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The Effects of Economic Recessions on Divorce Rates: A Research on Turkey

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Ekonomik Resesyonların Boşanma Oranları Üzerindeki Etkileri: Türkiye Üzerine Bir Araştırma

Abstract

This study analyses the relationship between short- and long-term relationships between divorce rates and economic recession in Turkey. The asymmetric and time-varying asymmetric causality tests are used to analyse the short-term relationship, the Maki cointegration test is used to analyse the long-term relationship. The dependent variable of the model is the divorce rate. Labour force participation rate of women, unemployment rate, GDP per capita, legal regulations, and economic crises are independent variables. According to the estimation results, unemployment, national income, legal regulations, and economic crises positively affect divorce rates. The time-varying asymmetric causality test results also indicate a temporary causality relationship between positive income and unemployment shocks.

Keywords : Asymmetric Causality Tests, Cointegration Tests, Divorce Rates, Economic Recession.

JEL Classification Codes : C22, D19, E70.

Öz

Bu çalışmanın amacı Türkiye'de ekonomik resesyonlar ile boşanma oranları arasındaki kısa ve uzun dönemli ilişkileri analiz etmektir. Uzun dönemli ilişkiyi analiz etmek için Maki eşbütünleşme testi, kısa dönemli ilişkiyi analiz etmek için asimetrik ve zamanla değişen asimetrik nedensellik testleri kullanılmıştır. Modelin bağımlı değişkeni, boşanma oranıdır. Kadınların işgücüne katılım oranı, toplam işsizlik oranı, kişi başına düşen GSYİH, yasal düzenlemeler ve ekonomik krizler bağımsız değişkenlerdir. Tahmin sonuçlarına göre kadınların işgücüne katılım oranları, işsizlik oranları, ulusal gelir, yasal düzenlemeler ve ekonomik krizler boşanma oranlarını pozitif etkilemektedir. Zamanla değişen asimetrik nedensellik testi sonuçlarına göre pozitif gelir ve işsizlik şokları arasında geçici bir nedensellik ilişkisi bulunmaktadır.

Anahtar Sözcükler : Asimetrik Nedensellik Testleri, Koentegreasyon Testleri, Boşanma Oranları, Ekonomik Resesyonlar.

1. Introduction

In the articles 161 to 184 of the Civil Code numbered 4721, adopted in 2001, divorce was reconsidered, and unilateral and non-fault divorce was legalized with the regulations that were made. The new legal regulation has caused divorce rates to rise significantly. Despite being the second country where the divorce rate is the lowest among European countries, the divorce rates in Turkey have increased significantly in recent years. According to the Turkstat (Turkish Statistical Institute) data, the crude divorce rate increased from 0.46 per thousand in 1994 to 1.41 per thousand in 2001. Although it has shown a decreasing trend in recent years, divorce rates are still at high levels.

Goode (1963; 1971), Glenn & Suspancic (1984), South (1985) and Trent & South (1989) separated the factors affecting divorce rates on the social level into four groups as socio-economic development level, status, and women's labour force participation rate, gender ratio and religion.

In studies investigating the relationship between socio-economic development and divorce rate, the effect of modernization and industrialization processes on divorce has been addressed. Goode (1963), Kerckoff (1972), Cole & Powers (1973), Hareven (1976) and Lee (1982) conducted first studies regarding the industrialization process on the divorce. Urbanization and industrialization increase divorce rates by causing changes in social and cultural values. Jones (1997) stressed that despite the increase in industrialization and urbanization rates in Islamic Southeast Asia and Western countries, divorce rates have been decreasing. Then, despite the increase in the speed of modernization, the divorce rate remains low in these countries, which implies divorce is still unwelcomed.

Increases in the trend of modernization and industrialization affect the divorce rates by leading to an increase in the education level of women and in the female labour participation rate. Levinger (1976), Fergusson et al. (1984), Jalovaara (2003), Chan & Halphin (2005), Cooke & Gash (2010) suggested that the increase in the education level of women caused an increase in the relative income level of women and accordingly increased divorce rates, while Kreager et al. (2013) emphasizes that the increase in the education level of women decreases the tendency of domestic violence and therefore causes a decrease in divorce rates.

Ross & Sahwill (1975), Spitze & South (1985), South & Lloyd (1995) assert that there is a positive relationship between female labour participation rate and divorce rates. Ross & Sawhill (1975) explains the positive relationship between female labour participation rate and divorce rates with the increase in the number of resources available. Increases in the female labour participation rate also increase the divorce rates through income and freedom channels. Increases in the income level of women lead to the idea of getting rid of an unhappy marriage. According to Spitze (1988) and South & Lloyd (1996), increases in the female labour participation rate also increase domestic violence and cause

divorce. Bremmer & Kesselring (2004) reached results that support the hypothesis that female labour participation rate increase divorce rates.

