Does economic stress matter for the rising divorce rate in China? A provincial perspective

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ABSTRACT

Purpose: Marriage is an infinite bond between two partners that can be caused to fail by several factors. Economic stress leads to psychological stress and in some cases, marriage dissolution. The current study investigates the impact of economic stress (measured by the unemployment rate and inflation rate) on divorce rates using Chinese province-level panel data from 2010 to 2019.
Design/Methodology/Approach: The panel fixed effects (FE) model, panel random effects (RE) model, and fixed effects- Driscoll and Kraay standard errors (DKSE) model were used for empirical analysis.
Findings: The research findings support the hypothesized economic stress theory of divorce by Reuben Hill. According to the empirical findings, economic stress indicators such as unemployment and inflation have a positive and significant impact on the divorce rate in China and its regions. Furthermore, urbanization, education and mobile phone variables have a positive relationship with divorce rates except for children's dependency.
Contribution to literature: Taking into account both parties' perspectives, this study contributes to the existing literature by looking at economic stress in the context of divorce. We are particularly interested in how economic stress affected the marriage relationship's quality. We investigated the relationship between the unemployment rate, inflation rate and divorce rate in China's 31 provinces for the period 2010-2019. The entire sample is then separated into three sub-samples: Eastern China, Central China and Western China.

Keywords: Divorce, Economic stress, Inflation, Panel data, Unemployment.

1. INTRODUCTION

Divorce which is the breaking of a marriage bond has ramifications for family peace and stability and also affects society (Liyun, Yang, & Xiangwu, 2015). According to several studies, economic stress is one of the major factors in divorce. When couples have financial difficulties, they may suffer individually as well as a couple in society (Conger, 1990; Conger & Elder, 1994). Economic hardship creates stress on marriages, increasing the risk of marital conflicts and dissolutions (Halliday, Hardie & Lucas, 2010; White & Rogers, 2000). Constant unemployment and financial difficulty increase psychological suffering and marital conflict between spouses (Elder, 2018). There are at least two implications of rising unemployment rates for marriages. Firstly, it has the potential to affect the non-monetary aspect of marital relationships. Rising unemployment rates in one's industry can result in personality changes such as becoming more easily irritated. It has the potential to result in a divorce. Second, a rise in the unemployment rate has the potential to change marital surplus as it alters the expected income available within marriage compared to singlehood. Marriage allows one to have some control over the spouse's income even if one were to lose his or her job (Roy, 2011).
Unemployment and inflation are commonly used to describe economic stress (Jackson, 1986; Keyssar, 1986). Higher costs of products (inflation) combined with a high unemployment rate create economic stress in people's lives, justifying their economic vulnerability (Keyssar, 1986). The inability to meet basic requirements is a source of economic stress in married life. A couple's social disintegration is exacerbated by a decline in their financial situation. The unemployment rate can put a lot of stress on marriages (Roy, 2011). Many people

view inflation as a "psychological stressor" (Epstein & Babad, 1982). Inflation reduces the purchasing power of a household and eventually creates economic stress in the household as it becomes more and more difficult for the household to pay its bills (Caplovitz, 1981). There are three types of economic stress. The first relates to the difficulties and strains that result from a significant loss of income and a spike in the price of basic items. The second is concerned with economic phenomena and ways to change a family's economic situation. The third is the family economy. A failing economy is linked to a decline in family wellbeing (Elder Jr & Caspi, 1988).

Divorce is a widespread occurrence in the world for example, the Maldives has the world's highest divorce rate of 5.52 per 1000 people in 2020 whereas China has 3.2 per 1000 people (World Population Review, 2022). According to data from China's divorce rate, it has risen steadily from (0.05%) in 1985 to (0.35%) in 2015 (CSY, 2015). Economic stress is causing an increase in divorce rates which may lead to a deterioration in social harmony and socio-economic concerns. According to empirical analysis, the rise in the divorce rate in China will last for a long time (Anqi, 1991; Fu & Li, 2008; Zhu & Cai, 2010). Since 2003, China's divorce rate has risen for 13 years. In 2013, 3.5 million couples divorced in China. This number increased to 3.637 million in 2014 and then to 3.84 million in 2015. According to a Supreme People's Court official in December 2015, there were around 1.6 million marriage and family cases in 2015 with more than 1.2 million being divorce proceedings (Liyun et al., 2015). The high divorce rates have become a contentious issue in Chinese society (Su, Liang, Yang, & Liu, 2018). In 2011, the province of Sinkiang in China had the highest divorce rate at 4.81 percent while Tibet had the lowest at 0.68 percent. In 2000, the divorce rate in China increased by 1.22 times with Guangdong Province experiencing the largest increases (2.02 times) and Qinghai Province the smallest increase (0.32 times) (Liyun et al., 2015). The aforementioned statistics show that divorce rates are rising across all of China's provinces. The sustained increase in China's divorce rate has harmed the country's communal stability, particularly the objective of establishing a harmonious society.

