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Demographic and socio-economic determinants of contraceptive use in Poland and Romania in 2005: a cross-sectional study

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Abstract: The fall of state socialism brought major social and political changes in all the countries that belonged to the Eastern Bloc. The most significant demographic transformations during the transition period were the decreasing fertility rates, the decline in marriages, the rise in cohabitation and the shift from traditional birth control methods towards effective contraception. This thesis tries to determine if there is any relationship between women's propensity to use modern contraception and their partnership status in Romania and Poland in 2005. Various demographic and socio-economic controls are used in order to determine the outcome. The study also tries to establish in which country does union status have a greater impact on the use of birth control. It does so by using GGS cross-sectional micro-data from 2005. The main methodological approach consists of logistic regression models that test the likelihood of using modern contraception. The findings show that both demographic and socioeconomic factors together with partnership status are significant predictors of modern contraceptive use both in Poland and Romania. The results of the interaction effect between country and union status indicate a higher propensity to use modern birth control among Romanian cohabiting women rather than among Polish women.

Keywords: Fertility, Contraception, Cohabitation, Romania, Poland, GGS, bivariate logistic regression

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1 Introduction

Since the beginning of the 1990s, Eastern European societies have suffered complex transformations in terms of family formation (Billari, 2001). The reproductive behavior has been shaped by new patterns of decreasing fertility, decline in marriages, postponement of childbearing and adoption of effective birth control. The new trends of family formation raise fundamental questions about how marital status affects fertility decisions and contraceptive behavior. Family demographers frequently look into the relationship between union status and fertility behavior and its patterns across different countries and time frames.

These new shifts responsible for the fertility decline have been explained by scholars through the theory of the Second Demographic Transition suggesting that the changes within family trends are a consequence of the changes in the culture and ideology of a population (Lesthaeghe and Van de Kaa 1986; Sobotka 2008). The effects of the Second Demographic Transition were experienced in Eastern Europe later than in the West, only after the fall of the communist regimes took place in 1989. Here, the economic and political context at the time of transition was marked by instability and uncertainty which eventually led to decreasing marriage and fertility rates. Aside from the economic factors that impacted family formation patterns, new ideational changes shaped the reproductive context in Eastern Europe. Freedom of speech and expression and rise of individualism and normlessness enabled individuals to gain more control over their individual choices including childbearing, partnerships and contraceptive behavior (Potârca et al., 2013). Thus, new norms and institutions have emerged with the decline in marriages and postponement of childbearing. Non-marital cohabitation and extramarital births increased to a large extent, while the transition from cohabitation towards marriage decreased in the majority of former socialist countries in Eastern Europe due to the weakening of normative restrictions (Thornton & Philipov, 2008).

There are several views explaining the dramatic changes in the reproductive behavior and union formation, among which the existence of causal forces, emerging during the transition from state socialism towards capitalism. During this period marked by growing unemployment and reduction of various welfare provisions, couples became more likely to choose cohabitation over marriage, as a temporary living arrangement with fewer obligations. Under these circumstances of financial insecurity, investments in education became a way of preventing unemployment risks. Low educational attainments are generally associated with the most vulnerable groups to financial insecurity. The negative educational gradient is more common among couples deciding to not to enter marriage and to choose cohabitation as a form of first union. Thus, in comparison with postponed childbearing, often viewed as an indicator of higher educational attainment, cohabitation and non-marital childbearing are found to be more representative among groups with lower educational attainments (Sobotka, 2008).

Poland and Romania represent two similar examples of post-communist contexts of decreasing fertility, declining marriages rates and increasing rates of effective contraception. However, the countries present major differences in the legal contexts regarding abortions. Romania's political standpoint on abortion became very liberal after the fall of communism, as opposed to its former socialist legislative framework which outlawed abortions and effective contraception. In Poland, on the other hand, abortions have been legal before 1989 but a ban was enforced in the following period for most of the circumstances, excepting situations when birth represents a life threat for mothers and their children or in cases of rape or incest (Levine and Staiger, 2004).

Given the legislative framework, it is essential to examine what is the contraceptive behavior of women in absence or presence of legal induced abortions and which are the main drivers of fertility control decisions. It is also important consider the ideological transformations that occurred in the transition period that affected both fertility behavior and the socio-economic status of individuals. Therefore, the thesis will examine the relationship between demographic and socio-economic characteristics of women and their propensity to adopt modern contraceptive methods.

1.1 Research Problem

The changing dynamics of family formation raise interest in how marital status together with background and socio-economic characteristics impact on the reproductive lives of women. There is an extensive body of literature linking the aforementioned factors with fertility decline. However, the relationship between contraceptive use and demographic and socio-economic determinants still remains unclear for cases like Poland and Romania. Thus, the paper will try to answer the following research question: "What are the determinants of contraceptive use in the two countries?".

The widespread of new family formation patters in France and the United States during the mid 1990's has accounted for the rise in effective contraception (Sweeney et al, 2015). However, in Eastern European countries, it is still unclear if cohabiting couples are more likely to use modern contraceptive methods than married ones. According to Heuveline and Timberlake (2004), "marginal" cohabitation is a phenomenon that is relatively uncommon as compared to cohabitation viewed as an "alternative to marriage". The latter represents a non-marital type of partnership that is already widespread and common. Since Poland and Romania fall into the "marginal" category, cohabitation is seen a proximate determinant of fertility control. It is expected that the differences between married versus cohabiting and non-cohabiting women with respect to contraceptive use to be greater when cohabitation is relatively rare. Thus, given that the novelty of the phenomenon is the two countries, the study will try to answer the second research question: "In which country does cohabitation have a stronger impact on the use modern contraceptive?".

1.2 Aim and Scope

The aim of this paper is to provide a comparative demographic perspective on two former Eastern Bloc countries, Romania and Poland and to determine how partnership status impacts the use of modern contraception among women living in these countries, while controlling for demographic determinants (age and parity) and for socioeconomic factors (education, income, residence and region). The study uses Generations and Gender (GGS) cross-sectional data from 2005. The methodology used in this paper is represented by bivariate logistic regression expressed in odds ratios. The study will adopt a stepwise model, expanding from a first basic model which looks into the relationship between partnership status and use of modern birth control, to a more complex model that also takes into account fertility intentions, demographic and socioeconomic determinants of contraception. The last part of the analysis will consist of an interaction effect model that will try to establish the differences between the two countries in terms of contraceptive use as an outcome of partnership status.

The scope of the thesis is to enlarge the literature on contraceptive use for Poland and Romania. Although fertility decline is a common topic of research for Eastern European countries, the determinants of contraceptive use are still unclear in this context. An additional goal of the paper is to provide an overview of the main fertility theories in the demographic literature while finding more practical implications for contraceptive behavior. The motivation behind choosing these two countries is driven primarily by the similarities found in family formation patterns and contraceptive behavior and secondly by the cultural and economic differences (Perelli-Harris et al., 2012). Therefore, the novelty of the research is represented by the comparative perspective upon the contraceptive behavior in two different contexts from Eastern Europe.

1.3 Outline of the Thesis

The thesis is structured as follows. In the first section, an introductory part is provided in order to get a general an overview of decline of fertility and marriage rates in Eastern Europe. Subsequently, in the background section, the focus will be turned to more country specific information on the contraceptive behavior. In the theory section, the relationship between demographic and socioeconomic factors and contraceptive use will be discussed while considering the main fertility theories based on economic, ideational and gender models. Several hypotheses that have been developed based on the theoretical considerations will be presented afterwards. In the second part of the study, the data and the methodological approach are explained in order to provide a better understanding of how the study will be performed. The results will be presented and discussed afterwards while considering the main limitations of the study. The section will be closed with some general conclusions linking the aim and objectives of the study with the findings.