In addition to these factors, legal regulations and economic recessions that facilitate divorce are expected to have an impact on divorce rates by considering different perspectives. Studies conducted by Peters (1986), Yi & Deqing (2000), Friedberg (1998), Clarke-Stewart & Brenteno (2006), Wolfers (2006), Rasul (2006), Drewianka (2008), Kneip & Bauer (2009), Brown & Lin (2012), Gonzalez-Val & Viitanen (2009) and Nurlaelawati (2013) confirm the hypothesis that facilitating legal regulations causes a significant increase in divorce rates.

Economic recessions also affect divorce rates through unemployment and income channels. But there is no consensus in the literature on the magnitude and direction of the effect. Four main approaches in the literature account for the effects of economic recessions on divorce rates. The first of these approaches is the psychological stress approach. This hypothesis, put forward by Komarovsky (1940), emphasizes that stress has negative effects on marriage. Individuals are optimistic that they can find a new job at the beginning, but the perceived happiness level decreases as the unemployment period is extended, and this results in divorce by causing conflicts between spouses. From this hypothesis, Elder's (1974), South (1985), Johnson & Booth (1990), Jensen & Smith (1990), Conger & Elder (1994), White & Rogers (2000), Brammlet & Mosher (2001), Lewin (2005), Hansen (2005) and Arkes & Shen (2010) obtained results that supported the psychological stress approach. Conger et al. (1999) and Wilcox (2011) examined the effects of economic recessions and financial difficulties on marriage and happiness with a different approach. The results obtained from their studies showed that, as financial problems increase, the number of married people and the level of happiness decrease. Therefore, the findings obtained to support the main theme of the psychological stress approach.

Another approach that examines the effects of economic recessions on divorce rates is the divorce cost approach. This hypothesis, put forward by Hoffman (1977), suggests that individuals decide to divorce considering the change in the quality of life and loss of welfare after divorce. The studies conducted by Peterson (1996) and Smock et al. (1999) showed that divorce negatively affects women's well-being. Because of the high welfare loss caused by the high costs that individuals will bear to establish a new order as well as court expenses, individuals will prefer to stay married rather than divorce, especially in times of unemployment. Therefore, there is a negative relationship between unemployment rates and divorce rates. The results obtained from studies conducted by Cherlin (1991), Amato & Beattie (2011), Hellerstein & Morrill (2011), Cohen (2014), Payne (2014), Gonz´alez-Val & Marc´en (2017), Schneider & Hastings (2015), Tumin & Qian (2015) and Alola et al. (2020) were consistent with the divorce cost approach. Fischer & Liefbroer (2006) concluded that macroeconomic conditions and cultural climate changes affect divorce rates negatively. Tumin & Quian (2015) emphasized that increases in men's unemployment rates rather than women's unemployment rates decrease the likelihood of divorce. Likewise, Harknett & Schneider (2012) concluded that crises did not increase divorce rates in their

study, which examined the effects of the 2008 crisis on divorce rates. Divorce decisions are postponed, especially in those communities with low levels of education and different ethnic backgrounds.

Based on the 1929 crisis, Cherlin (2009) emphasized that the direction of the relationship between divorce rates may change over time. The results obtained by Cherlin (2009) indicated that the divorce rates decreased during the great crisis period, but these rates increased as the effects of the crisis decreased. This approach is called the hybrid approach, and the direction of the relationship between unemployment rates and divorce rates is determined based on the divorce costs and living standards of households. Findings obtained by Arkes & Shen (2010) and Roy (2011) also emphasized that the probability of divorce may vary depending on the economic conjuncture.

By analysing the effects of cyclical fluctuations on divorce, Schaller (2013) emphasized that recessions are effective on marriage and divorce rates, but the direction and magnitude of the effect may vary depending on the family structure and cultural factors. According to the study, unemployment shocks have permanent effects on temporary divorce rates and marriage.

There is a limited number of studies in Turkey which study causes of divorce rates and analyse economic factors on the effect of divorce. Doğan (1998), Yıldırım (2004), Aydin & Baran (2010), Ersöz (2011), Başkaya & Inal (2017), Binay (2018), Aktaş-Akoğlu & Kucukkaragoz (2018), Ayhan (2018) performed studies by drawing attention to the increase in divorce rates and emphasized that the main reason of divorce is the irreconcilable differences. In these studies, it has been specified that economic factors play a decisive role in irreconcilable differences, but the effect of economic factors on divorce rates has not been analysed empirically.

Atik (2020) and Gavcar (2020) empirically analysed the effect of factors stemming from family problems such as family conflicts and the number of children on divorce rates, rather than economic factors. Irreconcilable difference increases divorce rates.

In Turkey, rather than the effect of the economic recession on divorce rates, the effect of the unemployment rate on the divorce rate was examined. Bayrak (2010) analysed the effects of unemployment rates on divorce rates on a country basis while Sandalcılar (2012) conducted research on a regional basis. Bayrak (2010) states that there is no statistically significant relationship between unemployment rates and divorce rates in the long term in Turkey while Sandalcılar (2012) claims that there is a negative relationship between regional divorce rates and regional unemployment rates.

