Ongoing Fertility Transition in Kinshasa: Evidence from the 2007 DHS*

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Abstract

This paper examines fertility transition in Kinshasa, capital of the Democratic Republic of the Congo (DRC) and second-largest city in sub-Saharan Africa. Shapiro (1996) documented the onset of fertility transition in Kinshasa, using data from 1990. Women's education was strongly inversely related to fertility, beginning with secondary-level schooling, and increases in women's educational attainment that had taken place were important in initiating fertility transition in the city. This paper uses data from the 2007 Demographic and Health Survey (DHS) to examine fertility in Kinshasa and assess fertility transition since 1990. During the early 1990s the DRC experienced an acute economic crisis, with pillaging and looting in 1991 and 1993 contributing to substantial shrinkage of the modern sector of the economy, followed by civil war during the second half of the 1990s, resulting in extremely poor economic performance throughout the decade. Data from the 2007 DHS allow us to assess how fertility and several of its determinants have changed since 1990.

I. Introduction

This paper examines ongoing fertility transition in Kinshasa, capital of the Democratic Republic of the Congo (DRC). With an estimated population as of 2010 in excess of 9 million (United Nations, 2008), Kinshasa is the second-largest city in sub-Saharan Africa. As Leopoldville in the Belgian Congo, in the mid-1950s (with a population of about 300,000) the city had an estimated total fertility rate (TFR) of 7.5 (Romaniuk, 1967, 1968). Twenty years later, a large-scale demographic survey of the city carried out in 1975 indicated that the level of fertility had not fallen (Sala-Diakanda, 1980). However, using data from a 1990 survey, Shapiro (1996) documented the onset of fertility transition in Kinshasa, finding a TFR of just under 5.7 (see also Shapiro and Tambashe, 2003, especially chapter 4). Women's education was strongly inversely related to fertility behavior, beginning with secondary-level schooling, and the increases in women's educational attainment that had taken place following independence in 1960 and continuing up to 1990 along with the associated delays in entry to marriage were clearly very important in initiating fertility transition in the city.

Using data from the 2007 Demographic and Health Survey (DHS) that was carried out in the DRC, this paper examines fertility behavior in Kinshasa and assesses the pace and nature of fertility transition in the city since 1990. During the early 1990s the DRC experienced civil disorder and an acute economic crisis, with pillaging and looting in 1991 and 1993 contributing to substantial shrinkage of the modern sector of the economy. Civil war characterized the latter part of the 1990s and the first part of the new millennium. Extremely poor economic performance was apparent throughout the 1990s and beyond. Women's educational attainment, economic activity, entry into marriage, and overall fertility may well have changed in response to these events. Data from the 2007 DHS allow us to assess what has happened since 1990 to

fertility in Kinshasa and to several related factors, such as women's education and employment as well as entry into marriage.

In brief, as we shall see below, fertility transition in Kinshasa has been ongoing since 1990, with the TFR falling by roughly a third to 3.7. The pace of decline has been comparatively strong and steady since the mid-1970s. Declines in age-specific fertility rates have been largest at both younger and older ages (under age 25 and age 35 and older, respectively).

Women's educational attainment has continued to increase despite the country's economic and political problems. Median schooling of women aged 15-49 has risen from 8.4 years in 1990 to 9.9 years in 2007. Given the generally inverse association between education and fertility, this increased education of women has contributed to the decline in fertility. At the same time, holding constant age and educational attainment, it is apparent that fertility as of 2007 is lower than that as of 1990. This may be seen in lower cumulative fertility in 2007, holding age and schooling constant, and it is apparent as well in considering TFRs by education group in the two years.

Women's employment activity has increased overall, and nearly 65 percent of women aged 25-49 were employed in 2007, compared to about 50 percent in 1990. Growth in women's employment has taken place in both the modern and informal sectors of the economy, but predominantly in the informal sector. Further, entry into marriage has been delayed considerably, and changes in this important proximate determinant of fertility contribute substantially to the ongoing fertility transition.

The following section of the paper provides a descriptive overview of changes in fertility, women's education, employment, and entry into marriage that have taken place in Kinshasa. This is followed by multivariate analyses of fertility, with comparisons of such analyses from the

DHS data from 2007 to similar analyses of the 1990 data. The concluding section of the paper discusses the empirical findings and prospects for further declines in fertility.

II. Fertility, Women's Education, Employment, and Marriage in Kinshasa: A Descriptive Overview

According to the DHS data, the TFR for Kinshasa for the three years preceding the 2007 DHS was 3.7. This is well below the DHS-estimated national TFR of 6.3, and it represents a substantial reduction from the estimated TFR of 5.67 in 1990, amounting to an average annual decline since 1990 of about 0.12. This is the same pace of decline as that which took place between 1975 and 1990 in Kinshasa.

By comparison, a recent study of fertility transition at the national level in nearly four dozen developing countries around the world found that in sub-Saharan Africa the average annual decline in the TFR between the two most recent DHS surveys was only 0.03, compared to 0.09 and 0.12 for countries in Asia/North Africa and in Latin America and the Caribbean, respectively (Kreider et al., 2009). Going back over a longer time period, Bongaarts (2008) reports an average annual decline in the TFR of 0.09 for all developing countries other than China for the period from 1965 to 1990. For the period from about 1992 to 1998, Bongaarts finds an average annual decline in the TFR of 0.07 for sub-Saharan Africa and 0.08 for both Asia/North Africa and Latin America. For the period from about 1998 to 2004, he finds average declines of only 0.02 per year in sub-Saharan Africa, compared to 0.10 in Asia/North Africa and 0.07 in Latin America. Clearly, then, the pace of fertility decline in Kinshasa has been comparatively quite strong, and one result is that present fertility is less than half of the TFR estimated for 1975.

Fertility in Kinshasa is well below the TFR levels of the other provinces of the DRC, and it is distinctly lower than fertility in urban places elsewhere in the country. Kinshasa is one of 11 provinces in the DRC, and it is the only province whose population consists essentially almost entirely of urban residents.[1] Nationally, the TFR for urban areas from the 2007 DHS is 5.4, compared to a TFR of 7.0 for rural areas. Shapiro and Tambashe (2002) noted that in a number of sub-Saharan countries, fertility was not only lower in urban than in rural places, but was frequently especially low in the large capital cities as opposed to smaller urban places. This is clearly the situation with regard to Kinshasa and other urban places in the DRC.

