



Childlessness and the Hajnal line: A real division or based on other contextual and individual factors?

A quantitative study

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Abstract

This thesis examines the phenomenon of childlessness and its manifestation across Europe in association with ideas of Hajnal's west and east division of Europe. I explore whether other potentially correlated factors explain this division. Specifically, contextual factors such as accession to the European Union or individual factors such as educational level or values associated with the Second Demographic Transition may explain the association with the Hajnal line. The data set used for analysis comes from World Values Survey 6 and stepwise logistic regression was used on women born 1959-1975. Results revealed that Hajnal's East and West division of Europe matters in terms of childlessness, and belonging to Western Europe increases the odds of staying childless, yet, the association between childlessness and European Union membership is robust, as well. Hajnal indicator appeared to absorb the difference in childlessness related to traditional values adherence, while positive association between tertiary education and childlessness revealed to be more robust in all contexts. The models have shown that accession with European Union is positively associated with childlessness and societies of EU are more likely to stay childless. The study has shown that a clear geographical or regional difference in childlessness can be identified, but whether it is related to cultural factors discussed by Hajnal or the developments related to EU accession is still not clear.

Key-words: childlessness; voluntary and involuntary childlessness; Hajnal line; EU-accession; second demographic transition; traditional values; Eastern and Western Europe

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Introduction

The European family pattern has always been unique, in comparison to other parts of the globe. During the 20th century, the European population has gone through a range of changes in perception of family, partnership and values related to it. Starting from the time of Malthus (1798/1960), positive and negative population growth has been observed from many various angles and still no consensus is reached, yet all the arguments support the idea that each population's goal is to increase itself by means of fertility, which is embedded in nuptiality. Some decades before, marriage functioned as a birth-control measure, when out-of-wedlock childbearing was stigmatizing and considered indecent (Engelen & Puschmann, 2012). Desire for self-realization and overall movement towards more individualistic lifestyles have decreased the value of children, and led to the development of certain family behaviors. Voluntary childlessness is one of them; it is an escalating phenomenon particularly in Western societies and continual increase of the voluntary childless population is forecasted through social, cultural and economic changes (Peterson, 2015).

As Europe is generally known for lowest low fertility (see e.g. Weselowski, 2015), continued increase in childlessness causes a lot of concern. From European population perspective, the increase in childlessness is a negative factor: high childlessness can decrease total fertility, causing disproportional population structure and redistribution of financial resources due to forthcoming shortage of population in working ages. On the individual level, unwanted childlessness can lead to psychological distress and increased loneliness (Miettinen et al, 2015), affecting happiness and wellbeing. Childlessness can cause stigmatization among peers, even if it was chosen voluntarily (Lampman & Dowling-Guyer, 1995), and a deficit of instrumental care and emotional well-being needed in older ages (Goldscheider, 1990; Miettinen et al, 2015).

Some scholars argue that variation in European family formation and childbearing behaviors are significant from a geographical perspective - John Hajnal (1965) in his thesis advocates that differences in Eastern and Western European patterns of union formation are existent; moreover, he argues that those differences can be applied geographically in the form of a line. Hajnal (1965) asserted that the level of celibacy in Western Europe of 19-20th centuries was higher than that of Eastern and Central Europe, same as ages of first union formation and birth were lower to the East. Hajnal in his thesis talks about celibacy in relation to childlessness, since he explored demography

in the past, when the term “celibacy” in statistics was meant to be a synonym of “not entering a marital union” and, in this way, staying childlessness. In nowadays Europe, trends of family behavior discovered by Hajnal appear to be still in existence -indeed, women in Eastern and Central Europe societies appear to be less often childless and opt more for marriage than in Western (Sobotka, 2008; Rowland, 2007). This idea supports findings of Hajnal and makes them applicable for exploring childlessness systematically in contemporary European society.

Other factors that have developed in recent history make it unclear whether the basis for this geographical division can be understood according to Hajnal’s arguments only. For example, apart from Hajnal division, contemporary Europe can be also assessed and divided geographically from the perspective of membership in European Union (hereinafter -EU). Each country intending to join the Union must meet certain requirements, which act as a guarantee that social and economic conditions of potential member are stable enough to join the Union (European Commission, 2012). Presumably, countries classified as non-members of EU might not be able to achieve the same level of socioeconomic stability yet. As socioeconomic conditions are related to childlessness levels within a society, I would anticipate differences in childlessness in contexts of EU-countries and non-members.

Adherents of the second demographic transition explain childlessness through changes in values, from traditional gender roles and family values towards post material values, equity of genders and women’s empowerment (see e.g. Lesthaeghe, 2014; Sobotka, 2008). Another reason for the East and West difference is that the SDT began much earlier in the West, because communist regime was present in the Eastern countries for longer time (Hiekel et al, 2014), and changes associated with the SDT have not developed as far as they have in the West yet.

A variety of opinions on the topic and absence of robust conclusions makes one wonder about the meaning of context for explaining childlessness. Since many scholars (e.g. Perelli-Harris et al., 2010; Kalmijn, 2007; Fahlén & Oláh, 2013) argue for the significance of educational attainment in relation to self-selection into a fertility career, especially when approaching decision to bear the first child, I would like to examine how education is related to childlessness as well.

Hence, I would like to study the issue of childlessness in Europe in terms of Hajnal thesis and additional contextual variables which might be relevant for interpretation. The main question for my study is following:

- Is the Hajnal line still a relevant tool for predicting variations in childlessness?

Other studies have answered this question by visually observing rates in different countries and no study has yet systematically answered this question. If the Hajnal line is statistically related to childlessness, the second question in this thesis is the following:

- Can this division be explained rather by different levels of educational attainment, differences in traditional value orientation or by accession to the European Union?

The aim of this study is to conduct a quantitative research using data from World Values Survey database, which contains observations from numerous countries for the period of 2010-2014. To execute my investigation, I extract countries lying to the East and West of the Hajnal line, group them together by East or West location, and then define those countries by their membership in EU. The sample will include all women born 1959-1975. Logistic regression is to be used as research method. The following sections provide a theoretical framework, brief literature review on the subject of childlessness, methodology, results and conclusion with followed discussion.

Theoretical framework and previous research

The theoretical framework and previous studies related to the subject will be presented in this section. I will review the thesis of Hajnal (1965) and theory of second demographic transition in order to discuss factors, including contextual and individual characteristics, which are relevant to the phenomenon of childlessness across Europe.

