

Perception of economic conditions and fertility desire in urban areas of sub-Saharan Africa: the case of Benin

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Abstract: This study aims to see how the perceptions of poor economic conditions in the place of residence is associated with the desire for additional children in the urban context of Benin. Data from the 2017-12 Benin DHS are combined with Afrobarometer data on opinion surveys using detailed geospatial information. The results of the multivariate analyses suggest a positive association between negative perceptions of economic conditions and the desire to have children in the future. Thus, women living in contexts where perceptions of economic conditions are strongly negative are likely to want a child. This association is moderated by women's level of education. Women with secondary education and above are less likely to want their next child than their counterparts with less than secondary education when they live in contexts where economic uncertainty is high. The trend is reversed when the level of economic uncertainty is low.

Keywords: Fertility preference, fertility desire, economic conditions, urban area, Benin, Sub-Saharan Africa

Introduction

Questions about the exceptionalism of the fertility transition in sub-Saharan Africa, in terms of the pace of decline or stagnation, continue to fuel debates on the demographic transition of African countries (Caldwell et al., 1992; Bongaarts, 2017; Eloundou-Enyegue et Hirschl, 2017; Schoumaker, 2019). However, there is a consensus that fertility preferences are high and play a central role in the nature of the fertility transition (Bongaarts et Casterline, 2013; Casterline et Agyei-Mensah, 2017). Moreover, a large body of literature emphasises that fertility preferences are flexible, dynamic, and influenced by uncertainty and changes in economic conditions (Jennifer Johnson-Hanks, 2005; Yeatman et al., 2013; Trinitapoli et Yeatman, 2018).

Several recent empirical studies highlight the negative response of fertility to economic uncertainty and labour market conditions in industrialised countries (Adsera, 2011; Goldstein et al., 2013; Guzzo et Hayford, 2023). In sub-Saharan Africa, to our knowledge, few studies have

addressed this issue, with the exception of Eloundou-Enyegue et al. (2000) in Cameroon, Agadjanian (2005) in Mozambique, Shapiro (2015) in the city of Kinshasa in Congo DRC, Kodzi et al. (2012) and Owoo et Lambon-Quayefio (2021) in Ghana. However, our understanding of the effect of economic conditions on fertility remains incomplete. Firstly, the studies carried out in the African context have been based on macro-level indicators that may have little impact on fertility at the individual level. Secondly, studies have focused on the use of standard measures of economic conditions such as gross domestic product per capita, employment, unemployment, income, or level of education (Shapiro, 2015; Brauner-Otto et Geist, 2017) which obscures the subjective aspects that are also important. Finally, very few studies have been carried out in the Benin context on the response of fertility to the impact of economic conditions.

The aim of this study is to examine the link between perceptions of economic conditions and fertility preferences in the urban context of Benin. To this end, the following research questions are at the heart of our study: To what extent does the perception of economic conditions at the local level affect women's fertility preferences? How does this relationship vary according to a woman's type of employment and level of education? The analysis focuses on urban areas to gain a better understanding of fertility, as this is the part of the African continent that is developing rapidly in socio-economic terms and for which recent research suggests a slowdown in the decline in fertility (Schoumaker, 2019; Sánchez-Páez et Schoumaker, 2022).

Data and variables

Data

We are combining individual data from 2017-2018 Benin Demographic and Health Surveys (DHS) and 2016 Benin Afrobarometer project with geolocated coordinates of respondent's places of residence at cluster level. Afrobarometer is a pan-African research project that conducts surveys to measure public opinions on attitudes to democracy, governance, economic conditions and related issues, in over 35 African countries, repeated on a regular cycle (BenYishay et al., 2017). The sample sizes for 2016 Benin survey are 1,200 individuals aged 18 year and over. Afrobarometer's sampling is stratified according to country's first administrative unit (region or province) and urban/rural residence. In the Afrobarometer data, we are interested in information relating to individual's perceptions of the economic conditions prevailing in their country.