It is of interest to note that the substantial decline in fertility since 1990 has been accomplished despite a rather low prevalence of modern contraception. In 1990 only about 8 percent of women in union in Kinshasa were using modern contraception; as of 2007, the corresponding figure was 14 percent. Examination of recent DHS data on fertility and modern contraceptive use from the regions containing the capital or principal cities in nearly two dozen sub-Saharan countries reveals a generally negative relationship, as one would expect (the simple correlation is -0.4). Overall, the (unweighted) average TFR among these capitals is 3.6 and average prevalence of modern contraception among women in union is 25 percent.

Thus, comparatively, use of modern contraception in Kinshasa is on the low side. But there is considerable variability, and a number of other capitals also have a TFR of 3.7 or below and modern contraceptive use in the mid-teens or lower. These include Lomé, Abidjan, Monrovia, and Brazzaville. At the same time, there are capital cities with similar TFRs but much higher use of modern contraception. For example, in Maputo, Kampala, and Lusaka, with

[1] The province of Kinshasa is a sprawling area of 9,965 square kilometers (Institut National de la Statistique, 1991, Table 1), or almost 3,850 square miles. The vast bulk of this area is very sparsely populated rural land. For administrative purposes the province's entire population is classified as urban, but the resulting misclassification of residents who in reality live in an urban area affects only a very small percentage of residents of the province.

TFRs ranging from 3.2 to 4.1, fully 40 percent of women in union use modern contraceptives. In brief, then, among these capital cities there is only a comparatively weak relationship between fertility and modern contraceptive use. This parallels the finding by Westoff and Bankole (2001) that the link between use of modern contraception and fertility is weaker in sub-Saharan Africa than elsewhere in the developing world.

Figure 1 shows age-specific fertility rates from the 2007 survey, as well as comparable rates from three earlier surveys of fertility in Kinshasa, in 1955, 1975, and 1990. Since 1990 there have been declines in fertility rates in all but the oldest age group (that 45-49 year old group already had zero fertility in 1990). The younger and older age groups are where the fertility declines have been greatest. For example, among those under age 25 and those aged 35-44, age-specific fertility rates in 2007 are more than 40 percent lower than they were in 1990, while among those aged 25-29 and 30-34 the declines are by 30 percent and 20 percent, respectively.

It is also evident from Figure 1 that there has been continuation of an earlier tendency for peak fertility to occur at older ages. In the 1950s and 1970s peak fertility in Kinshasa was observed among women aged 20-24, while by 1990 the highest age-specific fertility rate was that for women aged 25-29. As of 2007, this peak fertility age group had become those aged 30-34. This change in the timing of fertility reflects increasing educational attainment of women as well as trends toward delay in marriage, as we shall see below.

At the same time, examination of the data in Table 1 on the educational attainment of women of reproductive age, overall and by age group, makes it clear that despite the economic and political chaos that characterized much of the 17-year period between 1990 and 2007, women's education has continued to increase over time. For example, among all women aged

15-49, the percentage who had reached at least upper-level secondary school more than doubled, increasing from not quite 17 percent in 1990 to more than 37 percent in 2007, with corresponding reductions in the fraction of women with lower levels of schooling. There were especially large declines in the share of women with less than secondary schooling, from nearly a third of all women of reproductive age down to 18 percent in 2007. The median level of schooling of these women increased from 8.4 to 9.9 years during the period.

These increases in schooling are apparent for the different age groups as well. This improvement is shown graphically in Figure 2, covering a half-dozen surveys of the city going back to the mid-1950s. The focus in the figure is on women who have reached secondary schooling or higher, and the figure shows that, particularly among women aged 30 and above, the percentages having at least reached secondary schooling have increased quite substantially since 1990. Earlier work (Shapiro, 1996; Shapiro and Tambashe, 2003) identified increased exposure to secondary education as a key factor contributing to fertility decline in Kinshasa between 1975 and 1990.

Women's employment activity has increased since 1990, largely in response to very poor economic conditions. Nationally, real GDP per capita declined steadily throughout the 1990s, with a drop of close to 60 percent between 1990 and 2004 (see Appendix Figures A1 and A2). Increased educational attainment of women has also contributed to their greater employment activity: as shown in Shapiro et al. (2009), women's labor force participation in Kinshasa tends to increase with educational attainment, particularly at the higher schooling levels. In 1990, among women aged 25-49 (the vast bulk of whom had completed their schooling), just over half were employed. Self-employed women, virtually all in the informal sector of the economy, represented more than 40 percent of women in this age range, while only about seven percent

were employees (primarily in the modern sector of the economy). By 2007, almost 65 percent of women aged 25-49 were employed. Close to 55 percent of all women in this age group were self-employed, while about eight percent were employees. Hence, the increased employment of women since 1990 has been concentrated very heavily in the informal sector.

Associated at least in part with the increased schooling of women, but perhaps also with the adverse economic environment that characterized much of the period since 1990, there has been a clear decline in the propensity of women to be in a marital union, particularly among women under the age of 30. This may be readily seen in Figure 3, showing the percentage of women in union by age group for women under age 30 in each of the six surveys. In 1990, about 45 percent of those aged 20-24 and 75 percent of those aged 25-29 were in union. These figures represented a substantial and moderate drop, respectively, from their levels of close to 95 percent as of the mid-1950s. By 2007, however, the percentages married in these two age groups had declined substantially, so that only about a third of those aged 20-24 and about 55 percent of those aged 25-29 were married. In about half a century, then, being married (in union) has gone from being close to universal among women in their twenties to being unusual among women in their early twenties and constituting the state of only a small majority of women in their late twenties.

Along with the declining propensity of women under age 30 to be in union, there has been an increase in the percentage of women who have not yet initiated childbearing. Figure 4 shows the percentages of women who are childless, by age group, for women under age 30. Compared to 1990, there have been increases in childlessness in all three age groups.[2] These increases have been greatest among those aged 20-29. By 2007, almost a third of women aged

[2] This increase in childlessness is evident among older women as well. More than 10 percent of women aged 30-44 were childless in 2007, compared to fewer than 3 percent in 1990.

25-29 were childless, representing more than twice the corresponding percentage in 1990. And the increases in childlessness are not simply a consequence of school enrollment. For example, among those aged 20-24 in 2007, just under 30 percent were enrolled in school, almost the same percentage as in 1990. However, in 2007 nearly 60 percent of these women had not yet had a child, compared to less than 40 percent among their counterparts in 1990.

Broader and more general evidence of declining fertility, given age and schooling, is apparent in Table 2. The table shows the mean number of children ever born, by age group and educational attainment, for 1975, 1990, and 2007. Holding constant both age group and education, it is apparent that the average number of children in 2007 tends generally to be distinctly lower than the corresponding average from 1990. Overall, the mean number of children has declined by 20 percent, from 2.5 to 2.0. However, this 20 percent reduction in the average number of children ever born to women of reproductive age actually understates the magnitude of the decline in fertility.