Hajnal line

In 1965 John Hajnal discovered a unique European marriage pattern, which was persistent only across Europe and nowhere else at least two centuries up to 1940. Hajnal (1965) geographically divided Europe into two parts, each exhibiting an exclusive family formation pattern. The “European” pattern included countries lying to the West of the line; and “non-European” was represented by Eastern and South-Eastern blocs of countries (ibid.). Geographically, the line was drawn roughly from Leningrad (Saint Petersburg at present) to Trieste (see Appendix I). According to Hajnal (1965), differences were historically embedded into household types and economic constraints- in Hajnal’s non-European population households are large and joint family form prevails (Kalmijn, 2007), thus, supportive family ties make marriage and further entering into childbearing possible to happen even when economic prospects are poor (Dixon, 1971). For further convenience, European and non-European patterns will be named as “Western” and “Eastern”, respectively, in order to be consistent with terminology used by other scholars. Particular qualities of Western European pattern are remarkably different from this to the East - in Western societies, age at first marriage and the proportion of never married are higher and larger than those in Eastern bloc (ibid.).

European society has changed a lot from Hajnal times in family-related values. For defining unmarried population, Hajnal (1965) used the term “celibacy”, and nowadays this term may be interpreted differently. As Engelen and Puschmann (2012:389) advocate, during the first demographic transition marriage was seen as a fertility control measure, meaning that fertility within wedlock became “unrestricted”. Hajnal wrote his thesis on the edge between the first and the second transitions, in 1965, meaning that he could not take into account new concepts and reasons of marital union. One of the specific changes family institute has experienced during the era of second demographic transition, is increasing number of consensual unions and its identification with

conjugal unions (ibid.), meaning that neither celibacy nor childlessness could be defined just by the fact of marriage. Likewise, Sobotka and Testa (2008) say that, in the case of Hajnal studies, celibacy could be identified with absence of marriage, and childlessness derived from it, because in times observed in Hajnal studies, marital union was still particularly meant for reproduction. Even though the changes in marital and childbearing behavior appear to be universal, Sobotka (2008:176) suggests that yet the diversity between countries is enormous, driven by their variations of “culture, history, family policies, and different pace of secularization”. The highest childlessness in Europe is found in Austria and Western Germany (ibid.) (both belong to the Western bloc and are members of European Union) , meanwhile shares of childless women are smaller in countries of Eastern Europe (Figure 1; Testa, 2007).

Changes in marital and childbearing behavior can be explained by the theory of second demographic transition (hereafter called SDT), when, even though attitudes towards parenthood and marital unions remained generally positive, voluntary childlessness and non-family living arrangements have risen rapidly (ibid.), wedlock stopped being a measure of controlling fertility (Engelen & Puschmann, 2012), and marriage became more of an optional, than mandatory act, even for childbearing. Taking this statement as a starting point, the division of Europe from the point of Hajnal and the line proposed by him can be used for examination and comparison of childlessness across contemporary Europe.

Childlessness as manifestation of second demographic transition

In order to fully understand the phenomenon of second demographic transition, there must be mentioned some introductory descriptions of the first demographic transition. Lesthaeghe (2014) defines the first transition as “classic” and refers it to historical declines in mortality, as well as in fertility, which started in Europe in 18th century. In early 1970s, the end of this transition were forecasted to occur, as soon as fertility would reach replacement level of just over two children per woman, population growth would be zero and lifespan would exceed 70 year; formation of household would be redirected towards nuclear and conjugal types and sustained immigration for demographic need would be necessary (ibid.). After the baby boom of the 1960s and following the baby bust of the 1970s, those prognoses were transformed, and then fertility fluctuations were seen

as adaptive after labor-market conditions of those times (ibid.), and this was a beginning of second demographic transition in Europe.

Even though low fertility and childlessness are two different aspects of fertility behavior, Sobotka (2008: 188) advocates that the rise in childlessness can be seen as an “aspect of low fertility”, due to “a substantial proportion of childless men and women in Europe, [who] do not intend to have a child, or are uncertain about their parenthood intentions”. As parenthood ceases to be a ‘natural’ part of individual biographies and the main goal in a woman’s life, voluntary childlessness becomes a broadly accepted option (ibid.). This has led to a rise in the proportion of people who are undecided about whether they will have children later in life.

In contrast to first demographic transition, the second demographic transition does not determine population equilibrium as a final goal. Lesthaeghe and van de Kaa in 1986 (mentioned in Lesthaeghe, 2014), argue that tendencies from 1970 and onwards were to bring sub replacement fertility, a variety of forms of relationships and living arrangements other than marriage, distinguishing between wedlock and procreation and absence of stationary population per se. Lesthaeghe (2014) suggests that the second demographic transition triggers a multitude of social challenges, such as aging, integration of immigrants and cultural adaptation, instability in partnerships, increase in household complexity and poverty, as well as emergence of exclusive forms of household, such as lone parents and single individuals. Weselowski (2015:88) argues that “the theory of the second demographic transition postulates that prospective parents have altered their assessment of economic, psychological, and structural costs and benefits of childbearing, thus lowering their fertility intentions”. Reasons of this event are grounded in individuals’ aspirations to realize their personal goals and enjoy individualistic lifestyle longer (ibid.).

Education and career are considered to be aspects of self-realization, and these aspects differentiate childlessness as well - in most of the European countries higher-educated women have the highest levels of childlessness (Sobotka, 2008). This manifestation of SDT is more frequently observed in countries where career attachment and educational attainment are incompatible with motherhood because of “lack of childcare facilities, low level of labor flexibility, low gender equality within the family, or the prevailing normative pressure on mothers to interrupt their work career” (Sobotka, 2008:203). In other countries, women’s emancipation and unwillingness to quit leisure activities in favor of parenthood are reasons of choosing a childfree lifestyle (Sobotka, 2008). Along with SDT development, motives of entering parenthood were changing profoundly - having a child stated to be seen less as a duty, rather than as a result of a cautiously planned decision of

individual(s), who has carefully considered all the possible issues of parenthood and the consequences it might have for one's relationship, lifestyle, and economic well-being (ibid.). Instead of viewing childbearing as a normatively-bound decision, SDT postulates parenthood as a matter of "individual self-fulfillment and private joy" (Sobotka, 2008:177).

A great comparative summary of transitional features was presented by Lesthaeghe (2014: table 1) in form of detailed overview on demographic and societal characteristics of first and second transitions. There he mentions that the era of second demographic transition is remarkably different from first by, inter alia: 1) rising symmetry in sex roles, rising female education levels, greater female economic autonomy; 2) increasing of cohabitation, both pre- and post-marital; 3) rising definitive childlessness among women ever in a union and 4) appearance of "higher order" needs : individualization and autonomy, changes in perception of work and values towards socialization, self-actualization, recognition, democracy and tolerance. Based on Lesthaeghe's and Sobotka's assumptions on female emancipation and higher acceptance of post materialist values within society, one can anticipate those changes to be positively associated with childlessness in most contexts, however, in case of Eastern Europe those associations are probably somewhat less pronounced than in Western, and this is one of the questions current study seeks to answer. Since changes in childbearing norms (according to SDT) were still ongoing in countries of Eastern bloc in fertility ages of my cohorts chosen for study, while cohorts of Western countries have were mostly done this phase (see e.g, Merz & Liefbroer, 2012; Sobotka, 2008;), Hajnal's "non-European" population of Eastern bloc should still turn out to be less childless; even though most of population of this region has gone through regime and economic collapse, this type of constraints has influenced fertility rates, but not childlessness as much (Merz & Liefbroer, 2012).

