

The Development of Nonmarital Fertility in Europe

Unstable Labor Markets, Female Employment or Decline in Normative Backing of Marriage?

Alexander Mack, GESIS – Leibniz Institute for the social sciences, GERMANY

Abstract

Nonmarital fertility has increased drastically in Europe over the past decades. The population processes behind this development are fairly well understood. Delays in marriage timing, the spread of cohabitating unions and particularly increasing numbers of births within cohabitation are generally believed to be responsible. However there is considerable debate about the social mechanisms at work. This paper seeks to provide an overview of the development of nonmarital fertility in Europe over the last decades and explain this development within a comparative framework. Panel regression analysis is conducted on the basis of a country level dataset containing economic, demographic and aggregated attitudinal data for 26 European countries from 1980 onward.

Three key hypotheses are tested: The independence hypothesis assumes that women's increasing financial independence has made the male breadwinner model a less desirable division of labor and has decreased the attractiveness of marriage. The insecurity hypothesis assumes that planning insecurity caused by volatile labor markets has lead couples to avoid the long-term investment of marriage in favor of cohabitation. The normative backing of marriage hypothesis assumes that declining social support for the institution of marriage has reduced the stigma of nonmarital birth thus reducing the social costs of parents who choose not to marry.

Preliminary Draft

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1. Objective

The percentage of births outside of marriage has increased drastically in Europe over the past decades with 38.3% of live births in the EU27 occurring outside of marriage in 2010 compared to 27.4% in 2000 and 17.4% in 1990¹. While the population processes behind this development are fairly well understood: delays in marriage timing, increasing rates of cohabitation (Perelli-Harris et. al. 2012) and particularly births in cohabitation (Kiernan 2004) there is considerable debate about the social mechanisms at work.

The aim of this macro-level analysis is to study the changes of nonmarital fertility in Europe since the early 1980s in order to understand how this development can be situated in large scale societal changes that have been taking place over the last decades. In particular this research aims to understand how women's labor market integration, increasingly volatile labor markets and value changes are reshaping the relationship of marriage and childbearing in Europe. The choice to restrict this research to the macro-level was made consciously in order to complement existing micro-level research, which due to issues of data availability cannot inquire into all these questions, for a wide range of countries and such an extended period of time. The dataset employed in this analysis incorporates country level data from a wide range of sources and includes data on 26 European societies² for the timespan from 1981 to 2010.

The remainder of this paper is structured as follows: Section 2 elaborates on the hypotheses to be tested and the theoretical concepts they are derived from, section 3 provides an overview of the development of nonmarital fertility in Europe since the 1960s highlighting different developmental trajectories. Section 4 outlines the data employed, provides an overview of the substantive variables as well as the statistical methods employed as well as results of multivariate analysis. Section 5 contains the multivariate analysis and section 5 provides a summary of results.

2. Hypotheses

Below I outline the hypotheses to be tested within this paper. The analytical focus in explaining determinants of nonmarital fertility is placed on marriage behavior as changes in nonmarital fertility can be attributed primarily to altered marriage behavior (compare for example Gray and Stone 2013). Underlying this assumption is the belief that marriage presents an optimal choice particularly when the inner familial division of labor is characterized by asymmetry while more egalitarian modes should be associated more strongly with cohabitation (compare Brines and Joyner 1999). However the hypotheses presented below consider not only economic factors but also the impact of values as well as institutional boundary conditions.

Independence Hypothesis

The relative position of men and women, both within the family context as well as in society as a whole is an important factor in determining the importance of marriage within a society. I assume that the division of labor within families is of central importance to the marital bargaining process and the decision whether to conceive a child within or outside of marriage. Women's increasing participation in the labor market is an important step towards higher levels of gender equality.

¹ [http://epp.eurostat.ec.europa.eu/statistics_explained/index.php?title=File:Live_births_outside_marriage,_1960-2011_\(%25_share_of_total_live_births\).png](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php?title=File:Live_births_outside_marriage,_1960-2011_(%25_share_of_total_live_births).png)

² AT, BE, CY, CZ, DK, EE, ES, FI, FR, GR, HU, IE, IT, IS, LT, LU, LV, NL, NO, PO, PT, RO, SE, SI, SK, UK

Following Becker (1980) I assume that increased financial independence of women has reduced the attractiveness of the male breadwinner model and the insurance function of marriage. Thus I assume that in contexts where women can participate more readily in the labor market we will observe higher rates of nonmarital fertility. In order to assess women's position in the labor market the effect of female labor force participation on the rate of nonmarital fertility will be examined.

Hypothesis 1a: Higher rates of female labor force participation should increase the rate of births outside of marriage.

However the degree to which mothers, particularly those with under school age children, can participate in the labor force is strongly dependent on the provision of child care by the state. In the welfare state literature the term de-familialization (Lister 1994, Esping-Andersen 1999) is used to measure the degree to which individuals are able to participate in the labor force independently of their family context. In order to assess in how far the state is willing to support working mothers the percentage of GDP spent on childcare will be included in the models.

Hypothesis 1b: The degree of public spending on childcare will increase the rate of births outside of marriage.

Insecurity Hypothesis

Unsteady economic circumstances hinder individuals' ability to make long term investments due to planning insecurity. Following arguments originally laid out by Oppenheimer (1988), Mills and Blossfeld (2005) argue that uncertainty leads young people to seek more flexible partnerships and avoid binding commitments such as marriage or children for the sake of cohabitation.