In part because of the reductions in fertility in Kinshasa that have taken place since 1975, the age distribution of women in Kinshasa is distinctly older in 2007 than it was in 1990.[3] Just over half of the weighted sample of women aged 15-49 in 1990 was in the two youngest age groups, 15-24, while just under 14 percent were aged 35-49. By 2007, the percentage aged 15-24 had fallen to 45, while those aged 35-49 had increased their share considerably, amounting to 24 percent of all women of reproductive age. This aging, in and of itself (i.e., in the absence of changes in educational attainment and in fertility by age and schooling), would result in an increase in the average number of children ever born. Conversely, the observed decline in this

[3] The age distribution in 2007 reflects two factors: natural increase of the population of Kinshasa and the age composition of net inmigration to the city. Fertility decline in Kinshasa will result in population aging in the absence of migration. Net inmigration has not prevented the aging of Kinshasa's population of women of reproductive age.

measure understates the effects of changes in educational attainment and in fertility by age and schooling, because of the aging of the population.

Total fertility rates by education group, shown in Figure 5, confirm that for each education group there has been a decline in the TFR since 1990. These declines are quite substantial, ranging in magnitude from roughly 1-2 children per woman. Thus, while increased women's education has contributed to the overall reduction of fertility from 5.7 to 3.7, it appears that declining fertility within education groups has played a major role in the overall reduction.

Indeed, using TFRs by education group and the proportion in each education group for each year, one can decompose the difference in TFRs between 1990 and 2007 into a portion attributable to increasing women's schooling and a portion reflecting changing behavior (i.e., lower fertility) of women with given schooling. Application of this decomposition to the data suggests that at most, about a quarter of the observed reduction in the city's overall TFR may be attributed to the growth in women's schooling. The remaining three-quarters of the fertility reduction is a consequence of the lower fertility of women with given schooling – what we've characterized as changing behavior.[4]

The evidence presented so far makes it clear that ongoing fertility transition in Kinshasa is occurring as a consequence of both 1) increasing women's educational attainment and 2) declining fertility among women with a given educational level and age group. We turn now to an examination of multivariate results analyzing fertility behavior.

[4] We carried out a similar procedure for the data in Table 2. To eliminate the effect of changing age composition, we used a standard population for both years that was the simple average of age-specific rates for the two years. For that decomposition, approximately one-third of the decline in the average number of children ever born was attributable to increased schooling of women, with the remaining two-thirds due to changing behavior.

III. Multivariate Analyses of Fertility

Earlier multivariate analyses of fertility in Kinshasa in 1990 that we carried out focused on children ever born as our measure of fertility, and controlled for age, ethnic group, educational attainment, and employment status (Shapiro and Tambashe, 2003, Table 4.7 and Table 4A.2). Fertility differentials by ethnic group in Kinshasa and the DRC had historically been quite substantial (Romaniuk, 1967, 1968; Sala-Diakanda, 1980), and while those earlier studies did not focus much on education,[5] in our earlier work we wanted to examine fertility differentials by educational attainment as well.

In brief, our analyses indicated that, other things equal, the number of children ever born increased with age, varied somewhat by ethnic group, tended to be lower for women with higher levels of education, beginning with low-level secondary schooling, and especially lower for women with upper-level secondary or university education. The number of children ever born also was significantly lower for women employed in the modern sector, but not significantly different for self-employed women in the informal sector, as compared to non-employed women. By 1990, fertility differences by educational attainment were considerably larger than those by ethnic group.

[5] Sala-Diakanda (1980) looked at education and its relationship to fertility as of the mid-1970s. He noted that despite the vast increase in women's schooling between the mid-1950s and the mid-1970s, fertility had not declined. With the benefit of hindsight, the explanation for this finding is clear. Indeed women's schooling had increased substantially: the median woman of reproductive age had gone from having no schooling in 1955 to having several years of primary schooling in 1975 (Shapiro and Tambashe, 2003). But in 1975 as in 1990, the generally negative association between fertility and schooling was apparent only beginning with secondary schooling. In both years, peak fertility by education group was for women with primary schooling. In effect, then, as of 1975 increased schooling of women was not yet sufficient to generate a decline in overall fertility from the level of the mid-1950s. By 1990, however, when the median woman aged 15-49 had lower-level secondary schooling and a substantial proportion of women had higher levels of education associated with sharply lower fertility, this increased educational attainment contributed to the observed decline in the overall TFR.

Table 3 reports results of estimating comparable equations for 1990 and 2007.[6] The first two columns of estimates are for all women, while the latter pair of columns pertains to married women. In examining the coefficients of age, ethnicity, schooling, and employment status and comparing those coefficients across years, several observations may be made.

Among all women and among married women, the number of children ever born rises with age in each case, typically at a declining rate. Evaluation of the partial derivatives with respect to age shows distinct changes in the pace of childbearing over time (partial derivatives were examined for ages 25, 35, and 45). In 1990, these partial derivatives were about 0.3 among women aged 25, and did not decline with age among all women while declining with age only slowly as one considered women aged 35 and 45. By 2007, the partial derivatives at age 25 for the two groups of women were about a quarter lower, at 0.22-0.24, and they declined slowly with age for all women and more rapidly among married women as one evaluated the partial derivatives for women aged 35 and 45. The implication of the comparison across years is that the pace of childbearing has slowed, and especially among older married women.

Fertility differentials by ethnic group among all women show only one significant coefficient in 2007 as compared to three in 1990: the significantly higher fertility of Luba women in 1990 is not apparent in 2007, and Bakongo women no longer have significantly lower fertility, as compared to women from Kwilu-Kwango. Among married women there are no significant ethnic group coefficients in 2007. The decline in importance of ethnic group differences that was noted in 1990 as compared to earlier surveys appears to have continued up

[6] The equations for 1990 reported here are slightly different from those published previously. In light of the ongoing increase in educational attainment, we have altered the education reference group from primary to low-level secondary in order to facilitate comparisons between 1990 and 2007. Further, we have altered our ethnic categories by combining two Bakongo subgroups from 1990, since the DHS data for 2007 do not allow us to distinguish these subgroups.

to the present: with the exception of the lower fertility of Ubangi women, ethnicity is no longer significantly related to fertility, other things equal.

