Migrants' Fertility in Italy: A Comparison Between Origin and Destination

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Abstract

Previous research analysed the effect of migration on fertility and a number of hypotheses have been developed: namely adaptation, socialization, selection, disruption and interrelation of events. Comparison among stayers in the origin countries, migrants and non-migrants in the destination country is essential to gain better understanding of the effects of migration on fertility. However, this joint comparison has been rarely analysed. We aim at filling this gap and analyse migrants' fertility in Italy. For the first time by merging different data sources, we are able to compare our target group of migrant women respectively born in Albania, Morocco and Ukraine with both Italian non-migrants and stayers in the country of origin. Considering the first three orders of births, multi-process hazard models were estimated in order to provide a more exhaustive and diversified scenario and to test the existing hypotheses. Results show that there is no single model of fertility for migrants in Italy. Besides, some hypotheses provide a better explanation of the fertility behavior than do others. Among women from Morocco, the socialization hypothesis tend to prevail whereas Albanians' fertility is mostly explained in terms of adaptation. Disruption emerged as the main mechanism able to explain the fertility of migrants from Ukraine. Moreover, a clear interrelation between fertility and migration emerge for women from Albania and Morocco, but only for the first birth.

1. Introduction

In the first decade of the twenty-first century, migration to Italy reached unexpected and exceptional levels and, at the beginning of 2015, the foreign residents in the country exceeded 6 million, including regular and irregular (Blangiardo 2016). Italy attracted a large number of economic migrants from abroad in the first decade of the twenty-first century: the factors were economic growth of the country and a demand for labor in family-care services, in the north-central factories, and in the southern agriculture sector (Istat 2016). In recent years, the wide increase of foreign presence was also linked to the rising number of families and of births from foreign parents (Istat, 2016). Some studies have mainly described the feminization of flows directed to Italy and the presence of different kinds of households (Ambrosini 2008; Bonizzoni 2007; Istat 2011; Maffioli et al. 2012; Simoni and Zucca 2007). Moreover, research has highlighted the wide variety of origins of migrants, which is often related to different migration patterns and associated with distinct reproductive behavior (Bonifazi 2007; Mussino and Strozza 2012; Mussino et al. 2015; Ortensi 2015).

Many scholars have considered the relationship between fertility and migration also focusing on the heterogeneity among migrants (Choi 2014; Gabrielli et al. 2007; Lübke 2015; Sobotka 2008). However, fertility patterns of migrants are compared alternatively to the non-migrant population of the destination countries (de Valk and Milewski 2011; Glick 2010; Kulu and González-Ferrer 2014) or to stayers living in the country of origin (Baykara-Krumme and Milewski 2017). The need for a joint comparison among migrant and non-migrant women in both destination and origin countries has been widely stressed in the literature but rarely satisfied, in particular in the European context. Such comparison is essential to gain better understanding of the effects of migration on fertility. We aim at filling this gap by focusing on the Italian case.

Due to the availability of data, we focus on Albania, Morocco and Ukraine, that are the largest non-EU nationalities (third countries) of migrant women in recent years: the most recent register data (December 31st of 2018) show that they represent respectively the 12.1%, the 11.1% and the 10.4% of total resident non-EU women. For the first time by merging different data sources, we are able to compare our target group of migrant women with both Italian non-migrants and stayers in the origin country.

We adopted an ex-post merging approach consisting in assembling single datasets composed of microdata that were collected separately in different countries. In detail, we merged data on migrants in Italy, collected by the "Social Condition and Integration of Foreigners" survey (SCIF), with data on Italian non-migrants gathered in the Multipurpose survey on "Families and Social Subjects" (FSS), and three national surveys from "Demographic and Health Surveys" (DHS) related to the behaviour of stayers in the three countries of origin.

This approach can be considered one of the best strategies for a multi-site perspective (Beauchemin 2014) that seeks to go beyond "methodological nationalism" (Wimmer and Glick-Schiller 2003), i.e. the tendency to view the nation-state as a natural container and unit of analysis in mainstream social sciences. Indeed, despite the fact that migration involves by definition (at least) places of origin and destination, research has long been dominated by studies on destination countries, and concurrently by studies of migrants within receiving nations (Beauchemin 2014).

Considering the first three birth orders, we developed multi-process hazard models in order to provide a more exhaustive and diversified scenario. In this way, we contribute to the international debate on the fertility of migrant women, evaluating if some of hypotheses developed in international literature (adaptation, disruption, socialization, and interrelation of events) fit the Italian case. To the best of our knowledge, it is the first time that it is possible to shed light on such hypotheses for the Italian case by considering different patterns of migrants' fertility through a dynamic perspective and conducting multi-process analysis of parities.

The article is structured as follows: the next section sets out the theoretical framework and research hypotheses; the third section describes the survey data and the method of analysis; the fourth section shows macro and micro outcomes, whereas section five contains the results of the multi-processes analyses. Finally, sections six and seven contain respectively a discussion and conclusions.

2. Theoretical background and research hypotheses

2.1 Migration strategies and origin background

Among the migrants' characteristics influencing fertility, the literature has given large emphasis to the country of origin as a proxy for cultural/religious heritage and values that can be maintained after migration (Coleman 1994; Gabrielli et al. 2007; Adserà & Ferrer 2014). Persons from different geographical origins may show differences in reproductive behaviour in the same country of destination (Andersson and Scott 2007; Bijwaard 2010). Distinguishing by area/country of origin allows "to take the different cultural and background characteristics" (González-Ferrer et al. 2016: 3) into account as they often reveal heterogeneity in demographic characteristics and behaviours, as well as in migrant strategies.