Childlessness and education

Childbearing norms, which used to provide parents with social esteem in times of the first demographic transition, depreciate, and the desire to have children now gives way to new childbearing intentions, based on quality of life, which includes career pursuits and educational attainment (Wesolowski, 2015).

Oláh and Fratzak (2013) have mentioned in their chapter, that in some literature investigating childbearing decisions, desires and intentions are sometimes used interchangeably, however, it is more preferable to draw a clear distinction between them. Heiland et al. (2005) have defined the difference between intentions and desire as follows: *desire* depicts individuals' ideal and preferred family size; *intentions* characterize somewhat more concrete childbearing plans, and thus intention may be assumed as better measure of future fertility career. Ideal family size is grounded in social norms (Oláh and Fratzak, 2013), while intentions are embedded in one's own situation and its appropriateness for desire realization, which may include educational attainment. Intentions may also include considerations about constraints individual may meet on a way to desired size of a household (Heiland et al., 2005; Oláh and Fratzak, 2013), such as high opportunity costs of children. In cases of future uncertainty of economic situation and employment, some people are more likely to invest time and efforts in enhancing their position on the labor market, which makes some postpone or refrain from childbearing (McDonald, 2002; in Oláh and Fratzak, 2013). Higher education provides opportunities for gaining resources for building a family (Oláh and Fratzak, 2013), same as education gradient can be understood as "a proxy for the opportunities and resources available to women and subsequently transmitted to their children" (Perelli-Harris et al, 2010:775). Education gradient may reflect social stratification based on socioeconomic situation of each strata, it may shape their family behavior and attitudes towards childbearing (ibid.). Oláh and Fratzak (2013) suggest that studying childbearing intentions is crucial for understanding actual fertility behavior, as well as it allows accounting for socioeconomic and biological barriers, caused by prolonged education career, what is even useful in terms of approaching and understanding the phenomenon of childlessness.

Higher education for women can be accessed as a path to better financial situation and secures positions in the labor market (Frejka, 2008), which makes women more independent and provides them with more alternatives to choose self-realization beyond family (Rowland, 2007), however, waiting too long until a better financial time by extending labor market experience for childbearing is a common way to female childlessness (see e.g. Oláh and Fratzak, 2013; Rowland, 2007). Yet, employment activity for women has proven to have a negative relation to childlessness in countries located in Central and Eastern Europe (Miettinen et al, 2015), which supports the idea of Sobotka and Testa (2008), that in this region desires to have a child are stronger and more of a "duty", if compared to career attainment. These facts allow me to make an assumption, that educational attainment prior employment in Eastern and Central Europe are more of a way to

enhance one's wealth prior to first childbearing, than to reach self-realization goals. This might mean that in case of Eastern bloc, the effect of tertiary education on childlessness is less.

Higher education attained by women may act as an obstacle for engaging in a partnership, because "mismatch" and "limited independence" within a unit might not be worth it (Lundberg and Pollak, 2015), since lower education may reflect a weaker position in labor market; and, in case of countries with traditional perception of labor division, where man must be a breadwinner, woman obtained tertiary education may be assumed as less attractive for partnership among lower educated men. Wirth (2007; in Nitsche et al, 2015) stated that childlessness is somewhat more common among couples with different educational attainment among partners, compared to couples, where both potential parents have reached higher education level. Since self-selection into parenthood is strongly dependent on partnership, the educational factor is important for approaching childlessness, and it must be influential for making decisions of self-selection into childbearing, as well as for understanding abstinence to engage into fertility career. Women across all regions in contemporary Europe are generally more enrolled in tertiary education than previously (Nitsche et al, 2015); thereby, the effect of higher education on women childlessness is anticipated to positive and somewhat less in Eastern than Western blocs.

Childlessness and traditional family values

The second demographic transition encouraged a shift from material values to post-material values, which, in fact, according to Inglehart (2000) is just an aspect of the change from modern values to postmodern values. Inglehart (2000) argues that postmodern values are related to prosperity and, in contrast to modern norm, to self-seeking realization, female emancipation and general lack of interest for material possession (Ungureanu, 2015). Postmodern societies are more individualistic; people operate more for the honor of self and not for society, which involves "a romantic life, human skills development, expression of individuality, emphasis on environmental protection, and interest for cultural topics even in conditions of opposition to economic interests" (Ungureanu, 2015:92). Generally, postmodern norms are associated more with cultural heritage and gender equality, than with traditional gender roles or value of children.

Apart from normative changes, the second phase of demographic transition is also known for secularization of society (Kalmijn 2007; Engelen & Puschmann 2012; Sobotka 2008). While value changes in the West have started to occur somewhat earlier, countries to the other side of the Iron Curtain exhibited some robust altering in standards and views (Sobotka, 2008). Sobotka (2008)

believes that post-communist countries have experienced a perceptible attitudinal development at the end of the 20th century. Weselowski (2015:88) supports the idea of Lesthaeghe, saying, that manifestations of the second demographic transition are still ongoing in Central and Eastern Europe, “especially as people continue to postpone marriage and childbirth despite the economic recovery”. Likewise, Kowalska and Wróblewska (2008) advocate, that postmodern values are prominent and spreading across Central and Eastern European countries among the younger generations; although, value transformation is happening considerably slower and to a lesser degree compared to Western Europe. Sobotka (2008) affirms those findings, saying that development of new family attitudes and norms is connected to the second demographic transition, even in post-communist countries

Statistically, Sobotka and Testa (2008) show that family-oriented values are still very much pronounced in Central and Eastern Europe, including Slovenia and Hungary, which can be assumed as a manifestation of Hajnal line, because, according to Hajnal (1965), Hungary and Slovenia belong to the Eastern bloc. Nevertheless, manifestations of transition across Eastern European countries are still heterogeneous - some of them exhibit both high acceptance of postmodernist values and, moreover, all the attributes of the behavioral changes referred to the second demographic transition, meanwhile other country representatives in the East do not show the same level of acceptance, even when some behavioral changes connected to the second demographic transition are present (Sobotka, 2008).

Review of previous studies enables one to claim, that adherence to traditional family values is important; however, the extent to which those factors actually matter for childlessness is expected to be different in Hajnal’s Western and Eastern blocs due to different path of value altering. I would expect traditional values to be more relevant in the Eastern bloc.