Fertility differentials by educational attainment for all women show a clearer inverse relationship between education and fertility in 2007 than in 1990, in that across all levels of education increasing schooling as of 2007 is associated with lower fertility. This inverse association was apparent in 1990 only after primary education. At the same time, the magnitude of the fertility differentials by education (compared to women with low-level secondary education) has diminished a bit since 1990 for the mid- and upper-level secondary schooling categories, while the differentials have widened at the lowest schooling levels and remained largely unchanged among university-educated women. The overall range of fertility differences by education group has clearly widened since 1990. These same results are apparent for married women as well. The results suggest, taking the long view of determinants of fertility in Kinshasa, that the process noted in 1990 by which ethnicity was becoming less important and education was becoming more important as a determinant of fertility has continued up to the present.

With regard to employment status, there are significant and substantial negative coefficients for employees in 1990 but not for the self-employed. Hence, differential fertility by employment status in 1990 was limited to women working in the modern sector of the economy. By 2007 this differential remained statistically significant but had diminished by almost half among all women (while a weakly significant negative coefficient emerged for self-employed women), and had become very small and insignificant among married women.

The implications of these equations were considered by examining predicted values in 1990 and in 2007 of the number of children ever born for women aged 25, 35, and 45, for

women with different schooling levels, from primary to university. The equations for all women were used for this purpose. Predicted fertility was lower in 2007 than in 1990 in every case. Typically, among women aged 25 the predicted number of children ever born was about 0.5 lower in 2007 than in 1990. Among those aged 35 and 45 the corresponding differences were approximately 1.4 and 2.4, respectively. The widening gap reflected smaller increases in fertility with age in 2007 as compared to 1990.

IV. Summary, Conclusions, and Prospects for Further Declines in Fertility

This paper has documented that the decline in fertility in Kinshasa that was evident in 1990 has continued up through 2007, at essentially the same strong pace as the city's initial decline in fertility between 1975 and 1990. The total fertility rate has fallen by an average of a little more than 0.1 per year, from 5.7 in 1990 to 3.7 in 2007. The declines in fertility have been greatest at both younger (under age 25) and older (ages 35 and older) ages. The ages at which peak childbearing occurs have continued to increase, such that by 2007 the highest age-specific fertility rate was evident among women aged 30-34. In addition, total fertility rates by educational attainment have declined substantially, across all education groups, and this change in behavior has been a major factor contributing to the sustained decline in fertility.

Despite the economic difficulties during the 1990s, educational attainment of women of reproductive age has continued to increase, thereby contributing to the ongoing fertility decline. Overall, however, increased educational attainment appears to account for perhaps a quarter to a third of the observed decline in fertility, with the bulk of that decline being a consequence of changing behavior: across-the-board reductions in fertility by education group.

The proportions of women in union among women under age 30 have declined considerably since 1990, especially for those aged 25-29. Associated with what appears to be later entry into marriage is a correspondingly later entry into motherhood. In particular, the data show distinct increases in the proportion of women under age 30 who are childless. It thus appears that women are remaining out of union and childless for distinctly longer in their lives than in the past.

Multivariate analyses of the determinants of the number of children ever born in 2007 and in 1990 suggest that the pace of fertility has slowed a bit both among all women and among married women, and particularly so among older married women. Ethnicity, once a major factor associated with differential fertility, has become largely irrelevant to fertility. Educational attainment is more strongly negatively related to fertility in 2007 than it was in 1990. Among all women the fertility of those working in the modern sector remains lower than that of other women, but as the overall level of fertility has declined the magnitude of this differential has diminished. Women working in the modern sector of the economy were in the vanguard of Kinshasa's fertility transition; now, in effect, women not working in the modern sector have partially caught up to those employed in the modern sector with respect to fertility decline.

What factors help explain the behavioral change – the lower fertility across all education groups? The economic crisis that persisted throughout the 1990s is certainly a likely explanation, particularly in view of earlier studies suggesting the adverse economic conditions in sub-Saharan Africa may contribute to fertility decline (see, for example, Eloundou-Enyegue et al., 2000; National Research Council, 1993). In addition, a recent study of fertility transition in sub-Saharan Africa (Shapiro and Gebreselassie, 2010, forthcoming) finds that controlling for other factors such as changes in women's educational attainment, infant and child mortality, and

modern contraceptive use, growth in real GDP per capita is associated with slower fertility decline. These results (based on national-level data that did not include the DRC) are quite consistent with Kinshasa showing both sharp declines in real GDP per capita and large reductions in fertility as well.

What is the future of fertility transition in Kinshasa? The secular and ongoing increase in women's schooling, in conjunction with the clear negative effect of schooling on fertility, suggests that fertility will continue to decline. But what happens to the economy may also be relevant, with the possibility that improvements in the economy might slow fertility decline. We expect fertility to continue to decline – but to what level? Lesthaeghe (1989) suggested that so long as children remained the primary source of old-age security among parents, fertility was likely to stop falling well short of the replacement level.

As noted earlier, the reductions in fertility to date have been accomplished despite a rather low prevalence of modern contraception: in the DHS data, prevalence of modern contraception among women in union is on the order of 14 percent. While there are at least a few other large African cities similar to Kinshasa with regard to the TFR level and the low prevalence of modern contraception, it seems likely that for fertility to continue to decline, modern contraceptive use will have to increase.

