



Yıl / Year: 2021

Cilt / Volume: 11

Sayı / Issue: 21

Sayfalar / Pages: 30-56

Araştırma Makalesi

Gönderim Tarihi: 15.01.2021

Kabul Tarihi: 04.03.2021

AN EMPIRICAL INVESTIGATION ON THE SOCIOECONOMIC DETERMINANTS OF DIVORCE RATES IN CEE COUNTRIES

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Abstract

The paper examines the relationship between divorce rates and socioeconomic variables in CEE countries whose economic and political regimes were changed from communism to capitalism. Factors such as regime change have been ignored, although there are many studies that examine the impact of changing gender roles and female labor force participation on the family structure. This study focuses on the impact of socio-economic impacts on divorce as well as regime change. Panel LM unit root test was used with the aim of finding out whether the destabilizing effect of divorce rates in CEE countries was permanent after the regime change. Also, panel data regression was employed to determine the social factors that affected divorce rates from the years between 2008 and 2017. The Czech Republic appears to have left behind the shock effect it experienced on divorce rates, which is considered to be a result of the country's closeness to liberal values from past to present. The result of panel regression was supported the fact that growth rate and openness have a significant negative effect on divorce rates.

Key Words: Divorce Rate, Socioeconomic Transition, Panel Data Analysis.

Jel Codes: J12, Z13, C23.

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Atıf/Citation

Çuhadar, P. and Cafri Açı, R. (2021), "An Empirical Investigation on the Socioeconomic Determinants of Divorce Rates in CEE Countries", *Dicle Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 11(21), s.30-56.

MDA ÜLKELERİNDE BOŞANMANIN SOSYOEKONOMİK NEDENLERİ ÜZERİNE AMPİRİK BİR ARAŞTIRMA

Öz

Bu çalışma, ekonomik ve siyasi rejim değişimi ile komünizmden kapitalizme geçen Merkezi ve Doğu Avrupa (MDA) ülkelerindeki boşanma oranları ile sosyoekonomik değişkenler arasındaki ilişkiyi incelemektedir. Değişen cinsiyet rollerinin ve kadınların işgücüne katılımının aile yapısı üzerindeki etkisini inceleyen birçok çalışma olmakla birlikte rejim değişikliği gibi faktörlerin etkisi çoğunlukla göz ardı edilmektedir. Bu çalışma, sosyo-ekonomik faktörlerle birlikte rejim değişikliğini boşanma üzerindeki etkisine odaklanmaktadır. Çalışmada MDA ülkelerindeki boşanma oranlarının istikrarsızlaştırıcı etkisinin rejim değişikliğinden sonra kalıcı olup olmadığını belirlemek amacıyla 1960-2016 yılları için LM panel birim kök testi kullanılmıştır. Ayrıca, 2008-2017 yılları arasındaki boşanma oranlarını etkileyen sosyal faktörleri belirlemek için panel veri regresyonuna başvurulmuştur. Elde edilen bulgular, geçmişten günümüze liberal değerlere yakınlığı ile Çek Cumhuriyeti'nin boşanma oranları konusunda yaşadığı şokun etkisini geride bıraktığını göstermektedir. Panel regresyonu sonucu, büyüme hızı ve dışa açıklığın boşanma oranları üzerinde önemli bir olumsuz etkiye sahip olduğu görüşünü desteklemektedir.

Anahtar Kelimeler: Boşanma Oranları, Sosyoekonomik Geçiş, Panel Veri Analizi

Jel Kodları: J12, Z13, C23

INTRODUCTION

Family is the first institution where an interaction between an individual and a society occur. The institution of family is established through marriage and it is disintegrated through divorce. Balestrino et al. (2013) presented a remarkable increase in divorce rates particularly in Western societies. Considered to be a solution to the problems of the industrialized society, welfare state, which has taken over many functions of family, has also created a significant dissolution in the institution of family. Many Catholic Western countries, which had previously not accepted and prohibited getting divorced for centuries primarily due to religious reasons, could not resist the change that the industrialization process imposed on the social structure. In relation to this, studies on family began to be a part of the literature with the beginning of industrialization (Meriç, 1989). Cross cultural analysis about family and marriage studies focus on traditional characteristics of marriages instead of divorce. Evolutionary feminism approaches addresses changes in society within framework of gender and kinship relations. Cross nation comparisons highlight women's participation in labor market and divorce linkages (Hendrix and Pearson, 1995). Economic point of views about divorce also include the cost and benefit of divorce, gender roles with acceptance level of women's economic and social independence in the society, conflicts about house chores and its effect on work-family conflict (Cerrato and Cifre 2018; Horne and Johnson, 2018; Pearson

and Hendrix, 1979; Ono, 2003), property rights related with unilateral divorce law (Gray, 1998).

The aim of this study is to examine the relationships between socioeconomic variables and divorce in Central and Eastern European (CEE) countries, whose economic and political regimes were changed from communism to capitalism. Regime change in CEE had impact on not only economic and political institutions, but also social institutions such as family. Social transformation came with regime change is a specific research area with the sudden nature of its impacts on CEE countries (Friedlmeier and Friedlmeier, 2012). The interaction between an individual and a society is a complex subject. The complexity arises when the concept of “individualization” and “differentiation” are brought together which are a kind of conflicted area for self identification and autonomous social systems. These processes can be considered as the reasons why fields such as science, economy, family, religion, politics, legal system and morality have turned into separate social systems. This separation caused society’s shared meanings and common values to be lost. The loss of such meanings and values caused social institutions, which were previously stable thanks to the behavioral factors created by the different roles that individuals had within a society, to become uncertain and lose their functions. The situation is not any different for the institution of family, which is seen as the foundation of a society (Balerdinelli, 2002). Aside from modernism's effects on individuals and societies, the transformation from communism to capitalism changed all political and institutional structures as well as material resources, business opportunities, shared knowledge and beliefs, individuals and individual relationships suddenly. However, it is also worth stating that there were historical and cultural differences among the countries in this region before the socialist regime was founded as well as the differences after they became members of the Soviet Union. Similarly, there is no homogeneity in the policies applied after the regime change. (Thornton and Philipov, 2009). In respect to this, divorce tendencies in CEE countries as a cross national investigation, need to examine within framework of socioeconomic impact of regime change.