2 Background

The purpose of this section is to provide more in-depth information regarding the reproductive context in Poland and Romania during the transition period. The section contains country specific information regarding the economic context, the legislative framework on abortion. Religious and regional differences are also discussed in the context of fertility, marriage and contraception.

2.1 Contraceptive context in Poland

Poland is the largest country in Central-Eastern Europe, being the sixth most populous country in the European Union, with a total population approximated at 38.5 million people in 2005. Warsaw is the capital city and the largest city in Poland with a population of approximately 1.7 million inhabitants. The country was the first in the Eastern Bloc to become a democratic state 44 years of communism. In May 2004, the country has officially become a member of the European Union (European Parliament, 2015).

In the early 1990s, Poland experienced a severe economic downturn followed by a period of significant economic growth during the mid-1990s. Poland is classified as a high income economy, with a nominal GDP that doubled from 1990s onwards, reaching approximately $300 billion 2005 (European Commission, 2008).

Poland is characterized by significant economic disparities across regions and urban-rural areas. The highest GDP per capita is reported in Warsaw, reaching about 82% of the European Union average. After the capital, the Western part of the country represents the most developed region in terms of GDP per capita and employment, followed by the Southern and Northern regions. The Eastern part is the least developed region with almost 40% of the European Union average GDP, mostly due to its low-productivity agricultural sector, poor infrastructure which lowers investment opportunities (Bogumił, 2009). 62% of the total population of Poland is concentrated urban centers, while the rest of 38% lives in rural areas with a significantly lower Human Development Index – 0.794 compared to 0.828 in cities. The population concentrated in rural regions experience lower levels of life expectancy, educational attainment, literacy and GDP per capita. Thus, territorial economic disparities are characterized by the differences in income and labor between East and West, the economic advantage of the capital and a growing gap between urban and rural regions.

In terms of religion, Poland is relatively homogeneous compared to the other countries in Central Eastern Europe. According to the 2002 census, Poland's population is mostly Roman Catholic in proportion of 89.8%, from which 75% declared practicing Catholics. The following largest religious groups are a mix of Eastern Orthodox with a share of 1.3%,

Protestant 0.3% and unspecified religion 8.6% (UNRISD, 2009). After the fall of state-socialism, the Catholic Church has gradually gained a more powerful role in reducing the public and legal acceptance of abortions.

During the transition period, Poland has suffered complex changes in terms of family formation patterns. One of the most distinctive characteristics of the demographic transformation has been the dramatic decline of the total fertility rate of 2.08 in 1998 to almost 1.39 in 2005. The long-term fertility decline was marked by several other factors among which: falling fertility rates for all age groups, increasing age of maximum fertility from 22 to 26, increasing age at first birth and rising share of children born out of wedlock from 5.8% in 1989 to almost 13.2% in 2001 (Kotowska et al., 2008).

Another feature of the change in fertility behavior was represented by the declining role of marital status. The reluctance towards marriage has gradually increased, particularly among women, with the first marriage rate dropping from 0.91 in 1989 to 0.56 in 2004. Alternatives to marriage have emerged gradually but at a slow pace. Cohabitation has developed mostly as an urban phenomenon, with 75% of cohabitors living in cities. Also, the trend has become more popular among middle-aged individuals with children and lower income and education (Mynarska and Bernardi, 2007). In a study conducted by Matysiak (2009), it has been indicated that the percentage of women deciding to enter non-marital unions in 2005 was 18% as compared to 82% of women who chose direct marriage. The incidence of cohabitation in the lowest social strata has increased sharply during the 1990s, but with the beginning of the 2000s, reported cases of cohabitation have increased in number among secondary and tertiary educated individuals. The findings of the study showed cohabitation rates have increased during the transition period, while the risk of converting from cohabiting to marriage unions has remained more substantial among the higher social strata. An apparent reason for the slow development of cohabitation suggested by Matysiak (2009) is the common perception of cohabitation as not being an appropriate environment for parenthood, but rather a temporary living arrangement prior to marriage.

The current legislative framework allows women to have abortions only in case of rape or if their life or the child's life might be endangered. Around 100 and 200 legal abortions were conducted in 2005, more precisely around 1 abortion per 2000 live births. Similarly, the use of modern birth control methods is still not widespread due to limited contraceptive knowledge, supply shortages and unwillingness to break religious norms. The condom represents the most popular contraceptive method, with a use rate of 43%, followed by the pill with 22%. Roughly 30% of women rely on traditional birth control methods, from which 15% use coitus interruptus as the main contraceptive method, while 20% use the rhythm method (European Parliament, 2015).

2.2 Contraceptive context in Romania

Romania is the largest Southeastern European country, with a population estimated at around 21.7 million inhabitants in 2005. Bucharest is the capital and the largest city of the country. Romania is also a former Eastern Bloc country which became a democratic state in 1989. In March 2004, the country became a member state of NATO.

Romania is classified as an upper-middle income country with almost $100 billion in nominal GDP. The economic disparities between regions have grown during the transition period, although at a slower pace compared to other Eastern Bloc countries. The Bucharest-Ilfov region represents the most developed region with almost 75% of the European Union average, followed by West, North, South and lastly by East which is the least developed in terms of GDP per capita (Goschin et al., 2008).

The largest religious group in Romania is represented by Orthodoxism. 86% of the total population identifies as Orthodox, followed by 4.7% Roman Catholics, 3.2% Reformed Christians and other religions. Since the fall of communism, the Orthodox Church has started playing a more important role in political and social life (Turcescu and Stan, 2005). However, unlike in the case of Poland, the Romanian Church has been less involved in social matters like abortions. Regional differences with respect to religion can be distinguished between the Center-Western part of the country, where 4.7 of the Catholic population is concentrated, and the rest of the country which is mostly Orthodox.

Just as in the case of Poland during the transition period, a multifaceted demographic transition took place in Romania after the collapse of communism. The total fertility rate has decreased from 2.22 in 1989 to almost 1.36 in 2005. Similarly, the marital status has started to play a less important role in family formation patterns. In the socialist period, the time spent on cohabitation was largely viewed as a prelude to marriage. Starting with the late 1980s, non-marital partnerships have become more widespread and by 2005 the proportion of time spent in these types of partnerships has increased by almost 10%. The time spent in marriages has decreased from around 90% to almost 70% (Hoem et. al, 2013). Marriage rates have dropped from almost 90% for both men and women in the period between 1990-1994 to almost 80% between 1996 and 2005. Also, motherhood was no longer universal, as opposed to the pre-1989 era, but still above 80% (Mureşan 2008).

In a cross-sectional study conducted by Perelli-Harris et al. (2012) it is revealed that in all former socialist countries, the share of women living in cohabiting partnerships has increased in the transition period. It is shown that in Romania, the shift from cohabitation towards marriage increases when pregnancy occurs, but the risk of marriage decreases if couples do not get married shortly after childbirth. Women with secondary and higher education are more likely to cohabitate first then enter marriage and childbearing. In 2005, Romania was among the countries with the lowest number of reported non-marital unions, with a cohabitation rate of 18%, together with Italy with 10% and Hungary with 28%.