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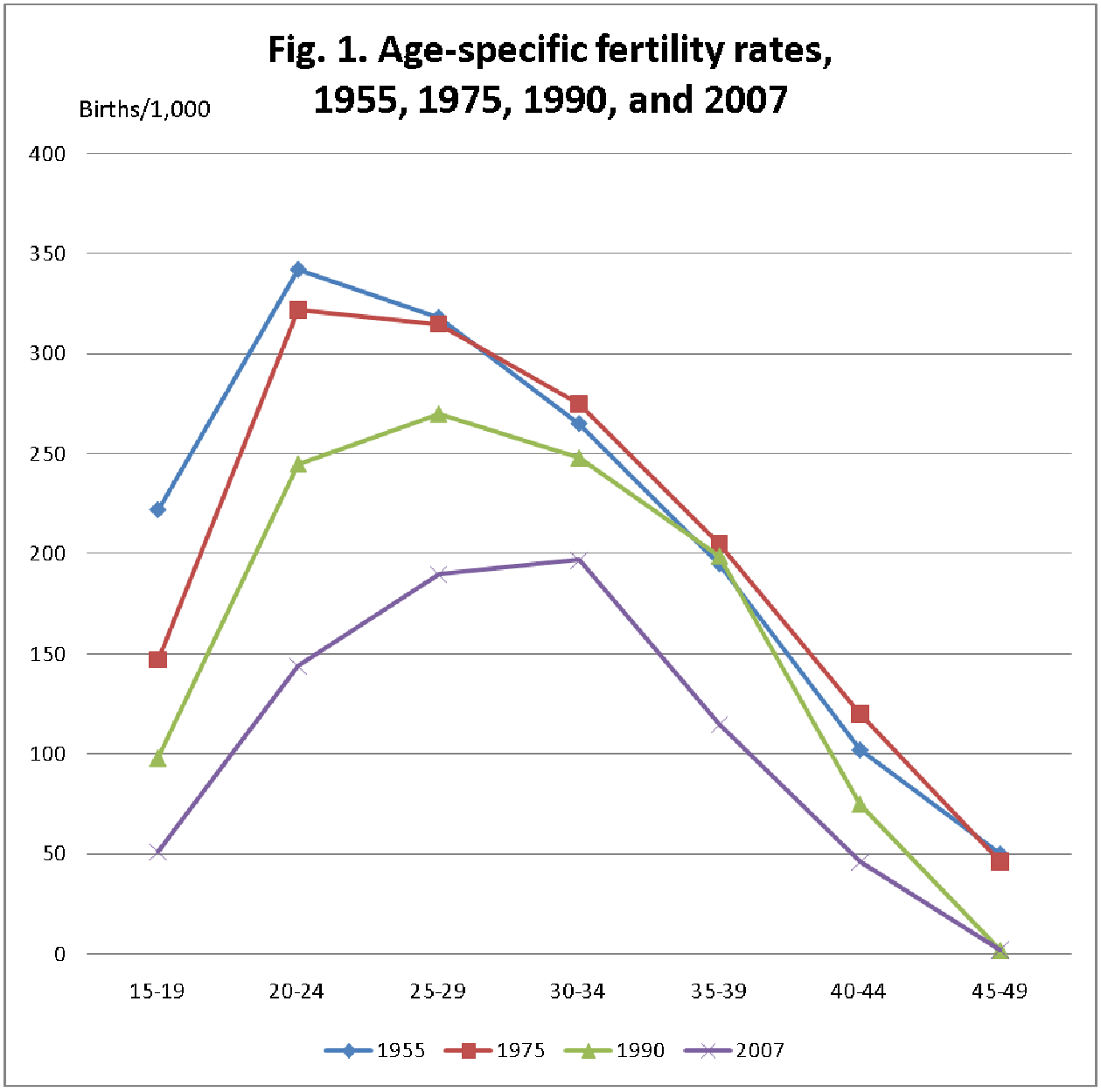


Fig. 1. Age-specific fertility rates, 1955, 1975, 1990, and 2007
Births/1,000
400
350
300
250
200
150
100
50
0
15-19
20-24
25-29
30-34
35-39
40-44
45-49
1955
1975
1990
2007

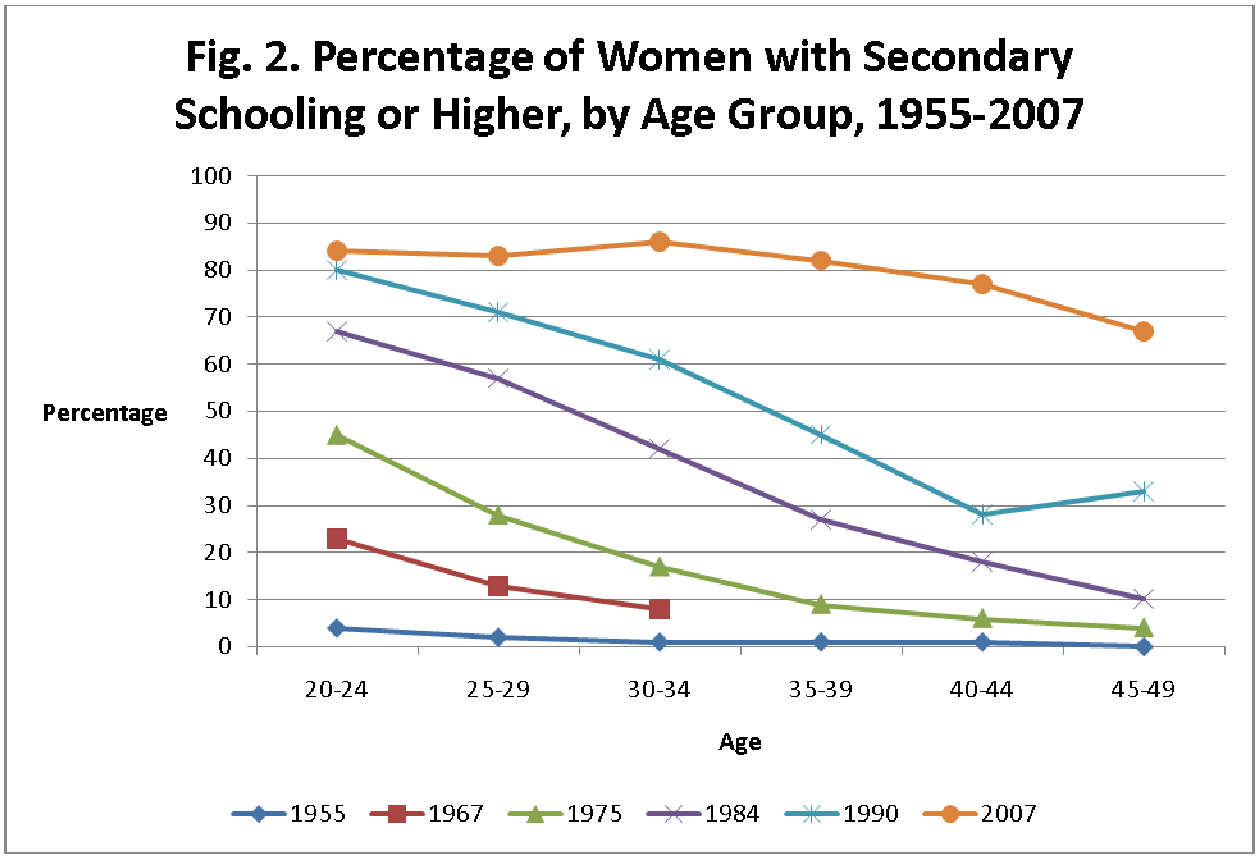


Fig. 2. Percentage of Women with Secondary Schooling or Higher, by Age Group, 1955-2007
Percentage
100
90
80
70
60
50
40
30
20
10
0
20-24
25-29
30-34
35-39
40-44
45-49
Age
1955
1967
1975
1984
1990
2007