Koç (2019) analysed factors affecting the divorce rate in Turkey by means of Beta regression and used the unemployment rate in the model. According to the analysis results, there is no statistically significant relationship between unemployment rates and divorce rates.

In the studies conducted by Komarovsky (1940), South (1985), Jensen & Smith (1990), Lewin (2005), Arkes & Shen (2010), Amato & Beattie (2011), it is underlined that unemployment rates have been increasing during the economic recession while these rates have been decreasing during economic expansion periods. In these studies, the increase in divorce rates caused by the unemployment has also been focused. Based on these studies, Schaller (2013), Gonz´alez-Val & Marc´en (2017) used unemployment rates as a basic indicator for economic expansion and economic contractions and analysed the impact of economic cycles on the divorce rates.

Under normal circumstances, the unemployment is expected to decrease during periods of economic growth. But, in the 1990s, in countries like the Czech Republic, Hungary, Poland, Slovakia, Slovenia, Lithuania, Bulgaria, Romania and as of 2000s in countries like Turkey, it is observed that unemployment increases despite economic growth. This phenomenon is called jobless growth in the literature (Onaran, 2008). Therefore, all unemployment increases alone are not indicator of an economic recession. Then, when analysing the effects of economic recessions on the divorce rates in countries with jobless growth, unemployment rates should not be used alone. Besides, in countries with jobless growth, variables of unemployment rates and economic crisis should be added to the model as separate variables. In this context, the study is expected to contribute to the literature.

During the periods of economic crisis, the national income level decreases, changes in the national income level affect the unemployment and the female labour participation rate. All these also imply changes in divorce rates. Therefore, in the study, in addition to the economic crisis, legal amendments and unemployment rates, national income level and female labour participation rates have also been added to the model. However, economic crises cause asymmetrical effects on the variables included in the model. Hatemi J (2012) developed the asymmetric causality test by claiming that economic crises have asymmetric effects. In this study, by considering the asymmetric effects of economic crises, causality tests between variables were tested using asymmetric causality relationships, asymmetric and time-varying asymmetric causalities. The time varying causality test analyses whether the causal relationships between variables change over time. Another difference that distinguishes this study from the studies in the current literature is that the asymmetric effects were considered. The study is completely original both in terms of the methodology and the findings obtained.

Understanding the effects of economic factors on the divorce rates is important for analysing the sources of irreconcilable difference within the family. In addition, in an economy where economic recessions positively affect divorce rates, the coefficient indicating the relationship between national income level and divorce rates is expected to be negative and statistically significant. Coefficients showing the relationship between the economic crisis and unemployment rates are statistically and positively significant while the coefficient of national income is also positively and statistically significant. All these can be explained by the availability of jobless growth in Turkey.

The work consists of four parts. In the first part, the theoretical infrastructure and how economic recessions affect divorce rates within the framework of the current literature are discussed in detail. In the second part, the methodology and data set are introduced. In the third part, estimation results are included. The results obtained are evaluated in the final part.

2. Data and Methodology

The effects of economic recessions on the divorce rates in the period of 1990-2017 were analysed in this study. National income level decreases, changes in national income level affect unemployment rates and female labour participation rate and thus lead to changes in divorce rates. By considering the relationships between variables, two different methods were used in the study. First of all, the long-term relationship between national income level, unemployment rates, female labour participation rate, economic recessions and divorce rates in 2001 were analysed via the Maki cointegration analysis and the DOLS cointegration estimator.

The variables used in the study are available in Table 1. GDP per person, unemployment rate and female labour participation rate are annual based data obtained from TURSTAT database. The effects of legal amendments and economic crises were included in the model using artificial variables.

D2 variable, representing legal regulations, was defined as "0" until 2001 while it was defined as "1" following 2001. D1 variable, which represents crises, was defined as "0" for periods before crises and "1" for post-crisis periods. Logarithmic series were used in the study.

Table: 1
Variables Used in the Model

Dependent variable	Notation	Independent Variables	Notation	Frequency	Database
Crude Divorce Rate	LNCDR	Total Unemployment Rate	LNTUR	Annual	TURKSTAT
		Female Labour Force Participation Rate	LNFLPR		
		Per capita Gross Domestic Product	LNGDP		
		Law Regulations	D2	Created by the author.	
		Crisis periods	D1	Created by the author.	

In Maki Cointegration analysis, the dependent variable of the model was crude divorce rates. Per capita gross domestic product, female labour force participation rate, the impact of legal regulations and the effects of crisis periods were the independent variables of the model.

