The Relative Influence of Contraception, Abortion, Postpartum Infecundability on Fertility Trends in 22 Sub-Saharan African Countries: 1986 and 2007

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(1) Significance

The proximate determinants (PD) framework (Bongaarts 1982; Stover, 1998) remains a fundamental means for understanding the relative importance of key factors influencing fertility levels – exposure to conception through sexual activity, contraceptive practice, postpartum infecundability largely due to breastfeeding, induced abortion, intrauterine mortality, and sterility. Fertility transitions are variously influenced by these factors, with postpartum infecundability and exposure to sexual activity playing major roles at the early stages and contraception in the later stages. Induced abortion tends to be most influential when fertility is low but is often difficult to measure directly or accurately. The fertility transition in sub-Saharan Africa (SSA) distinguishes itself from those observed in other regions, such as Latin America, Asia and the Middle East, not only by starting at higher levels but also by being incomplete, declining more slowly and in some cases stalling (Bongaarts, 2008). However, while SSA fertility rates are high relative to other regions, there have been steady declines in some countries, such as Malawi, Ghana, Eritrea and Namibia. A close examination of trends in the PDs in SSA countries can offer insights into the enduring pace of fertility declines and patterns of influence that may not have been observed in the transitions of other developing regions.

(2) Study aims

The principal aim is to assess the relative influences of contraceptive practice, abortion and postpartum infecundability as well as other proximate determinants on fertility trends in the sub-Saharan Africa region over the past two decades. A secondary aim is to compare the estimates generated by the Bongaarts framework with those from an updated version by Stover, since the latter more explicitly addresses exposure to pregnancy through sexual activity and infecundity, as well as estimates a higher level of potential fecundity. A third aim is to observe trends in induced abortion relative to the contraception. Significant levels of unmet contraceptive need in this region with relatively weak delivery of contraceptive services and low levels of use suggest reliance on induced abortion may be significant.

(3) Methodology

We estimate the proximate determinants' indices for marriage (Cm), contraception (Cc), postpartum infecundability (Ci) and abortion (Ca) for sub-Saharan countries using the Bongaarts framework for all years. Similarly we estimate the index of sexual activity (Cx), index of infecundity among sexually active women (Cf), and contraceptive practice index (Cu) with the Stover framework. Ci and Ca remain the same as in the Bongaarts model, while potential fertility (PF) is estimated to be 21 births, as opposed to 15.3. The values of the indices range between 0 and 1, with values toward 0 reflecting greater negative influence on fertility levels. Ca is estimated using a residual approach in both frameworks, as initially suggested by Johnston and Hill (1996).

(4) Data

The data are drawn from 67 Demographic and Health Surveys in 22 SSA countries between 1986 and 2007. Countries are included if the DHS was conducted at least twice. Fifteen of the 22 have 3 or more survey rounds. To calculate PD indices, age-specific fertility, proportions sexually active, contraceptive use, duration of breastfeeding, proportion infecund, neonatal mortality and proportion childless are obtained by primary data analysis or from the country survey reports and StatCompiler.

(5) Findings

Based on the Bongaarts model, the two PDs exercising the strongest downward influence on natural fertility (measured by the total fecundity rate of 15.3) are postpartum infecundability and contraception. Across the 67 time points, the average unweighted Ci value was 0.567 and 0.846 for Cc. The marriage index (Cm) value was 0.871, slightly less influential than contraception. The average estimated Ca value was 0.911. The striking finding across these countries and time points is the consistently strong effect of postpartum infecundability, which captures both traditional abstinence and lactational amenorrhea. The range in Ci values is from a minimum of 0.487 to a maximum of 0.637 in this two decade period. Even in the lowest fertility countries of Namibia with a 2006 TFR of 3.6 and Ghana with a 2003 TFR of 4.4, Ci values remain low at 0.592 and 0.580 respectively. By contrast, the values of the contraception index show a steady downward trend across time but start near 1.0 in the late 1980s. Only four countries have Cc values below 0.70 by 2000 and onward (Cameroon at 0.565, Uganda at 0.586, Zambia at 0.658 and Senegal at 0.691). In some cases, condom use, which carries a lower use-effectiveness rating than other modern contraceptives, can drive a country's Cc value in unexpected ways. In Senegal the 1997 Cc value of 0.627 rises to 0.691 in 2005 as a result of a rise in condom use. In Uganda there is a significant drop in Cc values from 0.846 in 2000 to 0.586 in 2006 due to substantial increases in both injectable and condom use. Potentially due to unreliable estimates, the values of the abortion index (Ca) vary widely over this time period and do not exhibit a clear trend. Half of the 22 countries show increasing influence of abortion on fertility with declining Ca values, while the other half show rising values. In the 11 countries where Ca values decline, suggesting more reliance on abortion for fertility control, Cc values decline in half of these as well. Using the Stover indices, the (unweighted) average value of Cu (0.884) is similar to Cc (0.846) but that for Ca is greater at 0.765 as compared to the Bongaarts index value of 0.911.