The aim of this study is to examine how economic stress affects married couples' lives. We look at economic stress in the context of divorce taking into account both parties' perspectives and we are interested in how economic stress affected the marriage relationship's quality. We investigate the relationship between unemployment rates, inflation rate and divorce rate in China's 31 provinces from 2010-2019. The entire sample is then separated into three sub-samples: Eastern China, Central China and Western China.

The second section reviews prior research on this topic while the third part discusses the theoretical underpinnings of the problem. The study's specific methodology is addressed in section four. Finally, part five contains empirical findings and a discussion of the study in question.

2. LITERATURE REVIEW

This section offers an empirical review of previous studies on divorce. Important determinants such as economic stress (the combination of unemployment and inflation) and other control variables are boosting the divorce rate. Inflation and unemployment raise psychological stress. The divorce rate between couples is strongly influenced by psychological stress. The empirical studies in support of divorce and economic stress literature have been extensively described. Conger (1990) investigated the economic hardship experienced by rural families in Iowa during the 1980s farm disaster and found that economic difficulties appeared to enhance spouses' psychological discomfort such as animosity among males and depression among women resulting in decreased manifestations of emotional support, cordiality and contentment among spouses. Another study in this area by Amato and Beattie (2011) revealed that financially challenged farmers in Nebraska had higher propensities to consider divorce. In a countrywide survey of married couples, Amato and Beattie (2011) found that household income was a substantial indicator of observed economic hardship. Low spousal contentment, less marital communication, more marital conflicts and more recurrent considerations of divorce were all linked to perceived economic hardship. Studies have constantly shown that husbands' low earnings increase the likelihood of divorce (Hoffman & Duncan, 1995; Ono, 1998). These studies offer strong evidence for the association between economic hardship and strained conjugal relations.

The psychosocial stress theory was also supported by Preston and McDonald (1979); Ross, Sawhill, and MacIntosh (1975) and Bumpass, Martin, and Sweet (1991) focus on the issues of unemployment and divorce and found that unemployment was linked to a higher rate of divorce. Several different European countries have observed similar outcomes. Jensen and Smith (1990) conducted research in Denmark and found that male unemployment was significantly linked to divorce. Since a high divorce rate is often the result of one or both spouses being unemployed. It is not surprising that a high rate of unemployment for both spouses would have a greater impact on the divorce rate. According to Hansen (2005) and Jalovaara (2003), the

unemployment of either the husband or the wife has been found to increase the likelihood of divorce in Finland and Norway. As a result, stress lowers the quality of married life.

Komarovsky (2004) investigated the connection between husbands' unemployment and the divorce rates during the great depression in the United States and found that a significant number of marriages ended in divorce as a result of the rising unemployment rate. Initially, both spouses in the study had high hopes for their husbands' professional futures. But as time went on, they became discouraged and hostility developed between the jobless men and their companions. Since 1980, there has been a massive increase in the number of married women entering the labor market and women's real incomes have risen alongside this trend. After the great depression, the unemployment rate increased and then finally declined. These changes improved the financial security of married couple families and increased the economic independence of wives from their husbands. Unemployment indemnification and other methods of public support that were not available during the great depression are now accessible to spouses who lose their jobs. These factors have made divorce less expensive than it was previously, especially during the time of high unemployment. In recent decades, the negative association between unemployment and divorce has weakened.