In particular, the literature has shown how gender roles and norms in the origin country determine both women's social, occupational and economic positions, and women's participation in international migration, producing also different outcomes in the country of destination (Carling 2005; Hiller and McCaig 2007). Scholars have also underlined how the experience of migration among women changes dramatically between forerunners and tied migrants (Nedoluzhko and Andersson 2007; Ortensi 2015). On the one hand, first migrant women migrate with a project related to work, and childbearing can be considered only a secondary goal. On the other hand, women who migrate in order to rejoin the partner are, conversely, less (or not) subject to the trade-off between work and family. Thus, it is not surprising that international research on migrants' fertility has focused on the interplay between migration and the family dynamics of migrants (Landale 1997; Cooke 2008).

The importance of accounting for some measures of cultural origin to distinguish the complex path that each migrant group follows has been underscored (Adserà & Ferrer, 2014) such as religion, often used as a proxy for the cultural background of migrants (Mayer & Riphahn 2000; Milewski 2007) and their effects on family formation patterns (Clark et al. 2009). Following a multidimensional approach, Therborn (2004, 2006) considered gender roles, national/ethnic behaviors and religious/cultural/traditional characteristics in a comprehensive interpretative paradigm. He conceptualized and described different patterns in performing family roles and responsibilities by culturally prescribed ways. This geo-cultural approach can be considered a useful interpretative key also concerning demographic behaviors of immigrants in their destination areas.

2.2 Migration and fertility: theoretical underpinnings

By comparing the fertility of migrants and non-migrants in the areas of origin and/or in the area of destination, scholars have stressed several research hypotheses concerning the interrelationships between migration and fertility (for a review, see also Milewski 2007; Kulu and González-Ferrer 2014).

The *adaptation* (or convergence) hypothesis suggests that the reproductive behaviour of migrants may converge with that of the receiving population because of the social, political, cultural and labor market conditions in the host society (Gordon 1964; Ford 1990; Alba and Nee 1997; Carter 2000). It takes into account that fertility patterns in the region of origin differ from those found in the region of destination, suggesting that costs and opportunities encountered by migrants in their new environment reduce the value of high fertility for parents, and increase the real and opportunity costs of each additional child. The duration in the place of destination is considered a measure of exposure to the destination environment (Gordon 1964; Ford 1990; Alba and Nee 1997; Carter 2000; Ford 1990, Carter 2000) and convergence with the native population may be achieved mainly with prolongation of the stay. However, convergence does not necessarily imply a process of acculturation; it can result from adjustment strategies intended to cope with the circumstances in the new country (González-Ferrer et al. 2017; Kulu 2005; Kulu and Milewski 2007).

The *socialization* hypothesis relies on the assumption that values, norms and family behaviours of migrants reflect those dominant in their childhood and assumes that these effects continue throughout the life of a migrant, neglecting consideration of any aspect of life in the new setting (Milewski 2007; Sobotka 2008). This approach is often used to explain the relatively high levels of fertility among migrants of certain nationalities, demonstrating that they exhibit fertility patterns more similar to those of stayers in the country of origin than to those of the natives in the country of destination. Moreover, it implies that persons from different geographical origins may show differences in family behaviours in the same country of destination (Alders 2000; Kahn 1988).

The *disruption* hypothesis suggests that the migration itself, as well as the time preceding and following it, is stressful for a person, due to a drastic change in daily-life conditions and to an interruption of social networks. Moreover, migration may seldom separate spouses at least temporarily. Therefore, migrants tend to have particularly low

levels of fertility immediately prior to the move and/or immediately after migration, due to the disruptive factors and difficulties related to the migration itself or to the new environment (Toulemon 2004). The recovery of fertility frequently observed shortly after migration is a process of catching up on childbearing, which was postponed or interrupted in the phase around migration (Carlson 1985; Bledsoe 2004; Kulu 2005; Kulu and Milewski 2007; Stephen and Bean 1992).

Conversely, other analyses have hypothesized that high fertility after migration occurs because several events take place at the same time (Mulder and Wagner 1993). This explanation is generally referred to as the *interrelation of events* and argues that high fertility shortly after migration is closely linked to family reunification or couple formation (Toulemon 2004). This interpretative approach assumes, in a life course perspective, that there is interdependence among migration, union formation and fertility (Courgeau 1989; Milewski 2007; Mulder and Wagner 1993). In particular, fertility and migration events in the life course are considered as "parallel careers", and it has been demonstrated that they are interrelated. This approach supposes that during the first years after migration, women often concentrate their reproductive period and have a higher likelihood of giving birth to their children (Andersson 2004; Lindstrom and Giorguli Saucedo 2007; Nedoluzhko and Andersson 2007; Mussino and Strozza 2012; Singley and Landale 1998).

Finally, the *selection* hypothesis considers the observed fertility of migrants in destination areas as a function of characteristics that migrants possess prior to migration. Migrants are not a random sample of the population in the origin areas since they constitute a selected group in terms of observed characteristics, such as educational attainment, marital status, socioeconomic resources, age, health (Feliciano 2005; Adserà et al. 2012) and unobserved characteristics, like social mobility ambitions, fertility preferences and family proneness (Abbasi-Shavazi and McDonald 2000; Kulu 2005). Selectivity suggests that these observed and unobserved factors may be associated with different fertility behaviours (Hill and Johnson 2004).