Childlessness and European Union accession

Changes in policies, labor, educational opportunities, currency and population mobility must have had an impact on fertility behavior, including abstinence from childbearing. Being a member of the European Union provided citizens with mobility within European Union to work and study, which increases one’s chances to increase income or career possibilities (Krings et al, 2013). Beyond work-related mobility within European Union, some scholars have recognized a growing overlap between economic and non-economic motives for moving (Krings et al, 2013). Individualization of society, post-materialistic values and desire of self-realization made people

move across borders for non-material reasons (Wallace, 2001). In relation to childlessness, which can be driven by absence of a proper partner to start a family with; European Union accession opens more possibilities for meeting and importing partners from another region or culture. Consequently, coming from non-EU countries might complicate or rather restrict access to larger marriage or partnership markets. Enlarged access to the labor market and mobility provides financial stability, yet some members of European Union might not have enjoyed advantages of accession as much, as the other. Accounting for accession with European Union, its timing and abstention from it might reveal some considerable effect when defining self-selection into childlessness (Guedes et al, 2015).

Despite differences in opinions on topic of profitability of EU accession, policies of European Union, financial and social prerequisites each country must meet, can be seen as productive conditions for childlessness decrease. Being a member of European Union does not imply that member-countries have totally identical cultural and economic background. Sobotka (2008) emphasizes that cultural and economic diversity of Europe is enormous, and attention must be paid to this fact when approaching childlessness in Europe. Czech Republic, Estonia, Slovenia, East Germany, and Hungary still appear to be very secularized and rather liberalized (ibid.). Religiosity plays a crucial role in shaping family values in countries like Poland, Romania and Slovakia (ibid); meanwhile, Western countries like Western Germany and Northern Europe are classified as most individualized ones, where manifestations of SDT are mostly prominent. Group of countries, which were historically distinct from the West (especially before the Second world war) is represented by predominantly Christian Orthodox and Muslim countries, for instance, Ukraine and Moldova (ibid.) (in our case, are also those countries not being a member of EU), which have had a unique path of economic restructuring under 1990s, and are still in phase of “large-scale economic privatization, opening of the economy, and market reforms” (Sobotka (2008:189.)). Varieties of developmental paths have led to “widely divergent outcomes and a vast differentiation in the overall economic performance and living standards” across countries in Europe (Sobotka (2008:189.)). Nevertheless, in order to join EU each single country must have fulfilled some common requirements, set up by European Commission (2012); those are:

- political criteria: stability of institutions guaranteeing democracy, the rule of law, human rights and respect for and protection of minorities;
- economic criteria: a functioning market economy and the capacity to cope with competition and market forces;
- administrative and institutional capacity to effectively implement the *acquis* and ability to take on the obligations of membership.

(Criteria copied unchanged from European Commission, 2012)

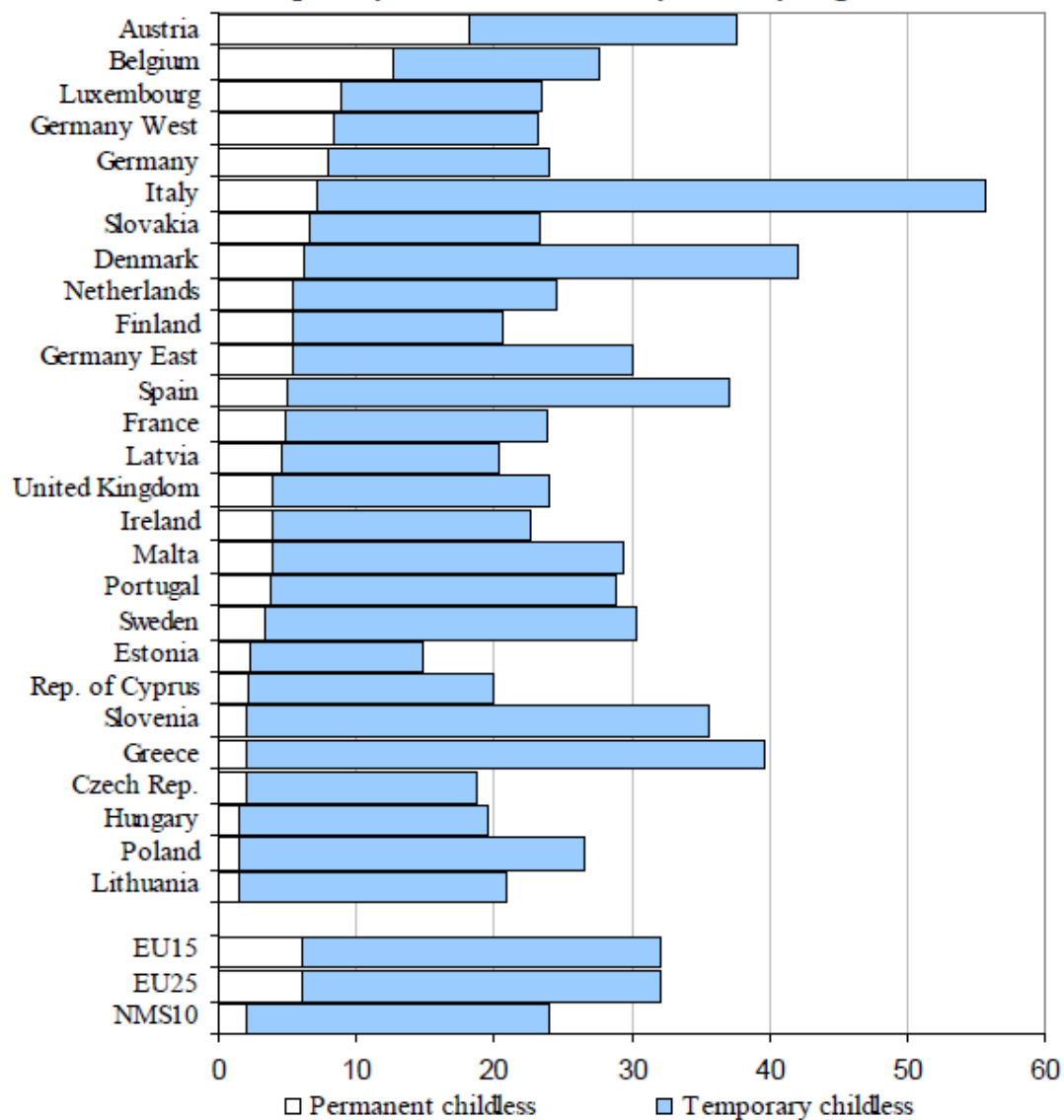
Based on this demands, it can be assumed that each country of EU have already gained economic, political and institutional stability to a larger extent, than those not members of the union.

According to SDT, liberalization of society and movement towards market economy led to modifications in family-related values. Greater economic and political stability have a positive influence on diminishing opportunity costs for childbearing, provide more gender equity in child rearing for both parents, and enables larger investment (of all kinds) into a child from both partners (Becker and Barro, 1988; in Wesolowski, 2015); socioeconomic stability of EU should have a negative association with childlessness. Although all EU members must have reached some sort of common level of welfare and economy, Sobotka (2008) postulates that transition towards post-materialist values was not ubiquitous across Europe, thus, neither was it ubiquitous across countries of Union. However, countries located to the West of Hajnal line entered EU before those, located to the East (European Union, 2016), which can be due to their (Western countries') quicker transition from material to post material values.