Within labor market research insecurity is a widely employed concept. Generally two different types of employment related insecurity are distinguished. Labor market insecurity refers to insecurity which arises out of difficulties in finding a new job when jobless, whereas job insecurity refers to the perceived potential of job loss (Dixon et al. 2013). The prime macro level indicator for both types of insecurity is the unemployment rate as it reduces worker's bargaining power (Silver 2003).

Hypothesis 2a: In contexts with high rates of unemployment rates of nonmarital fertility will also be higher.

Additionally I assume that welfare states can reduce insecurity through targeted intervention (Mills and Blossfeld 2005). The generosity of unemployment compensation, operationalized as the percentage of GDP spent on unemployment compensation, determines in how far a spell of unemployment becomes a problem for ensuring the livelihood of a family. Higher degrees of government investment are thus assumed to reduce the effect of unemployment on nonmarital fertility.

Hypothesis 2b: The more states invest in unemployment compensation the less pronounced the effect of unemployment on the rate of unemployment should be.

Normative Backing of Marriage Hypothesis

The independence hypothesis emphasizes that the insurance function provided by marriage has been on the decline, however it can likely be argued that not only the economic necessity for marriage has

been on the decline in the last decades but that its function as a mechanism of social control has as well.

Tyrell (1988) argues that the institution of the „bürgerliche Ehe“ (breadwinner family) encompassed far more than just a contract between two individuals but that it was a “package deal” held together by social control, laws and norms, which came with sex, companionship, love and a place for childbearing. This package deal was somewhat exclusive and through strong social norms had a monopoly position during the golden age of marriage which it has lost as new forms of partnership have arisen. The second demographic transition ascribes a central role to new contraceptive methods such as the pill in this process (Van de Kaa 1987) as they had allowed for the separation of sexual intercourse and child bearing thus undermining marriage's monopoly as the place for intimate relationships. Cherlin (2004) provides another similar interpretation of the process of deinstitutionalization of marriage. In his reading it is the rise of the individualized marriage which is characterized by self-fulfillment of partners and more flexible roles which weakens the position of marriage as a social institution.

The importance of marriage as a social institution determines the normative acceptability of having a child outside of marriage. In contexts where social institutions are binding actors have no free choice to have a nonmarital birth or this choice comes attached with costs in form of stigmatization. Thus I assume that the higher social support of marriage the lower the nonmarital fertility rate.

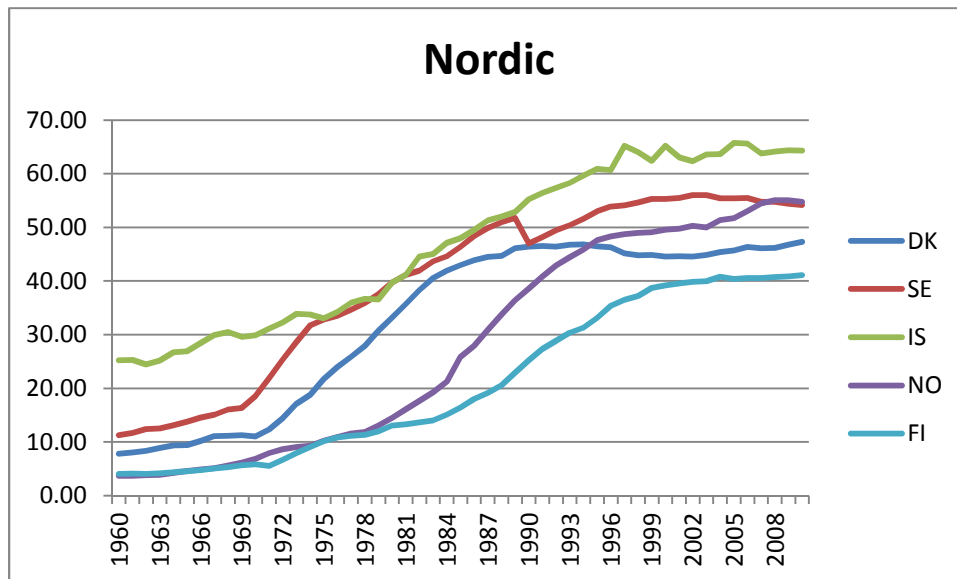
Hypothesis 3a: Declining social support for the institution of marriage should result in increased rates of nonmarital fertility.

The deinstitutionalization of marriage is often seen as going hand in hand with the deinstitutionalization of the church (Tyrell 1993). Wilcox (2008) argues that churches serve to uphold the institution of marriage as they not only provide a moral backing but also support behavioral patterns which help to stabilize marriage. The assumption goes that as the importance of church in people's lives declines, so does its power to uphold the moral support for religious institutions such as marriage. Thus church attendance shall also be considered as an indicator of the normative backing of marriage.