Positive and negative shocks occurring during periods of economic expansion and contraction are expected to have different effects on the national income level, unemployment rate and female labour force participation rates, while positive and negative shocks in the national income, unemployment rate and female labour force participation rate are also expected to have different effects on the divorce rate. For this reason, instead of

symmetric causality tests, asymmetric causality tests were used in the study, and a time-varying asymmetric causality test was added in order to test whether the causality relationships between positive and negative shocks changed over time.

Table: 2
Descriptive Statistics

Statistics	CDR	TUR	FLPR	GDP
Mean	1.10	9.42	27.04	6756
Median	1.37	9.75	26.45	5379
Maximum	1.70	14.00	37.6	12542
Minimum	0.46	6.50	20.70	2270
Std. Dev.	0.52	1.78	4.73	3713
Skewness	-0.32	0.22	0.58	0.23
Kurtosis	1.24	2.87	2.57	1.35
Jarque Bera	4.074	0.250	1.788	3.417
Prob	0.1304	0.8821	0.4089	0.1810

Table 2 illustrates descriptive statistics for the variables. In the period under consideration, the average divorce rate was 1.10 per thousand, while the average unemployment rate was 9.42% and the average participation rate of women's labour force was 27.04%. Average GDP is 6756 Turkish liras. There is approximately a four-fold difference between the lowest and the highest divorce rate as of the period under consideration. There is nearly a two-fold difference between the lowest and highest unemployment and female labour participation rate, while there is a six-fold difference between the lowest GDP per capita and the highest GDP per capita.

2.1. Maki Cointegration Test

An increasing risk appetite in the markets increases uncertainties in the economy, raises imbalances in both national and local markets and causes economic crises. Economic crises and important historical events cause significant deviations in the values of macroeconomic variables and thus cause structural breaks. These deviations in the values of variables affect analysis results, too. For this reason, using techniques that consider structural breaks in econometric analyses provides more reliable results. For this reason, the Maki (2012) cointegration test was used to analyse the cointegration relationships between the variables. The multiple breaks cointegration relationship was analysed using the following regression equations.

$$y_t = \mu + \sum_{i=1}^{k} \mu_i D_{i,t} + \beta' x_t + u_t \quad (1)$$

$$y_t = \mu + \sum_{i=1}^{k} \mu_i D_{i,t} + \beta' x_t + \sum_{i=1}^{k} \beta_i' D_{i,t} u_t \quad (2)$$

$$y_t = \mu + \sum_{i=1}^{k} \mu_i D_{i,t} + \gamma_t + \beta' x_t + \sum_{i=1}^{k} \beta_i' D_{i,t} u_t \quad (3)$$

$$y_t = \mu + \sum_{i=1}^{k} \mu_i D_{i,t} + \gamma_t + \sum_{i=1}^{k} \gamma_i \, t D_{i,t} + \beta' x_t + \sum_{i=1}^{k} \beta_i' D_{i,t} u_t \quad (4)$$

t = 1, 2……T. y_t and x_t are observable I (1) variables. u_t is the error term. y_t is a scalar and $x_t = (x_{1t}, x_{2t} \ldots x_{mt})'$ is an (m x 1) vector. Maki (2012) assumed that an (n x 1) vector z_t was generated by $z_t = (y_t, x_t')' = z_{t-1} + \varepsilon_t$. ε_t are i.i.d with mean zero, positive

definite variance-covariance matrix.μ, is a constant term, μ_i, γ, γ_i are structural break parameters and β' and β_i' are true parameters. $D_{i,t}$ represents structural breaks. If $D_{i,t}$, $t > T_{Bi}$, it takes the value of "1", if not, it takes the value of "0". T_{Bi} shows the break in time. k is the maximum number of breaks. Equation (1) is the model with a constant break, equation (2) is the regime-change model that allows structural breaks in β as well as the change in μ, equation (3) is the trendy regime-change model and equation (4) includes breaks in constant, trend and parameters. The cointegration relationships between the variables were analysed based on the error terms of the equations above.

Against the H_0 hypothesis "There is no cointegration relationship under structural breaks", the alternate hypothesis "There is a cointegration relationship under structural breaks" was tested. The critical values required to test the hypotheses were obtained using Monte Carlo simulations. If the calculated values are smaller than the critical values, the hypothesis H_0 is rejected.

2.2. DOLS Cointegration Estimators

After determining the cointegration relationship between the variables, the DOLS estimators were used to determine the direction and magnitude of the long-term relationship. The DOLS method developed by Saikkonen (1992) and Stock & Watson (1993) is defined as follows:

$$y_t = x_t'\beta + D_t'\gamma_1 + \sum_{j=-q}^{q} \Delta x_{t+j}'\,\delta + u_{1t} \tag{5}$$

y_t is the I (1) dependent variable and x_t' denotes the stochastic regressors, D_t' represents a deterministic trend and u_{1t} is error term with zero mean and covariance. q denotes the numbers of lags typically chosen using information criterion. γ_1 is the deterministic trend parameter and β true parameters.