Although these hypotheses have been often presented as distinct from each other, they turn out to be partially complementary given that contradictory views may be supported simultaneously (Kulu 2006). For example, both the socialisation and selection hypotheses emphasis the role of preferences acquired during childhood and that remain

mostly unaltered despite the context. The adaptation and, to some extent, the disruption hypotheses, in contrast, predict that fertility preferences may change over the life course in response to a changing social context. Thus, these hypotheses should be considered as not mutually exclusive being that a combination of them may help to explain the relation between migration and fertility (Goldstein and Goldstein, 1984).

2.3 Research hypotheses

Following the existing literature and according to the available data, we can formulate four general hypotheses by comparing migrant women in Italy with both stayers in the origin countries and Italian natives. In particular, we assume that:

H1 socialization hypothesis takes place if the reproductive behaviour of migrants and stayers in the country of origin are similar. In other words, despite the length of stay in the destination country, the risk in having the *j*-th child remains more similar to those of stayers in the country of origin than they are to those of Italian natives.

H2 adaptation hypothesis occurs if the risk differences between migrant women and non-migrants in Italy in having the *j*-th child tend to reduce as the length of stay in the destination country increases. We expect to observe it in the long-run, i.e. over several years after migration.

H3 disruption hypothesis occurs if a temporary drop (i.e. in the short run) occurs in the likelihood of childbearing just few years before and/or immediately after the migration event. Moreover, a (non-linear) effect of time since migration event is observed if a process of catching up on childbearing is verified in the subsequent years.

H4 interrelation of events takes place if an increasing likelihood of childbearing is observed close to the event of migration (or, in the short-run): the risk of having a child peaks only around the migration event (in particular, just after the event) and after that decrease.

We considered the above-mentioned hypotheses in order to evaluate whether or not they fit the Moroccan, Albanian and Ukrainian migrant women in Italy. Given their specific cultural/religious heritage, values and migratory strategies, we expect that the three selected groups of migrants would exhibit differences in reproductive behavior (see also section 4.1). National data (see Figure A1 in the appendix) reveal persistent differences

in the average number of children per woman (TFR), although only Morocco continues today to have values above the replacement level and which have remained stable since the last decade (2.51 in 2014). Albania declined below it (1.64 in 2014) and Ukraine shows a similar pattern to Italy (respectively 1.39 and 1.50 in 2014).

Childbearing has been progressively postponed in Italy. The mean age at childbearing reached 31.4 years in the period 2010-15. Ukraine, which in the 1990s had the lowest levels among the four countries, has thereafter been characterized by growing values, converging on those of Albania (respectively 27.1 and 27.4 in 2010-2015), while Morocco record persistent high mean ages at childbearing (30.4 year). In Italy, the peak of age-specific fertility rates (see figure A2 in appendix) is between 30 and 34 years of age whereas it is clearly anticipated in the other countries showing a similar fertility pattern up to 25 years. Subsequently, Ukraine's fertility rates remain stable at age 25-29 and declines thereafter; Albania's rate reaches the peak at age 25-29 but rapidly decreases in the next ages; Morocco's continues be higher than that of the other countries from ages 30-34 to ages 45-50.

Commentato [A1]: Qui ho cercato di riassumere un po' ma forse si può fare di meglio!

According to the Therborn (2004, 2006) scheme, the North African model remain characterized by strong patriarchal traditions, despite the process of modernization, while the East-European model, which is very similar to the Western model, is based on gender equality within the couple and women economic participation in the family management. Thus, we expect a higher likelihood of adaptation (*H2*) for migrant women coming from Albania and Ukraine. Conversely, socialization (*H1*) would prevail among migrants from Morocco. In adding, different migratory strategies by country of origin would determine different fertility patterns after migration. According to previous analyses on family formation (Toulemon 2004, Gabrielli et al, 2019), Moroccan and Albanian women more often migrate for family reunification or couple formation and, thus, would tend to have a more rapid transition to childbirth after migration (*H4*) than migrants from Ukraine, which migrate more often for working reasons, and thus with an higher risk of having a disruption (*H3*).

Although the comparison between migrants and non-migrants women may shed light on the above-mentioned hypotheses, we are not able to test explicitly the selection hypothesis. We are aware that migrant may represent a selected group compared to the population of origin but we have very few tools in order disentangle selectivity from

other possible mechanisms at play. For example, assuming that different migrants and stayers in the country of origin show different fertility pattern, this may be the effect of selectivity. However, migrants and stayers may also differ because the migrants have adopted the behaviour in the destination country. A possible strategy would be to include a set of observed factors that may be associated with the selection. Unfortunately, as we will see in the next section, harmonized data at our disposal offer a limited set of variables with many others potentially relevant factors that not available (e.g. religion, family background). In any case, further characteristics remain unobserved (e.g. fertility preferences). Furthermore, given that we refer to retrospective data, a second source of selection is given by the fact that we can observe only those migrants who decided to remain in Italy, a subgroup that can be selected in terms of peculiar patterns of integration and family formation.

