 unweighted cases that has been suppressed
Source: NDHS Reports (NSO and ORC Macro 1994, 1999, 2004, 2014)

Table 3 also displays the patterns of breastfeeding in the country, with an end result of a relatively constant median duration of 14.3 months from 1993 to 2008 and increasing to 16.7 months in 2013.

Across type of residence, there is a distinct difference in breastfeeding between urban and rural women with the rural women breastfeeding longer than their urban counterparts until 2013. An almost constant duration of breastfeeding was observed among rural women at about 16 months from 1993 to 2003 and slightly

increasing to 18.4 months in 2013 while a fall and rise was observed in the duration of breastfeeding among urban women down to 7 months in 2008 and up to 11 months in 2013.

On the other hand, the data demonstrated an inverse relationship between breastfeeding with the educational attainment of women. Women with higher educational attainment have lesser median duration of breastfeeding while those with no education registered the longest duration.

DECOMPOSING THE CONTRIBUTION OF PROXIMATE DETERMINANTS TO FERTILITY CHANGE

This section evaluates the contribution of marriage, contraception and postpartum infecundability to the fertility change in the country at the national level and across type of residence and highest educational attainment of the women.

National and by type of residence

It can be gleaned from Table 5A that the inhibiting effect of marriage (C_m) in the country is diminishing through time as observed in the increasing value of the marriage index from 0.576 in 1991 to 0.603 in 2006. Among the three factors considered contraception registered the highest and increasing fertility-inhibiting effect as indicated by its comparatively low and decreasing index values over time. Postpartum amenorrhea represented by breastfeeding on the other hand registered the highest index values, which imply that it has the least inhibiting effect to fertility with its inhibiting effect also diminishing through time. The inhibiting effect of breastfeeding fluctuated over the years with a 15-year end-result at a relatively constant level of 0.733.

Table 5A presents the indices of the proximate determinants of fertility from 1991 to 2011.

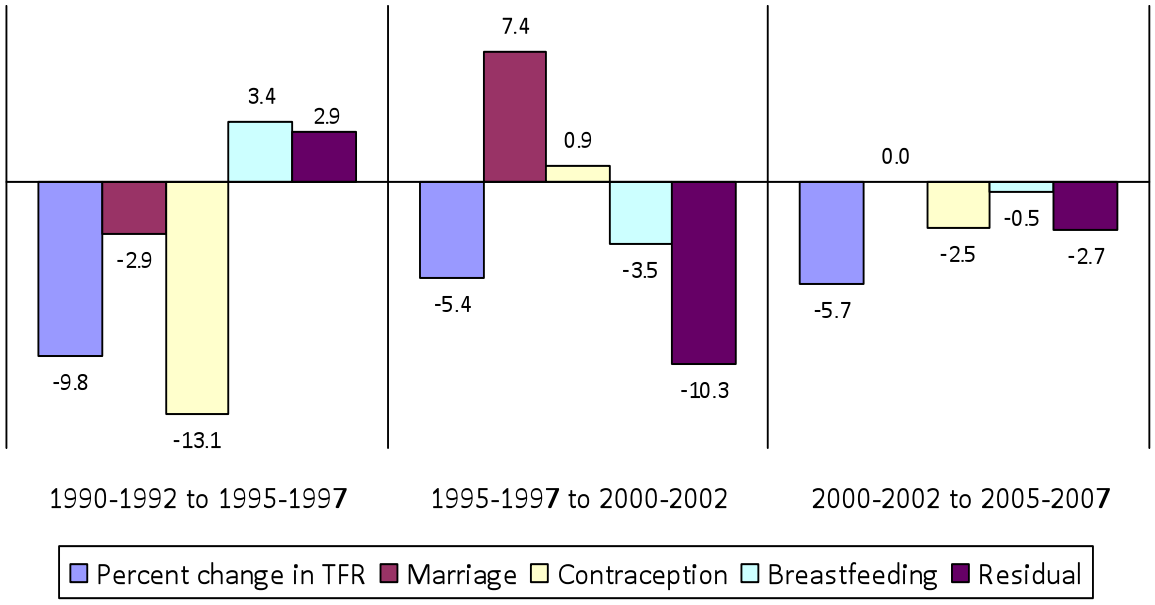
Table 5A. Estimates of the Indexes of the Proximate/Intermediate variables and Model Estimate of Total Fertility Rates for the Philippines and by type of residence: 1991-2006