In the equation, the function is assumed to conform to the central limit theorem, and problems arising from the problem of internality and autocorrelation problems are corrected.

2.3. Asymmetric and Time-Varying Asymmetric Causality Test

Wars, economic crises, and policy changes affect causal relationships between variables and distribution of error terms significantly. However, in the Toda &Yamamoto (1995) causality test, this situation is neglected, and the error terms are assumed to have a normal distribution. Therefore, using the Toda-Yamamoto causality test in cases where the error terms do not have a normal distribution causes erroneous result. In this context, Hacker & Hatemi J (2006) developed a bootstrap-based symmetric causality test, which provides more reliable results when the error terms are not normally distributed. However, in the symmetric causality test, positive and negative shocks are considered to have the same effect. Nevertheless, positive, and negative shocks do not have the same effect on variables. In this context, the asymmetric causality test was developed by Hatemi J (2012). In the

asymmetric causality test, the variables are divided into positive and negative components, and the causality relationships between positive shocks and negative shocks are investigated. The causal relationship between two integrated variables y_{1t} and y_{2t} was defined as the following random walk processes:

$$y_{1t} = y_{1t-1} + \varepsilon_{1t} = y_{1,0} + \sum_{i=1}^{t} \varepsilon_{1i} \quad (6)$$

$$y_{2t} = y_{2t-1} + \varepsilon_{2t} = y_{2,0} + \sum_{i=1}^{t} \varepsilon_{2i} \quad (7)$$

t=1, 2,….T, the constants $y_{1,0}$ and $y_{2,0}$ are the initial values, and the variables ε_{1i} and ε_{2i} signify white noise disturbance terms. Positive and negative shocks are defined as the following.

$$y_{1t} = y_{1t-1} + \varepsilon_{1t} = y_{1,0} + \sum_{i=1}^{t} \varepsilon_{1i}{}^{+} + \sum_{i=1}^{t} \varepsilon_{1i}{}^{-} \quad (8)$$

$$y_{1t} = y_{2t-1} + \varepsilon_{2t} = y_{2,0} + \sum_{i=1}^{t} \varepsilon_{2i}{}^{+} + \sum_{i=1}^{t} \varepsilon_{2i}{}^{-} \quad (9)$$

The variables $\varepsilon_{1i}{}^{+}$ and $\varepsilon_{2i}{}^{-}$ denote positive and negative shocks. The positive and negative shocks of each variable can be defined in a cumulative form as $y_{1t}^{+} = \sum_{i=1}^{t} \varepsilon_{1i}^{+}, y_{1t}^{-} = \sum_{i=1}^{t} \varepsilon_{1i}^{-}$.

The causal relationship between positive cumulative shocks and negative cumulative shocks is tested. The test for causality can be implemented by using the following vector autoregressive model of order p, VAR (p);

$$y_t^{+} = v + A_1 y_{t-1}^{+} + \cdots + A_p y_{t-1}^{+} + u_t^{+} \text{ (For positive shocks)} \quad (10)$$

$$y_t^{-} = v + A_1 y_{t-1}^{-} + \cdots + A_p y_{t-1}^{-} + u_t^{-} \text{ (For negative shocks)} \quad (11)$$

The variables y_t^{+} and y_t^{-} is the 2 x 1 vector of the variables, v is the 2 x1 vector of intercepts, and u_t^{+} and u_t^{-} are 2 x 1 vector of error terms. The matrix A_r is a 2 x 2 matrix of parameters for lag order r (r = 1,2……p).

The null hypothesis indicating there is no causality between the variables is tested by using the Wald test statistics. Wald test statistics is formulated as following;

$$Wald = (C\beta)'[C((Z'Z)^{-1} \otimes S_U)C']^{-1}(C\beta) \quad (12)$$

β is the parameter vector. C is $p\ x\ n(1 + np)$indicator matrix with elements ones for restricted parameters and zeros for the rest of the parameters. S_U is the variance-covariance matrix of the unrestricted VAR model estimated. If the calculated test statistics are greater than the critical values, H_0 is rejected. Rejection of H_0 means that there is a causal relationship between positive or negative shocks.

In the time-varying asymmetric causality test, the period during which causality relationships between variables are analysed is subdivided into periods. For this, firstly, the asymmetric causality test is performed for the whole period in hand. In the second stage,

sub-periods are created by discarding the first observation value for each period and adding an observation to the last period, and this process continues until the last observation value. In order to decide whether there is a causal relationship between the positive or negative components as of the sub-periods, Wald statistics calculated for the sub-period is normalized by the 10% bootstrap critical value. Normalized wald statistics and 1 boundary line are plotted. The periods when the wald statistics are located above the 1 boundary line are the periods when causality exists.

3. Estimation Results

The series must be I (1) to perform cointegration analysis. For this reason, firstly, whether the series is stationary or not was tested. The Kapetanios (2005) unit root test, which is a multiple breaks unit root test, was used to test the stationarity of the series.