3. Data and methods

Our analytic strategy was based on statistical exploitation of three different data sources, considering women aged 15-49 at the time of the interview. Data on *migrants in Italy* are collected in the Social Condition and Integration of Foreigners survey (SCIF). The SCIF survey, carried out for the first time in 2011-2012 by Italian National Institute of Statistics (Istat), aims at providing a framework on behaviours, characteristics, attitudes and opinions of migrants in Italy including place of birth, family composition, education, migratory path, employment status and fertility. In particular, we considered 705 women born in Albania, 530 born in Morocco, and 399 in Ukraine. Data on *non-migrant in Italy* are gathered in the Multipurpose survey on "Families and Social Subjects" (FSS) conducted by Istat in 2009, a survey which contains broad retrospective information on life course trajectories, including data on education, job career, family formation and fertility for a large sample of the resident population (8,867 women). The behaviour of individuals in the origin countries (*stayers*) was included through exploitation of the Demographic and Health Surveys (DHS), containing data on fertility, family planning, maternal and child health for several developing countries. We considered the three DHS datasets for the three

observed countries. In particular, the Albanian DHS survey was conducted in 2008-09 (and involved 7,584 women), the Morocco DHS survey in 2003-04 (16,798 women) and the Ukraine DHS survey in 2007 (6,841 women). Considering the most numerous migrant groups in Italy, we used the data most updated at the time of performing our analyses. We selected and harmonized all the common variables coming from the three different sources and then built a single dataset containing information on stayers in the country of origin, migrants in Italy, and non-migrant in Italy. Table 1 provides a description of the sample by the different subgroups.

[TABLE 1]

As a preliminary descriptive analysis, we estimated the percentages of migrant women who had a child before migration, stratified by countries of origin and parities, and the Kaplan-Meier survivor functions to the transition to the *j*-th birth by national group and migratory status.

The multivariate analysis consisted of three steps. Firstly, we applied hazard models on the pooled dataset in order to evaluate the propensity to have a *j*-th order child among migrants in Italy and stayers in the country of origin compared with non-migrants in Italy. Hazard models make it possible to consider not only women with a complete fertility history, but also those interviewed before the end of their reproductive age (i.e., right-censored). For the transition to the first child, we considered the duration from the 12th birthday to first birth (if any) or to the interview (right-censored) and the baseline is a function of the woman's current age. For the transition to the second (third) child, we focused on the duration between the birth of the first (second) child and the birth of the second (third) child or at the interview. In this case, the baseline is a function of the duration since the previous birth[1]. It should be stressed that we look at fertility irrespective of the place of birth of the children.

[1] All the dates were computed on a monthly scale as century month code (CMC), i.e. number of months since January 1900. In the SCIF dataset, the dates at birth of women and their children are not available and they were estimated using the information on the woman's age at interview, the woman's age at childbirth and the date at the interview. This causes an inaccuracy in the episode duration. In other words, there is no single moment, but a "window" within which the event occurred. In our analysis, the

Three hazard models for the first three birth orders were developed simultaneously. In other words, we applied a multi-process model with unobserved heterogeneity components at the individual level. In this way, we could control for potential bias linked to the different timing at the first birth, which may affect the second, and higher birth orders (Kravdal 2001, 2002, 2007). We try to explain this mechanism following Kravdal's (2007) suggestions. Let us assume that non-migrants women (from a specific country) tend to have their first child at older ages compared to migrants (say, respectively at 30 and 25 years). When we consider the hazard of second birth among mothers, we can evaluate the impact of being a migrant taking constant (among other things) the duration since the first birth and the mother's age at first birth. At a specific duration (say,*t*=2 years), we thus compare the subgroup of non-migrants (who, having had their first child at 30 years of age, fall perfectly within the average age at first birth) with the subgroup of migrant women (who are "deviant" in the sense that their age at first birth is later than the average of the corresponding subgroup). We suppose that there is a woman-specific unobserved factor (say, ε) that is constant throughout the reproductive life and that this is capable of influencing the path of first order births. Among migrants, the deviant behaviour "hides" a low ε value. Therefore, if ε is not taken into account, the propensity to relative risk of having a second child at 32 years of age among non-migrants would be overestimated. A possible interpretation of this unobserved factors lying behind fertility choices may recall the idea of "preference" for a greater or lesser number of children (Hakim 2000, 2003; Vitali et al. 2009). According to Hakim (2000), this preference forms during infancy and adolescence and varies little over the course of a woman's reproductive life. This interpretation does not conflict with the results of other studies that — following a different perspective — assume an influence of genetic factors — that do not change throughout life — on the propensity for low or high fertility (Kohler et al. 1999; Kohler and Rodgers 2003).

This research strategy has been widely used in the literature focusing on the interrelationships between fertility and other phenomena (Kulu, 2005, 2006; Kulu and

uncertainty in the event date is accounted for by the two duration variables: the lower and the upper bounds of event windows (see, Lillard and Panis, 2003).

Vikat 2007; Kulu and Steele 2013; Lillard 1993; Upchurch et al. 2002, Steele et al. 2005; Impicciatore and Dalla Zuanna, 2017).

Formally, the models were estimated according to the three following equations:

$$\begin{aligned}
\ln h_i^{(1)}(t) &= \beta_0^{(1)} + \beta_1^{(1)} A(t, \tau_1, \tau_2, \tau_3, \tau_4) + \beta_2^{(1)} X_i^{(1)}(t) + \varepsilon_i \\
\ln h_i^{(2)}(t) &= \beta_0^{(2)} + \beta_1^{(2)} D(t, \tau_1', \tau_2') + \beta_2^{(2)} X_i^{(2)}(t) + \varepsilon_i \\
\ln h_i^{(3)}(t) &= \beta_0^{(3)} + \beta_1^{(3)} D(t, \tau_1', \tau_2') + \beta_2^{(3)} X_i^{(3)}(t) + \varepsilon_i
\end{aligned} \qquad (1)$$

where t is the duration of the episode, $\ln h_i^{(j)}(t)$ is the logarithm of the hazard of having the *j*-th child at time t and $\beta_1^{(j)}$ is a constant, In the first equation, A is a piecewise linear spline transformation[2] of age, with nodes $\tau_1, \tau_2, \tau_3, \tau_4$ when the woman turned 20, 25, 30, and 35 years, respectively and $\beta_1^{(1)}$ is the corresponding row vector of associations. In the second and third equation, D is a piecewise-linear duration spline with two nodes at 4 and 8 years after the birth of previous child. $X_i^{(j)}$ is the vector of (potentially time-varying) covariates for the *j*-th equation and $\beta^{(j)}$ is the corresponding vector of parameters. The unobserved heterogeneity term ε is assumed to be normally distributed[3]. The estimate of the parameters of the model via maximum likelihood can be obtained using aML package (Lillard and Panis 2003).