Background Characteristics	C_m	C_c	C_i	Model estimate of TFR	Observed TFR	Difference
PHILIPPINES						
1990-1992	0.576	0.630	0.737	4.1	4.1	0.0
1995-1997	0.559	0.549	0.763	3.6	3.7	-0.1
2000-2002	0.603	0.554	0.737	3.8	3.5	0.2
2005-2007	0.603	0.540	0.733	3.7	3.3	0.4
2009-2011						
Type of Residence						
Rural						
1990-1992	0.655	0.663	0.700	4.7	4.8	-0.2
1995-1997	0.664	0.623	0.708	4.5	4.7	-0.2
2000-2002	0.705	0.569	0.699	4.3	4.3	0.0
2005-2007	0.696	0.563	0.671	4.0	3.8	0.2
2009-2011						
Urban						
1990-1992	0.506	0.600	0.841	3.9	3.5	0.4
1995-1997	0.479	0.541	0.904	3.6	3.0	0.6
2000-2002	0.543	0.542	0.823	3.7	3.0	0.7
2005-2007	0.526	0.517	0.879	3.7	2.8	0.9
2009-2011						

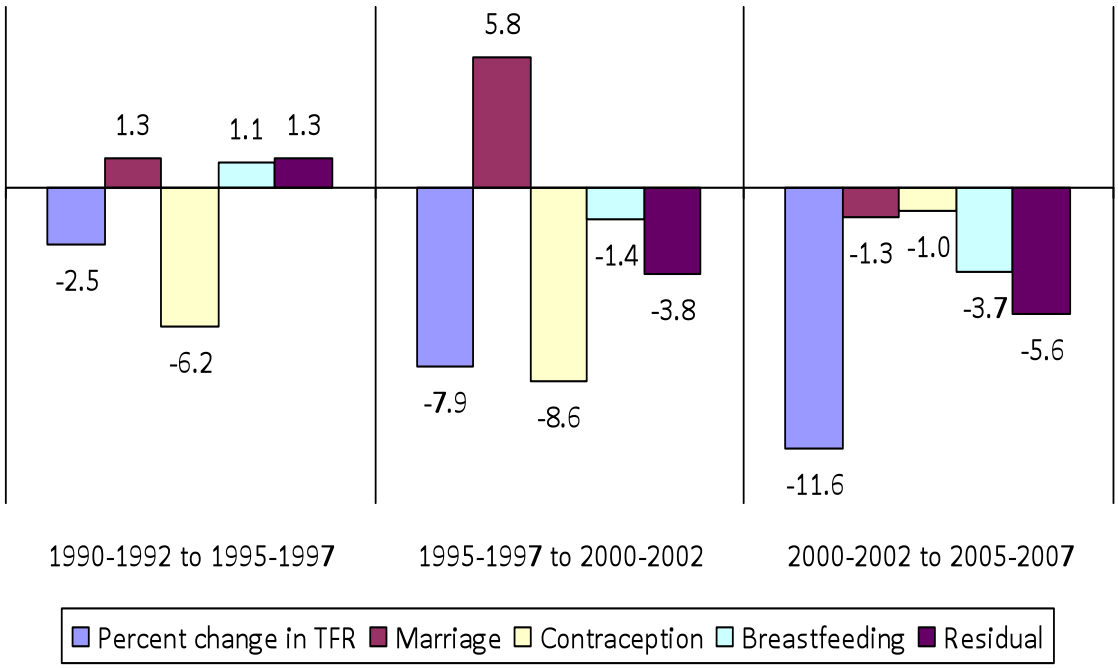
Data Source of Observed TFR: NDHS Reports (NSO and ORC Macro 1994, 1999, 2004, 2009)

Table 5B elaborates on the results presented in Table 15A by showing the extent to which the proximate factors such as marriage, contraception and breastfeeding contribute to the fertility change for the periods considered. Abortion was not considered in the model due to the lack of data.