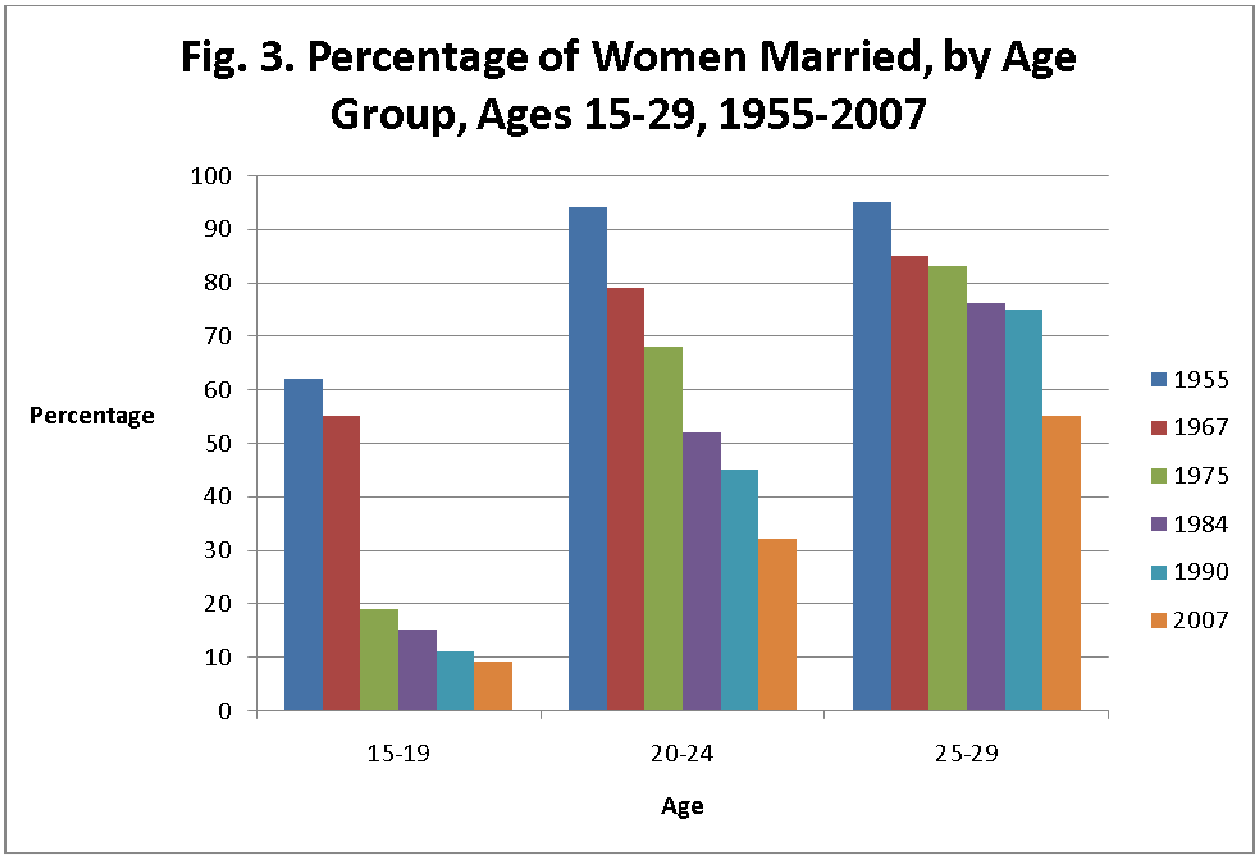


Fig. 3. Percentage of Women Married, by Age Group, Ages 15-29, 1955-2007
Percentage
100
90
80
70
60
50
40
30
20
10
0
15-19
20-24
25-29
Age
1955
1967
1975
1984
1990
2007

