Decomposition of Late Fertility Dynamics across Italian Regions in the Period 1955-2000

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Introduction

Most part of Europe has been moving towards lower and later fertility. Nevertheless, there are some country-specific traits in terms of intensity and pace with which these changes have been taking place. To this regard let us recall current differences in fertility levels between some Northern European countries and Southern Europe, in particular Italy and Spain. The former currently register the highest fertility levels, the latter are conversely included in the group of the so called lowest-low fertility countries (see Kohler et al., 2002; Billari and Kohler, 2004).
The continuous fertility decline observed all over Europe for decades has raised several important questions. Apart from the interest for studying the determinants of this decline, a crucial point regards the process of fertility ageing (see Bosveld, 1996). Relying on period data and adopting the proportion of fertility realized at age 30 and over as a preliminary indicator of late fertility, an increasing pattern of the contribution to the Total Fertility Rate of women aged 30+ has been observed since the second half of the 1970s in many European countries. As an example, in Sweden the proportion of fertility realized at age 30+ almost doubled from 24.6% in 1975 to 48.1% in 2000; in Denmark the increase was from 21.7% in 1975 to 47.1% in 2000; Italy registered a rise since the 1980s from 29.9% in 1980 to 40.1% in 1990 and 53.7% in 2000. Recently the phenomenon has been observed also in Central and Eastern Europe (Sobotka, 2004).
Nevertheless, in order to gain insight into the process of fertility ageing using period data it is necessary to focus on the interplay between the decrease of fertility intensity and the emergence of late fertility. In the European context the fertility decline and postponement have shown substantially uniform dynamics: the fertility decline has been accompanied with a shift to the right of the fertility age schedule. However, it is interesting to investigate since when to the increase of the proportion of fertility realized at age 30+ corresponds a rise of fertility at age 30+.

Aim of the research

The focus of the research is on the analysis of late fertility in Italy, a lowest low fertility country, where an increase in the proportion of fertility at age 30+ has been registered overall (Tab.1), but where nonetheless noticeable regional differences have continuously characterised the fertility dynamics (see Giorgi, 1995; Santini, 1995). Southern Italian regions registered at the beginning of the period a higher percentage of fertility realized over the age of 30, whilst recently higher levels are registered in Northern Italy.

Table 1 – Proportion of fertility realized at the age of 30 and over: Italian regional groupings and Italy

	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000
North	41.8	38.8	35.5	32.7	29.0	29.6	36.2	44.6	54.2	58.1
Centre	37.8	35.8	34.5	32.1	28.9	28.2	34.4	42.6	52.4	59.1
South	48.1	45.0	42.8	40.2	35.7	32.3	33.3	36.1	41.5	47.5
Italy	**43.6**	**40.8**	**38.3**	**35.5**	**31.4**	**29.9**	**33.8**	**40.1**	**48.0**	**53.7**

Source: our elaboration on Istat data

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We would like to understand whether the 20 Italian regions are homogenous in terms of late fertility dynamics or if there is different regional dynamics. We investigate whether the dynamics of late fertility in Italy is the result of a single model of behaviour at regional level. If so, heterogeneity across Italian regions would only be due to a time lag in late fertility dynamics. If not, we would be in presence of various reproductive behaviour models and therefore regions might show not homogenous dynamics. However, before we proceed with the analysis, it is important first to focus on the definition of late fertility itself and on some *caveat* to be taken into account when analysing this phenomenon using period macro data.

From a general point of view, late fertility at individual level can be defined as the part of the reproductive process realized over the age of 30. In a context of macro level analysis, as the one adopted here, it is necessary a better definition of the concept of late fertility. We refer to the proportion of fertility realized over the age of 30 using a period approach. Such an indicator shows some critical aspects because it can vary also in absence of real changes of fertility tempo. It can therefore lead to ambiguous interpretations being able to hide dynamics of quantum and tempo also of longitudinal nature.

In Italy the greater contribution to the increase of the proportion of fertility realized over the age of 30 is due, until 1990 for the South and until 1980 for the North, to dynamics of fertility intensity at younger ages (Giorgi, 1995). In addition to the obvious role of period age schedule dynamics on the proportion of fertility realized over the age of 30, the role played by birth order dynamics has to be noted, as fertility age schedules by order are different. Therefore, modifications of the distribution by order, in absence of modifications of fertility age schedule for single order, can lead to modifications of the total fertility age schedule. In particular the increase of the proportion of first births (quantum) can lead to a reduction of the realized proportion of fertility over 30, also in absence of real modifications in the tempo of fertility by order.

We carry out the analysis relying on methods that help us overcome the limitations of the used indicator. If the purpose was to observe real modifications of the reproductive behaviour over the age of 30, it is obvious that the best instrument of analysis would be represented by age and parity-specific probabilities. Nevertheless, we want to rely on the traditional and available age and order-specific fertility rates (also known as reduced rates, incidence rates), and thus we use a decomposition model. Such a model is able to discriminate the effect of different fertility components on the total evolution of the proportion of fertility realized over the age of 30.

Finally, we use a multivariate statistical model able to manage more occurrences over time, the multiway factor analysis, in order to obtain a synthetic view of the evolution of the parameters of the model across Italian regions.

Data and Methods

We use Istat data on regional fertility, specific by age and birth order, for the period 1955-2000.

The decomposition model developed in the current research follows the guidelines of the classical decomposition approaches known from the literature (Kitagawa, 1955; Das Gupta, 1978). The effects in the model are included additively. Simple, conjoined, interaction and total effects are considered.