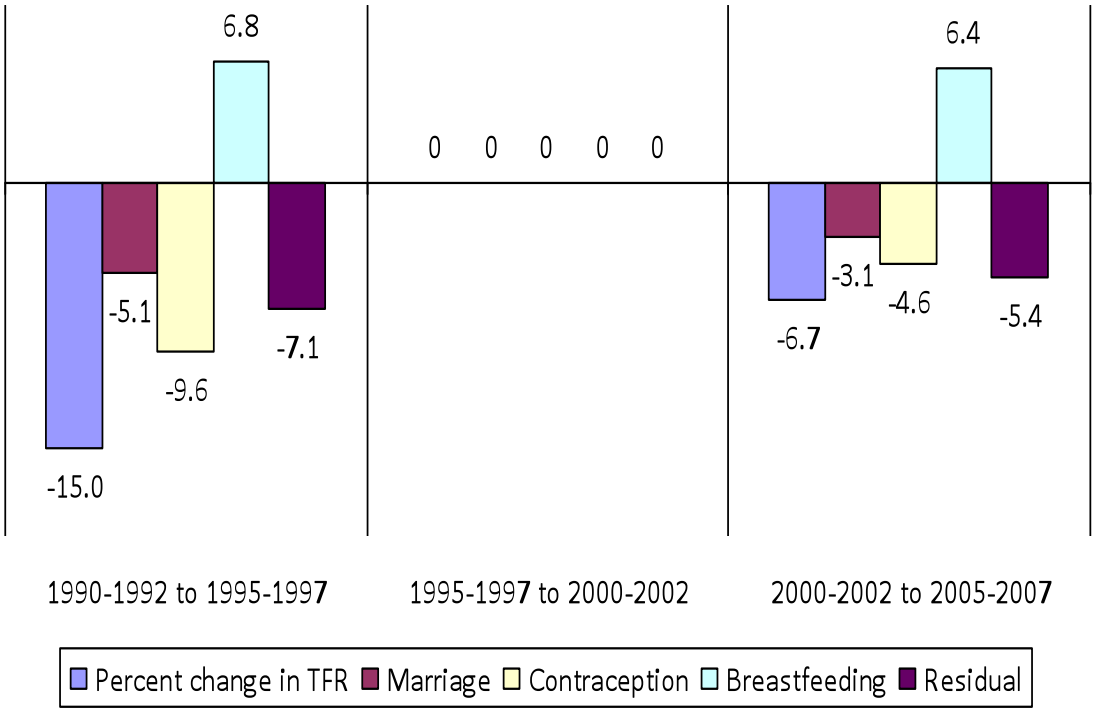
PHILIPPINES



RURAL



URBAN



Results show that among the proximate factors considered, contraception followed by marriage mainly accounted for the fertility reduction observed in the country in the 1991-1996 period while it was breastfeeding that had the most fertility-inhibiting role in the second triennium. This finding supports the analysis of Cabigon (2008) that marriage is one of the main factors explaining fertility decline during before the turn of the millennium. Cabigon (2008) further posited that one possible explanation to the shift in the role of marriage from a fertility inhibitor to a fertility enhancer is the increasing level of premarital conceptions over time in the country based on the same surveys under consideration. This phenomenon indicates that more women were getting sexually active before getting married meaning that the onset of marriage per se is no longer associated with the onset of fertility as women are having children outside of marriage, hence reversing the inhibiting effect to an enhancing effect of marriage. Results show that the major impact of residuals to fertility change far exceeded the inhibiting contribution of the other variables in consideration during some of the periods under review. This finding is significant because it implies that there are other factors other than the proximate determinants being studied that contributed in inhibiting fertility or

there might be substantial errors in the measurement of proximate variables considered.

Table 5A also presents the indices across type of residence. Data underscores the differential contribution of the proximate determinants of fertility between rural and urban areas with marriage and contraception exhibiting a relatively greater impact in the urban areas while breastfeeding having a relatively stronger inhibiting impact in the rural compared to the urban areas. The increase of the marriage indices in the rural areas during the first and second triennium is a signal of the weakening its fertility-inhibiting effect. Meanwhile, in the urban areas, a fall in the marriage index was observed during the 1991-1996 period indicating a strengthening of its fertility-inhibiting effect although this pattern was reversed during the 1996-2001 period where the rise in the marriage index means weakening of its fertility-inhibiting effect but then again an inhibiting effect was reflected in the decrease in the marriage index from 2001 to 2006. On the one hand, contraception remains an important factor in reducing fertility both in rural and urban areas. Even if the fertility-inhibiting effect of contraception is fluctuating over time, it remains to be present, in both type of residence.