Until the 1960s, divorce rates in Central and Eastern European countries were higher than other countries, and the legal regulations contributed to it. The rate of having children remained low for a long time in the region, as well. During the 1970s and 1980s, data about family and marriage became stable, especially as a result of the labor market regulations and

social support of the regime (accommodation support, in particular). Young individuals could get married and have children early in life in the absence of unemployment or a competitive system (Sobotka, 2011). The relationship between the communist state and its people was inconsistent with the western concept of social citizenship. The similarities in the policies during the communist period and the tendency to encourage having children were shaped in accordance with the state paternalism, citizenship and gender ideology that was embedded in the political structure. There were also constraints on abortion and contraceptives. Additionally, there were general maternity benefits, and the state provided childcare support. Mothers' needs were taken into consideration under the communist party's family policy and the general gender ideology (Fodor et al.2002).

Without any gender discrimination, everyone was encouraged to work and be productive under the communist regime. However, the decrease in female fertility rates over time led the state to make new policies about family. The regime obligated women to work for approximately 70 hours per week, often in limited sectors and for lower wages. Women's political representation in the communist regime was also insufficient. The state had social control through family. Even they had restricted political representation and heavy working conditions under communist regime, the transition process was detrimental to women's these restricted social and economic gains. Gender patterns within sectors began to change; women lost their jobs and public services became limited. The transition process resulted in an increase in domestic violence and divorce rates (Chorvát, 2007; Polert, 2003).

Following the fall of communism, the countries that previously had similar institutions during the communist era adapted to the market economy at different paces based on their own characteristics. The system changes in the countries that used to be governed with central planning brought about high unemployment rates, immediate poverty, decline in living standards, and regional differences. Studies show that the demographic change in Central European countries and the Baltic States was greater than in Eastern European Countries, and that the marriage age increased while the number of children decreased. The psychological pressure arising from the economic difficulties during the transition process prevented marriages from having stability. Even though the social policies of each country were different, the overall field of social policy became more restricted than the previous regime era, and this complicated the process of solving problems. Remaining distant from religious institutions during the previous system led to a lack of social support mechanisms that were

needed in the transition period (Basten and Frejka, 2015; Robila, 2004, 2011; Thornton and Philipov, 2007).

This study aims to carry out an empirical examination on the relationship between divorce rates and socioeconomic variables in Central and Eastern Europe (CEE) with the help of panel data analysis. Accordingly, a panel LM test was used in the first stage of the study as it takes evident structural breaks into consideration and is able to give single results for each unit. Whether or not the regime change had a permanent destabilization effect on the institution of family, which is thought to be more stable prior to the regime change, in Central and Eastern European countries between 1960 and 2016 was examined. In the second stage, panel regression analysis was used to examine the relationship between divorce rates and socioeconomic variables between 2008 and 2017. However, due to data restrictions, the time dimension in the study was limited. The limitations on the study sample, particularly the limitations on reaching the economic data from the communism period, restricted the interpretation and methodology applied in panel data. The study aims to formulate the impact that economic institutions which were reshaped with the regime change, had on family via divorce rate as a social institution. Moreover, the study makes a fundamental contribution by assessing the relationship between divorce rates and socioeconomic variables in Central and Eastern European countries by applying methods that differ from previous empirical studies. Therefore, the second part of the study provides an evaluation of the studies that reflect the relationships between the divorce factors and socioeconomic factors. In the third part of the study, the related data is given; the fourth part introduces the method and the fifth part discusses the findings obtained from the empirical analyses. Finally, the conclusion part presents an overall assessment.

1. LITERATURE REVIEW

The literature explaining the reasons behind divorce can be divided into four subgroups (Olah, 2015):

- The first group of approaches focus on the norms, values and behavioral patterns that changed from a cultural point of view (Clayton et al., 2013; Heaton et al., 2001; Leopold, 2018; Yip et al., 2015; Yodanis, 2005).
- The second group of approaches addressing the tendencies in the family structure is the economic approach, which highlights the structural changes. The economic

approach deals with women's independence and their higher participation in labor force and business life. One economic point of view proposes that women's inclination towards higher education or their later transition into adulthood is also a result of postponing the process of having family and children (Becker, 1991; Balestrino et al., 2013; White and Rogers, 2000).

- The third approach, i.e., gender-based approach focuses on the changing gender roles (Polert, 2003; Thornton and Philipov, 2009)
- The fourth and last group of approaches found in family studies, addresses welfare state and the effects of social policies. This approach looks into the impacts of a state's withdrawal from social areas where it could otherwise provide family protection (Fodor et al., 2002; Robila, 2012).