Figure 4. Percentage Childless, by Age Group, 1955-2007

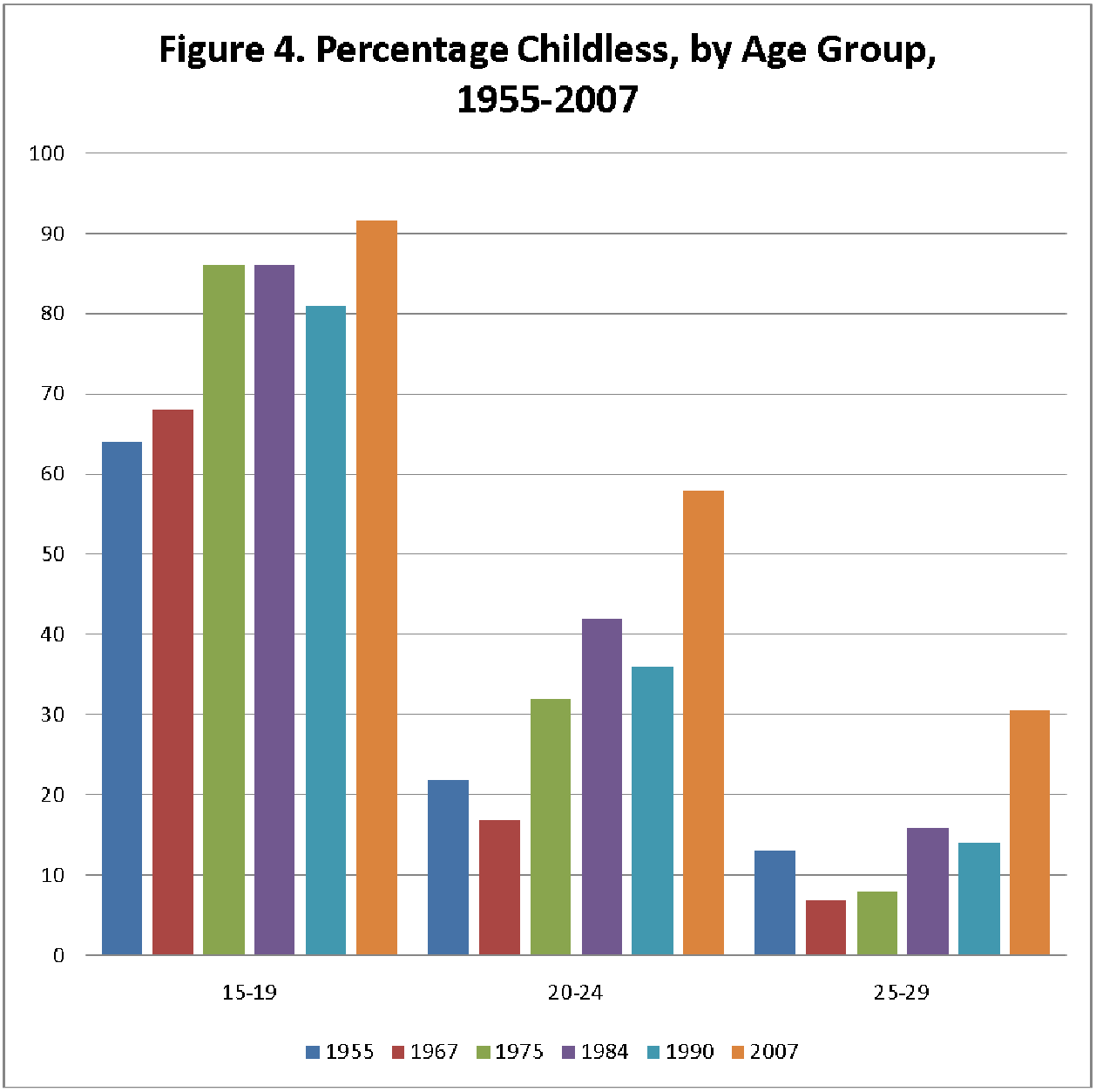
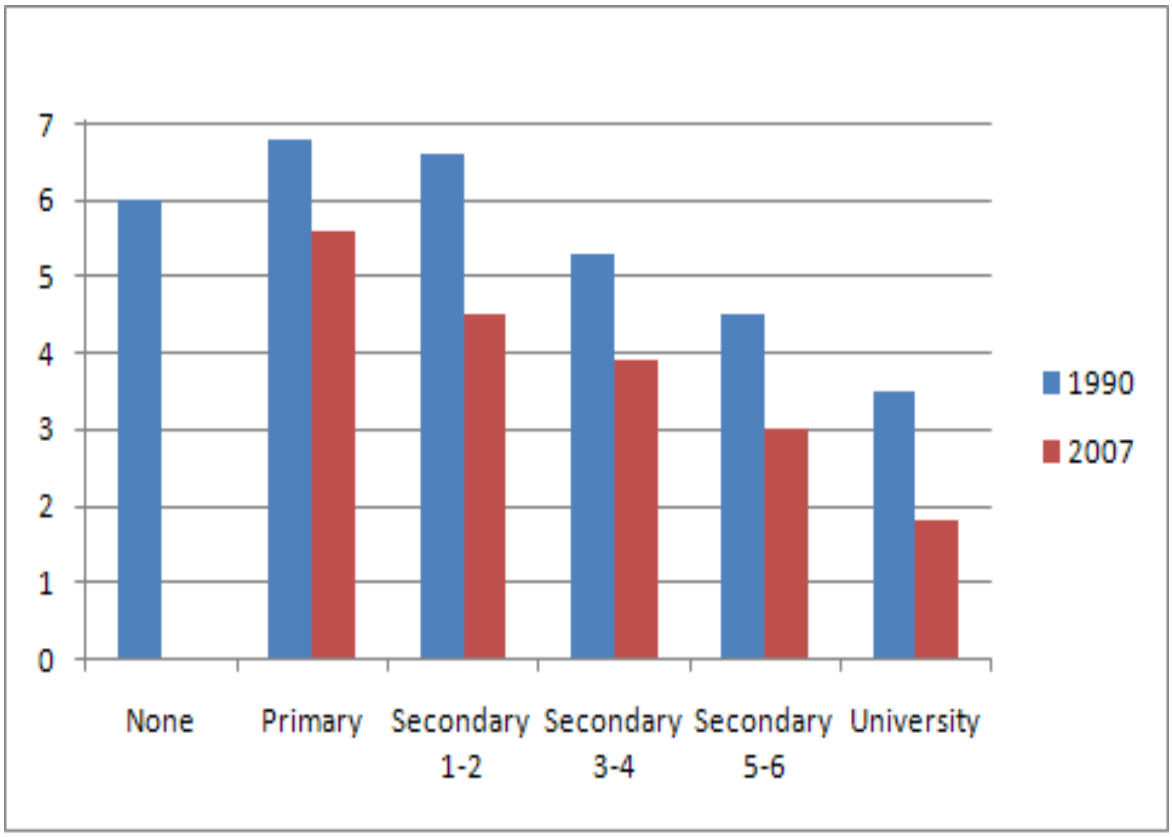


Figure 5. Total Fertility Rates, by Educational Attainment, 1990 and 2007



N.B. Inadequate sample size in 2007 for women with no schooling prevented calculation of a TFR for this group.

Table 1. Educational Attainment by Age Group, Women Aged 15-49, 1975, 1990 and 2007

				Secondary					
Age Group	**Year**	**None**	**Primary**	**1&2**	**3&4**	**5&6**	**Univ.**	**Total**	**Median Years**
15-19	1975	7.0	47.2	33.9	10.6	1.3	†	100.0	6
	1990	2.7	23.8	37.1	30.6	4.9	0.9	100.0	8
	2007	0.0	18.7	34.1	31.2	13.6	2.4	100.0	8
20-24	1975	16.0	38.7	20.9	16.7	7.7	†	100.0	6
	1990	4.3	14.6	21.5	35.3	17.5	7.0	100.0	9
	2007	0.8	15.0	13.7	21.1	35.6	13.8	100.0	10
25-29	1975	29.7	41.9	12.2	11.4	4.8	†	100.0	4
	1990	7.0	22.6	19.7	26.2	16.8	7.7	100.0	9
	2007	0.4	16.4	13.1	19.3	37.1	13.7	100.0	11
30-34	1975	43.8	39.8	6.3	8.3	1.7	†	99.9	2
	1990	7.0	31.2	20.1	23.4	13.3	5.0	100.0	8
	2007	0.5	14.0	19.5	21.4	34.7	9.8	100.0	10
35-39	1975	58.8	33.1	3.8	3.6	0.6	†	99.9	0
	1990	10.5	41.6	19.4	14.6	9.6	4.3	100.0	6
	2007	1.9	16.0	15.4	27.2	28.8	10.7	100.0	10
40-44	1975	64.3	31.0	2.5	1.9	0.3	†	100.0	0
	1990	18.9	51.0	14.9	9.7	3.8	1.8	100.0	5
	2007	2.9	19.7	16.9	19.4	31.2	9.9	100.0	10
45-49	1975	74.3	22.7	1.5	1.4	0.2	†	100.1	0
	1990	28.8	38.8	1.2	29.4	1.4	0.4	100.0	3
	2007	5.7	27.0	27.3	28.0	9.1	3.0	100.0	8
15-49	1975	29.5	39.8	17.5	10.1	3.1	†	100.0	5
	1990	6.4	25.1	24.1	27.6	12.0	4.8	100.0	8
	2007	1.1	17.1	20.4	24.1	28.0	9.3	100.0	9

† Figures for university are included in the secondary 5&6 data.