Preston and McDonald (1979) and Ross et al. (1975) showed that unemployment among husbands increased the probability of divorce. In 50 states across the USA, Amato and Beattie (2011) found a negative association between unemployment rates and divorce rates. They further empirically showed that tenured unemployment led to an increase or decrease in the divorce rate in the USA. Roy (2011) constructed a static model of divorce that depicts the conditions under which an increase in the unemployment rate in either one's own or one's spouse's sector increases the probability of divorce. According to some analysts, the rising divorce rate can be attributed to increased urbanization resulting from economic advancement (Zhang, Wang, & Zhang, 2014).

Zhang, Cheng, Wei, and Gong (2018) used a quantitative approach to explore the relationship between mobile phone usage and divorce rates in Chinese provinces from 2001 to 2016. Quantile regression and two divorce rate measures were used to improve the estimation results. To examine the lagging effect of mobile phone penetration on divorce rates, one-year to five-year lags were used as key predictor variables. Mobile phone penetration was positively correlated with Chinese divorce rates between 2001 and 2016. This study also found that central China had the highest divorce rate followed by eastern China but not western China. Xu, Yu, and Qiu (2015) argued that China's rising divorce rate is due to changes in marriage beliefs and the fertility rate.

The majority of the literature on the impact of economic stress on divorce rates is made up of numerous previous studies that have been discussed. Studies such as Preston and McDonald (1979) and Ross et al. (1975) sought to investigate the empirical evidence of unemployment on divorce rates. Similarly, various studies have been conducted on this topic but there is a study deficit in terms of economic stress, particularly at the provincial level in China where the divorce rate has risen in recent years. However, these studies have some research gaps on which we shall focus in this study.

3. THEORETICAL FRAMEWORK

The theoretical literature shows that unemployment has a variety of effects on the divorce rate. Four of them are: psychological stress, divorce costs, hybrid perspectives and individual liability perspectives (Amato & Beattie, 2011). The divorce rate (marital dissolution) has four theories in the literature. They are as follows: First, the classical viewpoint theory, which is founded on social solidarity, demonstrates Durkheim's (2018) thoughts. According to these thoughts, marital dissolution is brought about by economic considerations. Second, Becker's economic theory which is divorce theory Becker (1991). Becker's approach is focused on an economic model and centered on the amount of family utility. People will choose divorce if the utility level expected from the marital connection does not exceed the utility level expected from being single (Becker, 1973). He also believes that marriage is a market in which the partners act as customers and producers. When the utility of the consumer exceeds or falls below the utility of the producer, there is disequilibrium and the marriage finally fails. A successful marriage is similar to an equilibrium utility level between the producer and the consumer. The impact of industrialization and globalization on divorce is the third divorce theory. According to this theory, divorce is influenced by historical, cultural, moral and religious factors. This hypothesis is based on "World Changes on the Divorce Pattern" proposed by Goode (1993). The fourth divorce theory proposed by Hill (1949) is the family stressor which is a crisis or stress theory in use at present and explains and predicts when stressor events can lead to a crisis and family dissolution (Kraft, 2001).

4. DATA AND METHODOLOGY

4.1. Data and Empirical Framework

Based on the above-mentioned theories of divorce, the current study follows Hill's (1949) theory of stress and divorce. The main function of the divorce rate is as follows:

DR = F (Urban unemployment, Urban inflation, Control variables)   (1)

Equation 1 shows that the divorce rate is a function of unemployment, inflation and other control variables. The econometric equation is expressed as follows:

$$DR_{pt} = \beta_0 + \beta_1 UE_{pt} + \beta_2 UCPI_{pt} + \beta_2 X_p + \varepsilon_{pt} \tag{2}$$

In equation 2, DR is the divorce rate in province "p" at time "t". This study focuses on China and its various regions. The current study aims to empirically investigate the factors associated with divorce rates in terms of economic stress for a sample of 31 Chinese provinces from 2010 to 2019. We investigate this empirically using economic stress and other control variables. UE is the urban unemployment rate and UCPI is the urban consumer price index which is used to measure economic stress. ε is the error term.