Table 5B indicates the differential patterns in fertility declines between rural and urban areas wherein rural fertility sustained an accelerated rate of decline for the periods considered (-2.5% to -11.6%). Urban fertility on the other hand, manifested a significant drop during the 1991 to 1996 period at 15 percent but stagnated thereafter at 3.0 births per woman and has a decline of seven percent during the last triennium. Looking at the factors that explain the fertility decline in the rural areas shows that contraception played a major role in inhibiting fertility over time. Breastfeeding started to exhibit a fertility-inhibiting effect during the second triennium. The three proximate determinants contributed in inhibiting fertility in rural areas during the last triennium. This means that marriage only had a fertility-inhibiting role in rural fertility during the last period. In the urban areas, marriage and contraception played a role in inhibiting fertility while breastfeeding registered enhancing fertility effects during the two periods with fertility decline. Interestingly, this finding is similar to the result of the study of Sibanda, et al. (2003) where they found that the decline in the proportion of married women accounts for the fertility decline in Addis Ababa and in other Ethiopian urban areas.

By Highest Educational Attainment

The data in Table 6A presents the indices across the highest educational attainment of women with the findings confirming the established inverse association marriage

and educational attainment. It is not surprising to see that the marriage indices are least among the better-educated women and highest among those with no education implying the increasing fertility-inhibiting effect of marriage with advancing educational attainment of women. Better educated women have better career opportunities which can delay their entry to marriage and presumably delayed timing of childbearing hence lesser fertility in contrast to women who have lesser or no education who have lesser employment opportunities are more likely to enter married life earlier and they are exposed to the risk of higher fertility. Interestingly, a decreasing trend in the marriage indices from 1991 to 2001 was observed through time among those with no education which means strengthening of the fertility-inhibiting effect of marriage for this education group and an increasing trend among women with college education or higher during the same period which means a weakening of the fertility-inhibiting effect of marriage for the better educated women. This trend though was reversed during the 2001 to 2006 period.

The consistently declining trend in the indices of contraception across all education categories over the 15-year period is an indication of strengthening fertility-inhibiting effect of contraception across all education groups. However as expected, contraception indices were most significant at the highest educational levels and lowest in the low education groups which support the results of the Matlab study in Bangladesh and the study in Zimbabwe establishing a strong association between education and contraceptive use (RAND Abstracts, 1997; Razzaque, et al., 1998).

Findings reveal that fertility decline from 1991 to 1996 was mainly due to the decline in fertility among women with elementary and high school levels of education. In the second triennium, the fertility reduction was mainly contributed by women with at least high school education. While during the last triennium, women with elementary education or less and with college education exhibited fertility reduction. It is significant to note that the women with no education exhibited an increasing fertility for the first two trienniums, which offset the gains in fertility decline achieved by their better-educated counterparts.

The breastfeeding indices exhibit a positive association with educational attainment suggesting the greatest fertility-inhibiting impact of breastfeeding among the least educated and its minimum impact among the highly educated women. The highest infecundability indices during the 15-year period under review observed among women with higher education can be attributed to the fact that these women are more likely to be employed hence are less likely to breastfeed.

Table 6A. Estimates of the Indexes of the Proximate/Intermediate variables and Model Estimate of Total Fertility Rates by educational attainment: 1991-2006

Highest Educational Attainment	C_m	C_c	C_i	Model estimate of TFR	Observed TFR	Difference
No Education						
1990-1992	0.780	0.898	0.635	6.8	4.9	1.9
1995-1997	0.728	0.865	0.710	6.8	5.0	1.8
2000-2002	0.707	0.833	0.618	5.6	5.3	0.3
2005-2007	0.922	0.835	0.552	6.5	4.5	2.0
2009-2011						
Elementary						
1990-1992	0.721	0.679	0.685	5.1	5.5	-0.4
1995-1997	0.714	0.627	0.675	4.6	5.0	-0.4
2000-2002	0.801	0.597	0.679	5.0	5.0	0.0
2005-2007	0.797	0.585	0.638	4.6	4.5	0.1
2009-2011						
High School						
1990-1992	0.598	0.595	0.743	4.0	3.9	0.1
1995-1997	0.590	0.549	0.767	3.8	3.6	0.2
2000-2002	0.661	0.528	0.741	4.0	3.5	0.5
2005-2007	0.680	0.519	0.739	4.0	3.5	0.5
2009-2011						
College and higher						
1990-1992	0.405	0.568	0.908	3.2	2.8	0.4
1995-1997	0.438	0.548	0.922	3.4	2.9	0.5
2000-2002	0.445	0.532	0.892	3.2	2.7	0.5
2005-2007	0.432	0.519	0.904	3.1	2.3	0.8
2009-2011						

Data Source of Observed TFR: NDHS Reports (NSO and ORC Macro 1994, 1999, 2004, 2009,2014)

Looking deeper into the contribution of the proximate determinants to the fertility decline by education, it can be also gleaned from Table 6B that contraception had consistently registered an inhibiting effect on fertility across education groups during the periods with fertility decline. Marriage had a minimal inhibiting effect close to a neutral role across all education categories over time. The duration of infecundability through the breastfeeding indicator was intermittently observed in certain trienniums in all of the education groups. The group of women with no

education experienced the greatest fertility-inhibiting effect of breastfeeding during the last two trienniums.