Data linking method

The method consists of linking each cluster of DHS surveys to an Afrobarometer enumeration area based on spatial proximity, using geographical coordinates (GPS). The technique consists of retaining, for each DHS cluster, the enumeration zones from the Afrobarometer data that are closest within a radius of 5 km. A sensitivity analysis will be carried out for radius of 2 km, 10 km, 20 km, and 30 km (Table A2, in the appendix). The 5 km radius was chosen because the geographical coordinates of the DHSs were randomly shifted over a distance of up to 2 km for urban areas and 10 km for rural areas in order to protect the confidentiality of the individuals surveyed. (Burgert et al., 2013). In addition, the DHS programme guidelines suggest using distances ranging from 1 to 5 km for urban areas and 5 to 10 km for rural areas, when assessing the effect of contextual variables (environmental, physical or socioeconomic) at cluster level (Perez-Heydrich et al., 2016). This ensures that the DHS cluster from which households were selected is within this chosen radius (Grace et al., 2019). Thus, the average value of perceived economic conditions will be an average weighted by the inverse of the distance between the DHS cluster and the Afrobarometer enumeration area. The procedure is implemented by Stata's `geonear` module¹(Picard, 2019). This coupling methodology has been used by other authors (Rotondi et al., 2020; Thiede et al., 2020; Grace et al., 2021). The analysis sample after data linkage is made up of 2,312 married and cohabiting women aged 15-49 who have been living in the 149 clusters² for at least one year. This makes it possible to consider the length of time women has been exposed to their place of residence, as there is an eleven-month delay between the start of the Afrobarometer survey and the DHS.

Dependent variable: The main dependent variable is derived from the question in the DHS: "*Would you like to have (another) child, or would you prefer not to have (any more) children?*"³. From this question, the desire to have another child is a dichotomous variable which takes the value 1 if the woman intends to have another child, 0 if not. Women who declared themselves infertile and those who had been sterilised were removed from the analyses. In the following, we use the expression

¹ "Distances are calculated using the user-written command `geonear`: "geonear finds the nearest neighbors using geodetic distances, i.e., the length of the shortest curve between two points along the surface" of a mathematical model of the earth" (Picard, 2012).

² The urban environment comprises a total of 251 clusters, 149 of which were used in the analyses after data linkage within a 5 km radius.

³ For women who are pregnant at the time of the survey, the question is asked as follows: "I would now like to ask you some questions about the future. After the child you are expecting now, would you like another child or would you prefer not to have any more?"

"desire for additional children" to refer to the desire to have the first child or the desire for additional children.

Main independent variable: perceived economic conditions: In the Afrobarometer survey, individuals were asked about their perception of their country's economic situation using the following question: "Looking back, how would you rate the economic conditions in this country compared to the last twelve months?" The possible answers to this question are: (1) much worse; (2) worse; (3) the same; (4) better; and (5) much better. We used this information to construct a measure of negative perceptions of economic conditions. Applying the sampling weights provided in the Afrobarometer surveys, we calculated the proportion of respondents in each cluster who thought that the country's current economic conditions, compared to the previous 12 months, were worse or much worse. The perceived economic condition variable for each of the DHS clusters will be a weighted average of the perceived economic conditions of each Afrobarometer enumeration area within a 5km radius, as explained in the linkage method above.

Analysis method: We estimate a two-level multilevel logistic model, with a random effect given the dichotomous nature of the variable depending on the desire for additional children and the hierarchical structure of the data. Level 1 is for women and level 2 is for clusters. Multilevel models are appropriate in cases where the observations are nested within a larger set and for estimating contextual effects (also known as random effects).

Preliminary results

Perceived economic conditions and desire for additional children

Table 1 presents the odds ratios estimated from the multilevel logistic random intercept model for the effect of economic conditions on the desire for additional children. Overall, perceived poor economic conditions are positively associated with the desire for additional children (Table 1). The effect of perceived poor economic conditions remains significant in the unadjusted model (model 1), disappears after adjustment for contextual variables (model 2) and becomes significant again in the full model after the addition of individual variables (model 3). Thus, women who live in a context where individual's perception of the country's economic conditions is strongly negative are likely to want a child (table 2, model 3). Furthermore, in terms of model 3, the contextual fertility norm variable identified by the non-use of modern contraception is associated with the

desire for additional children. Women who live in communities where a high proportion of married women do not use modern contraception, and those who live in communities with a high concentration of women with secondary education or more, are more likely than others to want a child. However, in the full model (model 3), the effect of not using modern contraception remains significant, while that of education at the contextual level disappears. Furthermore, it should be noted that at the individual level, age, the number of surviving children and the age difference between spouses are negatively associated with the desire for additional children.