Before empirically investigating the association between divorce rate and economic stress, we first check the issue of serial correlation, heteroscedasticity and cross-sectional dependence by applying the Wooldridge test, the Modified Wald test and Pesaran's cross-sectional dependence (CD) test. If CSD, serial correlation and heteroscedasticity exist in the dataset, an inappropriate estimation technique yields a spurious outcome. Our study employs the Driscoll-Kraay standard errors (DKSE) technique proposed by Le, Le, and Taghizadeh-Hesary (2020). The study uses the robust standard errors recommended by Driscoll and Kraay (1998) for panel datasets with CSD. Specifically, we used the xtscc command as suggested by Hoechle (2007) which provides Driscoll and Kraay (1998) standard errors (DKSE) for the linear panel model because they are consistent with heteroscedasticity and also resistant to general forms of temporal and cross-sectional dependence (Le & Tran-Nam, 2018). Comparative empirical analysis was also conducted using the FE, RE and Fixed Effect-Driscoll-Kraay standard errors (FE-DKSE) methods. The source of all data is the Chinese National Bureau of Statistics (CNBS).

We computed the provincial divorce rate by using the following formula:

$$\text{Number of divorce per 1000 people over a period} = \frac{\text{The annual number of divorces}}{\text{annual average population}} * 1000‰.$$

Table 1 shows the variables notations, descriptions and units of measurement.

Table 1. Variables definition.

Variable	Definition	Unit
DR	Crude divorce rate	‰
UE	Urban unemployment rate	%
UCPI	Urban consumer price index (2010 Used as base year)	Index
Urban	Share of urban population	Ratio
NSTU	No. of students in colleges and universities	10 thousand
CDR	Child dependency ratio	%
MPR	Mobile phone penetration rate	%
TDR	Total dependency ratio	%

4.2. Econometric Techniques

The study examines whether economic stress affects the divorce rate in China using FE, RE, and fixed-effects estimator with Driscoll-Kraay standard errors for coefficient estimates. Cross-sectional dependence causes inaccurate panel data estimates. Unlike conventional methods Driscoll and Kraay's (1998) technique handles the issue of cross sectional dependence, resulting in a robust estimated standard error. The Driscoll-Kraay method assumes heteroscedasticity, autocorrelation up to a certain lag and correlation across entity error structures. The nonparametric Driscoll-Kraay estimator, based on large T asymptotic is more adaptable without restrictions on the number of panels and more convenient as time length increases. The Driscoll-Kraay covariance estimator is robust for both balanced and unbalanced panel data and it can handle missing data. Because of the nature of the logarithmic transformation, the absolute of negative values is used in the study to ensure that no information is lost.

The DKSE for pooled OLS estimation for a linear model is expressed as:

$$y_{i,t} = x'_{it}\beta + \varepsilon_{i,t}, \text{ i=1,...,N; t=1,..., T}$$

Where $y_{i,t}$ is the dependent variable (DR), xi,t symbolizes the independent variables (UE, UCPI, Urban, NSTU, CDR and MPR) with the (K + 1) × 1 vector, whose first element is 1 and β represents the unknown coefficients with the (K + 1) × 1 vector and i denotes the cross-sectional units at time t.

After layering all of the observations, the formulation is as follows:

$$y = \left[y_{1,t_{1,1}}, \ldots, y_{1,T_1} \quad y_{2,t_{2,1}}, \ldots, y_{N,T_N}\right]' \text{ and } X = \left[x_{1,t_{1,1}}, \ldots, x_{1,T_1} \quad x_{2,t_{2,1}}, \ldots, x_{N,T_N}\right]'$$

This is based on the assumption that the scalar error terms $\varepsilon_i s$ are uncorrelated with xi, t for all s, t (strong exogeneity). $\varepsilon_{i,t}$ can display heteroscedasticity, autocorrelation and cross-sectional dependence. On the basis of the stated assumptions, β can be estimated consistently using OLS regression resulting in Hoechle (2007):

$$\hat{\beta} = (X'X)^{-1}X'y$$

For conciseness, the coefficient estimates of the DKSE are expressed as "square roots of the diagonal elements of the asymptotic covariance matrix" (Driscoll & Kraay, 1998):

$$V(\hat{\beta}) = (X'X)^{-1}\hat{S}_T(X'X)^{-1}$$

5. RESULTS and DISCUSSION

Table 2 displays the descriptive statistics of the variables used. The mean and standard deviation of the dependent variable (crude divorce rate) are 2.765 and 1.01 respectively. The standard deviation is smaller than the mean value. It meant that the data was spread around the mean. In the whole sample of Chinese provinces, the lowest and highest divorce rates were 0.43 and 5.19 respectively.