Keeping this diversity in mind, I expect non-members of European Union to be less developed in second demographic transition, same I expect from members of EU located in Central and Eastern Europe; and, as far as changes in fertility, family, and living arrangements are not as pronounce in Eastern countries as in Western, values and attitudes towards childlessness are still expected to be closer to traditional than in non-EU countries. Self-selection into childlessness is still a matter of childbearing preferences and desires, even though literally it is an absence of those. Maria Testa (2007) has compiled an ultimate study on childbearing preferences and family issues in Europe. Although the ideal family size is a matter of personal preference, traditionally one may believe that desired number of children in nowadays Europe must lie around replacement level or 2 children per household. Testa (2007) in her work refutes this idea by computing a table of permanent and temporary childless women by country located in Europe and being member of European Union, aged 25-39, where groups present amount of females in childbearing ages who are childless in the moment of observations, but have intentions to deliver or adopt a child in the future, and the other group of females, who are childless as well, but do not have any plans to have any

children in future. **Figure 1** (Testa, 2007: figure 3)

Permanent and temporary childless women by country. Ages 25-39



It is visible that temporary childlessness, related to postponement of childbearing, is observable in many European countries, but it only has a decreasing effect on actual family size, and supposedly does it temporarily (ibid.), while permanent childlessness is anticipated to become more stable over time and must have an effect on the finally intended family size, and it can be considered as marginal phenomenon (Testa, 2007; Sobotka, 2008). Austrian and Belgian permanent childlessness indexes are leading among the EU-25 countries. 18% and 13% of Austrian and Belgian women have opted for a childless family. The rest of the European countries have less than 10% of women who report themselves as permanently refraining from childbearing (Figure 1).

Studies of more recent cohorts reveal that the trend of childlessness will continue to strengthen (Sobotka, 2005; Frejka, 2008). Trends are already varying in time across regions: in

Northern and Western Europe the childlessness increase started with the birth cohorts of the late 1940s; in Southern Europe, among the 1950s cohorts; and in Central and Eastern Europe, it started with the 1960s cohorts (ibid.). Women born after 1970 in regions with high childlessness, for instance, West Germany, England, Wales (ibid.) and Austria (Sobotka, 2008) are 30 percent under the risk of remaining childless. More common range of childlessness across later cohorts in Europe is expected to lie between 15 and 22 percent (Frejka, 2008)

Graph (Figure 1) presented by Testa (2007) can be also accessed through the Hajnal division. It is clearly observable that the share of permanently childless women is considerably larger in countries belonging to the Western part of Europe. All countries of Eastern bloc are on the bottom of the graph, what stays for their low intentions of permanent childlessness. However, Testa (2007) does not observe childlessness in any non-EU country, rarely other researchers do. Frejka (2008) brings Russian federation into childlessness discussion, saying mostly that childlessness behavior of this country is not much different from the rest of Central and Eastern European countries. Ukrainian trends in childlessness are rising, but Perelli-Harris (2008) finds it highly unlikely that those trends will be similarly high as they are in countries of Western Europe. As childlessness data and its causality is hardly accessible for Eurasian countries not being members of EU, I would argue that those countries are expected to rise in childlessness due to socioeconomic uncertainties, but to a smaller degree than childlessness is expected to rise in EU members. It is hard to say, though, would the Hajnal line be more topical than EU accession for explaining childfree trends in society, but Hajnal division is anticipated to be more representative for childlessness, since it captures cultural differences more, than just socioeconomic.

Childlessness - voluntary vs involuntary

Historically, the most common reason for staying childless in all societies is a failure to marry or simply the absence of a proper partner to start a family with; even nowadays, the lack of a partner still remains one of the major reasons (Miettinen et al, 2015). Within the European context, single women are the most likely to be childless, while married women are the least likely to be

childless (see e.g. Miettinen, 2015), which goes in line with Hajnal's (1965) view upon family patterns; yet, the share of childless healthy and sexually active women, who are married or cohabiting, continuously enlarges (Coleman, 1996; Miettinen, 2015). Although, as cohabitation and out-of-wedlock fertility is becoming more and more common, especially in Western societies, marriage as precondition for first childbearing weakens. In post-communist countries of Central and Eastern Europe, changes in fertility behavior appear as a response to the altering socioeconomic situation: higher educated childless women were resisting admitting new forms of relationships suitable for further childbearing longer, than highly educated women in West (Sobotka, 2008). As in Western society premarital cohabitation were more common than in East, and STD made it prolonged or unnecessary to be premarital at all; the decision to have a first child within cohabitation became more acceptable, while in the East cohabitation was not counted as a stable form of relationship or suitable for childbearing, because cohabitation was associated with its general economic constraints and insecurity (Sobotka, 2008). Long-lasting difficulties in finding a stable partner to form a marital union with are important for understanding phenomenon of childlessness.

Under last forty years, changes which have occurred in culture and politics have transformed perception of childbearing and increased financial opportunities in order to afford a child, as well as enhanced welfare made childbearing and working for women more compatible (Peterson, 2015). Western countries have "better institutional child-care arrangements and high female labor force participation, have relatively high birth rates compared with Central and Eastern European countries, where low birth rates have been observed following the collapse of communism and the development of a capitalist market economy" (Merz and Liefbroer, 2012:591). This has resulted in increased costs of childbearing in countries of Eastern bloc, due to economic restructuring and uncertainties (ibid.). Inability to afford a child might be a reason to postpone childbearing or to refrain from it, if socioeconomic conditions would not develop in future.

In spite of the fact, that women in Western societies have finally gotten financial independence and personal fulfillment even after entering motherhood, yet some women are still choosing to remain childfree for the sake of increased opportunities and wider choices, grounded in freedom and autonomy (Peterson, 2015). Previous studies identify the whole range of reasons, such as - absence of "maternal instinct"; general antipathy to children; fear of painful childbirth; humanitarian concerns about population growth; career aspirations, and; more satisfactory partner relationships (Peterson, 2015). Frequently mentioned reason of childfree lifestyle is still "a feeling

of freedom it affords” (Houseknecht, 1987). Voluntary childlessness is often explained by freedom of choice or “women's ultimate liberation” (Movius, 1976:61). Movius (1976:62) interprets childfree lifestyle from the point of advantages it offers for women - “[...] enough time to have a life of her own, an equal sex role status to men and a more successful career life”.

Apart from motives connected to self-fulfillment and self-realization, volunteer childlessness can be also driven by feministic protestation against motherhood as part of the suppression and control of women, preventing them to develop self-dependence (Veevers, 1979). This statement allows us to define voluntary childlessness as a way to create feminine identity unrelated to motherhood (Wood & Newton, 2006).

