Analyzing the Sandwich Generation: an application of SOCSIM for the Brazilian Context[1]

Everton C. Lima (NEPO/UNICAMP)

Maria Carolina Tomás (CEDEPLAR/UFMG)

Bernardo L. Queiroz (CEDEPLAR/UFMG)

Introduction and Background

Since 1960, the demographic and epidemiological transitions combined lead to an increase in the percentage of deaths above age 65, for males and females. Furthermore, the Brazilian fertility transition is also been well documented by numerous studies (Perpetual and Aguirre, 1998; cited Merrick and Berquó 1983; Carvalho Paiva and Sawyer 1981; Paiva 1987; Faria 1989; Alves 1994; Potter, 1994). All these studies showed that this fertility decline was the result of the interaction of a complex set of transformations of economic, social and institutional order.

In a context of fertility delay and lower mortality, people are more likely to have small children at the same time that they have elderly parents, at an age that they already need some kind of care, especially their mothers, since women tend to live longer than men do. This is called the sandwich generation, most of the studies have focused on women at age because they are the ones more likely to provide care for both children and elderly.

The study of the sandwich generation is important for several reasons. First, because of the burden of work women at middle age may be affected, because they would need to provide more care to two intensive caring ages . It is worth highlighting that given the fact that women labor market participation has been increasing and that women do more household chores than men do, they would accumulate many functions in family. Second, it changes the family relations in the sense that children over time have higher chance to meet their grandparents at an older age, which implies changes in how they be more or less likely to provide childcare, and that women of sandwich generation may need to split their time between the two more intense care, i.e. the care of her children and mother. However, the grandmother can also be a good asset to childcare.

Although, in Brazil, unlike the many developed countries, we find an early fertility behavior. In other words, the fertility is very concentrated at young ages, with a high proportion of teenage mothers from low socioeconomic status, with the fertility mode located at the age group of 20 to 24 years old (Leite and Gupta, 2001; Berquó and Cavenaghi, 2005; Rios-Neto, 2005; Miranda and Potter, 2010). Moreover, according to Rios-Neto (2005), empirical evidences point out that a further pattern of fertility rejuvenation or increased proportion of younger mother.

These important issues has motivated the study that has twofold objectives: 1) The construction of the fertility rates according to civil statuses are by itself an important contribution for this specific study and future studies in Brazil; and 2)

[1] *please do not cite without authors' permission

explore the characteristics and the changes in the Brazilian sandwich generation over time.

The main questions are: 1) due to the decline of fertility and the decrease of mortality over time (70s, 80s, 90s, and 2000s), what is the probability of having a small child and a living parent? 2) Which is the average time women spends in the sandwich generation and how it has been changing over time? 3) What is the average age that children experience a grandparent death?

Method and Data

In order to create the family relationships, we make extensive use of the Socsim and micro simulation. The main advantage and justification for using this method is the absence of data that keeps track of extended family and relatives who live in a different household.

SOCSIM is a closed model, so the partners need to be found within the existing simulation population using an algorithm to ensure a realistic distribution of spousals. It is possible to consider heterogeneity: differential fertility, nuptiality and mortality by specific groups, such as, age, sex and race. In addition, it is possible to add a marriage search with scoring which allows the incorporation of racial assortative mating into the analysis. The program also permits time adjustments, so, the rates can be updated over time during the simulation process.

As input data, we use mortality data from 1980 to 2010, available at Latin American Mortality Data Base webpage (http://www.lamortalidad.org/). The fertility series were indirect estimated using own-child method and the micro census data from 1980 to 2010[2]. The transitions rates in the marriage market (marriage, divorce, remarriage and widowhood) are from year 2000. This is one shortcoming in this work. Another limitation is the absence of series of fertility rates according to distinguished marriage status. However, the next step of this paper is to perform series of calibrations, comparing the population constructed in SOCSIM with the one observed in the Census data and other sources, in order to obtain better series of rates.

Preliminary Results and discussion

The next figures are preliminaries results from simulations, using data up to the year of 2000. Figure 1 shows the evolution of age of grandmother and their granddaughters. As we can see, there is no much change on time. Thus, for each year considered in the simulation there is a gap of 25 years between these two generations.

Figure 2 shows the different birth cohorts and their mean years lived for grandmothers after the birth of a child. There is many fluctuations among the years and no clear trend is observed across cohorts. One reason is that all of these cohorts still experience the mortality decline in the country and the effects of this decline are affecting both generations at the same time. There is another hypothesis that concerns the age structure affected by mortality decline. Since the country is overlapping the many stages of epidemiological transition, there are no clear signs of what age is obtained more gains in mortality decline.

Other interesting result is the proportion of sandwiched mothers, which seems to reduce through time (see figure 3). This is an unexpected find, once we expect that

[2] This set of fertility rates was estimated by Lima (2012) and will be soon available at the Human Fertility Collection webpage (http://www.fertilitydata.org/cgi-bin/index.php).

the proportion of sandwiched mothers will increase over time. However, we need to mention that the Brazilian fertility behavior is quite different from many developed countries, and the increased proportion of younger mothers that the country has experienced during the years might play a role in these estimates.