Table 2. Descriptive statistics.

Var.	N	Mean	Std.	Minimum	Maximum
DR	310	2.765	1.010	0.43	5.19
UE	310	3.271	0.648	1.2	4.5
UCPI	310	1.137	0.074	1	1.306
Urban	310	0.561	0.134	0.227	0.896
NSTU	279	81.911	50.768	3.11	214.08
CDR	279	22.883	6.351	9.9	38.4
TDR	279	36.716	6.645	19.3	51.1
MPR	310	94.067	25.790	40.87	189.46

The mean value of the urban unemployment rate is 3.271 with a standard deviation of 0.648. The fact that the mean value exceeds the standard deviation indicates that the data is spread around the mean. Its minimum and highest values are 1.2 and 4.5, respectively. The consumer price index has a mean of 1.13 and a standard deviation of .074. It meant that the data was spread around the mean of this particular variable. The urban consumer price index has a minimum value of 1 and a maximum value of 1.306. The rate of urbanization is a significant factor in the rise in divorce rates. The mean and standard deviation of urbanization are 0.561 and 0.134, respectively. Human capital cannot exist without education. In China, more education causes an increase or a drop in the divorce rate. The mean and standard deviation of the number of students in colleges and universities were 81.911 and 50.768 respectively. This suggests that the data from the sample is adequately disseminated. The total dependency ratio (TDR) and child dependency ratio (CDR) are expressed as percentages. It suggests that youngsters depend heavily on their parents. According to cultural conventions, having more children lessens the risk of divorce. This variable's descriptive result indicates that the mean is greater than the standard deviation (i.e., 22.88>6.35). It also demonstrated that data is spread correctly. The highest and lowest values are 38.9 and 9.9 respectively. The divorce rate may be affected by information technology variables such as mobile phone penetration. The standard deviation is 25.08 and the mean value is 94.06. It also demonstrates that data is concentrated around the mean. The maximum value is 189.46 while the minimum is 40.87.

We used different approaches for comparison and robustness checks. Prior to estimation, the Wooldridge (2010) test and the Modified Wald test were used to test two separate assumptions about the error process, namely serial correlation and heteroscedasticity. The results in Table 3 suggest the existence of serial correlation and heteroscedasticity as the chi2 and F statistics are significant at the 1% level.

<p style="text-align:center">Table 3. Heteroscedasticity and serial correlation diagnostic tests.</p>

Test	Error process	Test statistic
Modified Wald (χ2)	Heteroscedasticity	6566.20***
Wooldridge test (F-test)	Serial correlation	13.21***

Note: *** shows significance at 1%. Heteroscedasticity: Modified Wald test for group-wise heteroscedasticity in a fixed effect regression model; H_0: Sigma(i)^2 = Sigma^2 for all i: no heteroscedasticity. Serial correlation: Wooldridge test for autocorrelation in panel data; H_0: No first-order autocorrelation.

Cross-sectional dependence in the FE specification may also exist, as shown in Table 4. Because of this, the study estimates the models with the robust standard errors suggested by Driscoll and Kraay (1998) for panel regressions with cross-sectional dependence. In particular, we used the Hoechle (2007) xtscc command which generates Driscoll and Kraay (1998) errors for linear panel models that are not only heteroskedasticity consistent but also robust to very general forms of cross-sectional and temporal dependence (Le & Tran-Nam, 2018).

<p style="text-align:center">Table 4. Pesaran's (2004) CD test for CSD in panel data.</p>

Variable	CD-test statistics	P-values
DR	44.03	0.000
UE	10.92	0.000
UCPI	60.71	0.000
Urban	52.81	0.000
NSTU	50.09	0.000
CDR	6.62	0.000

Note: Under the null hypothesis of cross-sectional independence, CD ~ N(0,1), p-values close to zero indicate data are correlated across panel groups.

For comparison and completeness, we estimate Driscoll and Kraay's (1998) standard errors for coefficients by pooled OLS, FE (within), and random effects regressions.