Childlessness can derive out of economic constraints (Sobotka, 2008; Frejka, 2008); moreover, women are more prone to forego parenthood than men, because of opportunity costs of motherhood than of fatherhood (Merz and Liefbror, 2012). In terms of Hajnal line, financial constraints are supposed to be less influential for childlessness in the East due to the supportive function of the joint family, however, in countries leading in SDT (Western bloc), the association between childbearing and wealth turns to be reversed - wealthier families tend to have fewer children (in Miettinen, 2015) or skip childbearing in favor of self-investment.

According to assumptions made by Engelen and Puschmann (2012), Hajnal's (1965) view of sexual abstinence and reluctance to enter marital union in the past could be translated nowadays as unwillingness to bear and raise any kids. However, childlessness may not only be the matter of self-selection, but of other factors interfering. Biological infertility is one of them, and, even though infertility is an involuntary form of childlessness, social perception of this issue is still negative. Lampman & Dowling-Guyer (1995) find it unfortunate that usually childlessness is the only infertility aspect that society notices. Social norms and standards say that couples should have children (Miall, 1985), and being a couple missing a kid is considered as abnormal and potentially stigmatizing way of being, partly due to misconceptions that being childless is always a choice one makes. Interesting though, that voluntarily childless people are treated by general public the same way as involuntarily - research exhibits that “voluntarily childless couples are seen as unhappily married, psychologically maladjusted, emotionally immature, materialistic, career driven, selfish, lonely, unhappy, and misguided in their choice to remain childless” (Lampman & Dowling-Guyer, 1995:214). Lampman & Dowling-Guyer (1995) call this scene for “commission of the fundamental attribution error” - a propensity to withdraw conclusions based on a dispositional rather than situational attributions of others' behavior. All factors stated above contribute to development of

stigmatization of childfree couples; those who are involuntarily childless are put under stressful conditions of stigmatization, and sometimes even use adoption as a coping strategy (ibid.). Eastern European view on childbearing is that a child is a mandatory condition for achieving happiness in life (ibid.) and that makes childlessness less prevalent, while in Western societies childbearing is not seen as a need of highest order anymore. Although tolerance towards childlessness, both voluntarily and not, have increased in all countries, which went or are currently going through STD, the phenomenon itself is still less tolerable to the East of the Hajnal line (Merz and Liefbroer, 2012; Lesthaeghe, 2010; Sobotka and Testa, 2008). On the whole, previous studies have revealed that, in term of approval of voluntary childlessness, Northern and Western European countries have shown the highest level of voluntary childlessness acceptance, followed by Southern Europe. Approval rates appeared to be lowest in former communist Eastern European countries (ibid.), confirming, that SDT is not manifested as much in Eastern as in Western block yet, and reasoning of childlessness are mostly grounded in financial limitations, than in transformation of values (Sobotka, 2008), which makes one expect a clear difference in childlessness degree between countries lying to the East and West of Hajnal line.

Apart from stigmatization in general, infertility is known for being strongly socially referred particularly to women (ibid.). Miall (1985) reveals results of the interviews, where infertile women were perceived to be so due to some psychological or sexual problems, rather than men. Childfree men are rather seen as socially normal and acceptable phenomenon, and it has several explanations—first, unlike in women’s case, men’s childrearing is not defined by strict biological frames, which makes it difficult to decide when can we state that a man is permanently childless; second, men are socially considered as “fulfilled” independently of their parenthood status, in contrast to childfree women (Valenti, 2015). As it was mentioned earlier, Western European countries are claimed to be front-runners of second demographic transition, including a greater acceptance, in comparison to Eastern Europe, of all kinds of demographic behaviors that deviate from traditional family norms—voluntary childlessness is considered to be one of them (Lesthaeghe, 2010; Sobotka and Testa, 2008). Involuntary childlessness is not grounded in purely physical constraints. Wesolowski (2015) adduces that in industrialized countries, the level of environmental pollution plays an important role in shaping one’s fertility desires. Apart from having a direct impact on male semen quality, low birthweight and miscarriages (Wesolowski, 2015), people’s concern about environmental pollution and adverse health outcomes caused by environmental pollution is proven to lower fertility intentions drastically. Hogan and Marandola (2005) and Wesolowski (2015) suggest that

technological hazards caused by environmental contamination can be accounted as substantial for making a child-rearing decision, because of its effect on costs and benefits of childbearing itself. This was the case in Eastern Europe, specifically in post-Chernobyl Ukraine, when societal concern about childbearing and environmental situation suitable for it was widespread (ibid.).

Even though it is statistically almost impossible to distinguish between involuntary and voluntary childlessness, it is assumed that share of voluntarily childless have increased substantially (Peterson, 2015). The proportion of women who chose to stay childfree in the 1960 cohort in Western, industrialized countries such as Sweden and Italy is approximately between 4 and 7 percent (ibid.). Some of those women did not choose to stay childless permanently; rather they have postponed it until the ages when fertility is essentially reduced (Merz and Liefbroer, 2012). Abilities to find a partner and engaging in stable form of relationship are relevant for women's childlessness in all contexts. Enhanced economic position of women has played role in voluntary childlessness increase in West; however, in Eastern context, women labor and expansion of tertiary education in conjunction with deficit of alternatives for self-realization outside the family were still more supportive to early marriage and childbearing, than to cohabitation and first child postponement (Sobotka, 2008).

Since Sobotka and Testa (2008:239) advocate for the idea that in countries of Central and Eastern Europe childbearing is seen as a "duty towards society" more than in Western societies, and that notion goes in line with Hajnal's (1965) ideas, I can expect childlessness to be much higher in Western bloc than in Eastern.

Data and method

The data used in this study comes from the World Values Survey, hereafter WVS, wave 6, which seeks to utilize the most rigorous, high-quality research designs in every country of observation. According to WVS (2010-2014), the survey itself covers 57 countries around the world and more than 85,000 respondents, providing relatively good sized samples. Since I am aiming to access information from different parts of Europe including developing and developed countries, this data is very suitable to my needs, because it is known for being the only academic study to cover the “full range of global variations, from very poor to very rich countries, in all of the world’s major cultural zones” (ibid.). The WVS is helpful for understanding changes in the beliefs, values and motivations of the global population. These data have also been broadly used by scientists in various fields in order to analyze the links between cultural factors and economic development (ibid.). In this study, the data set is exceptionally suitable due to its orientation on values and context, and because it covers a substantially wide range of countries lying to the East and West in Eurasia.

To explore associations between childlessness and region or/and accession to EU, method of stepwise logistic regression will be utilized. Logistic regression is suitable for my research question because childlessness is a statistically dichotomous variable, and logistic regression is a tool for predictive analysis on a binary variable (Statistics Solutions, 2016). I begin with estimating bivariate models to see the total variation in childlessness associated with a single indicator of Hajnal line. The same type of model will be run for childlessness and its association with EU accession. Then I will explore how the influence of residing East or West of the Hajnal line and EU membership is moderated by gradually controlling for other potentially important factors one by one. Four additional regression models will be presented; each is supposed to reflect the effect of characteristics of individual level and contextual aspect. Individual level characteristics include educational attainment and values related to traditional family norms. Individual level variable “tradition” will be built upon answers on questions, which are positive towards traditional family values and gender roles in particular. Educational attainment variable, which is also individual, is existent in original data set. Accession with European Union is a contextual variable, because it exhibits geographical specification. My models aim to estimate the relationship between contextual and individual characteristics and childlessness, and to show how the Hajnal line indicator performs when other population characteristics are accounted for.