In 2005, the number of abortions still remained comparatively high in Romania than in other European countries. Contraceptives were difficult to access and at higher costs when

compared to abortion. Estimates from WHO (2001) show that abortions among Romanian women aged 15 to 49 have decreased from 177.6 abortions per 1,000 in 1990 to 43.81 per 1,000 women in the year 2001.

Also, in a study conducted by Șerbănescu (1995) it is revealed that after abortion became legal in 1989, the total fertility rate has shortly reached sub-replacement level while the induced abortion rate doubled. Contraceptive use has increased by 20% mostly due to the increase in the use of traditional birth control methods. The results of the study indicate that almost half of the couples participating in the study were not using any birth control, and the couples using contraception mostly relied on traditional methods and abortion. It is suggested that the change in legislation has not generated a significant increase in effective contraceptive use. Factors such as lack of sex education and contraceptive information, mistrust of modern methods and a shortage or uneven distribution of contraceptive supplies were major reasons for the continued high rates of unintended pregnancy. However, by 2005, the modern contraceptive use rate has increased to 50.5% (United Nations, 2016).

3 Theoretical considerations

The theoretical framework combines three main considerations: the economic theory of fertility, the diffusion of innovation model and the gender perspective. It is suggested in the demographic literature that the economic theory brings a significant contribution to the explanation of fertility decline, but it fails to provide enough evidence for the relationship contraception and its determinants. The economic perspective should therefore be combined with additional theories when explaining the main determinants of birth control. Thus, the section will provide a review of the relevant theories within the subject of reproductive behavior.

3.1 Economic perspective

The neoclassical economic model of fertility proposed by Becker (1960) is often viewed as the foundation of fertility theory in the demographic literature. Becker associated households with factories trying to maximize their utility. The economic model suggests that individuals balance utilities against costs associated with having children. The concept of "quality of children" emerged from this view together with the proposition that when the family income rises, couples want to have both a greater quality and quantity of children. However, the elasticity of quality of children relative to income is much greater than the one of quantity.

Michael (1973) developed a similar model regarding contraceptive use, claiming that fertility decisions are based on the utility that children bring relative to other commodities. Thus, individuals may decide to prevent pregnancies if net benefit of having children is negative. Levine (2007) makes further contributions to the model by including a measure of birth control intensity in Becker's neoclassical theory of fertility. In this model, the intensity of contraceptive practice decreases the likelihood of pregnancy, despite that the cost of birth control increases. This suggests that women tend to use contraceptive methods that ensure the exact level of prevention that they desire. Thus, when the cost of birth control changes, women adjust their intensity of contraceptive practice accordingly.

Easterlin (1978) suggested that fertility decline is associated with both the change in demand and supply of children and with the changes associated with the cost of birth control. He shaped the term of "relative status" which is based on the assumption that couples strive to achieve a standard of living equally good or better than the one that they have experienced as children. Thus, if the income and job prospects are good, individuals are more likely to marry young, have children and still manage to attain the desired standard of living. Conversely, if the prospects are bad, couples will tend to postpone marriage and decrease the number of children. Central to this view is that the job market is strongly influenced by the cohort size,

which decreases the chances of employment for those born in years with large cohorts. The contributions of this view were remarked in the field of social sciences since it shifted the focus from the demand side of children to the physiological determinants of fertility.

In their paper, Levine and Staiger (2004) showed that the effect of abortions on pregnancy might differ from other methods of birth control because abortion is the only method which allows a woman to avoid a birth once pregnant, while other contraceptive methods regulate birth outcomes through changes in pregnancy behavior. Their theoretical framework assumes that a greater access to abortion provides value in the form of insurance against unwanted births and also reduces the incentive to avoid pregnancy. Therefore, pregnancy and abortion rates are inversely related to the cost of abortion. However, women might face non-monetary costs of abortions when the cost-benefit analysis is considered. Costs of induced abortions are associated with psychical discomfort as well as with the cost of social exclusion in contexts where social, religious and community norms oppose abortions. Higher costs of abortion and contraception are incurred in contexts where they are banned. Traditional methods also imply some inconvenience costs related to a higher risk of pregnancy. Modern contraceptive methods can also be associated with the cost of physical discomfort, as in the case of hormonal methods or with the need of more cooperation from the partner, as in the case of condoms. Given the economic considerations of birth control, it can be said that woman try to come as close to a desired parity, which often depends on their ability to pay the cost of contraception.

3.2 Diffusion of innovation

In the literature, a significant amount of studies link the use of birth control with ideological determinants. The spread of any social and behavioral innovation is associated with the diffusion of positive beliefs towards this new behavior. Ideational changes are influenced by individualism and transition from old social norms to new values and attitudes (Lesthaeghe and Surkyn, 2001).

The model named “Ready, Willing, and Able” proposed by Coale (1973) was firstly used to illustrate the fertility decline in Europe during the First Demographic Transition. The method employed ideological changes that subsequently led to the adoption of new innovations. The model assumes that three preconditions (readiness, willingness and ability) should be met simultaneously so that innovation diffusion can take place. The speed of innovation adoption is therefore influenced by the time that individuals take to fulfill any of any of these three preconditions. Adoption of new behaviors can also be inhibited if any of the steps in the model is resistant to change (Dereuddre et al., 2016). With regard to the reproductive behavior, the innovation diffusion consists in the adoption of new methods contraception.

The first component, readiness, refers to the cost–benefit equation where the gains of having children must exceed the costs (Lesthaeghe and Vanderhoeft 2001). Readiness, in this context, takes place when individuals consider that preventing pregnancy brings benefits that outweigh the cost of prevention. The cost-benefit ratio differs across the contraceptive

methods, in the sense that traditional practices require less financial efforts but are proved to be more inefficient than modern methods. The decision of having children can reflect the perceived costs and benefits of fertility. Positive or negative views on parenthood also have a timeframe consideration which can have either a short term or a long term impact. An example with respect to the time perspective is represented by highly educated women who prefer to postpone entering the motherhood stage in order to consolidate their earning potential as well as certain non-pecuniary benefits of their careers. In the analysis of the study, the fertility intention predictor will be used as an indicator describing the readiness dimension.

The second component, willingness, represents the compliance with new forms of behaviors and the eagerness of individuals to overcome some barriers inhibiting the adoption of new norms (Coale, 1973). Historically, willingness has been experienced in the postponement of childbearing during the Second Demographic Transition stage across Europe in the mid-twentieth century. Another obvious transition to new values and culture took place with the fall of state socialism in Central Eastern Europe at the end of the century (Lesthaeghe and Surkyn, 2001). In this context, individuals' willingness regarding fertility can be viewed from the perspective of changing ideational values, regarding births and marriages. Literature also finds that religious affiliation seems to be a significant determinant of fertility decisions. McQuillan (2004) distinguishes between different religious communities and their views on birth control and observes that the Catholic view completely opposes contraception other than abstinence and the rhythm method. Although being more permissive with regard to this matter, The Protestant and Orthodox Church share the same view, especially in more conservative groups.

Marital status, which represents the union between two married partners living in the same residence throughout a certain period of time, can be used as a proxy for the willingness dimension. According to Kiernan (2002), the diffusion of cohabitation as an alternative to marriage consists of four different stages. The first one is regarded as an innovative behavior adopted only by a small and select group of individuals. In the second stage, this behavior is viewed as a prelude to marriage and it spreads out among more socially homogenous groups. The third stage implies that cohabitation comes as an alternative to marriage and even though this type of living arrangement becomes more popular, legal or social discrimination may still exist. The final stage of diffusion implies that marriage and cohabitation become equivalent. Thus it can be implied that, the willingness dimension can be captured by new types of unions like cohabitation, which corresponds to the emergence of new behavioral norms.