Clayton et al. (2013), Heaton et al. (2001), Yip et al. (2015), Yodanis (2005), are examples for the first group of studies. In relation to cultural factors, Heaton et al. (2001) worked on Indonesia. In their study found a negative correlation between women's education, women's employment and divorce. They established that those who got married at a later age had higher education levels, chose their own partners themselves and lived in cities. They also found that the people who were getting married for the first time had a lower tendency to get a divorce. The study suggested that the legal institutional structure and genders had a low impact on divorce. Economic developments, industrialization and increasing education levels changed the lives of both highly educated and poorly educated women. Consequently, contrary to Western countries, marriages in Indonesia gained stability due to the social transformation that occurred after the industrialization of the country. In her paper, Yodanis (2005) studied the gender inequality levels in marriages based on how household chores were distributed and who provided for the family, while also examining the acceptability of divorce. The findings of the study indicated that divorce rates were low in Catholic and collectivist countries such as Italy, Philippines, Poland, and Ireland due to strong family ties while they were high in countries such as USA, Canada, Sweden, Norway. The study also found that gender roles changed in all of mentioned countries. According to this, when data obtained at individual level was reviewed, it was concluded that the distribution of household chores was more equalitarian when women's education levels were higher or when the wife's income exceeded the income of husband.

Clayton et al. (2013) carried out a field research to examine the use of internet and social media as well as their negative impacts on interpersonal relationships. The results of the

study, in which separation, divorce, emotional cheating and physical cheating were analyzed, indicated that using Facebook had a negative effect on relationships.

In their study, Yip et al. (2015) focused on the relationship between divorce rates and suicide cases as well as examining gender inequality, uncertainty of cultural characteristics on an individual level, the desire to be emotionally connected, and the cumulative effect of changing social welfare regimes. The study examines the impact of individualism and collectivism on suicide cases and divorces; and indicates that people living in collectivist cultures more easily cope with stress factors thanks to the support they receive from others. In the study, gender inequality was considered as an important macro element that needed to be evaluated in terms of public health. Such inequalities affect the health of children, i.e., future adults, as well. Leopold (2018) examined how divorce affect men and women in a different way related to mental and physical health, economic well-being and social relations variables. Leopold (2018), came to conclusion that societies preserving traditional family and gender relations, in the short run men lose their life satisfaction after divorce process, in medium term women lose their economic wellbeing.

Becker (1991), Palestrina et al. (2013), White and Rogers (2000) are examples from the second group of divorce studies. In his influential study, which analyzes the processes related to family with regards to economic and rational behavioral principles, Becker (1991) asserted that change in socioeconomic conditions rather than legal changes would be more effective for explaining divorce rates. According to this approach, the rational preferences of a woman whose income is higher than her husband's determine the decision of divorce. White and Rogers (2000) reached a different conclusion in their study, which examines the impacts that the economic conditions in the United States of America had on families during the 1990s. Despite the expansion in the welfare level, the general tendency in the American economy during this period was an increase in the income distribution inequality, an increase in racism, and low salary rates. Contrary to those who asserted that increase in women's income would have negative effects on families, White and Rogers (2000) came to the conclusion that income increase for both men and women had positive impacts on the examined variables. Balestrino et al. (2013) studied the reasons behind the decrease in marriage rates and the increase in divorce rates in the USA during the last 40 years. According to the main argument of the study, the fact that many individuals thought their marriage was highly likely to end in

divorce constituted an important reason why people refused to get married. The financial and psychological impacts and costs of divorce were deemed to be much more severe. When people felt that their marriage would end in divorce, their tendency to get married declined. As a result, their tendency to prefer relationships that cost less and require less commitment increased. However, González-Val and Marcénb (2012) found that although economic, political and social factors had certain effects on high divorce rates, the permanent and sudden impact came from the legal structure. Therefore, despite the differences in their management styles and cultural characteristics, some approaches explain the tendency towards getting divorced in Western countries as a consequence of these countries' legal frameworks that deal with marriages and divorces (Fahey 2013).

Fodor et al. (2002) examined the family and women's studies on the effects of post regime change social policy and welfare state practices on family and demographics. They underlined the heterogeneous nature of the family policies that were enforced in CEE countries after the regime change. The economic and social policies employed by these countries during the period of transition into capitalism had important effects on the structure of society, especially on the institution of family. Robila (2012) listed the four main components of family policies as marriage, childcare, financial support and family protection. Additionally, she mentioned how important these policies were with regards to family education, gender equality and domestic violence. However, welfare policies, which had a direct effect on family and women, were restricted after the regime change. Thornton and Philipov (2009) argued how western modernization transformed the social and economic environment through gender roles. Even though many studies associate Central and Eastern Europe with modern western society, Khazova (2010) claimed that traditional religious rules gained importance in some countries, as well. Polert (2003) argued that both communism and capitalism had similar approaches for exploiting female labor force. However, the period of transition into capitalism further harmed the already limited economic and social gains of women. In addition, the traditional gender roles had a significant weight in society. Dohotariu (2015) argued that the traditional family patterns in Romania changed after the regime change. Marriage lost its importance and cohabitation became ordinary in the society. This meant that the traditional norms and values could not be preserved among younger generations. The applied studies on the region can be divided into further subgroups, as well. On the one hand, there are studies comparing West Europe to Central and Eastern Europe (Kalmijin, 2007); on the other hand, there are studies making comparisons among the

countries in the CEE region (Vignoli et al., 2018). There are also some studies that examine individual countries only (Maslauskalite et al., 2015; Styrc and Matsiak, 2012).

Kalmijn (2007) studied the factors that affected family structure indicators, such as marital age, marriage rate and unmarried cohabitation in Northern, Southern, Central and Eastern European countries during the 1990s. The impacts of variables like religious roots, gender roles, educational and economic status on creating critical differences between the regions were identified by using regression analysis. The findings suggested that religion and gender roles were important indicators while unemployment rates had limited impact. Contrary to what was predicted, the findings demonstrated that higher education did not have negative effects on marriage and divorce rates. Moreover, according to the results of the analysis, during the transition period, Central and Eastern European countries had abnormal indicators and saw an emergence of suicide, alcoholism, violence and illnesses. The study showed a relationship between suicide rates and divorce rates.