As control variables we considered: birth cohort (-1964, 1965-69, 1970-74, 1975-79, 1980-84, 1985-); level of education at the time of the interview (years of education standardized according to the origin country[4]); currently enrolled in education (a

[2] Through a piecewise linear spline specification the parameter estimates for the baseline log-hazard are slopes for linear splines over user-defined periods. With sufficient nodes (bend points), piecewise linear-specification can efficiently capture any pattern in the data (Lillard and Panis, 2003).

[3] As an additional robustness check, we relaxed the normality assumption in favour of a finite mixture distribution. Results (available on request) widely confirm those reported in this article.

[4] Education was considered as the number of years of attendance to achieve the highest level of education at the time of the interview. Given the strong heterogeneity among countries, we considered the years of education standardized according to the country of origin. Thus, considering four main groups, namely non-migrants in Italy, women born in Albania (both living in Italy and Albania), women born in Morocco, and women born in Ukraine, the standardized level of education is computed as follows: (number of years of schooling – mean of the group) / standard deviation of the same groups. In order to relax the assumption of a linear relationship between education and the hazard of having a *j*-th child birth, a quadratic term was also included in the models. By introducing this variable in the models, we implicitly assume that who achieve higher levels of education are, from a very early age, oriented towards accomplishing the latter (see e.g. Bratti 2011; Kravdal 2000). However, in this case the estimates may be

dummy of being a student at the time of the interview, based on the age of leaving school); and age at previous birth (for the analyses on second and third child birth), a variable that can capture the potential catch-up effect for women with a postponed fertility. All these characteristics are widely considered in the literature as being among the most important determinants of fertility (Billari and Philipov 2004; Blossfeld and Huinink 1991; Goldscheider and Waite 1986; Hoem 1986; Kravdal 2007).

In the second step, we extended our multi-process hazard models by including the (non-linear) time-varying effect of the time since migration in Italy (the considered categories are: years pre-migration, 0-3 years, 4-7 years, and 8+ years after migration) on the log-hazard of having a *j*-th child. The propensity to have a child according to the time of arrival in Italy was evaluated separately for women from Albania, Morocco and Ukraine using the (time-constant) hazard of the Italian women as a benchmark.

In the third step, we applied the multi-process model only to the sub-sample of migrant women (SCIF sample). Again, we include in the models the time-varying variable relating to the time since migration but here we aim at shedding light on what happen more closely around the arrival in Italy and thus considering. Thus (current) time since migration is evaluated (for the first childbirth) considering the following intervals: up to 24 months before migration, between 24 and 12, and 0-12 months before migration; 0-12, 12-24, 24-48 and 48+ months after migration. Due to reduced number of events when analysing the second child, intervals have been collapsed in four categories (up to 24 month before migration, 0-24 months before migration, 0-24 and 24+ months after migration) and the third childbirth is not considered.

The focus on migrants allowed us to include also other relevant individual characteristics that are, by definition, available only for migrants such as place of residence before migration (rural/urban), age at migration (before 20 years old, 20-24, 25-29, 30-34, 35+ years old), reason for migration[5] (employment/living conditions,

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confounded by reverse causality given that childbearing may have affected a woman's interest in and opportunities for taking further education, thus producing an underestimation of the true causal effect (Kravdal 2004, 2007; Hoem and Kreyenfeld 2006). For example, the original education goals can be hindered by an unplanned birth and revised upwards in case of unexpected childlessness (Kravdal 2001). Being aware of that, we successfully checked the robustness of our results even when this variable is dropped by the models. Given this evidence, we prefer to include the education at the interview being one of the few variables at our disposal in order to (partially) take into account selection bias among migrants.

[5] The questionnaire included the following question "What were the main reasons that led you to leave your origin country?" Among all the possible answers, we selected those related to family reasons

family, other). Finally, the interaction between the time at migration and the reason for migration is provided.

According to previous research (Hoem 2014; Hoem and Nedoluzhko 2016; Hoem and Kreyenfeld, 2006), estimation bias may appear in comparison of childbearing before and after migration. In particular, the analysis of first childbearing shortly before an observed case of migration may underestimate the fertility of childless migrants in the sending country if the presence of a child hampers out-migration, while in contrast an assessment of the corresponding rate after migration correctly estimates the fertility of in-migrants in the receiving population. Here, the main problem is that the computation of 'negative durations' involves conditioning on the future, i.e. is based on an anticipatory research strategy (Hoem and Kreyenfeld, 2006). The conditional pre-and-post-event approach does not allow the user to distinguish between, on the one hand, the bias produced by anticipatory analysis, and on the other hand, the effects of intentional behaviour (Hoem 2014). In order to test the robustness of our results, we also followed a non-anticipatory procedure suggested by Hoem (2016) and Hoem and Nedoluzhko (2016). Limiting our focus on the first birth only, we considered a state space with four possible states (childless, no migration; birth, no migration; migrated, no birth; both birth and migration) and four transitions:

(a) to first birth at age x for a woman before their arrival in Italy(since the 12th birthday);

(b) to migration to Italy at age x instead of having a child, i.e. considered as competing risk of (a);

(c) to migration to Italy among women who had her first birth at age x (since the first birth);

(d) to first birth among women who did migrate to Italy at age x (since the migration).