To create my sample from the variety of countries observed, I have extracted those located in Europe and Eurasia. Those countries are Azerbaijan, Armenia, Belarus, Estonia, Georgia, Germany, Kazakhstan, Kyrgyzstan, Netherlands, Poland, Romania, Russia, Slovenia, Spain, Sweden, Ukraine and Uzbekistan. The East and West division was done in accordance to Hajnal (1965); the Western bloc includes Estonia, Germany, Netherlands, Spain and Sweden; the Eastern bloc consists of Azerbaijan, Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Poland, Romania, Russia, Slovenia, Ukraine and Uzbekistan.

A single variable called “West” was created, including Western counties coded as 1, and Eastern counters coded as 0. Then the division of countries was made in accordance with European Union accession (European Union, 2016). A single variable “member” was generated. Thus, countries of European Union available in data set are: Germany, Netherlands, Spain, Sweden, Poland, Estonia, Romania and Slovenia. Azerbaijan, Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Russia, Ukraine and Uzbekistan are not associated with EU. Members and non-members of European Union were coded as 1 and 0 respectively.

The variable depicting childlessness was based on question V58: “How many children do you have?”, where answers coded 1 and above are answered by those having one or more kids.

The sample contains women who were at least 39 by the time of the survey, by which time they had experienced the majority of their childbearing careers, in order to obtain as many observations as possible. Countries were under observation in different years, from 2011 to 2014. I have categorized cohorts by year of birth 1959-72 for survey year 2011, 1959- 73 for 2012, 1959- 74 for 2013 and 1959- 75 for 2014. The reason I do not observe women born before 1959 is to make sure all women in the sample have experienced the majority of their fertility career after the fall of communism, so that we can see avoid a confounding effect of this contextual factor. Even though many of Central and Eastern European countries were part of the Soviet Union or the communistic camp, it would not be objective to define differences in childlessness using Soviet Union accession as a comparative angle. The communistic regime and its pronatalist policies were aimed to replace the dead in the postwar Soviet Union by introducing taxation system for small families, bachelors and single citizens, by making the governmental pronatalist support affordable (Kaminsky, 2001). The economic stimulation of childbearing by the Soviet government during the 1940-50s makes it impossible to assess the development of SDT in relation to childlessness and the changes in values in the societies of former Soviet countries. Thus, using Hajnal indicator as a comparative angle captures the variety of household formation and its types, while the EU accession reflects the path of

SDT across Europe. Years of age of these cohorts on the date of survey therefore varies from 39-55. All men were dropped from observation, due to complexities in definition of their fertility ages. All in all, 3088 respondents are included.

Variable “educ” (education) was drawn from responses to question number V248: “What is the highest educational level that you have attained?” There the respondents were asked to choose their educational category out of 9 categories. It was decided to concentrate on those who have described their education level as “the University-level education, with degree” and the rest of responses were categorized as less educated. Sample size of this category is 782 respondents.

In order to evaluate values toward traditional gender roles, the following questions were used (Figure 2):

Figure 2. Questions representing adherence to traditional values, and codes of answers accounted

Question ID	Text of the question	Answers taken into consideration, as coded in survey
V45	When jobs are scarce, men should have more right to a job than women	Agree (1)
V47	If a woman earns more money than her husband, it's almost certain to cause problems	Agree (1)
V48	Having a job is the best way for a woman to be an independent person	Disagree (3)
V50	When a mother works for pay, the children suffer	Strongly agree (1) Agree (2)
V54	Being a housewife is just as fulfilling as working for pay	Strongly agree (1) Agree (2)

When a respondent answered according to the third column, they were assigned a value of 1 for that variable and these were then summed to create a score that indicates how many questions to

which they answered with a traditional response. The lowest score in this variable was coded as (not traditional at all); the highest was coded as 5 (very much traditional). The value questions selected for observation are the only those that reflect the research questions, i.e. those representing adherence to traditional family values and gender roles. There were no questions representing value of children available in survey.

Results

This part presents results of logistic regression of six models in total, two of them are bivariate and four other regression models are adjusted for additional covariates. The results are presented in Figure 3.

Model 1

In this section the variable “childless” was tested for association separately with variable, representing the Hajnal division. Adjusting for division reveals, that Hajnal’s idea of the line appears to be supported – so far in countries belonging to Western bloc, the likelihood of staying childless is 2.4 times higher than those of Eastern countries. .

Model 2

The second model intends to investigate how the Hajnal division correlates with childlessness when adjusted for education. The Hajnal division is still significant; odds of childlessness in the Western bloc are 2.46 times higher than those for the Eastern bloc. Adjusting for higher education increases odds of childlessness in 1.33 times, comparing with lower educated women.

Model 3

The third model intends to investigate how the Hajnal division correlates with childlessness when adjusted for education and traditional values. The Hajnal division is still highly significant; odds of childlessness in the Western bloc are 2.28 times higher than those for the Eastern bloc. Adjusting for higher education continues to increase odds of childlessness in 1.33 times; yet, traditional values are not shown to have any statistical correlation with childlessness, when the Hajnal division and education are controlled for (OR=0.92; $p>0.132$).

Model 4

Accession to the EU also appears to be important for understanding childlessness –the model shows that odds of staying childless are 2.03 higher for women in countries being member of EU, that those of non-members.

Model 5

This model tests if there is any statistical relation between childlessness and EU membership, when accounting for tertiary education. Higher education reveals to be relevant for understanding the phenomenon of childlessness, increasing its odds in 1.33 times; odds of childlessness in countries within EU are 2.11 times higher than those of non-members.

Model 6

The last model is designed to find any associations between childlessness and EU membership, when adjusted for education and adherence to traditional values. Traditional values do not appear to have any robust statistical relation to childlessness ($OR=0.91$; $p>0.116$), however, neither have they diminished much the significance of relationships between childlessness and other factors: odds of staying childless within EU are 1.92 times higher than outside EU and tertiary education still increases odds of childlessness in 1.32 times.

The Bayesian Information Criterion (BIC) and Akaike's Information Criterion (AIC)

The Bayesian Information Criterion test and Akaike's Information Criterion are means of model selection. AIC and BIC calculate two information criteria used to compare models, based on log-likelihood function. The model which has smaller AIC and BIC fits the data better, than any other one with larger criterion, thus, models with smallest AIC and BIC are more preferable (Stata, 2016). Out of six models run, models number two and five give a better fit to data and the outcomes of this model can be assessed as the most informative.