Styrc and Matsiak (2012) carried out a research about Poland in order to examine the stability between women's participation in labor force and marriage both before and after the regime change. Using the findings obtained from the fieldwork, the study analyzed the risk of failure in marriages and marriage durations based on time-dependent and time-independent features. The related findings demonstrated that women's participation in the labor market did not risk their marriages prior to 1989. However, this started to change in the 1990s and the difference became quite apparent in the 2000s. It was suggested that in comparison to non-working women, the risk of marital disruption for working women increased after the 2000s. As for men, it was observed that marriages were more likely to end when men were unemployed.

Maslauskalite et al. (2015) conducted one of the limited number of studies that centers on Central Eastern European countries to present the economic and social reasons for divorce. The study used data about education and employment, and the period from 2001 to 2003 was analyzed with Poisson regression. Similar to many other institutions, the institution of family was affected by the economic and social transformation. The transformation also caused regional wage gaps, regional polarization and differentiation among these countries. With its neoliberal market organizations, Lithuania is one of the countries that have a high level of income injustice and social exclusion as well as being one of the countries with the lowest social protection. Maslauskalite et al. (2015) examined the divorce rates by reviewing the

tendency towards divorce in countryside and in cities separately. The second variable in the study was the unemployment of men, and the third variable was women's participation in the labor force. It was observed that the socioeconomic factors had an impact on divorce rates in Lithuania. Regarding the divorce rates in first marriages, the findings indicated that level of education were lower than secondary education had a higher rate of divorce, so it is seen that low educated persons have lower divorce rates. It was noted that divorce rates decreased in families where there was a househusband or housewife. With the second least divorce rate, inactive women came after housewives. It is also important to pay attention to the fact that education levels and employment rates provide significant results when considered together with other socioeconomic indicators. When the subject was evaluated in terms of gender, it was found that non-working and inactive disabled men had a higher divorce rate than women. As education levels were lower in towns, divorce rates were higher in these regions. In this study, working women with any education levels were found to have a higher tendency to get divorced. When unemployed, men with secondary and higher education had a higher tendency to get divorced than men with lower education levels. When women lost their job in towns, divorce cast a big threat for marital stability. When the study is separated into subgroups, the impact of socioeconomic factors on divorce appears to be different.

In their study that focused on Germany Italy, Poland and Hungary, Vignoli et al. (2018) conducted an empirical research about the impact of women's employment on marital stability by taking into consideration the countries' institutional, economic and cultural settings. They used simultaneous models in order to investigate the unobserved variables related to divorce tendencies and women's employment. While they found positive correlations between divorce tendencies and female employment in Poland and Italy, there was no effect on Hungary and Germany. In Poland and Italy, weak social protections and supports, and the existence of traditional gender roles constituted a difficulty for women's decision to get divorced. However, Hungary had long internalized the fact that both partners participated in the labor force. Therefore, divorced single mothers had greater opportunities for social protection, which in turn increased the tendency to get divorced. In such countries, the relationship between women's employment and divorce was observed to be weaker.

To sum up, gender roles, which have changed with women's participation in production and welfare policies, have crucial effects on family structure and marriage. Societies' speed of adjustment to these changes is related to the formal and informal institutions they have. It is not quite possible to have a general conclusion about the relationships between all these

factors and divorce tendencies. This should be accepted a result of the cultural relativistic nature of social sciences. In comparison to other countries, the situation in Central and Eastern European countries got more complicated after the regime change. The economic conditions, which became more difficult after the change, and the restricted social policies had negative effects on the quality of life and the structure of society. The socioeconomic structures that were transformed with the regime change caused dramatic differences in traditional family and marriage patterns. Women's role in production got restricted, competitive structure increased women's education rates, which in turn increased the age of getting married and having children, and the desire to become a family through marriage decreased. However, the literature supports that the socioeconomic impacts that occurred after the transition period are not homogeneous in CEE countries.

2. METHOD

In this study, panel data analysis method was used with the aim of finding out whether the destabilizing effect of divorce rates in Central and Eastern European countries was permanent after the regime change. The method was employed to determine the sociocultural factors that affected divorce rates. Panel data is created through a combination of countries and time dimension. Therefore, the degree of freedom increases as a result of a greater set of data. Moreover, this method offers advantages such as diminishing the problem of multicollinearity among explanatory variables and providing estimation for safer and effective parameters. A panel data model is shown as below:

$$y_{it} = \alpha + x'_{it}\beta + u_{it} \quad i = 1, \dots, N; \quad t = 1, \dots, T \quad (1)$$

In the first equation, the subscript i represents cross sections, such as an individual, company or country while the subscript t indicates time dimension. In the model y_{it} dependent variable expressing divorce rates for the i . country in t time; x_{it} is considered to affect divorce rates includes a set of explanatory variables such as unemployment rate, growth, and economic openness for the i . country in t . time. The pooled regression model, which is the simplest estimation method, does not take panel structure of data into consideration, and data are handled as if they belong to one single cross section. The method of least squares applied to this model provides estimations about stability and slope, regardless of any difference between cross sections and time dimensions. In panel data models, error terms are handled as error component models and are stated as $u_{it} = e_t + \lambda_i + \varepsilon_{it}$. In this equation, λ_i , e_t , and ε_{it}

reflect individual-specific time-independent effects, time-related effects that are independent from individual, and the random effects that are dependent on time and individual, respectively (Baltagi, 2008). In order to predict the error component model, it may be assumed that e_t and λ_i effects are either fixed or random. Fixed effects assume that λ_i 's are picked up from a fixed distribution while random effects assume that they are randomly picked up from a probabilistic distribution. Moreover, fixed impact models associate unobservable individual effects with explanatory variables while random effects models do not assume that unobservable individual effects are related to such variables (Davidson & MacKinnon, 2003).