Hypothesis 3b: Declining attendance of religious services should likewise lead to decreases in nonmarital fertility

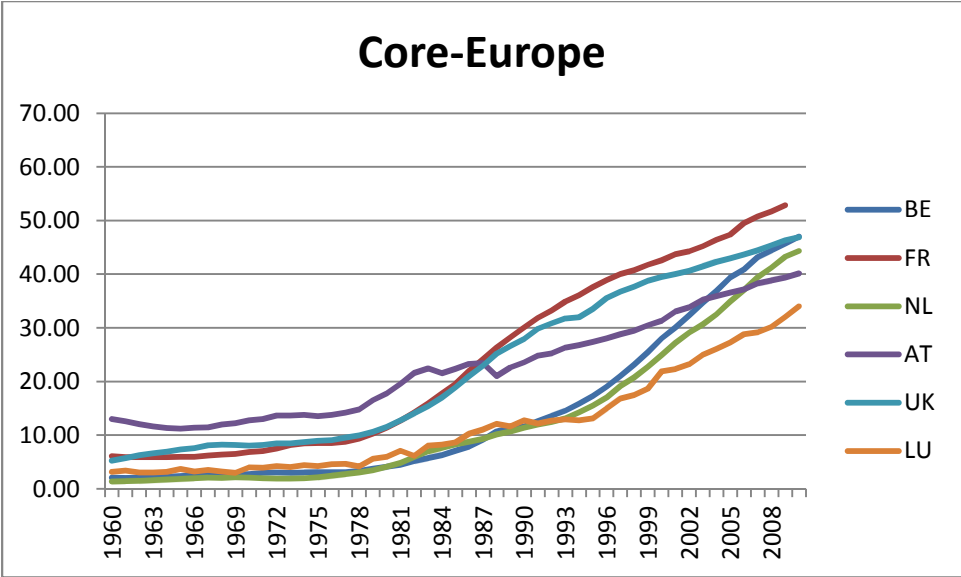
3. Development of nonmarital fertility in Europe

In this section I present data on the development of nonmarital fertility (NMF) in Europe since 1960. The figures reported here are percentages of live births outside marriage and were taken from the Eurostat dissemination database. These data highlight the massive increase of nonmarital fertility throughout Europe and the different patterns of development in this timeframe. For the sake of ease of presentation and to better highlight common trends and regional and cultural differences I have classified all countries under study into 4 ad-hoc groups. The group of Nordic states consists of DK, SE, FI, NO and IS. The second group titled Core Europe includes AT, BE, FR, NL, LU and the UK. The group of Post-Communist countries includes CZ, EE, HU, LV, LT, RO, SK and SI. PO has been classified as Catholic/Orthodox together with IE, IT, ES, PT, CY and GR.

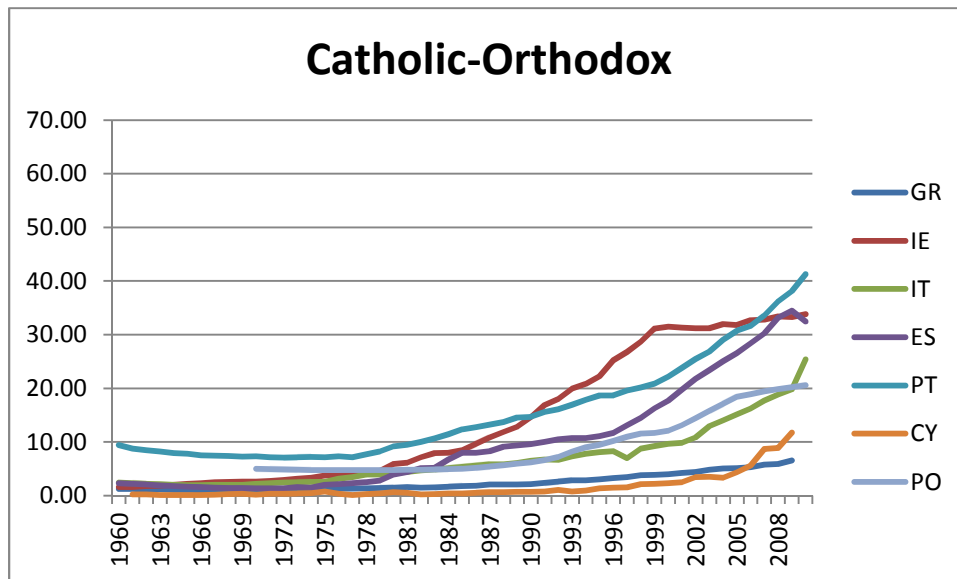


The Nordic countries are very interesting as they are among the countries with the highest levels of nonmarital fertility throughout Europe over the last 50 years and exhibit a shared developmental trajectory. Common to all Nordic countries is that after an era of sharp increase they reach a plateau where there is little to no change in the nonmarital fertility rate over time. However there are large differences between the different Nordic countries at what time and at what level the nonmarital fertility rate has stabilized. In Finland such a plateau seems to have been reached at the turn of the century at a nonmarital fertility rate of about 40%. Between 2000 and 2009 the rate has increased by merely 1.67 percentage points whereas in the 1980s and 90s it had increased by 23 percentage points in total. In Denmark the sharp increase began much earlier at around 1970. This rapid growth already began to slow in the 1980s and reached its plateau by the end of the decade. While the level of NMF has not been as stable as in Finland, it has remained fairly constant at around 45% for almost 25 years. The development in Sweden ran parallel to that in Denmark albeit at a slightly higher level from the late sixties to the late eighties. In fact the absolute increases in the rate of NMF in the 1970s and 80s were almost identical to those in Denmark. However the plateau has not been as level as in other countries. After a short but sharp drop off in the rate of NMF in the late 1980s a new period of albeit slower growth began which has dropped off again around the turn of the century so that we are recently observing a slight decline. The development of NMF in Norway shows a very individual pattern. After a very sharp increase between the early 1980s and the mid 1990s (from 16 to 48% in the fifteen years from 1981 to 1996) the NMF rate seemed to have stabilized at about 50% around the turn of the century only to have jumped by another 5% points in the noughties. Iceland is a completely different animal when it comes to nonmarital fertility. Historically nonmarital fertility in Iceland has been very high a fact that is attributed to a persistence of pre-Christian ethics (Tomasson 1976). What it has in common with the 'other' Nordic countries is that the rate of NMF has remained consistently high at around 65% for the last 15 years. However the rate of nonmarital fertility was already at around 25% in the early 60s and the rate of increase between then and the mid 90s when the current plateau was reached is almost linear. Overall this group of countries displays a common developmental pattern having reached a plateau of nonmarital fertility within the last twenty years. Increases in NMF in Nordic countries were greatest in the 1970s and 80s, when we witnessed an overall absolute increase in the rate of NMF of over 25 percentage points, however as of late this development has slowed to an almost complete halt. We do observe substantial differences in the