<p style="text-align:center">Table 5. Economic stress and divorce in China.</p>

Variables	FE		RE		FE-DKSE	
	(1)	(2)	(3)	(4)	(5)	(6)
UE	0.158**	0.186**	0.187**	0.172*	0.158**	0.186**
	(0.080)	(0.092)	(0.076)	(0.090)	(0.072)	(0.088)
UCPI	5.905***	2.427***	5.960***	4.810***	5.905***	2.427**
	(0.331)	(0.938)	(0.329)	(0.813)	(0.268)	(1.094)
Urban		8.242***		3.054***		8.242***
		(1.807)		(1.145)		(2.026)
NSTU		0.003		0.003		0.003***
		(0.004)		(0.002)		(0.001)
CDR		-0.080***		-0.051***		-0.080***
		(0.019)		(0.017)		(0.018)
MPR		0.002		0.001		0.001
		(0.003)		(0.003)		(0.001)
Constant	-4.468***	-3.847***	-4.625***	-4.175***	-4.468***	-3.847***
	(0.565)	(0.810)	(0.571)	(0.813)	(0.506)	(0.611)
F/Wald stats	203.17	52.48	403.47	279.48	443.86	2271.54
P-val	0.000	0.000	0.000	0.000	0.000	0.000

Note: The divorce rate is a dependent variable in all models. N is 310 in odd numbered columns and 279 in even numbered columns. FE-DKSE stands for FE regression with Driscoll-Kraay standard errors.
Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

As shown in Table 5, models (1), (3) and (5) show the impact of core variables on divorce using fixed effect, random effect, and FE-DKSE models. According to the empirical findings, economic stress indicators such as urban unemployment and urban inflation have a positive and significant impact on the divorce rate. Our empirical result relating to inflation is consistent with the findings of Nunley (2010). Both concurrently and prospectively, chronic economic stress was considerably more strongly linked to marital tension.

Greater rates of marital instability (separation or divorce) were linked to higher levels of marital tension, a finding that is consistent with prior studies associating economic hardship to marital disintegration (Conger, Ge, & Lorenz, 2020). One of the factors contributing to the rise in divorce rates is economic stress (South, 1985).

The models (5) and (6) are accurate, consistent and free of heteroscedasticity and cross-section dependency. Models (2), (4), and (6) show the impact of core and control variables on the divorce rate using fixed effects, random effects, and FE-DSKE. Except for the child dependence rate, urban unemployment, urban inflation, urbanization, and the number of students at the university level, models (2), (4), and (6) have a positive and significant relationship in the fixed effect, random effect, and FE-DSKE models.

Table 6 shows the robustness results of the current study. Column (1) indicates that the unemployment coefficient is 0.158 and significant at the 5% level. It shows that a 1% increase in the urban unemployment rate causes a 0.158 increase in the divorce rate. The empirical findings are in accordance with the findings of Amato and Beattie (2011); South (1985). Additionally, urban inflation has a positive and significant effect on the divorce rate. In general, economic stress increases the divorce rate in China. This empirical finding contradicts the findings of Nunley (2010) and Yiping (2012). With the inclusion of urbanization as a control variable in the core model, the impact of urbanization is shown in column (2). Economic stress indicators and urbanization are found to have a strong positive relationship with the divorce rate. Other control variables, such as the number of students enrolled in colleges and universities and the total dependency rate are incorporated with the main variables in column (3). The empirical findings corroborate the theoretical findings. Our findings are in line with the findings of Yiping (2012). The findings suggest that increased education raises people's knowledge, lowers unemployment, gives individuals more options for new marriages and finally raises the divorce rate. Our findings are consistent with those of Zheng, Duan, and Ward (2019). The core variable results show a comparable effect when these control variables are included as in columns (1) and (2). The total dependency burden has a significant negative impact on the divorce rate.

The partial effect of the child dependency rate is included in column (4). With this variable included, the core variable has a similar relationship with the divorce rate. However, the child dependency rate has a negative relationship with the divorce rate. As the number of children increases, the dependency burden rises as well making it increasingly difficult for parents to meet their basic demands. It encourages people to reduce their chances of divorce.

Table 6. Economic stress and divorce in China (Robustness check).