The trends in the four Bongaarts indices are graphed in Figures 1 to 4. For the final version of this paper, we will provide more detailed analysis of the proximate determinants' trends, particularly in relation to comparing the two frameworks' precision in estimating induced abortion and investigating parity-specific contraceptive method use. Overlap between postpartum practices of lactation, contraceptive use, and sexual abstinence will also be investigated in more detail.

(6) Discussion

For most analysts contraceptive practice remains the anticipated driver of the fertility transition in SSA countries but progress in the latter has been incremental although

steady. At the same time, the strong and consistent influence of postpartum infecundability in suppressing fertility has gone largely unnoticed. Similarly, the effects of the proximate determinants have largely been between births, as opposed to in an open birth interval. Postpartum infecundability is due primarily to prolonged breastfeeding and may also capture customary practice of sexual abstinence in a number of countries. Increasingly adherence to this practice is weakening. Lactating women are adopting contraceptive injectables, often discreetly to resume conjugal relations while avoiding social or partner detection. The estimation algorithms for the PD indices have been refined by Johnston and Hill (1996) and Stover (1998) and may fit patterns of sub-Saharan African reproductive behaviors better than those originally analyzed by Bongaarts. Estimating the effect of induced abortion still remains a methodological challenge but there are strong suggestions of its influence in several incipient SSA fertility transitions. The time-varying influences of the proximate determinants not only contribute jointly to the fertility transitions but do so largely within a post-partum context.

Figure 1. Index of Marriage by Year for 22 Sub-Saharan African Countries with DHS 1986-2007