Table: 3
Estimation Results of Unit Root Test

Variables (Level)	**LNCDR**	**LNFLPR**	**LNTUR**	**LNGDP**
τ statistics	-2.622	-3.732	-2.046	-2.913
Breaking Dates	2001	2008	2009	2009
Variables (Difference)	**ΔLNCDR**	**ΔLNFLPR**	**ΔLNTUR**	**ΔLNGDP**
τ statistics	-5.175	-9.660	-5.941	-5.712

**Critical values on the 1%, 5% and 10% significance level are: -5.014, -4.495 and -4.144, respectively.*

The finding that the absolute values of the calculated test statistics are smaller than the absolute values of the critical values shows that the series are not stationary in their level values. To make the series stationary, the first differences of the series must be taken. When the estimation results of the unit root tests are performed for the series whose differences are taken, it is seen that the absolute values of the calculated values are greater than the absolute values of the critical values. The series whose differences are taken are stationary. Therefore, the series are I (1). The Maki (2012) cointegration test was used to test whether there was a cointegration relationship between the series.

Table: 4
Estimation Results of Cointegration Test

H_0	There is no cointegration between divorce rates and female labour force participation rates				
	Test Statistics	**Critical values**			**Breaking Dates**
		1%	**5%**	**10%**	
Model 0	-7.548	-5.959	-5.426	-5.131	1994,1999,2002,2009
Model 1	-8.899	-6.193	-5.699	-5.449	2000,2002,2005,2008
Model 2	-8.613	-6.915	-6.357	-6.057	1995,2000,2008,2014
H_0	There is no cointegration between divorce rates and unemployment rates				
	Test Statistics	**Critical values**			**Breaking Dates**
		1%	**5%**	**10%**	
Model 0	-8.145	-5.959	-5.426	-5.131	2001, 2003,2009,2015
Model 1	-8.433	-6.193	-5.699	-5.449	2001, 2003,2009,2015
Model 2	-10.958	-6.915	-6.357	-6.057	2001,2002, 2009,2014
Model 3	-11.237	-8.004	-7.414	-7.110	1995,2001,2004, 2009
H_0	There is no cointegration between divorce rates and income levels				
	Test Statistics	**Critical values**			**Breaking Dates**
		1%	**5%**	**10%**	
Model 0	-7.441	-5.959	-5.426	-5.131	2001,2005,2009, 2015
Model 1	-8.074	-6.193	-5.699	-5.449	1991,1994,2001,2009
Model 2	-9.491	-6.915	-6.357	-6.057	1995,2001,2006,2009,

If the absolute values calculated in the Maki (2012) cointegration test are greater than the absolute values of the critical values, the hypothesis H_0 is rejected. When the cointegration estimation results are examined, it is seen that the absolute values of the values calculated in all models were greater than the absolute values of the critical values. Therefore, the hypothesis H_0 was rejected in all models. There was a cointegration relationship between the divorce rates and female labour force participation rates, unemployment rates and income level. In order to determine the direction and magnitude of the cointegration relationship between the variables, the effects of the periods of crisis and legal amendments were included in the models, and the DOLS cointegration estimator were conducted.

Table: 5
Estimation Results of DOLS Cointegration Estimator

Dependent Variable: LNCDR

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDP	5.1905	1.2405	4.1896	0.0019
LNTUR	0.0974	0.0294	3.3066	0.0079
LNFLPR	0.0074	0.0063	1.1754	0.0267
D1	1.2462	0.1105	11.270	0.0000
D2	0.1718	0.0720	2.3833	0.0384
C	1.2898	0.3380	3.8159	0.0034
R-squared	0.996585	Mean dependent var		1.139789
Adjusted R-squared	0.991805	S.D. dependent var		0.515488
S.E. of regression	0.046665	Sum squared resid		0.021777
Long-run variance	0.002326			

When the estimation results are analysed, it is seen that the probability value of all variables was smaller than the significance level of 5%. In this case, all variables are statistically significant. The per capita GDP, female labour force participation rates, unemployment rates, legal regulations and dummy variables representing crisis periods positively affect the divorce rates. While a 1% increase in the per capita income increases the divorce rates by 5.19%, the same increase in the female labour force participation rates increases divorce rates by 0.007%. In addition to, 1% increase in the unemployment rate increases the divorce rates by 0.09. The legal regulations and periods of crisis that facilitated divorce caused an increase in divorce rates.