Additionally, we can also consider the transition to the first birth at age *x* among women who never moved from their native country (based, in or case on DHS data). The

(migrated for getting married/living together/family reunification") and those related to employment and living conditions (lack/difficulty finding a job in the origin country; get higher wages; improve the quality of life). All the other possible answers (study, persecutions, war/conflicts, looking for new experiences, other reasons) were recoded as "Other". The three not mutually exclusive resulting categories (work, family, other) were treated as three separated dummy variables.

intensities are assumed piecewise constant over the same time intervals of age *x* (in intervals: -19; 20-24; 25-29; 30+ years) and time *t* after migration (0-12, 12-24, 24-48 and 48+ months after migration).

4. Descriptive Results

In order to introduce the fertility behaviour of the observed sample by country of origin, we considered the percentages of migrant women, stratified by parities, who had children before migration (table 2). The main finding is the very high quota of migrant Ukrainians who had both the first and the second child in the country of origin (respectively 77.3% and 70.9%). Conversely, the Moroccans show low values in having the second and the third child (respectively 28.0% and 26.9%). The Albanians assume intermediate levels in all the three parities. This result is, to some extent, connected to the different age distribution of subgroup of interest. Indeed, women from Ukraine have a median age of 39 years compared to 33 and 31 for migrants born respectively in Morocco and Albania.

[TABLE 2]

Moreover, figure 3 sets out Kaplan-Meier survivor functions to the transition to the *j*-th birth by national group and migratory status, irrespective of the country of birth of the child.

In the transition to the first child (figure 3.a), migrants from Ukraine are similar to stayers in same country at early ages, but they drastically reduce their propensity after age 25. No significant differences in survivor functions occur between migrants and the Albanian stayers. Migrants from Morocco recover the gap with stayers after age 30. The transition to first child for the non-migrants in Italy is clearly delayed compared to the other groups.

Focusing on the median ages at first childbirth (data not shown), no significant differences emerged between migrants from Albania and stayers (+0.3 yrs. old); while the largest disparity is between migrants originating from Ukraine and the stayers in the same country (+3.7 yrs. old).

The transition to the second child (figure 3.b) reveals the delaying effect of migration on fertility: the Kaplan-Meier functions of migrants are higher than those of stayers in the three countries. In particular, the pattern of migrants from Albania overlaps with that of the non-migrants in Italy. Similarly to what emerged for the first child, the survivor curve of migrants from Morocco reduces the gap with the function of stayers in the same country over time. Both migrants stayers from Ukraine have the highest curves suggesting a delayed transition and a lower intensity (also later and lower than the Italians' one).

Looking at the transition to third child, four curves resemble each other in having the lowest percentages of women that experience this event (fig.3.c). They are: non-migrants in Italy, migrants and stayers from Ukraine, and migrants born in Albania. Stayers in Albania significantly anticipate the transition to third child with respect to the migrant ones. Women from Morocco, particularly the stayers, have the lowest level of survivors, i.e. the highest hazard of experiencing the transition to the third birth.

[FIGURE 3]

5. Multi-process hazard models

We applied simultaneous estimation of hazard models relating to the transition to the j-*th* child birth. Figure 4 shows the log-hazards by migration background, together with their confidence intervals (99%). Comparing the values for the transition to the first birth (figure 4.a), women born in Morocco and Albania show a similar level regardless they are migrants or not. Conversely, among those originating from Ukraine, there is a gap, with stayers that clearly show a higher propensity to have the first child compared to migrants, which are more similar to the non-migrants in Italy.

The figures showing the transition to the second (figure 4.b) and the third child (figure 4.c) are similar and both of them vary from the figure 4.a. Women from Albania are divergent according to the migration background: migrants show a lower propensity to have a second and a third birth compared to stayers, approaching to the non-migrant

Italian pattern. The stayers and (above all) the migrants from Ukraine have a lower propensity to experience the second and the third parity events compared to the reference group. The dissimilarity between Ukrainian migrants and stayers is highly significant for the first and the second child than for the third one, which is not surprising given the reduced size of this subgroup (see table 1). Women from Morocco show a log-hazard that is particularly high for the third childbirth but no clear distinction emerge between migrants and stayers, a result that is different from the KM estimates, at least for the third childbirth. This is mainly due to the diverse composition in terms of educational attainment and age at second birth. In particular, migrant women from Morocco in Italy are more educated and have the second birth later than stayers in the country of origin. Given the strong negative effect of education and age at previous birth on fertility levels, differences reduces substantially after having controlled for these two variables.

[FIGURE 4]

As a second step of our analysis, we looked at the (time-varying) effect of the time since the arrival in Italy on the propensity to have a child according to the country of origin together with its confidence intervals (95%). We used as reference the group of Italian women, whose hazard is obviously constant over time not having experienced any migration. The propensity to have the first child (figure 5.a) peaks for both migrants from Albania and Morocco during the first three years after the arrival in Italy. However, the two groups differ in the subsequent period, since among the former this propensity declines, while among the latter it tends to recover in the long run, i.e. eight years or more since the arrival. The hazard profile for women from Ukraine shows a decline after the arrival.