The last dimension of Coale's theoretical framework is represented by ability and it refers to the institutional and normative factors that lead to the utility of adopting new behaviors. When referring to fertility control, the ability perspective is linked with the access and information on contraceptive methods and to the legal context that either allows or restricts contraception and abortion. Consistent with this view, Sandström (2012) finds that unmet need for birth control is common among those who do not have access to contraception. With regard to this dimension, the socioeconomic status should be considered when trying to determine the likelihood of women to use contraception. Higher educational accomplishments indicate a higher likelihood to use modern and efficient methods. In addition to the education dimension, household income is proved to have a positive impact on the likelihood of using

modern contraception. Differences in urban–rural residence, especially in Central Eastern Europe or developing countries, can also determine the access to contraception, since urban centers are more likely to be supplied with modern contraceptives. Therefore, the ability dimension can be captured by the socio-economic status of individuals.

The three perspectives of Coale's are deeply interrelated given that the change in one dimension can be reflected in the other two. For instance, institutional changes such as an abortion ban can have implications on the contraceptive decision that couples make. The framework helps to structure the analysis of this study in which various determinants of contraceptive use are dependent on each other. It is expected that the three preconditions will explain individuals' behavior when it comes to the adoption of modern contraceptives.

3.3 Gender perspective

A more recent body of literature has started considering the gender implications for the reproductive behavior, more specifically the women's empowerment influencing fertility. The gender systems perspective considers the interactions, norms and statuses governing male versus female sociocultural roles. Central to this theory formulated by Mason (1997) is the women's autonomy regarding fertility decisions. The most significant features of women's autonomy are the following: decision-making power, personal freedom of movement, freedom to take economic decisions within the household and power in relation to the husband.

The approach has brought new insights among family demographers by looking at the reproductive behavior as a range of tasks that are important to consider in the process of generating labor force and household activities. Findings from studies based on this theoretical consideration have revealed that women are the main actors managing activities like childrearing or organizing the family budget. Interest on men's involvement in the domestic activities grows when women become more active in labor market. Therefore, the division of households work becomes a significant determinant of the participation and involvement of men in the family life (Zavala, 1999).

The model proposed by Mason (1997) consists of a multivariate, cross-sectional model which studies the relationship between women's socioeconomic status and fertility outcomes at the individual level. The findings of the study reveal that education and socioeconomic status are associated low fertility rates. Greater social inclusion, lower infant and child mortality, lower religious commitment and higher costs associated with childrearing also lead to lower fertility levels. In addition, lower fertility is often related to the shift from large to nuclear families. These considerations can also apply in the context of contraceptive use since a higher propensity to use birth control leads to lower fertility levels.

The theory on gender systems can be interpreted through the following arguments. Firstly, fertility is affected by the individual actions of women and men undertaken in order to prevent births. Secondly, sustained low fertility levels are supposed to lead to structural changes women's lives. The first argument suggests that the changes fertility changes in

different social contexts can be explained rather through individual terms than through institutions. The second proposition can be tested in contexts with high fertility levels, where women tend to spend a lot of time on childbearing and childrearing. In this case, if fertility decreases, the division of labor will not have such a great social importance among individuals and households.

Even though it is difficult to determine the causality suggested in the arguments presented above, the common view among demographers is that the change in women's lives occurs first and then it is followed by the decision to reduce family size. The opposite causality is used in order to argue that women reduce the family size in order to change their lives onwards. Based on these considerations, avoiding a birth is seen as an effort to change the future life course of individuals, not as an outcome of individuals' background and socio-economic characteristics (McDonald, 2000).

3.4 Theoretical approach

The paper aims at providing a thorough theoretical perspective explaining the adoption of new innovative behavior, namely the use of modern contraception. Since the study lacks data on cost of contraception and female employment, it is difficult to integrate the economic or the gender perspective in the theoretical approach. Therefore, the study will consider Coale's model, due to the availability of data allowing the study of socioeconomic variables related to ideational change. The diffusion of innovation model assumes that large scale behavioral changes can occur if material and cultural conditions are met. Since the main goal of the study is to establish what are the determinants of modern contraceptive use, this theoretical approach seems like suitable option. A more detailed explanation about how readiness, willingness and ability are captured in the study will be provided alongside with the definition of the variables employed in the statistical model.

4 Hypotheses

Based on the theories cited above, several expectations are developed. The association between partnership status, demographic, socio-economic factors and women's use of modern contraceptive methods can be concentrated into the following set of hypotheses:

- Demographic characteristics are expected to have a non-linear relationship with the use of modern birth control methods. Thus, partnership status, age and parity should have different effects on the current use of modern contraception. Age and marriage are expected to have a negative association while parity is expected to have a positive effect on the use of modern contraception. Therefore, younger women, with children, living in cohabiting or non-cohabiting partnerships should more likely to use modern birth control. (H1)

- Women wanting children are expected to be less likely to use modern contraception (H2)

- Socioeconomic characteristics such as education, income, settlement and region are expected to have a positive association with use of modern contraception. Thus, women with higher income and education, currently studying and living in urban areas in the Western part of the country are more likely to use to use modern contraception. (H3)

- It is expected that cohabitation should have a greater impact on the use of modern contraception in Poland than in Romania. Thus, cohabiting and non-cohabiting Polish women should be more likely than Romanian women to use modern birth control. (H4)

The hypotheses are consolidated while taking into consideration the restrictions and limitations imposed by the availability of data. Before turning section containing the test results, the following part of the thesis will provide an overview of the data and methods.

5 Data

The main goal of the study is to identify the relationship between demographic and socio-economic determinants of contraceptive use. In order to achieve this aim, I will employ first wave cross-sectional data collected from The Generations and Gender Survey (GGS) database which will be described in the first part of this section. In the second part of the section, a general description of the variables will be provided together with their expected association with the response variable.

5.1 Source material

The GGS contains a database providing high-quality data used in scientific research and policy making decisions. The main advantage presented by the GGS data is represented by its cross-national comparability due to the common features of the questionnaire components and methodology. Moreover, due to the availability of several survey waves coming in five years intervals, the data can be used in panel studies. The GGS consists of nationally-representative surveys that collect data on households, fertility, partnership dynamics, family planning, economic activities and gender relationships from 17 European countries, Australia and Japan. The large samples of respondents contain a broad age range from 18 up to 80 which allows significant research opportunities in fields such as demography, economics, social sciences and epidemiology (Vikat et al. 2007). The sample used in this study contains 19,986 for Poland and 11,986 observations for Romania. However, there is a large number of missing observations (14,629 for Poland and 7,646 for Romania) for the variable "Current contraceptive method used" which was used in the study. Since the sample was reduced only to women aged 18-49 who responded to the question regarding the use of current contraceptive method, the number of observations was reduced to 1,495 for Poland and 1,332 for Romania.

5.2 Variables

In this section, I will provide a brief overview of the dependent, independent and control variables employed in the study. First of all, I will indicate the way in which the variables are constructed. Secondly, I will provide the expected relationship between the variables in accordance with the demographic theories that have been previously mentioned.

