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The Fertility Transition: Panel Evidence from sub-Saharan Africa

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In this paper, we investigate the theoretical linkage between various socioeconomic indicators and fertility declines in 48 sub-Saharan African countries between 1970 and 2012. We test the various theories put forward in literature as contributing to fertility declines in industrialised economies in order to identify the determinants which have contributed to the fertility transition in sub-Saharan Africa. We complement this empirical exercise by also investigating the effective channel through which technology has contributed to declining fertility rates. For example, literature cites that one of the main catalysts for raising demand in education or sustaining rising incomes per capita is industrialisation which comes with technological progress, and this increased development in education and income induces declines in fertility rates (Galor 2005, Galor & Weil 2000). By conducting this empirical analysis we are able to place sub-Saharan Africa within a particular theoretical framework and developmental stage.

Several mechanisms in literature have been proposed as triggering the decline in fertility rates. Firstly, the Barro-Becker wealth theory (1988, 1989) which focuses on opportunity costs involved with rising income per capita which may induce parents to reduce the quantity of children. Secondly, the unified growth theory which emphasises the effect of education in reducing fertility (Becker, Cinnirella & Woessmann 2010, Galor 2005). Thirdly, the health theory on declining infant mortality rates which reduce the need to have more children to replace those that do not survive (Conley, McCord & Sachs 2007, Murin 2013). Fourthly, the decrease in the gender gap in wages which raises the cost of children (Galor & Weil 1996). Lastly, the change in traditions regarding the old-age security hypothesis which views the younger generation as a measure of security for the older generation (Galor 2012, Reher 2011)

The results, based on panel analysis with fixed effects and instrumental variables, show that in the absence of technological progress both income per capita and infant mortality are significant determinants in explaining fertility declines. However the introduction of technology augments the effect of education in reducing fertility. The empirical evidence from this study lends credence to the unified growth framework with emphasis on the role of technology in raising the demand for education and bringing about a demographic transition during the Post-Malthusian period. There is inconclusive evidence on the role of technology through the wealth and health channels.

We also find that the reduction in the education gender gap has more impact on decreasing fertility rates than the reduction in the labour force gender gap. Increased female education reduces fertility because it raises awareness of early contraceptive use, delays marriage entry, increases female bargaining power in households regarding fertility preferences, encourages women to invest in the education of their children and increases opportunities for women to enter the labour market. The male labour participation rates induce higher fertility.

However these positive effects from the male labour force participation rates are counteracted with the inclusion of the technology instrument indicating the influence of technological progress in decreasing the comparative advantage of male labour and reducing fertility rates.

This study places sub-Saharan Africa in a Post-Malthusian period where a demographic transition is starting to take place as the economies become more industrialised. However, the study also indicates a region that is still characterised by a patriarchal system where women are expected to play a traditional role of raising children and this may be contributing to the stalling fertility declines leading to delays in the demographic transition.

The evidence points to including policies that create incentives for increased education, particularly for women. Stimulation of continuous industrialisation may create the necessary incentives to encourage investment in education through increased demand for skilled labour and higher wages. Technology also creates an expanded labour market with increased opportunities for female labour. These incentives may assist in discouraging early pregnancies and delaying marriages in sub-Saharan Africa.