Through the model it is possible to evaluate, for each region and for each time interval, the effect on the variation of the proportion of fertility realized at the age of 30 and over of two important dimensions: age and birth order. In particular, the decomposition model takes into account the effect on late fertility of the variation of first order fertility separately for the age groups 15-29 and 30+, and of the variation of second and higher birth order fertility for the same age groups. It is possible, thus, to highlight whether the obvious role of declining fertility intensity on the proportion of fertility realized over the age of 30 is accompanied by an effective shift of the fertility age schedule towards higher ages.

Afterwards, in order to synthesize the model results and to highlight regional differences and commonalities over time as regards the effect of different fertility components (timing and birth

order dynamics) on the variation of late fertility we perform a multiway factor analysis. For all the 20 Italian regions we include in the analysis the total effects from the decomposition model and the proportion of fertility realized at age 30 and over. By using time as the third dimension of the analysis we can observe changes over time of the association of the aforementioned dimensions of late fertility. Thus, the variables and their trajectory over time are plotted on the factorial plane, on which we project the regions as well and elucidate the prevailing associations in the late fertility dimensions in different regional contexts.

Results

The main findings of the study help better understand the dynamics of fertility ageing in Italy as a whole and across its regions. In particular, we gain insight into the development of the phenomenon of late fertility and, moreover, bearing in mind regional differentials in fertility dynamics in Italy, we highlight whether the shift of reproductive behaviour towards higher ages follows a homogeneous pattern.

In the period 1955-2000 the dynamics of fertility intensity plays a significant role in determining the trend of the late fertility indicator (Tab. 2). In the period of decline of the proportion of fertility realized at age 30+, up to the end of the 1970s, an important role is played by the decline of fertility at age 30+, and in particular of second and higher birth orders (negative sign of TFR II 30+ between 1965 and 1980). Since 1975 the effect of fertility in the age group 15-29 has become more evident (positive sign of TFR I 15-29) and it leads to the increase in the proportion of fertility realized at age 30+. An increase in the fertility at age 30+ is noted from the second half of the 1980s. Only then the increase in the proportion of fertility realized at age 30+ can be associated with an effective increase of the fertility at age 30+ (positive sign of aggregated total effects for age 30+ from 1985 to 2000) and, thus, with a real change of the reproductive behaviour process.

As regards the regional groupings, it emerges the particular Italian geography, with the North and the Centre, with some exceptions, showing a rather different late fertility dynamics in comparison to the South. The decomposition model allows to assess that the increase of the proportion of fertility realized at age 30+ is mainly due, at least until recently, to a notable decline of fertility intensity rather than to fertility postponement dynamics. In fact, in the North and in the Centre the effect of fertility at age 30+ becomes predominant over the other factors only in the period 1995-2000.

Table 2 – Results of the decomposition model: ITALY

Year	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000
%TFR30+	43,59	40,83	38,35	35,54	31,36	29,94	33,80	40,06	47,99	53,73

Period	1955-60	1960-65	1965-70	1970-75	1975-80	1980-85	1985-90	1990-95	1995-00
Δ %TFR30+	-6,32	-6,09	-7,32	-11,74	-4,54	12,90	18,52	19,79	11,95
Total effects									
TFR I 15-29	-2,85	-4,15	1,92	-1,21	9,38	9,14	2,76	8,54	-0.08
TFR I 30+	0,56	0,59	-1,95	0,01	-2,20	1,52	4,87	4,91	4,98
TFR II 15-29	-1,24	-4,27	1,15	3,24	7,91	6,69	7,14	8,10	3,55
TFR II 30+	-2,79	1,75	-8,44	-13,79	-19,63	-4,46	3,75	-1,76	3,50
Total effects aggregated by age and birth order									
TFR I	-2,29	-3,57	-0,04	-1,20	7,18	10,67	7,63	13,45	4,90
TFR II	-4,03	-2,52	-7,29	-10,55	-11,72	2,23	10,89	6,35	7,05
TFR 15-29	-4,09	-8,43	3,07	2,04	17,29	15,84	9,90	16,64	3,46
TFR 30+	-2,23	2,34	-10,39	-13,78	-21,83	-2,94	8,62	3,15	8,48

Factors: e.g. TFR I 15-29 is the total effect of first order fertility for the age group 15-29; TFR I is the total effect for first birth order aggregated by age.

Source: our elaboration on Istat data

The multiway factor analysis synthesises the model results. In particular, the projection of the variables on the factorial plane and the analysis of their trajectory highlight the late fertility evolution dynamics and the changes of the effect of the different components of the decomposition model. The most evident result regards the change of the association between the proportion of fertility realized at age 30+ and the variation of fertility before and after the age of 30. In particular, in 1955 a higher proportion of fertility at age 30+ is related to a modest contrast (negative sign in the decomposition model) or a major contribution (positive sign in the decomposition model) of fertility under the age of 30. In 1995, a high percentage of fertility realized at age 30+ is associated to a positive variation of fertility at age 30+, confirming the emergence of the role of fertility postponement.

The projection of the regions on the factorial plane shows that recently the variation of fertility at age 30+ contributes to the increase of the %TFR 30+ in the Northern regions. In the South the increase of the indicator is to date mainly determined by the variation of fertility under age 30 and there has not been yet a visible effect of fertility postponement.

The analysis confirms the presence of persistent differences in late fertility dynamics across Italian regions and there seems to be almost a diverging pattern between regional groupings. At the end of the period two more homogeneous groups emerge: the South, on the one hand, and the North and Centre, on the other. Such a result supports the argument derived from the decomposition model, according to which the differences between Italian regional groupings are not merely due to a time lag in the evolution of the phenomenon, but presumably to different reproductive models.

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