5.2.1 Dependent variable

Current method of contraception

The main variable of interest (dependent variable) is binary ("Modern" versus "Other"). Modern birth control methods refer to safe and highly effective products or medical procedures that prevent pregnancy (see Table 1). The methods that do fit the definition of modern are labeled as "Other" methods which can be represented by both traditional methods (withdrawal and rhythm) and also by non-use of contraception. They can be classified by effectiveness to prevent pregnancies as follows:

Table 1. Classification of contraceptive methods by effectiveness

Modern	**Other**
Condom (85%)	No method (15%)
Pills (92%)	Withdrawal (73%)
Diaphragm/cervical cap (68%%)	Safe period method (rhythm) (75%)
Foam/cream/jelly/suppository 72%)	
Persona (94%)	
Contraceptive patch (92%)	
Injectables (e.g. Depo-Provera) (97%)	

Source: WHO, 2004

5.2.2 Independent variable

Partntership status

The independent variable is grouped in three categories: married, cohabiting and non-cohabiting. Married women are represented by those who are currently married and have either a cohabiting or a non-cohabiting partner. The category cohabiting is represented by divorced, widowed or never married women who are currently living with their partner in the same residence. The category non-cohabiting includes the same marital union groups as the cohabiting category with the difference that women in this group live in a separate residence than their partners. The category single is excluded from the analysis since the survey does not provide information regarding the contraceptive behavior of those who are not currently in a partnership. Married women are expected to be less likely to use modern contraceptive methods than cohabiting and non-cohabiting women due to a greater positive selection of the latter categories. This is based on the argument that in its early stages, cohabitation is regarded as an innovative behavior adopted only by a small and select group of individuals (Kiernan, 2002). The willingness dimension of Coale's framework is represented by the cohabiting and non-cohabiting variables due to their association with of new behavioral norms.

5.2.3 Control variables

Fertility intention

Fertility intention is assessed through the question "Do you intend to have a/another child during the next 3 years?". Fertility intention takes into account the desire of couples for having children. The variable "Yes" shows that both partners intent to have children. The variable "Maybe" is represented if only one of the partners has fertility intentions, while the variable "No" shows that none of the partners wants children. Those who have fertility intentions are associated with a greater likelihood of having children and a lower likelihood of using modern contraception. The "Fertility intention" variable is used as a proxy for readiness since it captures the individual's views on parenthood which can be a possible determinant of the adoption of birth control.

Age

The variable age is divided into three main categories. Age groups between 18 to 24, 25 to 34 and 35 to 49 are created in order to make a distinction between women in different stages of their reproductive age. It is expected that younger women tend to limit the number of pregnancies by using more modern contraception. Contraceptive prevalence is expected to be lower among older women. This is due to argument that younger women tend to have a better positive selection than older women due to the recent improvements in education and contraceptive knowledge. The access to modern contraception became more widespread only after the fall of communism which leads to the expectation that younger cohorts are more likely to have more access and knowledge to contraception and thus a greater propensity to use modern methods.

Parity

The number of children is expressed by the variable parity and ranges from zero to three or more children. Women with no children are expected to report lower use rates of modern contraceptive based on the assumption that they have not yet reached their desired parity. The parity predictor can be strongly related with the age indicator, since older women have more time to reach a higher parity. Women with more children are expected to be more likely to use modern contraceptive methods than based on the assumption that they have come closer to the desired parity.

Education

Education represents a proximate socioeconomic determinant of fertility. Higher education is generally associated with a higher propensity of using contraception. An argument that supports this proposition is that more educated women and less educated women have different demand for children and therefore they tend to be have different effectiveness levels when using birth control (Perelli-Harris et al., 2010). A higher use of effective contraception can be explained by several factors such as: highly educated women have greater access to birth control methods, they can face lower contraceptive costs, both financially and mentally, and they can be more efficient in using a certain type of contraceptive method. Education is also associated with older age groups since a higher educational attainment requires certain

time investments. Three education levels are distinguished: primary, secondary and tertiary. The first group consists of women with compulsory eight years education. The second category covers women with at least four years of secondary education which can even fall into the post-secondary but non-tertiary stage. The last group consists of women with university level education.

School enrollment

School enrollment describes the current educational status of women which can be either "Studying" or "Not studying". Since the current educational status is not captured by the variable "Education", the "School enrollment" variable was created. Engagement with studies is usually associated with the decision of postponing or avoiding childbearing and thus with a higher likelihood of using modern contraception.

Income

Income is another indicator for socioeconomic status used in the analysis. It is usually associated both with age and education since an older age allows individuals to become more educated which will subsequently lead to better career opportunities and higher earnings. To represent income, estimates of the average monthly income for 2005 are used. The amounts are expressed in euros and range between low, average and high with different values for the two countries. For Poland, a monthly income of less or equal to 600 euros per month is classified as low, between 600 and 900 is average and above 900 is high. For Romania, a monthly income less or equal to 400 euros per month is classified as low, between 400 and 700 is average and above 700 is high. A higher monthly income can reflect the ability to afford more effective contraception.

Residence

The variable residence is divided in urban and rural areas. The variable rural represents the share of women living in villages and sub-districts, while the variable urban is described by women who live in cities. Urban centers often have a greater access to both medical facilities and contraceptive commodities. Therefore, a positive relationship is expected between the variable urban and the use modern contraception.

Region

The variable region was considered in this study due to the large economic disparities in the two countries. For region, the reference category for both countries is "West". When dividing into regions, the distribution of the GDP per capita is considered. In Poland, the Western part of the country is the most developed region in terms of GDP per capita and employment, followed by South and North and lastly East. In Romania, the Western region is also the most developed followed by North, South and lastly East.

The ability dimension can be captured by the all the socio-economic determinants presented above, based on the assumption that a higher ability reflected by the socio-economic status of individuals can translate as a higher ability to access modern contraception.

Table 4.Summary statistics of sample distribution across variables

		Poland	Romania
Dependent variable	**Contraceptive use**		
	Modern	46,6%	52,1%
	Other	53,4%	47,9%
Independent variable	**Partnership status**		
	Married	82,5%	90,2%
	Cohabiting	10,3%	5,6%
	Non-cohabiting	7,2%	4,2%
Control variables	**Fertility intention**		
	Yes	12,1%	11,3%
	No	80%	84,3%
	Maybe	7,9%	4,4%
	Age		
	18-24	9,4%	5,7%
	25-34	36,2%	34,2%
	35-49	54,4%	60,1%
	No.of children		
	0	14,1%	12,5%
	1	27,2%	33,5%
	2	38,1%	39,6%
	3+	20,6%	14,4%
	Education		
	Primary	7%	2,5%
	Secondary	66,1%	86,4%
	Tertiary	26,9%	11,1%
	Currently studying		
	Yes	9,4%	6,2%
	No	90,6%	93,8%
	Income		
	Low	26,1%	14,3%
	Average	32,7%	19,2%
	High	41,2%	66,5%
	Residence		
	Urban	63,4%	59,2%
	Rural	36,6%	40,8%
	Region		
	West	25,4%	23,1%
	North	13,7%	11,6%
	South	29,1%	45,9%
	East	31,8%	19,4%
Observations		**1,495**	**1,332**

6 Methods

6.1 The Approach

The main research question of the study is trying to determine if there is any relationship between women's propensity to use modern contraception and their partnership status. Various demographic and socio-economic predictors will be modelled in order to determine the outcome.