The propensity to have a second and a third child increases after the migration among women born in Morocco whereas it remains roughly constant for migrants from Albania. The small sample size does not allow tracing specific conclusion for the Ukrainian group. However, it can be noted that the significant and negative difference with the non-migrants in Italy, tend to disappear over time.

[FIGURE 5]

In the following step, we estimated how the propensity to have a child change more closely to the migration event (step 3). To do so, we used a more refined definition of the time-varying variable, considering the current time since the arrival in Italy, and we consider as the reference category the interval "up to 24 months before the arrival" (figure 6). The hazard rate for the first birth (figure 6.a) significantly increases among women from Morocco and Albania during the first months after the arrival in Italy, with persisting high values in the following years, in particular among Moroccans. Interestingly, for the Ukrainians an opposite pattern seems to emerge with a decrease of the hazard for the first child just before the migration event. However, in this case the uncertainty about the estimates are very high.

The "time-to-migration" has less clear effect in the transition to second birth (figure 6.b). We can only underline a negative risk just before the migration among migrants from Albania and a higher risk after migration for Moroccans. The small sample size prevents any significant description of patterns over time for women from Ukraine.

Figure 7 shows the effect of the reason for migration on the propensity to have the first child[6]. If migration occurs for family reasons, the risk of having a child remain roughly stable before migration and it increases significantly during the first and, above all, the second year after the arrival in Italy. Women migrated for employment reasons have a general lower propensity to childbearing than family-related migrants in the 4 years after migration. These results confirm that the reasons for migration affect the migrants' childbearing in the destination country (Nedoluzhko and Andersson 2007; Ortensi 2015).

[FIGURE 6]

[FIGURE 7]

[6] The hazard is computed for all the three migrant groups without distinguishing by the country of origin. However, estimations not shown here demonstrated that the effect of the reason for migration is similar within each group.

Aiming at evaluating whether the anticipatory research strategy implicitly considered in the implementation of a 'negative duration', may cause a bias in our results, we also developed an alternative procedure as suggested by Hoem (2014), and Hoem and Nedoluzhko (2016). The idea is to develop estimations for different transitions separately by considering an explicit distinction between pre-migration and post-migration fertility. Figure 8 contains a plot of the hazard (measured on a log-scale) of having a first child for women before their migration to Italy and after the arrival in Italy at ages 20, 25, and 30. Besides, it also shows 'negative durations' obtained looking at fertility behavior of woman observed in their country of origin (dotted part of the curves). Results are fully consistent with the previous ones. We have no signs of disruption among women from Albania and Morocco. Instead, for these two groups of migrants we clearly have a higher risk at migration and in the following years, although with a decreasing trend over time, in particular among women from Albania. Interestingly, we see that at each selected migration age *x*, first birth fertility is higher at and immediately after migration than before migration. The picture is different for women from Ukraine, who instead show a decreasing hazard of first childbearing at migration when they moved at 25 or at older ages. Among those moved at 30 years (or later), the hazard remains lower even in the first years after migration, suggesting a disruption effect (though some caution is required in interpreting this result due to the reduced number of cases). Finally, no relevant differences emerge among migrants (observed before and after the move) and stayers from Ukraine at younger ages.

[FIGURE 8]

6. Discussion

The outcomes achieved so far enable us to test our research hypotheses on the migrants' fertility in Italy. The selected groups of women exhibit interesting differences in their reproductive patterns according to the country of origin, the migrant condition (being a stayer *vs* being a migrant), and, among migrants, the time since migration. These results validates our strategy to observe them separately in our analyses.

Considering the countries of origin, in the period 1990-2015, women in Morocco showed the highest TFR and the highest mean age at childbearing whereas the opposite was found for women in Ukraine. Women living in Albania assumes in-between patterns of both indicators and a specific fertility rate that peaks at age 25-29 but rapidly decreases in the next ages. Similarly, fertility of migrants in Italy show high heterogeneity. Most of the Ukrainians (77.6%) experienced motherhood before the migration, while only 42.3% of Moroccans and 46.1% of Albanians had at least one child. Moreover, the Ukrainians have the lowest risk of parity transitions among the three migrant groups in Italy; the Albanians have the highest risk of having a first child, while Moroccans have the highest risk of experiencing the transitions to parity two and, above all, to parity three.

The migrants from the three origin countries considered are the expression of at least two different migratory models that can be synthetically described as follows (Rossi and Strozza 2007; Bonifazi 2013; Olivito 2016). In the first classic migratory model (observed mostly among migrants coming from southern and eastern Mediterranean countries), men assume the role of protagonists in the process of settlement in the destination country. Within this model, the Moroccans have a large percentage of single men (more than single women) arrived for work reasons at relatively young ages and a large percentage of Albanians are in union at migration. Completely different is the migratory model of the woman breadwinner, where the woman is the main actor of migration (observed mostly among migrants coming from East Europe and Latin America). Within this model, the Ukrainians have a large percentage of single women migrating for work reasons. More specifically, women from that country are often highly educated and have high ages at arrival in Italy and previous family histories (many of them are widowed or divorced). Results clearly confirm that migratory strategy strongly influences fertility patterns after migration.

Considering our research hypotheses, we confirm that they fit differently to the three observed national groups of migrants.