Table: 6
Estimation Results of Asymmetric Causality Test

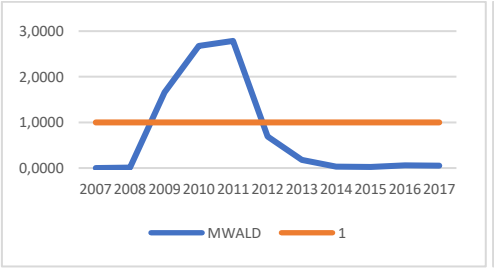
Variables	**Direction of Causality**	**Test Statistics**	**Critical Values**		
			1%	**5%**	**10%**
LNTUR→LNCDR	-→ -	1.453	9.287	4.628	3.044
	+ → +	0.052	13.653	4.956	2.889
LNFLPR→LNCDR	-→ -	1.134	10.948	5.886	3.969
	+ → +	0.164	16.269	7.063	4.819
LNGDP→LNCDR	-→ -	2.340	11.175	5.666	3.737
	+ → +	15.859	22.434	13.782	10.327

Asymmetric and time-varying asymmetric causality tests were also used to analyse the short run causality relationship between the variables. When the period under

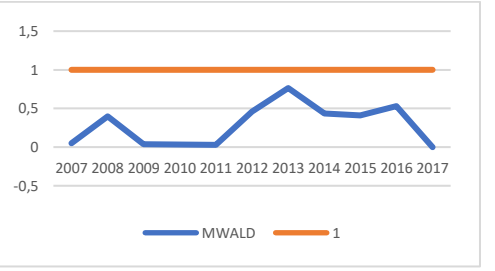
consideration is analysed as a whole, it is seen that there was only one-way causality from positive income shocks to positive divorce shocks.

The time-varying asymmetric causality test was used to analyse whether causality relationships change over time or not. The periods when the calculated normalized wald values are above the 1 line are the periods when the causality relationship is seen.

Figure: 3
Time-Varying Asymmetric Causality between Female Labour Force Participation Rates and Divorce Rates



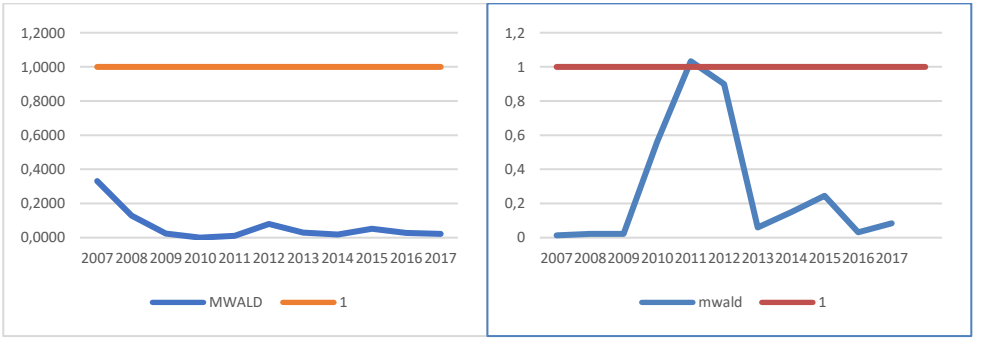
(a) Positive Shocks



(b) Negative Shocks

Figure 3(b) shows the time-varying asymmetric causality relationship between the negative labour force participation rate shocks and the negative divorce rate shocks, while Figure 3(a) shows the causality relationships between the positive female labour force participation rate shocks and the positive divorce rate shocks. When the estimation results are analysed, the emergence of causality relationships between the positive female labour force participation rate shocks and the positive divorce shocks in 2009-2010 means that the increases in the female labour force participation rates in the 1995-2011 sub-period caused an increase in the divorce rates, too. This period was also the period in which the 1997 Southeast Asian crisis, 1998 Russian crisis and 2008 global crisis were experienced in addition to the 1994, 2001 November and 2002 February Crises. This period also covers the amendment of the law. In this context, it may be stated that causality relationships were seen at a time when crisis periods and changes in the law were experienced.

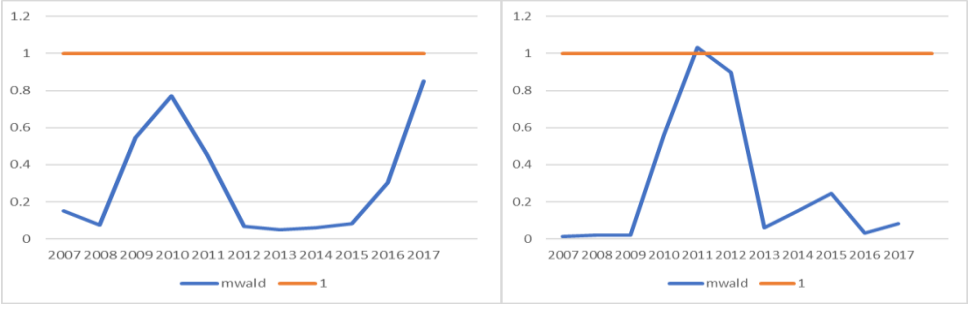
Figure: 4
Time-Varying Asymmetric Causality between Unemployment Rates and Divorce Rates



(a) Negative Shocks **(b) Positive Shocks**

Figure 4(a) shows the time-varying causality relationships between the negative unemployment shocks and the negative divorce shocks by sub-periods, while Figure 4(b) shows the causal relationships between the positive unemployment shocks and the positive divorce shocks by sub-periods. While there was no causal relationship between the negative shocks, it is observed that a one-way causality relationship emerged in 2011 from the positive unemployment rate shocks to the positive divorce shocks.