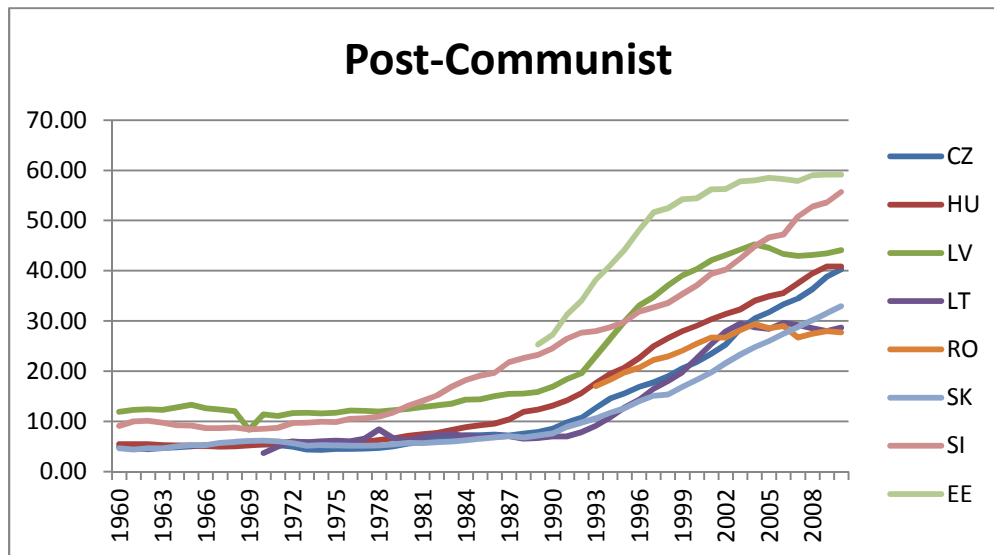
levels of NMF (in 2010 Iceland 64% Norway 41%). Also patterns of development do show substantial differences especially in the timing of phases of rapid growth and stability.



The group I have termed Core Europe, which contains central European countries along with the UK, displays a rather homogenous development in NMF over the last 50 years. It is one of moderate but constant increase that in most cases began in the 1970s and persists to this day. Austria appears as a bit of an oddity due to its historically high rate of NMF which is generally attributed to inheritance laws (Khema 1981) and its' subsequently rather modest increase over time. Another remarkable trend can be observed in France and the UK which show an almost completely parallel development in the rate of NMF until the end of the eighties, where France surpassed the UK. The Benelux countries all show a very similar developments as well, with Luxembourg being the odd one out as the rate of nonmarital fertility today is far below 40% due to the lower rate of increase since the 1990s. The neighboring countries Netherlands and Belgium show extremely similar developmental trajectories over the last 50 years. Both displayed very low rates of nonmarital fertility throughout the 60s and 70s, however the increase in NMF picked up in the 70s and 80s and NMF increased drastically in the 90s and 00s although the rate of increase has begun to slow slightly as of late. Again we find a common trend for this group of countries however this trend differs greatly from that observed for the Nordic countries. It is one of moderate but consistent growth over the last three decades. This trend is expressed in an absolute increase in NMF of roughly 10 percentage points per decade. The data presented here do not indicate that the growth of the NMF rate in the Core European countries has come to a halt yet but that it is beginning to slow. Whether a plateau of NMF, as in the Nordic states, will be reached remains to be seen however.