Generally, when unit and time effects are considered to be non-existing, pooled -or classical- regression is used. On the other hand, if unit and time effects exist, fixed effects or random effects estimator is more applicable. Despite the fixed effects estimator, F Test is appropriate to test the validity of pooled regression model. The test checks whether the existence of different invariables in the model is actually necessary for each group in the fixed effects model. Null hypothesis refers to the sameness, i.e., homogeneity of all invariables. In the event that null hypothesis is rejected, it is concluded that there is a different invariable for each group, and this leads to the conclusion that fixed effects estimator is appropriate (Asteriou and Hall, 2007).

The Wald test is used to test the existence of individual-specific random effects, and it enables checking pooled regression method in spite of random effects model. According to this test, if the variance of unobservable individual effects equals to zero, the random effects model is turned into pooled regression model (Greene, 2003).

According to the Hausman statistics that is created based on the difference between fixed effects and random effects estimations, generalized least squares (GLS) estimation is inconsistent while the results of least squares fixed effects are consistent, if there is a correlation between individual effects and explanatory variables. The hypothesis related to the Hausman test is as follows:

$$H_0: E(X'\alpha) = 0 \text{ (random effects)}$$

$$H_a: E(X'\alpha) \neq 0 \text{ (fixed effects)}$$

The Hausman test statistics is calculated as below:

$$H = (\hat{\beta}_{INGROUP} - \hat{\beta}_{GLS})' [\text{Var}(\hat{\beta}_{INGROUP}) - \text{Var}(\hat{\beta}_{GLS})]^{-1} (\hat{\beta}_{INGROUP} - \hat{\beta}_{GLS}) \sim \chi^2(k) \quad (2)$$

When the Hausman statistics, which is calculated using the second equation above, is higher than the critical value obtained with K degree of freedom from χ^2 table, H_0 hypothesis is rejected, leading to the decision that the results of the fixed effects estimator are consistent or, at the very least, more appropriate (Wooldridge, 2002).

If autocorrelation and variable variance issues exist together as a result of panel estimation, the method devised by Arellano, Froot and Rogers is employed to reach resistant estimators. Even though the residuals are correlated, consistent standard errors that occur after clusters (which are created with the clustering technique) become unrelated. Within this context, cluster option is used to obtain resistant estimators (Hoechle, 2007).

In the study, panel LM unit root test was used to test whether the destabilizing effect of the regime change that occurred in Central and Eastern European countries between 1960 and 2016 was permanent with regards to family institution, which was deemed more stable prior to the regime change. Panel LM unit root test considers structural breaks in constant and slope to be heterogeneous, and offers an advantage by being insensitive towards parameter problems related to finding breakpoints (Im et al., 2010). Adapted for the panel, this test is a different version of Lee and Strazicich (2003)'s test, which allows for two structural breaks. The test provides Panel LM test statistics as the standardized version of the LM unit root test average, which is estimated for each country.

$$H = (\hat{\beta}_{INGROUP} - \hat{\beta}_{GLS})' [\text{Var}(\hat{\beta}_{INGROUP}) - \text{Var}(\hat{\beta}_{GLS})]' \times (\hat{\beta}_{INGROUP} - \hat{\beta}_{GLS}) \sim \chi^2(k) \quad (3)$$

When the Hausman statistics, which is calculated using the second equation above, is bigger than the critical value obtained from K degree of freedom χ^2 table, H_0 hypothesis is rejected, leading to the decision that the results of the fixed effects estimator are consistent or, at the very least, more appropriate (Wooldridge, 2002).

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$$\Gamma_{LM} = \frac{\sqrt{N}[\overline{LM}_{NT} - E(LM_T)]}{\sqrt{V(LM_T)}} \quad (4)$$

In this equation, $E(LM_T)$ and $V(LM_T)$ show the expected value and variance of LM statistics, which are estimated for each country, respectively. Similar to conventional unit root tests, the null hypothesis demonstrates that the series contains unit root while the alternative hypothesis indicates that the series is stationary (Yılancı et al., 2013).