The models will be tested through binary logistic regression determining the log odds of modern contraceptive use. The first stage will regress the dependent variable on the independent and control variables for the two countries separately. In the second stage, interaction effects will be determined in order to identify in which country does partnership status have a greater impact on the use of modern contraception. The analysis is conducted in a stepwise manner, by successively adding control variables which will allow the comparison with the previous steps. This type of regression represents a process of constructing a model by gradually adding or removing variables based on their t-statistics values.

Logistic regression is mostly used in cases when the dependent variable is dichotomous/binary. It is to determine the relationship between one dependent binary variable and one or more independent variables which can be either continuous, discrete, dichotomous or mixed. In the case of a logistic regression, the dependent variable is dichotomous which indicates an outcome such as presence or absence (Collet, 1994). The relationship between the response variable and independent variable is represented by a logistic regression function, which can be written as follows,

$$\pi i = Pr(Yi = 1|Xi = xi) = \frac{\exp(\beta_0 + \beta_1 x_i)}{1 + \exp(\beta_0 + \beta_1 x_i)}$$

where, , Y is the binary response variable and $X = (x_1, x_2, ..., x_k)$ is a set of explanatory variables for the observation i.

The binary regression model aims at explaining the probability of a binary dichotomous dependent as function of several covariates. It is different from the ordinary logistic regression in the way that the response variables are necessarily independent from each another. The bivariate logistic odds-ratio model can be represented as follows:

$$\psi = \frac{p_{11}}{p_{10}} / \frac{p_{01}}{p_{00}}$$

where ψ represents the ratio between the odds of Y_1 = 1 if Y_2 = 1 and the odds of Y_1 =1 if Y_2 = 0 and where ψ = 1 indicates independence between Y_1 and Y_2.

The general model used in the study can be represented through the following equation:

$$\pi i = Pr(modern\ contraceptive\ method = 1|Xi = xi),$$

where Xi= partnership status, fertility intention, age, parity, education, school enrollment, income, residence, region.

7 Empirical analysis

This section contains the results of the bivariate logistic regression presented separately for two countries together with the results of the interaction effect between country and partnership. The second part of the section provides a general discussion regarding the limitations related to data and theoretical approach.

7.1 Results

The first part of the results section provides the distribution of contraceptive use rates for various methods. It is clear from the first two tables that the two countries present similar patterns in women's choice of contraceptive method.

Table 2. Current method of contraception – Poland 2005

Modern	**Other**
Condom (27,4%)	Did not use or do anything (37,7%)
Pills (14,1%)	Withdrawal (5,7%)
Diaphragm/cervical cap (3,5%)	Safe period method (rhythm) (5,5%)
Foam/cream/jelly/suppository (0,3%)	Not applicable (4,3%)
Persona (0,1%)	
Contraceptive patch (0,6%)	
Injectables (e.g. Depo-Provera) (0,2%)	

Table 3. Current method of contraception – Romania 2005

Modern	**Other**
Condom (24,5%)	Did not use or do anything (23,8%)
Pills (18,2%)	Withdrawal (7,4%)
Diaphragm/cervical cap (0,3%)	Safe period method (rhythm) (15,3%)
Foam/cream/jelly/suppository (0,07%)	Not applicable (1,1%)
Persona (1,05%)	Other (0,1%)
Contraceptive patch (0%)	
Injectables (e.g. Depo-Provera) (0,5%)	
Intra-uterine device (coil, loop) (6,9%)	
Hormonal emergency contraception (0,3%)	

Table 4. Results of binary logistic regression of current use of modern method of contraception on partnership status in Poland 2005 presented as odds ratios.

	A.1	St.Error	A.2	St.Error	A.3	St.Error	A.4	St.Error	A.5	St.Error
Partnership status										
Cohabiting	1.604**	(0.275)	1.702**	(0.299)	1.351	(0.249)	1.530**	(0.276)	1.347	(0.269)
Non-cohabiting	3.052**	(0.667)	3.103**	(0.690)	2.695**	(0.644)	2.717**	(0.644)	2.430**	(0.638)
Married	1.000		1.000		1.000		1.000		1.000	
Fertility intention										
Yes			1.000						1.000	
No			2.759**	(0.499)					4.515**	(0.930)
Maybe			3.177**	(0.805)					3.895**	(1.046)
Age										
18-24					1.000				1.000	
25-34					0.583**	(0.124)			0.607**	(0.146)
35-49					0.333**	(0.074)			0.300**	(0.074)
No. of children										
0					1.000				1.000	
1					1.294	(0.250)			1.220	(0.260)
2					1.547**	(0.306)			1.267	(0.285)
3+					1.229	(0.270)			1.181	(0.295)
Education										
Primary							0.360**	(0.092)	0.353**	(0.095)
Secondary							0.741**	(0.097)	0.681**	(0.096)
Tertiary							1.000		1.000	
Currently studying										
Yes							1.810**	(0.364)	1.533	(0.345)
No							1.000		1.000	
Income										
Low							0.725**	(0.105)	0.673**	(0.102)
Average							0.840	(0.108)	0.843	(0.112)
High							1.000		1.000	
Residence										
Urban							1.000		1.000	1.000
Rural							0.782**	(0.091)	0.775**	(0.094)
Region										
West							1.000		1.000	
North							0.575**	(0.104)	0.539**	(0.101)
South							0.974	(0.141)	0.950	(0.142)
East							0.705**	(0.101)	0.739**	(0.109)
Constant	0.767**	(0.044)	0.305**	(0.053)	1.315	(0.298)	1.462**	(0.220)	0.847	(0.284)
Observations	1,495		1,495		1,495		1,495		1,495	

**** p<0.05, † p<0.1. Standard errors in parentheses.**

The analysis begins with the basic model (A.1) which uses the current partnership status as the only predictor for contraceptive use. In this model, the odds of a cohabiting woman being a user of modern contraceptives are 2.759 higher than those of a married woman. Non-cohabiting women have 3.052 higher odds of using modern birth control than those who are married. It is clear from the first model that the association between the predictor and the dependent variable is both substantial and significant.

When adding the fertility intention in Model A.2, the significance level for the two union status variables remains unchanged at 0.05 per cent level but their magnitude slightly increases. In addition, it is suggested that women who do not want children have 2.710 higher

odds than the ones who have fertility intentions, while the ones with possible intentions have 3.177 higher odds of using modern contraception. Both fertility intentions predictors are significant at a 0.05 level.

In model A.3, the age estimate suggests that each older age groups are associated with a decrease in the woman's odds of being a user of modern contraception. However, the number of children has a positive effect on the likelihood of using modern contraceptives. The age determinants are statistically significant at a 0.0.5 level, while the parity predictors are insignificant at this level, with the exception of the category of women with two children. The partnership status predictors decrease in magnitude, making the odds of cohabiting and non-cohabiting women to be somewhat lower than in the previous models. The significance of the category "non-cohabiting" remains unchanged at a 0.05 level, while the "cohabiting" becomes insignificant.

In model A.4, controls for socioeconomic characteristics are added. It is shown that a woman with primary and secondary education has 0.360, respectively 0.741 lower odds of being a modern contraceptive user. Those who are currently studying are also more likely to use modern birth control. Residents of rural areas with low and average incomes have lower odds than those who live in urban areas and who have high salaries. The likelihood of being users of modern contraceptives is highest for women living in the Western region of Poland, followed by women living in the South, East and lastly North. The partnership status predictor remains significant at a 0.05 level for both categories and increases slightly from the previous model (A.3).