A distinguishing feature of those countries surmised under the label Catholic-Orthodox is the overall lower level of nonmarital fertility. Also the increase in NMF over the last 50 years has been lower than in Nordic or Core European countries but has picked up markedly over the last two decades. Portugal seems a bit out of place in this group as the NMF rate has surpassed 40% as of 2009 and has always been at comparably high levels, a fact that is attributed to a traditionally high prevalence of nonmarital fertility in southern Portugal (Livi-Bacci 1971). Looking at its development over time it seems that Portugal likely would have fit better into the Core Europe category as it shows a constant and fairly strong increase since the late seventies. Spain, much like Portugal, is characterized by a pattern similar to the core European countries. A period of slow growth beginning in the late seventies is followed by a growth spurt from the second half of the nineteen nineties onward. Italy shows a similar pattern although the period of rapid growth picked up much later, at around the turn of the century. The development in Ireland on the other hand looks much like those in the Nordic countries with an era of fast growth from the late 70s to the end of the 90s and a period of stability from the mid-nineties to this day, however the plateau seems to have been reached at around 30% and there has been slight increase in this period. Data for Poland are only available since 1970 but show a fairly unique pattern. For one the nonmarital fertility rate was comparably high in the seventies but did not show any marked increase until after 1990 but even then the rate of increase has been fairly moderate and the nonmarital fertility rate today stands at only 20%. The only two countries that have seen no sharp increase in non-marital fertility up until very recently are Greece and to a lesser extent Cyprus. Historically these two orthodox countries are characterized by extremely low levels of nonmarital fertility even in comparison to the Catholic countries. While Greece exhibits a very slow rate of increase ever since the 1970s which has picked up in the 90s and 00s, there was next to no increase (and next to no NMF) in Cyprus until around the middle of the nineties. However since the middle of the noughties the rate of NMF has increased drastically and in 2009 exceeds 10%. With the exception of Ireland and Cyprus in the noughties the countries surmised under the label Catholic-Orthodox show very moderate rates of increase in NMF which also kicked in far later than in Northern and Central Europe. However this group is somewhat heterogeneous with regards to the levels of nonmarital fertility today even though they are remarkably low on average. Also there exist major differences between Orthodox and Catholic countries.



The last group consists of post-communist countries. Data for these countries are not as readily available and as such a number of time series do not begin until the eighties or nineties. Overall the development of NMF in this group appears very heterogeneous. The available data suggest that during socialism rates of NMF were fairly stable and the increase kicked in mainly after 1990. A major exception here is Slovenia where a process of steady and almost linear increase began in the late seventies and persists to this day. This is likely due to liberal family policies implemented in Slovenia in this time (Sarcevic 1981). Data for Estonia are only available since 1989 but these suggest that development in Estonia shows a pattern similar to that in Nordic countries. After a period of rapid increase in the nineties to levels of far above 50% the rate seems to have stabilized in the second half of the last decade at a very high level. A similar pattern albeit at a far lower level is observable in Latvia. Latvia is characterized by a fairly high rate of NMF in Soviet times which began to increase slowly as of 1980. A rapid increase in NMF began in the nineties where the rate increased by 22 percentage points in a single decade. This period was followed by a minor decline and the rate has now stabilized at around 45%. Hungary showed an almost linear increase in nonmarital fertility ever since the early eighties but now after having exceeded 40% seems to have stabilized. The developments observable in the nations of former Czechoslovakia are very similar. In both the Czech and Slovak Republic a steady increase in NMF set in after 1989 which after the separation of the two countries in 1993 continued at a higher rate in the Czech Republic so that it has reached a rate of 40% whereas NMF is at slightly above 30% in Slovakia in 2010. Data for Romania are only available since 1993 but show a steady increase in NMF in the nineties and first half of the noughties, however since then a slight decline in the rate of NMF has been observable. Another country where we observe a similar period of slight decline in NMF after the turn of the century is Lithuania. After a sharp rise in the nineties the rate of NMF has apparently reached a plateau at about 30% in the last decade. Overall we find diverse patterns of development in the post-communist countries with a common trend being the sharp increase of NMF starting in 1990. There is indication that in a number of these countries a plateau has been reached but it is less conclusive than for the Nordic countries. Also overall this group seems to be somewhat heterogeneous with patterns of development reminiscent of their respective regional or cultural heritage. For example the developments in Estonia and Latvia are similar to those in the Nordic group, whereas countries with a strong orthodox heritage such as Romania exhibit comparably low rates of NMF.

In conclusion we have found a universal trend towards an increase in NMF throughout Europe during the observed time period. However the pattern of increase varies from country to country, between the country groups and between time periods. In a number of countries rates of increase have slowed or halted all together while other countries are in the midst of a period of rapid increase and others look to be at the beginning of such a development. The most striking finding of this analysis is that there is a fairly large group of countries where the increase in NMF has apparently come to a halt and the rate of NMF has reached a plateau much like in a diffusion model. This is true for all Nordic countries, although we observe great differences in regards to the level of this plateau, its stability and its duration. However we also find evidence for similar developments in such diverse settings as Ireland, Estonia, Lithuania, Latvia and Romania. However for these cases' evidence is far less conclusive than for the Nordic countries. Even if these countries might have reached an end point or more likely a temporary equilibrium in the development of NMF this is definitely not the case for the majority of observed countries, where we observe patterns of steady growth for all countries of Core Europe, the majority of Post-Socialist and Catholic Countries. The Orthodox Countries Cyprus and Greece on the other hand appear to be at the starting points of such a development.

4. Analysis

4.1 Data and methods

The dataset employed in this analysis incorporates country level data from a wide range of sources and includes data on 26 European societies for the timespan from 1981 to 2010. As much of the data collected is not available before 1990 for former communist countries the panel is unbalanced. In sum 567 observations are included (an average of 21.8 per country), with the longest time series spanning 30 years (Finland) and the shortest including 11 observations (Cyprus).