H1 (socialization hypothesis). Moroccan migrants have patterns of childbearing similar to those in the origin country, for any birth order (net of other characteristics): the transition to the three parities do not assume significant differences on comparing migrants and stayers. Migration has an overall delayed effect, but women from Morocco

reduce the gap with the level of stayers in the native country over time. This confirms previous research (Mussino and Strozza 2012) showing that their fertility transitions remain significantly higher than those of Italian natives, and the risk of having a further birth does not decline over time. This pattern is well explained by the North African model that, despite the process of modernization, is characterized by strong patriarchal traditions where women is considered as tied migrant and is less (or not) subject to the trade-off between work and family.

Also among women from Albania, we found hazard levels for the first birth that are similar between migrants and stayers in the country of origin thus suggesting the persistent of preferences acquired in the country of origin. However, this similarity is not confirmed for the second and third childbirth whereas, conversely, migrants show a behaviour that is closer to that experienced by Italian natives.

H2 (adaptation hypothesis). Considering the effect of the time spent in the destination country in the "long run", we observe that the risk of Albanian migrants in having the first child clearly decreases as their length of stay in Italy increases and converges toward the level of Italian non-migrants after four years since arrival in Italy. This is a specific pattern not observed for the other groups of migrants. Thus, only women from Albania exhibit an adaptive pattern probably because they have a more gender egalitarian behavior within the couple with an active participation of women in the family management. Conversely, women from Ukraine, even if they are generally characterized by East-European model (Therborn, 2004 2006), achieve different outcomes during the migration mostly because of their older age at migration, their role of forerunners and their migratory strategy (Nedoluzhko and Andersson 2007; Ortensi 2015).

H3 (disruption hypothesis). Considering the "short run", the period of time just before the migration tends to be characterized by a depressive effect on fertility. However, only among Ukrainians do we find a significant reduction in the hazard compared to the previous period (up to 2 years before the migration). Interestingly, this emerge more clearly among women arrived in Italy later in life, i.e. after 30 years of age. For this migrant group, the arrival in Italy is often a new opportunity for affective relationships and family life, which however takes time to stabilize, resulting in slower transition at childbearing. This is a very typical pattern in comparison to the other national groups.

H4 (interrelation of events). The analysis of the "short" period around migration provides elements to support also the interrelation hypothesis among women from Albania and Morocco mostly in the transition to first birth. These two migrant groups have a non-linear effect around migration in having first birth, and their risk in having first birth peaks 12-24 months after migration. This is line with previous literature (Mussino et al. 2015) showing that migrants from these two countries have first birth shortly after arriving in Italy. The same does not occur for women from Ukraine. The interrelation hypothesis is less evident in the transitions to second birth (also because of the small sample size).

Finally, according to our expectancies, significant differences in fertility between migrants and stayers in the country of origin persist, also controlling for a selected number of characteristics. For example, Ukrainian migrants show lower and delayed hazards compared to the stayers for any parities. Similarly, risks for migrants from Albania in having second and third child are significantly lower than stayers in this country, but only for the second and the third child. These results may suggest that Ukrainian and Albanian migrants may be somehow selected and characterized by a lower fertility preference or family proneness. Nevertheless, this may also be due to a progressive adoption of fertility behavior experienced by the majority population. In the light of previous results, this is likely to be for the Albanians whereas we can speculate that women from Ukraine seems to be more selected. However, our empirical evidences do not allow us to confirm this hypothesis due to reasons explained in section 2.3.

7. Conclusion

In this paper, we compared our target group of migrant women respectively born in Albania, Morocco and Ukraine with both Italian non-migrants and stayers in the country of origin. Results show, for the first time in a wide and comprehensive picture, that migratory strategies and origin backgrounds as well as other individual characteristics affect fertility, and that there is no single model of fertility for migrants in Italy.

Moreover, as regards the three groups of migrants, the results are able to test a number of different hypotheses that provide a better explanation of the different fertility

behaviors. Generally speaking, it is possible to see the participation of different mechanisms in the definition of the overall reproductive behavior of migrants. Among women from Morocco, the socialization hypothesis tend to prevail whereas Albanians' fertility is mostly explained in terms of adaptation. Disruption emerged as the main mechanism able to explain the fertility of migrants from Ukraine. Moreover, a clear interrelation between fertility and migration emerge for women from Albania and Morocco, but only for the first birth.

Some limitations in our analyses are still present. Firstly, our results do not shed light on the effects of the recent economic crisis, which has rapidly changed the patterns of migration in Italy. At individual level, the financial uncertainty has deeply influenced demographic behaviors, delaying childbearing in early adulthood. Updated data will enable inclusion of these changing patterns in future analyses. Secondly, the number of events affect our analyses of parity three. Thirdly, the ex-post data harmonization among different data sources reduced the number of available variables that could be used as control factors in our multivariate models. This increased the probability that selection biases might emerge due to unobserved factors. Furthermore, the different retrospective surveys here considered (FSS, SCIF, and DHS) were not conducted in the same year thus causing a non-perfect alignment of birth cohorts among subgroups of interest (see Table 1). Fourthly, we observed only migrants who were still living in Italy at the time of the interview. This group may artificially increase an adaptive behavior, i.e. those who did not adopt such behavior may be more prone to go elsewhere or return to the country of origin, thus inflating selectivity. More in general, we are not able to disentangle the effect of selectivity from the other possible mechanisms able to explain fertility behaviour.

Despite these shortcomings, our analysis makes at least three contributions to the existing literature. First, it gives a rare opportunity to provide empirical evidence on different hypotheses in Italy by merging different data sources. Second, it makes it possible to go beyond the methodological nationalism that is typical in quantitative analyses of migrants' behaviors. Third, it provides a dynamic perspective though applying event history techniques and conducting multi-process analysis of parities.

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