Table 2. Mean Number of Children Ever Born, by Age Group and Educational Attainment, Women Ages 15-49, 1975, 1990 & 2007

Age Group	Year	None	Primary	Secondary 1&2	Secondary 3&4	Secondary 5&6	Univ.	Total
15-19	1975	0.43	0.22	0.14	0.12	0.18	‡	0.20
		0.41+				0.09+		
	1990		0.37	0.18	0.16		‡	0.22
	2007	†	0.14	0.08	0.11	0.08	0.00 ‡	0.10
20-24	1975	1.78	1.85	1.44	0.92	0.56	0.35	1.50
		1.56+						
	1990		1.85	1.44	1.13	0.59	0.21**	1.15
	2007	0.31 ‡	1.10	1.13	0.92	0.38	0.07	0.66
25-29	1975	3.40	3.52	3.39	2.99	2.08	1.35	3.34
	1990	2.97**	3.53	3.50	2.36	1.79	1.25	2.69
	2007	3 ‡	2.50**	1.97**	1.76	1.41	0.48**	1.61
							2.69+	
30-34	1975	4.72	5.00	5.04	4.61	3.85**		4.83
		4.99+						
	1990		4.96	4.21	4.12	3.56	2.62	4.31
							1.26+	
	2007	4.00 ‡	4.26**	3.77	2.87	2.53		2.97

						4.13[+]		
35-39	1975	5.77	6.32	5.76	6.22		‡	5.96
		7.11[+]					3.56[+]	
	1990		6.75	6.16**	6.43	4.58**		6.26
							1.88[+]	
	2007	8.60 ‡	4.98**	4.97**	3.86	3.49		3.98
40-44	1975	6.15	7.00	6.44	6.05**	‡	‡	6.42
		7.76[+]		8.58[+]	7.14[+]	4.52[+]		
	1990		8.02**				‡	7.82
			6.36[+]	5.63[+]			3.35[+]	
	2007	6.87 ‡			4.76**	4.79**		5.21
45-49	1975	5.95	6.49	5.36**	6.96**	‡	‡	6.07
		7.72[+]	7.87[+]		6.74[+]			
	1990			‡		‡	‡	7.47
			6.95[+]					
	2007	7.92 ‡		5.26**	5.75**	5.75 ‡	3.82 ‡	5.96
15-49	1975	4.48	2.81	1.30	1.78	1.16	1.01	2.89
	1990	4.30	3.68	2.12	1.88	1.65	1.20	2.50

	5.95[+]					
2007	2.82	2.08	1.94	1.75	0.89	2.02

† No observations for 15-19 year olds in 2007
‡ Fewer than 10 observations
[+] 10-24 Observations
** 25-49 Observations

Table 3. Regression Analyses of Children Ever Born, 1990 and 2007

		All Women		Married Women	
VARIABLE		1990	2007	1990	2007
AGE AT SURVEY	AGE	.292**	.258**	.339**	.377**
	AGE SQUARED	.00001	-.0008+	-.0008	-.0027**
ETHNIC GROUP	BAKONGO	-.203**	-.121	-.174+	-.072
	KWILU-KWANGO	---	---	---	---
	MONGO	-.095	-.039	-.080	-.245
	UBANGI	-.249*	-.355*	-.307+	-.308
	LUBA	.421**	.047	.655**	-.005
	OTHER	-.053	-.146	-.087	-.185
SCHOOLING LEVEL	NONE	.019	1.531**	.130	2.167**
	PRIMARY	.273**	.347**	.346**	.590**
	SECONDARY 1-2	---	---	---	---
	SECONDARY 3-4	-.469**	-.350**	-.460**	-0.331+
	SECONDARY 5-6	-1.130**	-.778**	-1.136**	-.651**
	UNIVERSITY	-1.752**	-1.668**	-1.847**	-1.918**
EMPLOYMENT STATUS	NOT EMPLOYED	---	---	---	---
	SELF EMPLOYED	.014	-.148+	.018	.039
	EMPLOYEE	-.912**	-.499**	-.878**	-.173
PARAMETERS	CONSTANT	-4.605	-3.870	-5.165	-5.343
	R^2/ADJUSTED R^2	.708/.706	.622/.619	.659/.656	.506/.497
	F-RATIO	349.5	193.8	202.8	55.3
Sample Size		2323	1666	1693	771

** Significant at the .01 level.
* Significant at the .05 level.
+ Significant at the .10 level.

Fig. A1. Real GDP per Capita, 1970-2004

Source: Penn World Tables (Heston et al., 2006)

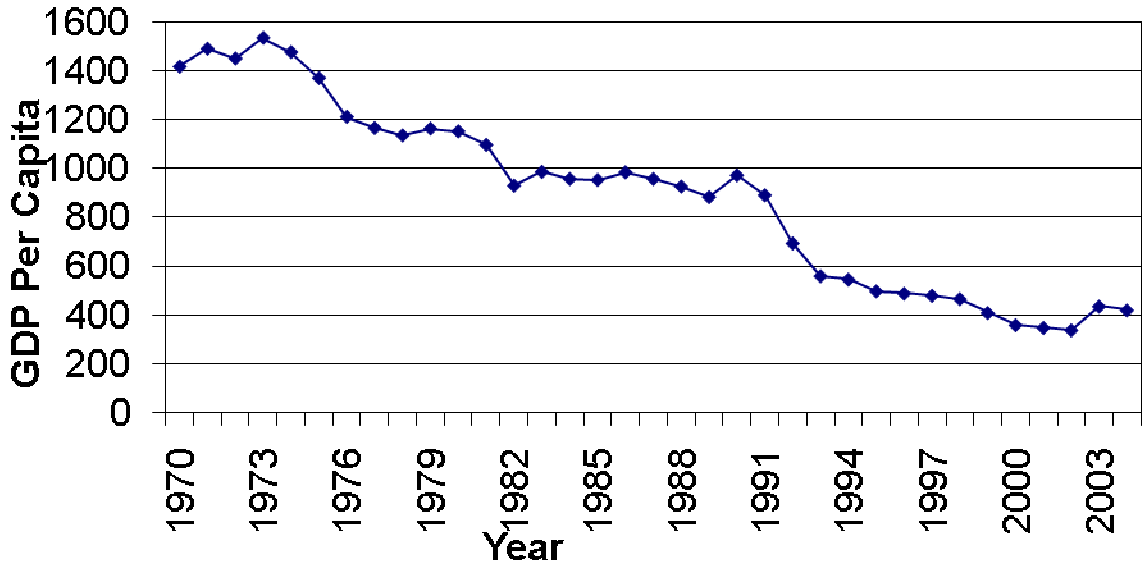


Fig. A2. Percent Change in GDP per Capita, 1971-2004

(calculated from data in Fig. A1)