Data on nonmarital fertility as well as mother's average age at birth, which will be employed as a control variable, were taken from Eurostat's dissemination database. Per capita gross domestic product converted at "Geary-Khamis" purchasing power parities in 1990 US \$ will also be included as a control variable and was taken from the Conference Board Total Economy Database. The unemployment rate and female labor force participation rate were taken from ILO's KILM database. Data on church attendance, measured as percentage of population attending church weekly, were collected from a wide range of comparative surveys (Eurobarometer, WVS, EVS, ISSP, ESS) as was attitudinal data on the percentage of population agreeing with the statement 'Marriage is an outdated institution' (EVS). Data on public spending as percentage of GDP on child care and unemployment compensation were taken from the OECD.stat online database.³ Appendix I provides detailed information on data sources and operationalizations.

Table 1 provides an overview of the relationships between the variables included expressed as Pearson correlation coefficients. The control variables average age at birth (AAB) and GDP per capita (GDP) show moderate degrees of correlation with NMF (.26 and .44 respectively). The finding that AAB and NMF are positively correlated appears counter intuitive on first sight since at the micro level we would expect higher age at birth to be associated with higher likelihood of a marital birth. However when considering, that increases in NMF and increases in age at birth show similar

³ Holes in the time series of aggregate data were imputed via arithmetic mean substitution. Additionally in order to remove sharp trends from the church attendance data 5 year rolling means were calculated.

temporal developments throughout Europe this positive association appears less surprising. Examining the correlation between the explanatory variables and NMF provides some initial proof for the *Independence Hypothesis*. The Female Labor Force Participation Rate (FLFPR) shows the expected positive relationship with NMF, the correlation of .76 is remarkably high and indicates a strong association between these variables. Equally the percentage of GDP spent on childcare (GDPCC) is also strongly correlated with NMF likewise giving considerable credit to the *Independence Hypothesis*. The correlation of -.57 between the percentage of population attending church on a weekly basis (CHURCH) and NMF also implies the expected negative relationship expressed in Hypothesis 2b. However the percentage of the population agreeing with the statement “marriage is an outdated institution” (MO) indicates little support for hypothesis 2a. The relationship of unemployment (UE) and NMF is negative, a finding that stands in stark contrast to the insecurity hypothesis. Furthermore the percentage of GDP spent on unemployment compensation (GDPUE) shows no correlation with NMF which is rather inconsequential as theory does not suggest a direct association but only a moderating effect on UE.

Table 1: Correlations among nonmarital fertility and predictor variables

	NMF	AAB	GDP	UE	Church	FLFPR	MO	GDPCC
NMF	1							
AAB	0.26	1						
GDP	0.44	0.67	1					
UE	-0.26	-0.11	-0.46	1				
Church	-0.56	0.02	-0.28	0.36	1			
FLFPR	0.76	0.12	0.27	-0.30	-0.57	1		
MO	0.01	0.27	0.39	-0.13	-0.12	-0.26	1	
GDPCC	0.69	0.3	0.43	-0.32	-0.58	0.69	-0.02	1
GDPUE	-0.12	0.17	0.00	0.39	0.03	-0.18	0.13	0.18

When examining the relationship between explanatory variables we find a number of high correlations. Most notable is the correlation between the FLFPR and GDPCC (.68) which come as little surprise as both are expressions of the underlying concept compatibility of work and family life. Both variables in turn show a high negative correlation with church attendance at -.57 and -.62 respectively. The Unemployment rate is also shows moderate levels of correlation with church attendance (.36) as well as FLFPR (-.30) and GDPCC (-.31). AAB and GDP also are highly correlated (.67), presumably as they share a developmental trajectory.

4.2 Regression Analysis

The analysis presented here is conducted on the country level and employs time series cross section regression analysis with the nonmarital fertility rate as the dependent variable. Prais-Winsten regression models with panel corrected standard errors (Beck and Katz 1995/2011) were estimated using Stata’s xtpcse command. Results displayed here include a lagged dependent variable and country fixed effects (not shown). This model specification was chosen in order to deal with severe degrees of autocorrelation in the data. Table 2 shows beta coefficients and standard errors (in parentheses). Due to the chosen specification beta coefficients should be interpreted as follows: if the independent variable increases by one unit over time for a given country, the nonmarital fertility rate increases by beta percentage points. With the exception of GDP where a one unit increases is equivalent to an increase of the per capita gdp by 1000 1990 US\$ and AAB where a one unit change

corresponds to one year, all variables are expressed as percentage values and thus a one unit increase corresponds to a 1 percent increase in the respective rate. Due to the high degree of correlation and the inclusion of a lagged dependent variable R^2 approaches 1 even for the baseline model thus it has not been included in Table 2. As can be seen from the number of cases Table 2 includes two sets of models. Models 1 to 3 were run on the full dataset whereas models 4 to 6 were run with a subset of the data due to limited availability of the indicators employed. The non-OECD countries LV, LT,RO, BG and CY were not included in these analyses, additionally most time series are slightly shorter than in the full model with the longest (FI) including 28 and the shortest (EE) 9 observations.