3. DATASET

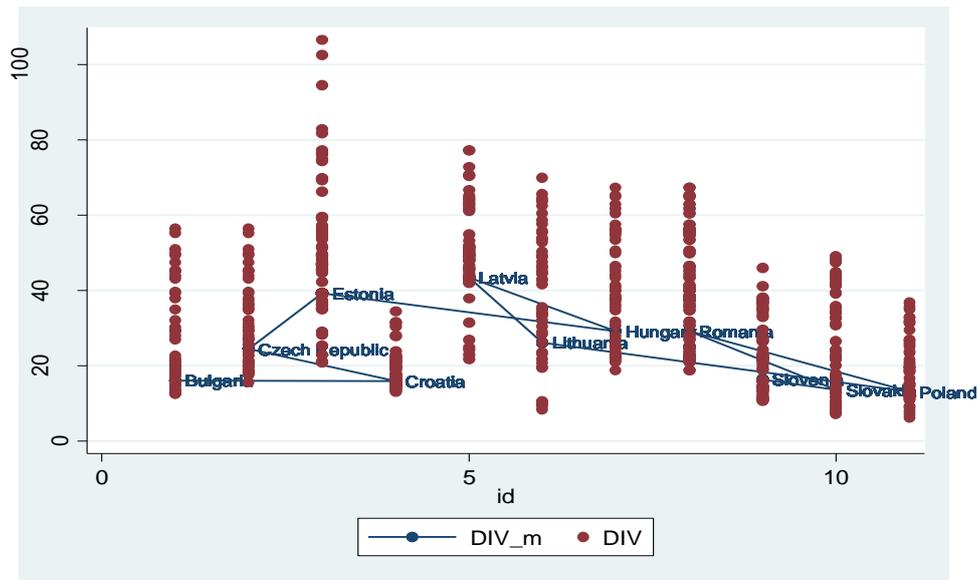
The fundamental determinant in selecting the methods used for predicting the socioeconomic determinants of divorce rates with the help of panel data analysis was the identical time dimension of all variables. Considering the period prior to the regime change in Central and Eastern European countries, which are Bulgaria, the Czech Republic, Estonia, Hungary, Croatia, Lithuania, Latvia, Poland, Romania, Slovenia, and Slovakia, the related data revealed that the only variable was the divorce rates from the years between 1960 and 2016. Therefore, the unit root test used for measuring the permanence of the regime change was only applied to the said variable. The variables used in the panel regression analysis were determined based on the studies available in the literature. Growth rate, economic openness and unemployment rates were used in order to determine the impact of production and employment on divorce rates after the regime was changed, by taking divorce rate as the dependent variable. Stable economic growth is thought to increase the demand for skilled labor by creating good jobs in an economy. In turn, good jobs in an economy create opportunities for people with higher education levels. It is emphasized that such a transformation in an economy affects the position of women within the economy and in doing so, has an effect on the family structure (White and Rogers 2000). For this reason, variables related to economic growth, unemployment, economic openness and rate of women's participation in education were included in the model. In order to discover the effects created when the state withdrew from the areas of social policy after the regime change, the variable of social protection

expenditures was employed as well as the rate of women's participation in education and the rate of internet usage were included in the rate regression to see the change in the social structure. Including internet usage in the model was deemed important as it has been suggested that internet and social media usage, which bring a new dimension to human relations and it is questioned whether internet and social media usage harms family relations by weakening the family ties (Frey, 2010; Lee and Chae, 2007, Zheng, Duan and Ward, 2019). Moreover, data from 2008 to 2017 were used in order to obtain balanced panel data from the variables, data were acquired from Eurostat and World Bank databases. The data and the intended purposes are summarized in the table below:

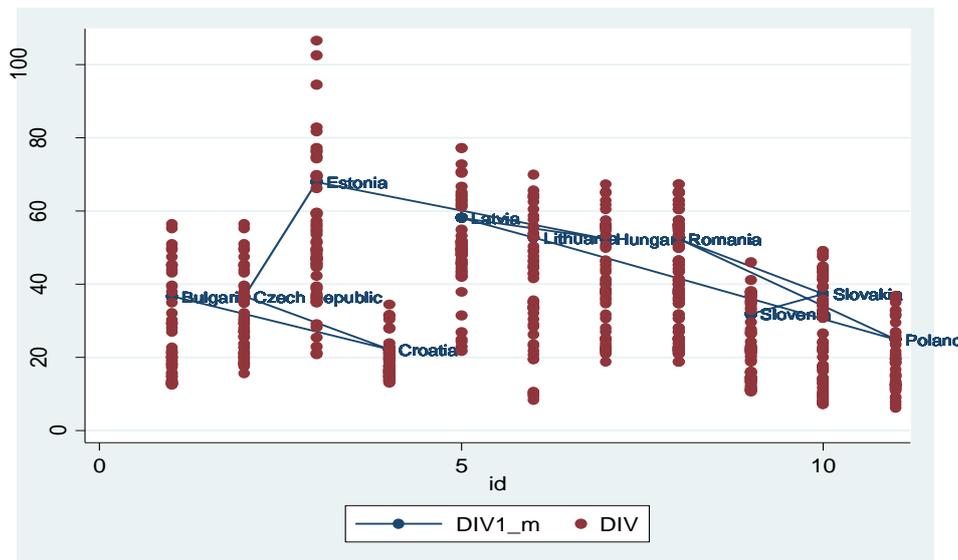
Table1. List of Variables

Mnemonic	Description	Source	Short Explanation
DIV	Divorce rate	Eurostat	Divorce rate per 100 marriages
UNE	Unemployment rate	Eurostat	Rate of the unemployed to active population
GRWTH	Economic Growth	Eurostat	Chain linked volumes, index 2010=100
OPNESS	Economic openness level	Eurostat	Main balance of payments and international investment position items as share of GDP
SEXP	Social protection expenditures	Eurostat	Expenditures algorithm per person
WE	Rate of women's participation in education	Eurostat	Less than primary, primary and lower secondary education (levels 0-2)
INT	Internet use rate	World Bank	Individuals using the Internet (% of population)

Graph 1 correlates the average values for divorce rates during the period of 1960-1990. According to the graphic, Bulgaria, Slovenia and Slovakia had relatively low divorce rates before the regime change. To state more clearly, Estonia and Latvia, where every hundred marriages ended in divorce, had the highest divorce rate during the said period.



Graph 1. Average Divorce Rates from 1960 to 1990



Graph 2. Average Divorce Rates from 1990 to 2016

*DIV_m represents the average values for the countries' divorce data between 1960 and 1990; DIV1_m is the average value for the countries' divorce data between 1990 and 2016; and DIV1 is the series of divorce rates for the period between 1960 and 2016.