FUTURE DIRECTIONS AND THINGS NEEDED TO BE DONE FOR THIS PAPER

a) Update the model using the 2013 NDHS data

b) Review the newly passed Reproductive Health Law

c) Develop the discussion and Conclusion section

Annex A

Table 7. Decomposition of change in the TFR into contributions of changes in marriage, contraception and postpartum infecundability for the Philippines: 1990 – 1992 to 2009 – 2011

Background Characteristics	Initial TFR	Later TFR	TFR change	Percent change in TFR	Marriage	Contraception	Postpartum Infecundability	Residual
PHILIPPINES								
1990-1992 to 1995-1997	4.1	3.7	-0.4	-9.8	-2.9	-13.1	3.4	2.9
1995-1997 to 2000-2002	3.7	3.5	-0.2	-5.4	7.4	0.9	-3.5	-10.3
2000-2002 to 2005-2007	3.5	3.3	-0.2	-5.7	0.0	-2.5	-0.5	-2.7
2005-2007 to 2009-2011								
Type of Residence								
Rural								
1990-1992 to 1995-1997	4.8	4.7	-0.1	-2.5	1.3	-6.2	1.1	1.3
1995-1997 to 2000-2002	4.7	4.3	-0.4	-7.9	5.8	-8.6	-1.4	-3.8
2000-2002 to 2005-2007	4.3	3.8	-0.5	-11.6	-1.3	-1.0	-3.7	-5.6
2005-2007 to 2009-2011								
Urban								
1990-1992 to 1995-1997	3.5	3.0	-0.5	-15.0	-5.1	-9.6	6.8	-7.1
1995-1997 to 2000-2002	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-2002 to 2005-2007 2005-2007 to 2009-2011	3.0	2.8	-0.2	-6.7	-3.1	-4.6	6.4	-5.4

Table 8. Decomposition of change in the TFR into contributions of changes in marriage, contraception and postpartum infecundability by educational attainment: 1990 – 1992 to 2009 – 2011

Highest Educational Attainment	Initial TFR	Later TFR	TFR change	Percent change in TFR	Marriage	Contraception	Postpartum Infecundability	Residual
No Education								
1990-1992 to 1995-1997	4.9	5.0	0.1	1.6	-0.1	-3.8	11.3	-5.9
1995-1997 to 2000-2002	5.0	5.3	0.3	5.8	0.0	-3.8	-14.4	24.0
2000-2002 to 2005-2007	5.3	4.5	-0.8	-15.1	0.2	0.2	-10.4	-5.1
2005-2007 to 2009-2011								
Elementary								
1990-1992 to 1995-1997	5.5	5.0	-0.5	-9.3	0.0	-7.6	-1.3	-0.3
1995-1997 to 2000-2002	5.0	5.0	0.0	0.0	-	-	-	-
2000-2002 to 2005-2007	5.0	4.5	-0.5	-10.0	0.0	-2.0	-5.9	-2.2
2005-2007 to 2009-2011								

Table 8. Decomposition of change in the TFR into contributions of changes in marriage, contraception and postpartum infecundability by educational attainment: 1990 – 1992 to 2009 – 2011 (Continuation)

Highest Educational Attainment	Initial TFR	Later TFR	TFR change	Percent change in TFR	Marriage	Contraception	Postpartum Infecundability	Residual
High School								
1990-1992 to 1995-1997	3.9	3.6	-0.3	-7.4	0.0	-7.7	3.1	-2.8
1995-1997 to 2000-2002	3.6	3.5	-0.1	-3.8	0.1	-3.9	-3.5	3.4
2000-2002 to 2005-2007	3.5	3.5	0.0	0.0	-	-	-	-
2005-2007 to 2009-2011								
College & Higher								
1990-1992 to 1995-1997	2.8	2.9	0.1	2.8	0.1	-3.7	1.5	4.9
1995-1997 to 2000-2002	2.9	2.7	-0.2	-6.9	0.0	-2.8	-3.1	-1.0
2000-2002 to 2005-2007	2.7	2.3	-0.4	-14.8	0.0	-2.4	1.3	-13.7
2005-2007 to 2009-2011								