Figure 3. Comparing associations between childlessness across Europe in relation to Hajnal line, EU membership, educational attainment and traditional values.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Hajnal line						
West	2.39***	2.46***	2.28***			
East	1	1	1			
EU accession						
Member				2.03***	2.11***	1.92***
Not a member				1	1	1
Education						
Lower/missing		1	1		1	1
Completed tertiary		1.33*	1.31*		1.34*	1.32*
Tradition						
Traditional values			0.92 p= 0.132			0.91 p= 0.116
Constants	0.083	0.076	0.089	0.08	0.073	0.089
AIC	2004	2002	2002	2020	2018	2018
BIC	2016	2020	2026	2032	2036	2042

* p<0.05,** p<0.01,***p<0.001

Conclusion and discussion

The main question raised in the introduction to this essay was following:

- Is the Hajnal line still a relevant tool for predicting variations in childlessness?

Analyzing the findings obtained from the statistical models presented above, I can draw a conclusion that a difference in childlessness is statistically observable in countries located to the East and West of Hajnal line, and women in societies of countries belonging to Western bloc are found to be prone to staying childless on average two times more than those of Eastern. This result supports the ideas of Hajnal, that the line roughly drawn from St Petersburg to Trieste reflects differences in childbearing behavior, at least in terms of childlessness.

The second question of this thesis took a critical approach to the Hajnal division by considering whether differences related to contextual aspects, such as EU accession, or higher educational attainment and adherence to traditional values may explain the association with childlessness across Hajnal line. Specifically,

- If Hajnal line appears to be relevant, can this division be explained rather by higher educational attainments, differences in traditional value orientation or by accession with European Union?

Joining the EU was shown to have a predicted effect on childlessness, increasing likelihood of childlessness within EU in almost 2 times. Countries that joined the Union are mostly Western countries, yet, their availability in my data set is restricted. This notion to a limited extend supports Hajnal's idea of higher childlessness in Western counties, as well. Considering findings above, one may conclude that, even though the Hajnal line appears relevant to childlessness, the difference between East and West of the line is very similar to the difference between EU members and non-members. It may indicate that a clear geographical or regional difference in childlessness can still be identified, but whether it is related to cultural factors discussed by Hajnal or the developments related to EU accession is not clear.

Modelling has shown that not only Hajnal indicator, but both the Hajnal line and EU accession are statistically relevant for understanding different manifestations of childlessness; however, models adjusted for Hajnal indicator can be considered as more informative due to their

lower AIC and BIC indexes. This finding reflects the descriptive findings of many other scholars—childlessness as a phenomenon is less pronounced in Eastern Europe than in Western. The reasons for that might be grounded in the prevalence of supporting joint families and a higher value endowed to children, as well as the strongly promoted social norm of at least one child per household in the East (Frejka, 2008; Dixon, 1971).

Educational factor appeared to be relevant for predicting childlessness likelihood both in Hajnal and European Union contexts. Remarkably, education was shown to increase the likelihood of staying childless to almost similar extent of approximately 1.3 times both in case of Hajnal division and EU membership. This result may be interpreted as a manifestation of second demographic transition across Europe, and it may indicate that tertiary education is prone to have a positive association with childlessness even in societies that are on their way to complete second demographic transition.

Traditional values were shown to be insignificant in all models presented. Interesting though, that after running robustness checks, where childlessness was tested for being associated with traditional values in a bivariate model, it was revealed that adherence to traditional family roles solely decreases childlessness reduces by 20 percent ($p=0.00$). Although association between childlessness and traditional values when adjusted for other variables is statistically insignificant, testing correlations of traditional values with childlessness when Hajnal indicator is adjusted revealed that the Hajnal line association was similar to its odds in the bivariate model that was designed to assess the association between childlessness and Hajnal line only. A similar finding appeared for models related to EU membership. These findings reveal that both Hajnal division and EU accession “absorb” the effect of traditional values by turning association insignificant. This finding goes in line with assumptions made earlier – traditional family values differ across Europe and their impact on childlessness is negative."

Hence, the main conclusion I can draw is that in contemporary Europe, female childlessness is strongly and positively related to women's higher educational attainment and to adherence to traditional values, which are absorbed by Hajnal division, because Hajnal theory is grounded in it. Hajnal line appears still to be essential for understanding the phenomenon of childlessness; the same appears for European membership division, even when adjusted for other contextual variables. This may be assumed to be a sign of some geographical difference present in relation to European childlessness pattern; however, it is still unclear whether it is related to Hajnal's explanation or EU membership because both seem highly correlated.

The greatest limitations of the current research are small number of countries located to the West of the Hajnal line and few contextual variables adjusted, due their limited availability in data set. Controlling for more characteristics at the individual level would have given more reliable results, as well as accounting for men to achieve more generalized findings.

Another limitation of this study is a little number of Western countries available in data set. The countries selected for study are the only ones available in the World Value Survey Wave 6 data. This limitation may also have affected the findings.

Suggestion for further research

Hajnal line appeared to be relevant for childlessness, not just for celibacy. However, the present study is devoted only to female childlessness, and phenomenon of male childlessness is still a subject to discuss. Miettinen, et al. (2015) agree that defining ages of male fertility is complex issue, but they decided to set a limit at 50-55 years, arguing that childless men after their fifties remain childless. Studies have shown that the Netherlands, Germany and Austria have the highest proportion of childfree men of early thirties (about 60%), while in Romania, France, Poland, Lithuania and Russia the share of thirty year old men who did not start their fertility yet is smallest (below 40%). Ten years later the situation has changed –the proportion of childless forty years old men in the Netherlands, Germany, Finland, the Czech Republic and Italy is 25%. Examination of life-time male childlessness of cohorts born 1956-65 reveals that in Finland, Italy, Germany, the UK and the Czech Republic around 25% of men remaining childless, whereas while Estonia, Russia and Georgia have only 10% permanently childless men (ibid.). It would be interesting to find out whether men of Western societies are more childless due to postponement of childbearing or due to some other continual changes in society, and how it will evolve in the future among men of later cohorts. Further investigation of contextual issues, related to male childlessness, is required in order to fully support Hajnal theory in relation to overall childlessness.

Since EU membership appeared to be statistically associated with childlessness, another suggestion for further research can be to test the association between timing of EU accession and childlessness. Testa (2007: figure 3) computed a table showing childlessness across European Union countries, and it is observable that bringing new members into the picture (mostly countries of Eastern bloc), compared with observing only EU 15 (older members) significantly diminishes childlessness proportion. Thus, timing of unification with EU is anticipated to be significant for self-selection into childlessness, because most of the countries which joined EU latest are those which have not accomplished second demographic transition yet (European Union, 2016; Sobotka, 2008). This idea can give a beginning to further investigation.

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Appendix I

Visualization of Hajnal line across contemporary Europe (own drawing, map obtained from Google Pictures)