Graph 2 shows that the divorce rates in all the countries increased between 1990 and 2016. It can be understood from this graphic that the prevailing economic, political and social change following the regime change resulted in an increase in the divorce rates. Subsequent to the regime change, Croatia had the lowest divorce rate while Estonia had the highest divorce rate. Being one of the fundamental institutions in a society, family stability after the regime change constituted the subject of the empirical analysis.

Table 2. Correlation Matrix

	DIV	GRWTH	OPENSESS	WE	UNE	SEXP	INT
DIV	1.000						
GRWTH	-0.0295	1.000					
OPENSESS	-0.0761	0.0263	1.000				
WE	-0.3916*	-0.3450*	-0.2213*	1.000			
UNE	-0.1395	0.0914	-0.1456	0.0066	1.000		
SEXP	0.1056	-0.1222	0.4059*	-0.2858*	-0.1504	1.000	
INT	0.3232*	0.4063*	0.5452*	-0.7312*	-0.1767	0.5670*	1.000

Table 2 displays the correlation matrix, which shows a negative correlation between the duration of women's education and divorce, and a positive correlation between the rate of Internet usage and divorce. According to this correlation matrix, having independent variables in the model would not cause any multicollinearity problems as there was no strong relationship between the variables.

4. FINDINGS AND RESULTS

LM test panel with break was applied to the divorce rates and the findings obtained from the trend break results are indicated below. In the study, the lag length was determined using t-significance method from general to specific. Additionally, a model that tested the breaks in the trend was used while conducting the tests.

Table 3. LM Panel Unit Root Test

Country	Test statistics	Break Year 1	Break Year 2
Bulgaria	-3.982(9)	1980	2000
Czech Republic	-6.729(9)*	1979	1999
Estonia	-2.190(9)	1998	2005
Croatia	-1.325(8)	1993	2007
Latvia	-2.962(9)	1996	2005
Lithuania	-2.027(8)	1988	1995
Hungary	-1.813(8)	1979	1988
Romania	-2.099(9)	1981	1993
Slovenia	-1.258(8)	1976	1984
Slovakia	-4.307(8)	1980	1999

Poland	-1.806(9)	1980	2000
Panel LM	0.863		
p value			

When the null hypothesis, which suggests that the panel contains unit root, was tested based on the alternative hypothesis, the null hypothesis was accepted, which means the series did indeed contain unit root. Divorce series with unit root proved that it would not be converged on a stable value in the long term and the effect of the shocks was permanent. During the 1960s and 1970s, women's participation in production was supported for the sake of labor force, which was required for industrialization. The number of working women during this period rapidly went up (Frejka, 2008). It can be said that having more women in business life may cause shocks on divorce to be permanent. This finding supports the conclusion that economic dependence and obligations affect marital stability (Rogers, 2004).

The origin of the differences among family structures in the countries was not only related to the regime change; there were also historical, cultural and religious differences. Countries have informal and formal institutional characteristics that fundamentally affect the decisions regarding marriage, childbearing, having an illegitimate child, or abortion. As for the women born after 1980, a cohort effect was observed, and the tendency to get married and have children declined in general. The decrease in the tendency towards marriage among women who were born after 1975 might have created a general tendency, resulting in the stability of divorce rates in the Czech Republic. To be more clear, the tendency to prefer cohabitation to marriage dates back to earlier times in the Czech Republic (Sobatka, 2011). The Czech Republic was the only stationary series, i.e., $I(0)$ where the alternative hypothesis was accepted. The Czech Republic's broad social security networks and its success in making small scale attempts to adapt to the then new economic system made the country different (Frejka, 2008). Family structure was intensively affected during the late 1980s when the communist regime ended, and also in 1990s, which was when economic, politic and social transformations were experienced. Starting from the early 2000s, many countries stayed in the Western Bloc as NATO and UN members.

The second part of the study covers the tests that were conducted using panel regressions on the relationships between divorce rate and growth rate, unemployment rate, economic openness level, women's education level, and Internet usage rates. The main limitation of the

study was the restricted time dimensions as obtaining regular data from the period before the regime change.

Table 4. Panel Regression Results

<i>VARIABLES</i>	<i>POLS</i>	<i>FE</i>	<i>RE</i>	<i>RE_{AFR}</i>
<i>DEPENDENT</i>				
<i>DIV</i>				
<i>INDEPENDENT</i>				
<i>UNE</i>	-0.391 (0.072)***	-0.48 (0.03)**	-0.47** (0.02)	-0.469 (0.113)
<i>GRWTH</i>	-0.428 (0.02)**	-0.46 (0.00)**	-0.49 (0.00)**	-0.49** (0.01)
<i>OPNESS</i>	-0.218 (0.40)	-0.291 (0.215)	-0.36 (0.09)***	-0.36*** (0.06)
<i>SEXP</i>	1.683 (0.90)	-4.28 (0.717)	-2.660 (0.660)	-2.660 (0.718)
<i>WE</i>	-0.445 (0.441)	-0.26 (0.576)	-0.48 (0.21)	-0.48 (0.15)
<i>INT</i>	0.127 (0.619)	0.12 (0.515)	0.13 (0.47)	0.13 (0.45)
<i>CONS</i>	79.35 (0.44)	125.48 (0.133)	119.75 (0.007)**	119.75 (0.015)**
<i>R²</i>	0.82			
<i>R²</i>	0.77			
<i>R_{within}</i>		0.296	0.293	0.293
<i>R_{between}</i>		0.006	0.09	0.09
<i>R_{overall}</i>		0.080	0.148	0.148
<i>F_{prob}</i>	0.000	0.000		
<i>Wald_{prob}</i>			0.000	0.000
<i>Hausman_{prob}</i>			0.059	

Note that the values between parentheses are prob values and round numbers. * $p < .05$. ** $p < .01$. *** $p < .001$. indicates significance level.