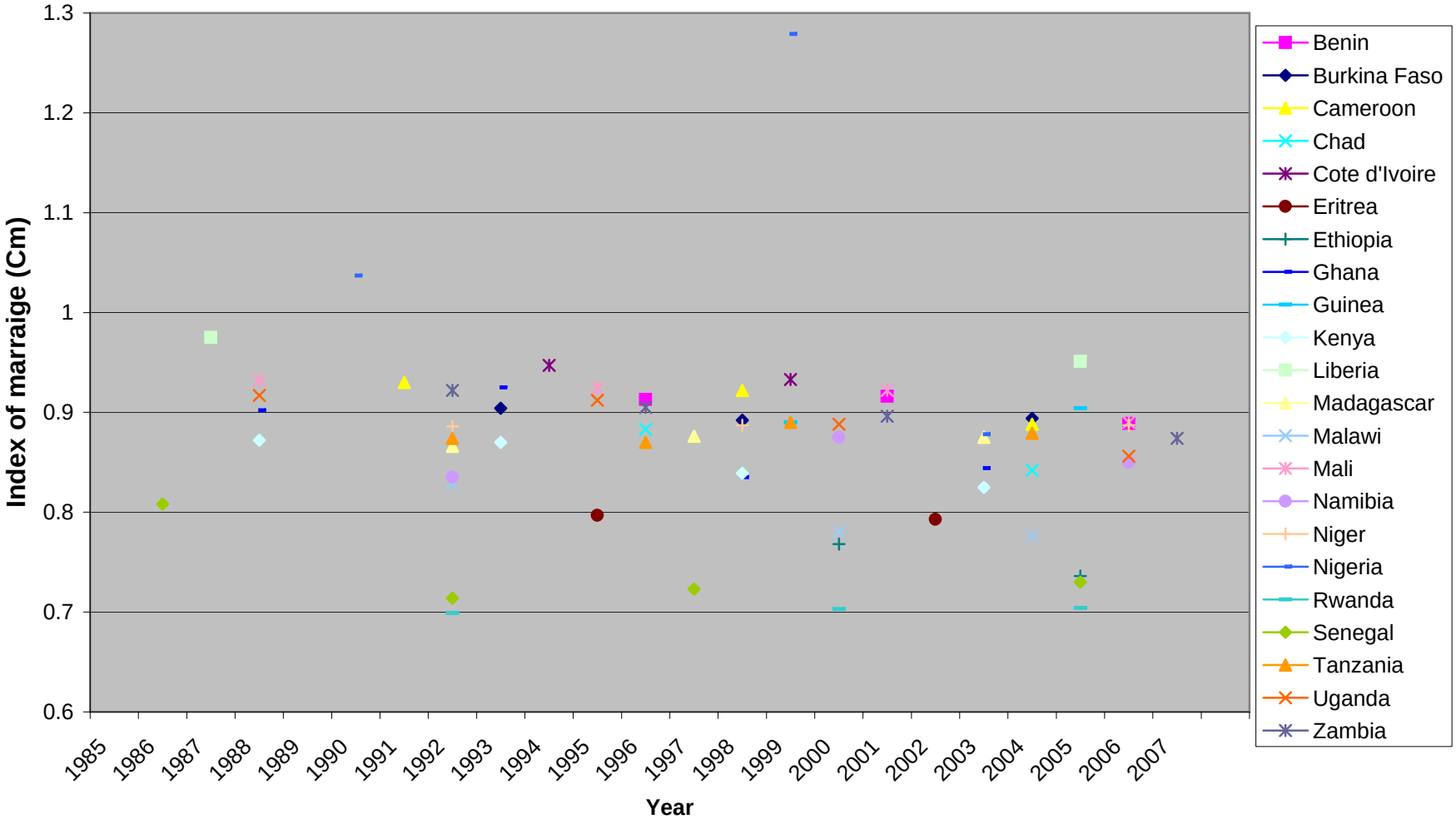

Figure 2. Index of Postpartum Infecundability by Year for 22 Sub-Saharan African Countries with DHS 1986-2007

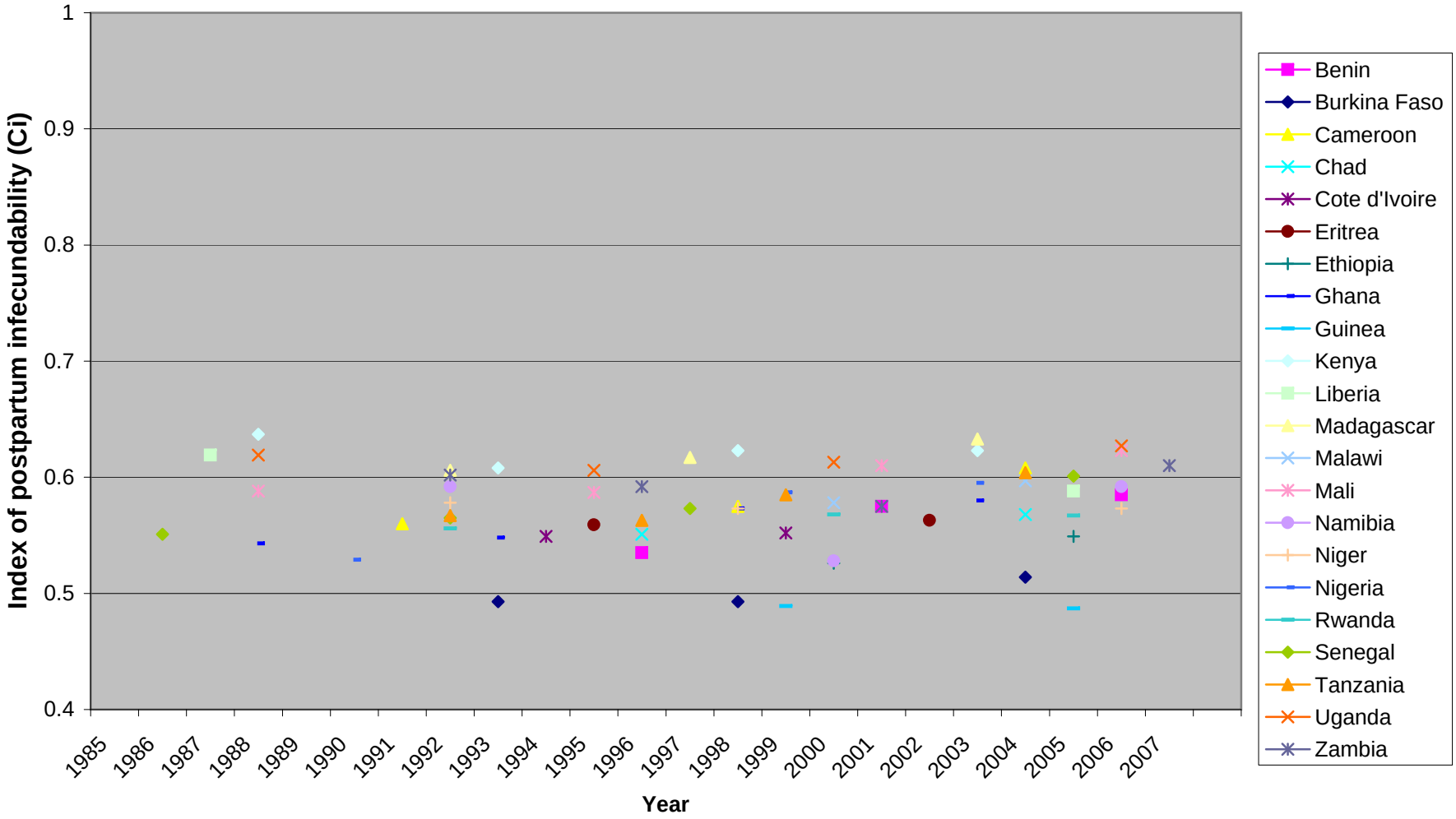

Figure 3. Index of Contraception by Year for 22 Sub-Saharan African Countries with DHS 1986-2007