Although, in further analyzes we will use data up to 2010 and do some checks and calibration to the data.

Figure 1
Mean age Grandmother at birth of average child - Brazil

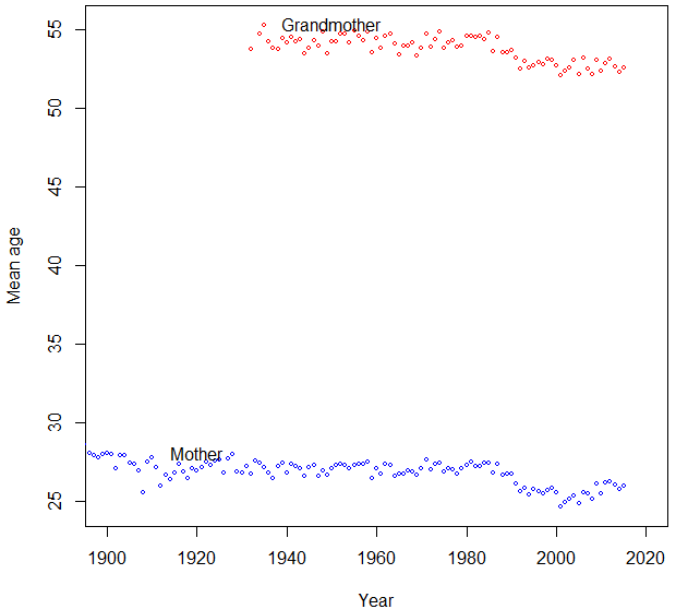


Figure 2
Mean Years of Grandmaternal Life after Birth of Average Child - Brazil

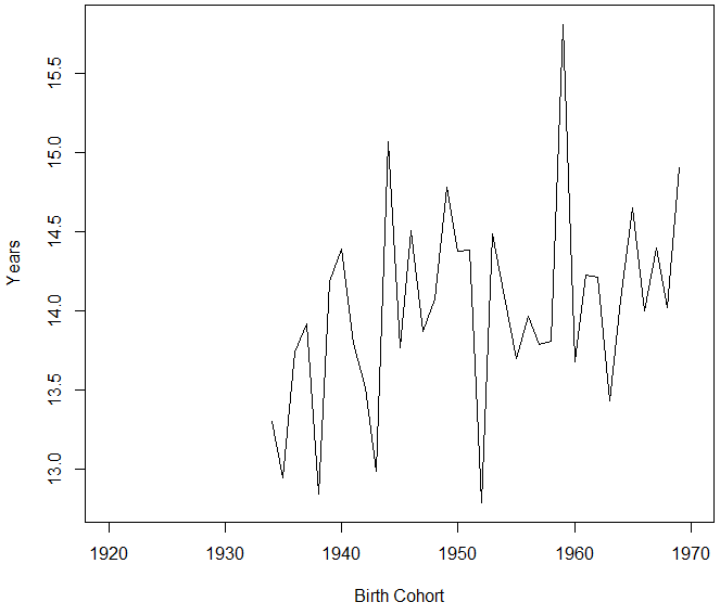
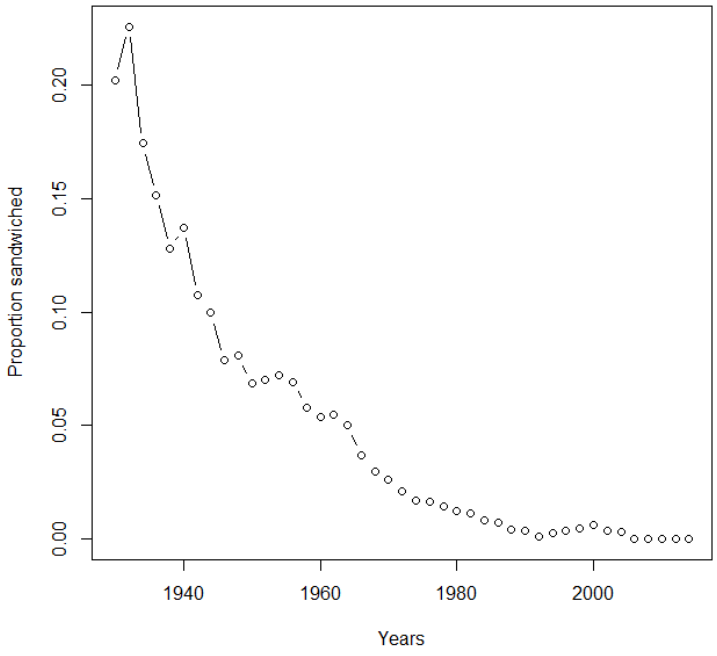


Figure 3
Proportion of mothers sandwiched in calendar year - Brazil



Source: Censuses from 1980 to 2010 and civil registers from 1980 to 2010.