With regards to the choice between POLS and fixed effects model, F test was performed, and the fixed effects model was tested against the classical model. According to result, fixed unit effects were accepted. LM test was conducted in order to choose between POLS and random effects model, and the significance of the random effects model was tested against the

classical model. According to Breusch-Pagan test results, random unit effects model was accepted to be valid. Regarding the testing between random unit effects and fixed unit effects model, the Hausman test was used, and random unit effects model was found to be appropriate. The diagnostic tests on the model pointed out to a problem of autocorrelation and varying heteroscedasticity, showing that there was no cross-sectional dependence. Arellano, Froot and Rogers estimator was used to eliminate the problem in the model. The result of the model revealed that economic growth and economic openness had a significant negative correlation with divorce rates. The results of these variables included in the model in order to reveal the economic structure and industrialization are as expected. However, there are studies in the literature that the relation of socioeconomic structure with divorce rates is similar to U-curve. According to this, socioeconomic structure up to a certain threshold value increases divorce rates and then divorce rates decrease (Amato and Beattie, 2011; Trent and South, 1989). However, since the time dimension of this study was limited, the frames of the variables were not included in the model due to the degree of freedom.

No significant relationship was found between divorce rates and other variables which include unemployment rate, social protection expenditures, women's education rate and Internet usage. Interestingly, there is evidence that shocks on unemployment have temporary implications for marriage and permanent divorce (Schaller, 2013). There is also a finding of divorce avoidance with the assumption that the default value of being a husband and wife increases during the periods of high unemployment rates and decreases the standard of living for both men and women in times of economic instability (Amato and Beattie, 2011). The education rate of women representing the status of women was included in the model but no statistically significant effect was found. Together with the change in the status of women in society, it is thought that the difficulties of combining parenting and employment increase the rates of divorce (Morgan et al., 1992). In addition, it is thought that the possibility of divorce increases with the fact that the woman feels economically safe and is economically independent (Amato and Beattie, 2011; South, 1985). The number of internet subscribers is included in the model considering that social network use is positively correlated with marital quality and happiness and negatively correlated with life and divorce (Valenzuela et al, 2014). However, due to data limitations related to the use of social networks in existing countries, this variable was not found statistically significant due to the number of Internet subscribers instead of using social networks.

It may be concluded that divorce rates declined with growing economy and increasing openness level. However, the findings of this study should be evaluated in relation to the restricted time dimension of the dataset since most of the countries completed their transition processes during the said period, and now have more matured economic institutions compared to the transition period. Together with these variables, the decline in divorce rates may also be considered as an outcome of the proliferation of unofficial relationship types, such as cohabitation, rather than marriage. The significant invariable with high value in the model may be interpreted in this sense.

CONCLUSION

Divorce is a phenomenon with psychological, social and economic impacts on couples and children in a society. As families are the smallest units in a society, their strength has a positive correlation with the strength of a society; in other words, as families grow stronger, it becomes possible for the society to grow psychologically, socially and economically stronger, as well. The importance of a family institution that is based on trust, respect and love is better understood when the micro and macro effects of divorce are considered. Accordingly, interdisciplinary studies which the problems that exist the institutions of family and marriage and find out the factors that increase the tendencies towards gain importance.

Changes in production structure alter social structures over time to ensure the continuity of production. The transition from agricultural society to industrial society had effects on gender roles and family institution. These effects emerged at different rates during different periods in Eastern and Western societies, depending on the development of their industrialization dynamics.

Western societies, which can be regarded as the homeland of industrialization, went through a substantial transformation in terms of marriage and family structure for almost half a century, and there are important studies in the literature addressing the related subject matters. The presence of liberal economic and political institutions in the West paved the way for the birth of trends that question gender and family roles. What makes Central and Eastern European countries different is that they experienced central planning, instead of free market economy and liberal democracy for a long period of time. The socialist system with central planning had determining impacts on not only production but also family, and affected marriage age and marriage rates. Due to the very essence of the socialist system, independent social

policies were not needed, and unemployment was not a problem, which resulted in early marriages and high marriage rates.

By the end of the 1980s in the CEE countries, the socialist system gave its place to market economy and liberal democracy, which caused an overall change in the economic, political and social institutions. The institutions of family and marriage were also affected by this change. Individuals wanted to become more qualified in this new competitive system and the duration of education got longer, which caused marriage age to get higher and fertility rate to decrease. After the 2000s, many countries started to leave behind the economic instability, which was caused by the transition process, and completed their transitions. This empirical research supports the view that positive progress in economic variables, such as growth and openness, decrease divorce rates. In addition to its advantages like providing more access to information, the Internet, which is indispensable from today's world, also has some disadvantages, such as social media and gaming addictions as well as having a negative impact on family communication. In this way, it is thought to be a factor in increasing divorce rates. However, the impact of internet usage on divorce was statistically insignificant the analysis results. If data specifically related to social media usage and gaming could be found instead of general internet usage, it would be more appropriate for the scope of the study. Nevertheless, it is necessary to make interpretations by taking the impact of previous international institutions and traditions into account. The Czech Republic appears to have left behind the shock effect it experienced on divorce rates, which is considered to be a result of the country's closeness to liberal values from past to present, and of its success in the field of social policy. However, shocks on divorce rates are permanent for other countries. In other words, the effects of economic structures, institutions and gender roles on the family structure have become permanent.

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