Partnership status, fertility intention, demographic and socio-economic determinants are used in the last model (A.5) in order to establish the impact of all these predictors on the use of modern contraceptive methods. The effect of the partnership status decreases in magnitude for both its categories, but the "non-cohabiting" variable remains statistically significant at a 0.05 level. The fertility intention indicators are both significant and have a greater impact on the outcome than in model A.2. The significance levels remain the same as in model A.3, but the magnitude of the predictors becomes greater for age and smaller for the number of children. For the socio-economic variables, the significance level remains unchanged with the exception of the variable describing school enrollment. Also, their effect on the outcome decreases slightly, when compared with model A.4.

Table 5. Results of binary logistic regression of current use of modern method of contraception on partnership status in Romania 2005 presented as odds ratios.

	B.1	St.Error	B.2	St.Error	B.3	St.Error	B.4	St.Error	B.5	St.Error
Partnership status										
Cohabiting	0.928	(0.222)	1.013	(0.249)	0.936	(0.236)	1.053**	(0.261)	0.971	(0.266)
Non-cohabiting	9.998**	(4.720)	9.764**	(4.644)	11.851**	(6.020)	7.788**	(3.780)	4.631**	(2.443)
Married	1.000		1.000		1.000		1.000		1.000	
Fertility intention										
Yes			1.000						1.000	
No			3.381**	(0.665)					7.271**	(1.811)
Maybe			3.573**	(1.170)					4.467**	(1.562)
Age										
18-24					1.000				1.000	
25-34					1.017	(0.302)			1.052	(0.347)
35-49					0.600	(0.180)			0.412**	(0.137)
No. of children										
0					1.000				1.000	
1					1.845**	(0.402)			1.044	(0.271)
2					1.938**	(0.423)			0.890	(0.244)
3+					1.089	(0.274)			0.605	(0.187)
Education										
Primary							0.335**	(0.149)	0.300**	(0.141)
Secondary							0.823	(0.155)	0.662**	(0.135)
Tertiary							1.000		1.000	
Currently studying										
Yes							1.532	(0.419)	1.480	(0.428)
No							1.000		1.000	
Income										
Low							0.794	(0.141)	0.764	(0.143)
Average							0.763†	(0.116)	0.734	(0.117)
High							1.000		1.000	
Residence										
Urban							1.000		1.000	1.000
Rural							0.926	(0.115)	0.916	(0.123)
Region										
West							1.000		1.000	
North							0.897	(0.183)	0.829	(0.177)
South							0.769†	(0.110)	0.727	(0.109)
East							0.871	(0.152)	0.920	(0.169)
Constant	1.020	(0.058)	0.341**	(0.064)	0.846	(0.264)	1.596**	(0.323)	0.678	(0.282)
Observations	1,332		1,332		1,332		1,332		1,332	

**** p<0.05, † p<0.1. Standard errors in parentheses.**

From the second table, it can be noticed that the association between the two variables is significant in its first form for the variable "non-cohabiting" and not significant for "cohabiting". The odds of a cohabiting woman being a user of a modern method are about 0.928 lower than those of a married woman, while the ones of non-cohabiting women are 9.998 higher than those of a married woman.

The inclusion of fertility intentions in Model B.2 changes the importance of partnership status for cohabiting women. In this model, cohabiting women are more likely than married women to use modern contraception. Both fertility intentions indicators and the "non-cohabiting" predictor are significant at a 0.05 level. It is also suggested that women with no fertility intentions and those with possible intentions have higher odds than women who want children. The magnitude of the indicator is similar for both categories.

The Model B.3 does not make any changes in the significance level of the partnership status predictors. It is suggested here that women in the 25-34 group have 1.017 higher odds of being users of modern contraceptive, while women in the 35-49 group have 0.600 lower odds to use modern methods. The estimates for parity suggest that women who already have children are more likely to use modern birth control than those without children. The age determinants are not statistically significant in this model, but the parity predictors are significant at a 0.05 level.

The results from Model B.4 show that both variables for partnership status become statistically significant at a 0.05 level, when controlling for socioeconomic factors. Furthermore, it is indicated than women with primary education have much lower odds (0.335) of being users of modern contraception than women with tertiary education. Women with secondary education are also less likely to use modern birth control than women with high education, but their odds of by 0.823 are significantly higher than those of women with primary education. Women who are not currently studying and those who live in rural areas, are less likely to use modern contraception than those who are currently enrolled in school, living in urban centers. Women living in the Eastern part of the country are next most likely to use modern birth control after those living in the West. Those with the lowest odds are living in the Northern and Southern part of the country.

In the last model B.5, partnership status has the lowest impact on the use of modern contraceptive, as compared with the previous models. As in model B.2, fertility intention predictors are still significant but their impact is greater than in the second model. The parity predictors become insignificant and their effect on the outcome is diminished. For the age determinants, the changes made by this model are visible for the 35-49 age group, since the variable becomes significant. The effects of education remain significant, but smaller than in model B.4. Also, the effect of all the other socio-economic determinants decreases both in magnitude and statistical significance from the one stage to another.

Table 6. Results of logistic regression from the interaction effects between country and partnership status

Country	Odds ratio	Standard errors
Romania	0.752**	(0.061)
Partnership status		
Cohabiting	0.928	(0.222)
Non-cohabiting	9.998**	(4.720)
Interactions		
Cohabiting*Romania	1.727†	(0.509)
Non-cohabiting*Romania	0.305**	(0.158)
Constant	1.020	(0.058)
Observations	2,827	

**** p<0.05, † p<0.1. Standard errors in parentheses.**

The last stage of the analysis consists of interaction effect between partnership status and the country predictor. The interaction effect identifies whether Romanian women living in cohabiting or non-cohabiting unions have higher odds of being users of modern birth control than Polish women living in the same types of partnerships. This model does not control for

fertility intention, demographic or socio-economic factors, leaving the base effect of partnership status and country to be the only predictors of modern contraceptive use.

The base effect of Romania relative to Poland shows that Romanian women report 0.752 lower odds than Polish women to be users of modern contraceptive. The country base effect is statistically significant at 0.05 level. As indicated in the previous section, Romanian women in cohabiting partnerships have 0.928 lower odds of being users of modern contraception than married women. Conversely, non-cohabiting women have 9.998 higher odds to use modern methods. For the last category, the results are both significant and substantial. When taking into account the interaction effect between country and partnership status, the value and the significance level of the odds change. Cohabiting women in Romania have 1.727 higher odds than those of Polish cohabiting women to use modern methods. On the other hand, Romanian non-cohabiting women are less likely than the Polish ones to be users of modern birth control. Both values of the interaction effects are statistically significant at a 0.05, respectively 0.1 level.

7.2 Discussion

The first hypothesis of the study assumed that age and marriage should have a negative association with the use of modern contraception while parity is expected to have a positive effect. For the case of Poland, the association between partnership status and use of modern contraception was positive and significant in model A1. However, in model A.3, only the "non-cohabiting" variable was statistically significant. The age predictors were both significant and negative. With respect to the parity indicators, only one of the categories is significant, which partially confirms the first hypothesis.

In model B1, the results have indicated that only the "non-cohabiting" is statistically significant and positive which has led to the conclusion that there is not enough evidence to support the first hypothesis in the case of Romania. In addition, the number of reported cases of women in non-cohabiting partnerships is very low, which affects the results of the analysis. As opposed to the results from model A3, in model B3, the parity indicators are significant while the age predictors are not. Interestingly, women in the 25-34 age group showed higher odds of being modern contraceptive users than younger women in model B3. A possible explanation for this could be that older women are more likely to have completed higher stages of education which has a positive impact on the use and knowledge of contraception (Perelli-Harris et al., 2010). In addition, the proportion of women in the second age category is about three times larger than the share of women in the 18-24 category, which might have affected the results in favor of women in the 25-34 group. However, the results have indicated that there is not enough evidence to support the first hypothesis in the case of Romania.