Table 2: Predictors of nonmarital fertility

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
AAB	0.144 (0.0986)	0.244* (0.102)	0.261** (0.0965)	0.485** (0.113)	0.478** (0.119)	0.440** (0.120)	0.450** (0.124)
GDP	-0.0357 (0.0336)	-0.0925** (0.0355)	-0.111** (0.0366)	-0.203** (0.0484)	-0.201** (0.0502)	-0.194** (0.0506)	-0.174** (0.0559)
UE	0.0223 (0.0179)	0.0269 (0.0172)	0.0271 (0.0166)	0.0122 (0.0203)	0.0122 (0.0203)	0.0120 (0.0200)	0.0469+ (0.0282)
CHURCH		-0.0594** (0.0124)	-0.0354* (0.0148)	-0.0393* (0.0163)	-0.0389* (0.0166)	-0.0303+ (0.0163)	-0.0206 (0.0169)
FLFPR			0.0573** (0.0173)	0.0681** (0.0176)	0.0667** (0.0177)	0.0607** (0.0181)	0.0629** (0.0188)
GDPCC					0.119 (0.325)	0.148 (0.330)	0.117 (0.316)
MO						0.0461** (0.0175)	0.0371* (0.0164)
GDPUE							0.388+ (0.204)
UE*GDPUE							-0.0304** (0.0117)
Constant	-1.871 (2.352)	-2.557 (2.321)	-5.335* (2.239)	-10.54** (2.651)	-10.32** (2.731)	-10.30** (2.749)	-11.49** (3.168)
N	567	567	567	404	404	404	404

Standard errors in parentheses; + $p < .1$, * $p < .05$, ** $p < .01$

In addition to the lagged dependent variable and the country level fixed effects Model 1 includes the control variables AAB and GDP and the unemployment rate. No significant effects can be observed for either of the control variables. As the bivariate correlation suggested an increase in average age at birth leads to increases in the rate of nonmarital fertility. However contrary to the positive correlation between the two variables, an increase in GDP per capita leads to declines in non-marital fertility. Returning to our initial hypotheses we observe however, that while the unemployment rate shows the expected positive effect it is not significant. Model 2 includes church attendance in order to test hypothesis 2b. A significant negative effect can be observed indicating that increases in the level of church attendance lead to a decrease in the rate of nonmarital fertility. Furthermore after the inclusion of CHURCH a significant negative effect for GDP and AAB can be observed, the effect for GDP has also drastically increased a finding which I will discuss in more detail below. Model 3 includes the female labor force participation rate in order to test Hypothesis 1a. The predicted positive effect of FLFPR on NMF can be observed. Also the effect of church attendance decreases considerably in magnitude likely due to the high correlation between CHURCH and FLFPR. In

summary these first three models give credence to the independence and normative backing of marriage hypothesis while rejecting the insecurity hypothesis. Two further observations from these models deserve further attention. The inclusion of the FLFPR drastically decreases the effect of CHURCH indicating that changes in religiosity as well as women's labor market integration might very well be part of a shared developmental trajectory as modernization theory suggests (Norris and Inglehart 2003). Another interesting observation is the effect of GDP per capita on the rate of non-marital fertility. Particularly after factoring out religiosity as well women's labor force participation we observe that economic development is actually associated with decreases in nonmarital fertility, an ad-hoc finding actually in line with the insecurity hypothesis. It would appear that the actual effect of GDP on NMF is actually somewhat ambivalent. On the one hand economic development is associated with increases in women's labor market integration and declines in church attendance on the other hand economic development might also be associated with decreasing insecurity. Modernization theory (Inglehart and Welzel 2005) argues that increase in GDP lead to decreases in "existential insecurity" which in turn might help individuals in making more long term decisions.

Model 4 replicates the results of Model 3 with the above mentioned subsample. While there is some change in the magnitude of the point estimates, particularly for the control variables the results on a whole are fairly consistent with those from Model 3. Model 5 additionally includes the percentage of GDP spent on childcare services, however no significant effect can be observed which means we must reject hypothesis 1b. The fact that GDPCC is so strongly correlated with FLFPR might be responsible for this finding. A substantial interpretation of this finding could be that women's factual labor market integration is more salient to their independence than the childcare infrastructure in a country. Model 6 includes the aggregated attitudinal variable percentage of population agreeing with the statement "marriage is an outdated institution" in order to provide a further test of the normative backing of marriage hypothesis. We find the expected positive correlation which is also significant. The inclusion of MO also reduces the effect of CHURCH, indicating that changes in the direct social support of the institution of marriage are associated with changes in the importance of religious institutions. While this finding is not overly surprising considering that MO is likely the more direct measurement of the underlying concept it does come as a surprise when considering the bivariate relationships between the variables. Model 7 includes the interaction term between the percentage of GDP spent on unemployment compensation and the unemployment rate, the assumption being, that the effect of job insecurity can be reduced by state intervention. The significant negative effect observed for the interaction term provides credence to hypothesis 2b furthermore after the inclusion of the interaction term a significant positive effect for UE can actually be observed. This indicates that the effect of the unemployment rate on the rate of nonmarital fertility is largely moderated by welfare state policy and that only after controlling for this interaction the predicted insecurity effect can be observed. However the overall low confidence in the insecurity hypothesis is further lessened by the fact that UE is only significant at the .1 level.