Variables	(1)	(2)	(3)	(4)	(5)	(6)
UE	0.158**	0.249***	0.200**	0.184**	0.202**	0.186**
	(0.072)	(0.070)	(0.083)	(0.085)	(0.088)	(0.088)
UCPI	5.905***	2.898***	2.752**	2.662**	2.371**	2.427**
	(0.260)	(0.630)	(1.057)	(1.981)	(1.100)	(1.094)
Urban		7.635***	8.192***	8.383***	7.950***	8.242***
		(1.340)	(2.052)	(1.981)	(2.068)	(2.026)
NSTU			0.004***	0.003***	0.003**	0.003***
			(0.001)	(0.001)	(0.001)	(0.001)
TDR			-0.0177*		-0.018*	
			(0.009)		(0.008)	
CDR				-0.081***		-0.080***
				(0.018)		(0.018)
MPR					0.003*	0.001
					(0.002)	(0.001)
Constant	-4.46***	-5.62***	-5.291***	-4.030***	-4.959***	-3.847***
	(0.500)	(0.380)	(0.405)	(0.658)	(0.419)	(0.612)
F stats	443.86	2835.01	690.68	1890.15	2235.65	2271.54
P val	0.000	0.000	0.000	0.000	0.000	0.000

Note: The divorce rate is the dependent variable in all FE-DSKE models. N is 310 in the first 2 columns and 279 for the rest of the columns. Standard errors in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

We then add the MPR (mobile phone penetration) variable in column (5). The findings regarding the impact of the key indicators on the divorce rate remained unchanged. Mobile phone adoption has a positive effect on

the divorce rate. The coefficient of mobile phone penetration is 0.003 which is statistically insignificant. The results indicate that during this sample period, a 1% increase in mobile phone penetration led to a 0.003% increase in the divorce rate. These findings correspond to those of Zhang et al. (2018) and Zheng et al. (2019).

For the control variable such as Urbanization, Models 2-6 show that it has a significant positive impact on divorce in China. This indicates that urbanization has been an important contributing factor in the rise in China's divorce rate during this period. These findings support those of Zhang et al. (2018). We use the total dependency ratio and the child dependency ratio. The results demonstrate a significant negative association between the total dependency ratio and the divorce rate. Also, the children dependency ratio and divorce rate have a negative association. Perhaps the reason is that the growth of the dependency ratio considerably increases the cost of living and stress which have an impact on divorce.

5.1. Regional Trend of Divorce

According to South (1985), the divorce rate rises during economic prosperity and declines during economic recession. Our empirical results contradict the findings of González-Val and Marcén (2017) and South (1985). Table 7 shows the results for regional China using core variables. The regional findings of this study revealed that in all regions, urban unemployment and urban inflation both have a positive impact on the divorce rate. This suggests that economic stress (a combination of urban unemployment and urban inflation) increases the divorce rate. Our findings are consistent with those of South (1985)and Zheng et al. (2019).

Table 7. Economic stress and divorce across the Chinese regions

Variable	China	Eastern	Central	Western
UE	0.157**	0.175	0.025	0.546***
	(0.072)	(0.135)	(0.100)	(0.086)
UCPI	5.904***	4.824***	7.664***	6.920***
	(0.267)	(0.306)	(0.426)	(0.847)
Constant	-4.467***	-3.364***	-5.774**	-7.011*
	(0.505)	(0.673)	(0.688)	(0.721)
F-stat	443.86	163.55	180.67	243.04
P val	0.000	0.000	0.000	0.000

Note: The divorce rate is a dependent variable in all models. N is 310,110, 80 and 120 in the first, second, third and fourth columns respectively. Standard errors in parentheses: ***p<0.01, ** p<0.05, * p<0.1.

Table 8. Economic stress and divorce across the Chinese regions

Variables	China	Eastern	Central	Western
UE	0.186**	0.188*	-0.271**	0.490**
	(0.088)	(0.096)	(0.093)	(0.166)
UCPI	2.427**	3.944***	2.827***	0.615
	(1.094)	(1.032)	(0.669)	(1.078)
Urban	8.242***	7.127**	3.306	9.273***
	(2.026)	(2.289)	(2.145)	(2.317)
NSTU	0.003***	-0.003	0.008***	0.001
	(0.001)	(0.002)	(0.002)	(0.003)
CDR	-0.080***	-0.026	-0.022*	-0.149***
	(0.018)	(0.022)	(0.011)	(0.021)
MPR	0.002	-0.006*	0.013*	0.008**
	(0.001)	(0.003)	(0.006)	(0.003)
Constant	-3.847***	-5.664***	-2.423*	-0.901
	(0.611)	(0.399)	(1.139)	(1.366)
F-stat	2271.54	500.50	870.09	928.84
P val	0.000	0.000	0.000	0.000