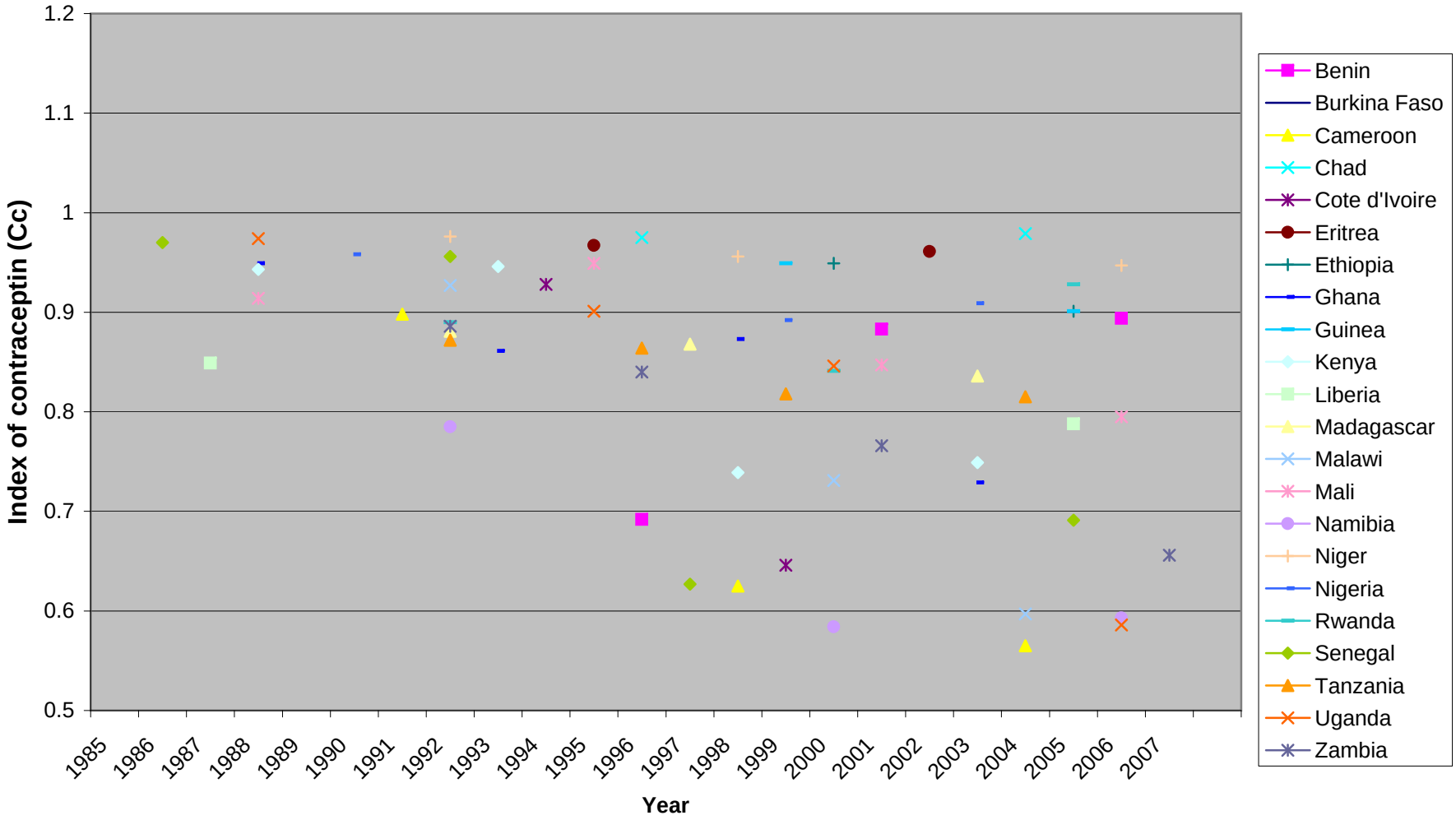

Figure 4. Index of Abortion by Year for 22 Sub-Saharan African Countries with DHS 1986-2007