The second hypothesis assuming that women wanting children are expected to be less likely to use modern contraception, was also supported by the results which were significant for both countries. However, for the case of Romania, the low reported numbers of women who

answered “Maybe” for the fertility intention question might have affected the odds value in favor of this category.

The third hypothesis suggesting that socioeconomic characteristics are expected to have a positive association with use of modern contraception has been confirmed for the case of Poland. The results have indicated that there is enough statistically significant evidence to support this claim. However, for the case of Romania, there is only enough evidence to confirm that women with primary education, average income and living in the Southern part of the country have lower odds to use modern birth control. The rest of the predictors are not significant. Furthermore, the findings have indicated that women with an average income are less likely to use modern contraception than those with low income, which is an unlikely supposition.

Lastly, the results have suggested that the fourth hypothesis, through which it was expected that Polish women should be more likely than Romanian women to use modern contraceptive methods, has been confirmed. The country base effect has indicated lower odds for Romanian women. However, when the partnership status was taken into account, cohabiting women in Romania reported greater odds to use modern contraception than those from Poland. Conversely, non-cohabiting Romanian women were less likely to be users of modern birth control than women from Poland in the same type of partnership.

7.3 Limitations

Before turning to the final part of the thesis, it is important to discuss some of the limitations of the paper. One of the drawbacks of the study is that the limited sample size might not ensure a representative distribution of the women living in cohabiting and non-cohabiting partnerships. Furthermore, the low response rates of approximately 30% of the survey question regarding the current use of modern contraception might also cause a non-response bias affecting the study. Therefore, the generalization of the results should be treated carefully.

Another limitation to the dataset consists of the lack of survey data from different years. Therefore, any comparisons with earlier or later years than 2005 cannot be ensured by this study since the survey data that has been accessed is only available for one wave. A further approach should be considered in order to depict the evolution of modern birth control in relation with partnership status in Poland and Romania. Thus, additional panel data sources should be accessed in order to study the patterns within the reproductive behavior in the two countries.

A possible disadvantage of the choice of the theoretical approach is that Coale’s framework might over-simplify the view on fertility and contraception decision of individuals. The study should also consider other theoretical models such as the economic and the gender perspective, but the lack of data limits the study only to this viewpoint.

8 Conclusions

8.1 Research Aims

The aim of this paper has been to examine the association between women's partnership status and their current use of modern contraceptive methods and to determine the potential influence of fertility intention, demographic and socioeconomic characteristics on the adoption of these methods. The study has been conducted using GGS data from Romania and Poland from 2005, which has given a cross-sectional dimension to the study that allowed the comparison of the two countries.

The general conclusion of the study is that the adoption of modern contraceptive methods is indeed driven by these demographic and socioeconomic factors. The paper has addressed two questions relevant for the issue of contraceptive use in relationship with union status: "What are the determinants of contraceptive use in Poland and Romania?" and "In which country does cohabitation have a stronger impact on the use modern contraceptive?". The highest use of modern contraceptive was found mostly among non-cohabiting and cohabiting women rather than among married women for Poland and partially for Romania. One assumption of the study was based on Coale's argument stating that when innovation diffusion takes place only if ideological changes have already occurred. Thus, if cohabitation is regarded as an ideological change, its effect on the adoption of modern contraceptive should be positive. This also opposes the claim that there is a negative social gradient among cohabitors (Sobotka, 2008), with the exception of Romania where they have indeed reported lower rates of modern contraceptive use. Once the basic model was adjusted for differences in demographic characteristics, the differences between married and non-married women decreased for the case of Poland, while in Romania they increased. When the model was adjusted for differences in socioeconomic characteristics, the differences between married and non-married women mostly decreased, excepting for Romanian non-cohabiting women. The findings were therefore consistent with the theory of diffusion of innovation, which showed that the spread of cohabitation can be regarded as the diffusion of positive beliefs reflected in the individuals' readiness, willingness and ability to adapt to new behavioral norms.

8.2 Research Objectives

The scope of the thesis was to enlarge the literature on contraceptive use for both Poland and Romania. The study contributes to the accumulation of more insight in the field of demography for the two countries. It is the first cross-sectional study on Poland and Romania examining the association between modern contraceptive prevalence and cohabitation.

Previous studies have approached these topics separately and for different time frames. In addition, the study contributes to the literature by considering variations in fertility intentions, demographic and socio-economic determinants of contraceptive use, which represents a novelty in its field given the cross-sectional perspective.

An additional goal of the paper was to provide an overview of the main fertility theories in the demographic literature while finding more practical implications for contraceptive behavior. The thesis has partially accomplished this goal since the empirical analysis of the study managed to incorporate the diffusion of innovation theory.

8.3 Practical Implications

Based on the results presented in the previous section, as well as on the theoretical considerations given in the first part of the thesis, the study has provided an extensive insight on the reproductive behavior in the two countries. One possible practical implication could be the provision of a general perspective on contraceptive use in two different legislative contexts regarding induced abortions. The study has provided a general overview of the factors driving fertility control decisions other than legislative. This could raise an interest in further examining the determinants causing women to limit family size in the context of decreasing fertility in Poland and Romania.

8.4 Future Research

As it was mentioned in the limitations section, the dataset that has been accessed for this study lacks data from different survey waves other than 2005. However, further research could be performed based on other data sources with more recent data on contraceptive use. Similarly, an interesting approach would be the comparison with the contraceptive trends prior to 1989. Therefore, the study could be expanded by adding observations from different years for a more in-depth analysis of how contraceptive patterns have developed throughout the transition period.

Furthermore, an extended theoretical perspective could be approached by considering economic and gender implications for contraceptive use. The study should therefore take into account different contraceptive predictors such as cost of birth control, women’s employment and their role within the household. This approach could provide a more insightful perspective on the reproductive behavior in Poland and Romania.

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Appendix A

The Boolean equation for the propensity to use a certain type of birth control method (S), following Coale's Ready, Willing, Able framework, can be expressed as follows:

$$S=R \cap W \cap A.$$

S is represented as a continuous variable, ranging from 0 to 1. R, W, and A are also assumed to be continuous, comprised between 0 and 1. Thus, the value 0 for R would be translated as having no advantages for limiting family size. 0.5 would signify a perfect balance between advantages and disadvantages, while 1 would imply only advantages for using birth control. Similarly, for W, there are the same assumptions but, from an ethical or religious perspective. With regard to this dimension, the score 1 would imply that there are no cultural or moral constraints in using preventive methods for limiting family size. For A, the value 1 would translate as total ability to control fertility.

Each individual in a population can have a particular score for each particular precondition. If a weakest link model is assumed, the score would consist of the smallest value of the three, Ri, Wi, or Ai. This can be expressed as follows: Si=Min (Ri, Wi, Ai) or S=Min(R, W, A) if the model is generalized to the entire population.

Assuming stochastic independence between the variables, the distribution of S=Min(R,W,A) can be determined from the following probabilistic model (where s can only take values between 0 and 1):

$$Pr(S>s) = Pr\ ((R>s) \cap (W>s) \cap (A>s))$$

$$= Pr((S>s)Pr(S>s)Pr(S>s)$$