Note: The divorce rate is a dependent variable in all models. N is 279, 99, 72 and 108 in the first, second, third and fourth columns respectively. Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Table 8 shows the results for regional China using the model's core and control variables. The Becker's marriage economics is supported by the fact that the coefficient of the urban unemployment rate is

significantly positive. It is believed that a high unemployment rate lowers household income and raises economic stress which leads to a rise in divorce rates. Because the higher the degree of urbanization, the larger the influence of open cultural concepts on family values, the effect of urbanization on the divorce rate is highly positive. As the urban population becomes more mobile, there are more marriage possibilities and remarriage expenses are lower so the divorce rate rises. Zhang et al. (2014) demonstrated that urbanization occurs in stages. Initially, there are no concerns with urbanization but as time goes on, more social issues emerge.

The empirical findings confirmed that the number of students has a positive impact on China's divorce rate. The literacy rate rises as the number of students in universities and colleges increases. Increased literacy decreases dependency and as a result diminishes tolerance resulting in an increase in divorce rates in China. Education has a two-way impact on the rate of divorce. Primary schooling has a positive impact on the divorce rate while secondary and tertiary education has a negative impact. Our findings contradict those of Jie and Wenyong (2014), Li (2018) and Zhang et al. (2014) which confirmed that educational level has a significant negative effect on the divorce rate indicating that the higher the average level of education, the lower the divorce rate. A higher level of education reduces unemployment and mutual dependence between spouses, ultimately increasing the divorce rate (Yiping, 2012). The eastern Chinese region is well developed in term of socioeconomic characteristics. More education levels   may increase or decrease the divorce rate in eastern China.

Education has a positive impact on divorce rates in central, western and overall China i.e., the larger the number of students at the college or university level, the lower the unemployment rate. This lessens mutual dependence resulting in a rise in the divorce rate in other areas. The higher a person's educational level, the more rational they will be when selecting a partner and thus the lower the likelihood of a marriage mismatch and hence the lower the likelihood of divorce.

Except for Central China, the urban unemployment rate has a positive and significant impact on the divorce rate. With the exception of Western China, inflation has a positive and significant influence in all of the sample regions. Urbanization has a positive and significant impact in all regions except for Central China. In overall China and the Central region, the number of students in universities has a positive and significant influence. However, in eastern China; it has a negative and insignificant effect. The child dependency rate has a negative impact on divorce and its coefficient is significant in overall and Western China. Mobile phone penetration rate has a positive and insignificant impact in all regions except for Eastern China.

6. CONCLUSION AND POLICY IMPLICATION

The study investigated the impact of economic stress on divorce rates in China from 2010 to 2019. China's divorce rate is steadily increasing. A good number of Chinese have experienced psychological strains that have forced them to divorce or dissolve their marriages. The study focused on China's 31 provinces, divided into three regions namely: Eastern China, Central China and Western China. For the econometric analysis, the fixed effect and random effect models were applied. The FE-DSKE model was used to control for heteroscedasticity, serial correlation and cross-sectional dependency. Our findings support the Hill (1949) hypothesis of financial stress and divorce. According to the empirical findings, economic stress or core variables such as urban unemployment and urban inflation cause psychological discomfort and have a positive impact on divorce rates in China and across its regions. We included control variables such as urbanization, the number of students in colleges and universities, children dependency and total dependency in the model. The empirical results of the control variables revealed that urbanization, the number of college and university students and mobile phone penetration all have a positive effect on the divorce rate. In China and its three regions, child dependency and total dependency affect divorce rates negatively. In order to lower the divorce rate in China, the government should provide unemployment insurance and take steps to reduce inflation. It will reduce financial stress as well as the divorce rate. The government should also put the divorce insurance system into effect and set a limit on the number of people allowed in metropolitan areas to curb urbanization. As the dependency burden of children reduces or increases the likelihood of divorce in China, the Chinese government should plan a strategy to address such issues.

CONFLICT OF INTEREST
The authors declare that they have no competing interests.

AUTHORS' CONTRIBUTIONS
All authors contributed equally to the conception and design of the study.

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