The contribution of individual and contextual variables to the explanation of the variation in the desire for children between communities is evaluated based on the intra-class correlation resulting from the multilevel model. Model 0, which represents the empty model containing only the dependent variable, indicates that 6.57% of the variation in the desire for additional children is attributed to differences between the clusters representing the communities in which the women live. With the introduction of poor economic conditions alone in the model, 5.88% of the variation in the desire for additional children is explained by differences between communities, which would mean that 10.5% $(1-5, 88/6.57)$ of the variation in the desire for fertility between communities comes from the contextual variable poor economic conditions. When the contextual variables of fertility norms, socio-economic development (model 2) and individual variables (model 3) are added, the intra-class correlation decreases to 2.91% and 2.90 respectively. The reduction in the intra-class correlation observed indicates that the contextual variables of fertility norms and socio-economic development contribute strongly to explaining the variation in the desire for additional children between communities compared with the individual variables.

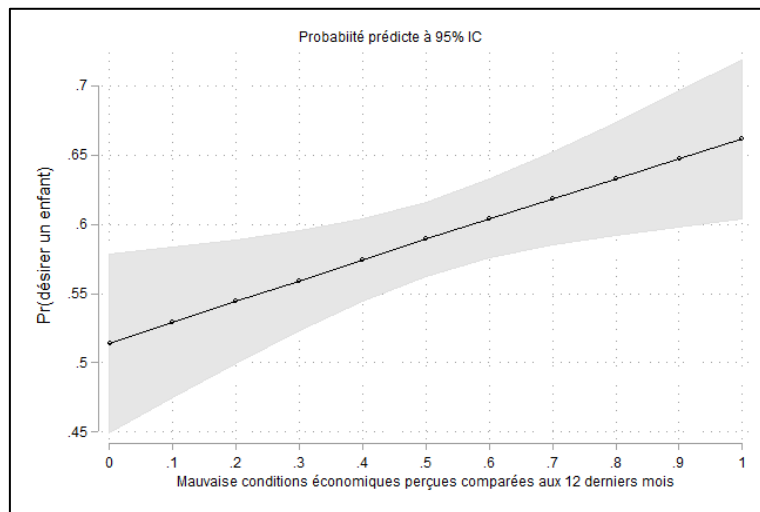
Table 1: Odds ratio estimates from the logistic multilevel model of the desire to have a child in an urban area in Benin

	Additional desire for children			
	Model 0	Model 1	Model 2	Model 3
Contextual variables				
Poor economic conditions compared to the last 12 months		2,04*	1,39	2,73**
		(0,71)	(0,41)	(1,05)
Proportion of married women not using modern contraception			10,9***	4,28**
			(4,31)	(2,02)
Proportion of women aged 20-35 with secondary education or more			3,42**	1,28
			(1,40)	(0,76)
Individual variables				
Women's paid employment in non-agricultural				1
No (ref.)				0,98

Yes					(0,14)
Women's education					1
None/Primary (ref.)					1,03
Secondary +					(0,15)
Age group					1
15-24 (Ref.)					0,60*
25-39					(0,14)
40-49					0,10***
					(0,03)
Surviving children (ref = 0-1)					1
0 -1					0,14***
2-3					(0,04)
4+					0,03***
					(0,01)
Modern contraception					1
No (Ref.)					0,84
Yes					(0,12)
Polygamous unions					1
No (Ref.)					0,86
Yes					(0,11)
Age difference between spouses					1
Less than 5 years (Ref.)					0,70**
5-9 years					(0,10)
10 years and over					0,69**
					(0,10)
Wealth index					1
Poor (Ref.)					0,87
Medium					(0,19)
Rich					0,66
					(0,16)
Religion					1,33
Traditional (Ref.)					(0,37)
Muslim woman					0,62
Catholic					(0,15)
Other religions					0,83
					(0,21)
Number of women			2312		
Number of clusters			149		
Intra-class correlation (%)	6,57	5,88	2,91	2,90	
Notes: Standard errors are presented in brackets and grouped at cluster level. Model 1 - basic model, including only perceived economic conditions. Model 2 - adds individual variables and model 3 adds contextual variables.					
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$					

The positive association between perceived economic conditions at contextual level and the desire for a child is illustrated in graph 1, using predicted probabilities. Thus, living in a context where perceptions of economic conditions are strongly negative increases the probability of wanting a child (graph 1).

Figure 1: Predicted probability of wanting more children according to negative perception of economic conditions



Source: Our elaboration from Benin combining data

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