Figure: 5
Time-Varying Asymmetric Causality between GDP Per Capita and Divorce Rates



(a) Negative Shocks **(b) Positive Shocks**

When the dynamic relationships between the income shocks and the divorce shocks are examined, it is seen that there was a one-way causality relationship from the positive income shocks to the positive divorce shocks in 2011.

4. Conclusion

The legalization of unilateral and non-fault divorces with the amendment to the Turkish Civil Code in 2001 caused a significant increase in divorce rates in Turkey. In 2000, the crude divorce rate was 0.52 per thousand, while in 2001 this rate increased to 1.41 per thousand. Although divorce rates fluctuated over the years in the periods following 2001, there was no serious decrease in the divorce rates. This sudden jump in divorce trend has led to an increase in studies examining the causes of divorce in Turkey, especially in recent periods. Indeed, Doğan (1998), Yıldırım (2004), Aydin Baran (2010), Aktaş (2011), Ersöz (2011), Başkaya and Inal (2017), Binay (2018), Akoğlu and Kucukkaragoz (2018), Ayhan (2018) performed studies by drawing attention to the increase in the divorce rates and emphasized that the irreconcilable differences are main reason for divorce. In these studies, the effects of economic factors on the divorce rates have not been empirically analysed. In this context, in addition to the legal amendments in 2001, this study analysed how economic recessions directly and indirectly affect divorce rates in the short and long term.

Following November 2000 and February 2001 crises, serious reforms were carried out in the Turkish economy. Along with the reforms, the Great Recession caused by the 2008 global crisis in the world economy significantly affected the labour markets in Turkey. In this period, despite the economic growth, the increase of the unemployment rate and increases in participation rates of women's labour force (i.e., the increase of their employment rates) are of importance in terms of the labour force markets. All these actually play a decisive role in the divorce rates. Results obtained from the study point out that there is a temporary causal relationship between positive woman labour force participation shocks, positive income shocks and positive unemployment shocks in the short term. There is, however, a long causal relationship between female labour force participation rates and divorce rates.

The results of the co-integration analysis show a positive long-term relationship between the participation rate of women's labour force, unemployment rate, national income level and the divorce rates.

Upon evaluating the results within the scope of the current literature, it can be stated that the relationship between economic recessions and divorce rates in Turkey can be explained by the psychological stress approach developed by Komarovsky (1940) in the long term. The fact that the main cause of divorce is the irreconcilable difference also significantly supports this finding.

The fact that causal relationships between unemployment rates and national income levels vary over time in the short term points out that the hybrid approach developed by Cherlin (2009) is valid in Turkey in the short term.

The irreconcilable difference is the main reason for divorce in Turkey. Yildirim (2004) emphasizes that the economic weakness or economic independence of spouses have

the determinant factors on the irreconcilable difference. Women's economic freedom, especially in families where there are too many conflicts, plays a role in encouraging the desire for the divorce. However, wage level is an important factor in determining the relationship between participation rates of women's labour force and divorce rates. Women with a low level of education and working on low wages have a lower tendency to divorce, whereas women with a high level of education and working on high wages have a greater tendency to divorce. The approval of unilateral divorce in 2001 also has an accelerating effect on the divorce.

In an economy in which economic recessions affect divorce rates positively, the coefficient showing the relationship between national income level and divorce rates is expected to be negative and statistically significant. Coefficients indicating the relationship between the economic crisis and unemployment rates are statistically significant positive, while the coefficient of national income is also positive. This can be explained by the presence of jobless growth phenomenon in Turkey.

In families where the irreconcilable difference is available, family members are exposed to intense violence. This also increases the tendency of children towards violence. On a global level, one in two children between the ages of 2 and 17 are exposed to violence in various ways each year. Children who are exposed to violence throughout their lives are at risk of physical and mental health problems. This also negatively affects the educational life of children. (UNICEF, 2020). For this reason, the issues of divorce and violence should first be addressed at the individual level and the origins of violence should be investigated.

In the ecological model developed by Heise (1998), the factors affecting domestic violence are classified as personal characteristics, characteristics of the relationship, social factors and social characteristics. Therefore, the divorce is not a technical concept that can be solved solely on the basis of economic problems.

In order to reduce the increase in divorce rates, first of all, legal regulations should be implemented to prevent all kinds of violence and bullying practiced by the social environment from childhood, rehabilitation centres should be established, especially for families with a high propensity to violence. A decrease in the trend of violence across society will increase both social welfare and economic well-being.

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