When reviewing the initial hypotheses we find credible evidence for the independence hypothesis. As posited in Hypothesis 1a increases in women's labor market integration lead to declines in the rate of non-marital fertility, however no effect could be observed for changes in public spending on childcare as proposed in Hypothesis 1b. While models excluding FLFPR do show positive effects of GDPCC on NMF (not shown) these findings indicate that actual labor market integration of women is more salient to their independence than welfare state spending on childcare. The evidence for the insecurity hypothesis is a bit thin overall. While no significant effect for the unemployment rate can

be observed in models 1 through 6, we find a positive effect after including the interaction with GDPUE. While this does suggest that Hypothesis 2b seems to be on target overall confidence in the insecurity hypothesis could be higher. A possible reason could be seen in the confounding effect of GDP per capita. In fact models specified without the inclusion of this control variable show stronger and significant effects for the unemployment rate. Also the results presented above confirm the normative backing of marriage hypothesis. Hypothesis 3b can at least be partly confirmed, however it appears that it is not so much changes in religious attendance that impacts the nonmarital fertility rate but instead the actual support of the institution of marriage as suggested in hypothesis 3a.

5. Summary

The objective of this paper is twofold. For one it provides an overview over the development of nonmarital fertility in Europe since the 1960s. This was done by highlighting four ad-hoc country groups. While a general trend towards increases in nonmarital fertility can be observed in all countries we observe heterogeneous developmental trajectories. While in a number of countries, particularly northern European countries, the rate of nonmarital fertility has apparently reached equilibrium, the countries of central Europe are characterized by a pattern of moderate yet consistent growth. Yet in other countries, particularly Greece and Cyprus rapid increase in the rate of nonmarital fertility can be observed as of late.

In order to understand the causes of this universal transition to high rates of nonmarital fertility three hypotheses were tested on a country level panel dataset. The insecurity hypothesis which proposes that unstable labor markets lead parents to forego marriage could not be fully validated. The independence hypothesis which assumes that it is primarily women's increasing independence, resulting from higher levels of participation in the work force, which lead to higher rates of nonmarital fertility, could be confirmed. Results indicate however that women's actual involvement in the labor force is of greater use in explaining changes in nonmarital fertility than is a country's investment in childcare services. Finally the normative backing of marriage hypothesis, which proposes that the declining societal support for the institution of marriage is responsible for increases in the rate of nonmarital fertility, could also be confirmed.

A point not originally anticipated but apparent in the data and multivariate results is the strong association between economic, social and institutional factors relating to gender equality. As such the processes proposed within the independence and normative backing of marriage hypothesis seem to be closely related. Modernization theory (Inglehart and Norris 2003) provides an explanatory framework for this observation. The multivariate analysis presented here indicates that women's labor market integration is the central element driving such changes.

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Appendix 1: Data

Data for this analysis were taken from a wide range of sources such as Eurostat, the OECD, ILO, national statistical institutes or extracted from social surveys such as the ISSP. Holes in time series were imputed via geometric mean substitution. The following variables are included:

NMF: The nonmarital fertility rate measured as the percentage of births to unmarried mothers. These data were taken from Eurostat's statistics database.

AAB: Age at Birth. The average age of mothers at birth of a child. Taken from Eurostat's statistics database. Data for Germany taken from BiB, data for Latvia taken from Statistics Latvia.

FLFPR: Female Labour Force Participation Rate. Measured as percentage of working age population (15-74) in the labor force (either working or looking for work). Data are taken from ILO's KILM database and from Statistics Norway.

MUE: Male unemployment rate. Measured as the proportion of the labour force that does not have a job and is actively looking and available for work. Taken from ILO's KILM database.

GDP: GDP per Capita measured in 1990 U.S. Dollars and converted at "Geary-Khamis" purchasing power parities. Taken from the Conference Board Total Economy Database.

MO: Percentage of population agreeing with the statement “marriage is an outdated institution”. Aggregate data were generated from the EVS and used weighted data.

Church attendance: Measured as the percentage of population attending religious services at least once a week. Data were taken from a number of social surveys: the Eurobarometer, the International Social Survey Programme (ISSP), the World Values Survey (WVS), the European Values Study (EVS) and the European Social Survey (ESS).

GDPCC: Percentage of GDP spent on day care and home help services. Taken from OECD.stat.

GDPUE: Percentage of GDP spent on unemployment compensation. Taken from OECD.stat.

Information from these various surveys was pooled in order to generate a single time series on church attendance which spans from 1970 to 2010. As these surveys use a wide range of different survey tools, sampling designs and are of varying quality (McAndrew and Voas 2011) a rigorous method was applied in order to generate a single long term time series from these varied sources. While the answer categories for this item diverged widely between the different study programs and, especially in the case of the ISSP, over time the least common denominator of all surveys is that they identify whether a person attends church at least once a week, usually through one category, often through two categories and very rarely through three categories.

In a first step these categories were collapsed and the percentage of the population who attend religious services on a weekly basis was calculated for every available year and country of all 5 survey programs. Especially for the last two decades this meant there were quite a few multiple observations for a single country in a given year but usually few observations in the 1970ies and 80ies. These time series were examined and major outliers (values that deviated more than 50% from average values over 3 years time span) were removed before generating the means of all values for a given year in a country. However these time series still contained considerable gaps which were imputed in a third step via geometric mean substitution. As these time series contained some rather sharp trends which are more likely to be methodological artifacts than actual social developments 5 year simple mean averages were applied. At the edges of the time series 3 and respectively 4 year averages were calculated instead. Figure Y below highlights the method for generating such a time series using the example of Denmark which covers the full time span from 1970 to 2010, uses data from all 5 different social surveys and shows some of the highest variation between years.

Figure 1: Church attendance time series for Denmark

