

# **Empirical studies with rising divorce rate under urbanization process**

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## **Empirical studies with rising divorce rate under urbanization process**

### **Abstract:**

We compiled data on unemployment rates, urbanization rate and divorce rates for each of the 23 provinces, 4 municipalities directly under the central government plus one autonomous region on the mainland except Tibet from 1999 to 2018 to study how the unemployment rate, urbanization rate and divorce rate are correlated. The empirical studies by running the panel data refers there is negative correlation between unemployment rate and divorce rate which supports the divorce cost. the urbanization rate is not significant which might due to the missing of relevant variables which could be included in the future studies.

### **1. Introduction**

Since after China issues the reform and opening up policy, the economy is undergoing a rapid development. Based on the statistical bulletin of Chinese's national economic and social development in 2019, per capita GDP in 2019 was 70,892 CNY, increased by 5.7% compared with the previous year. The gross national income was 6.88858 trillion in 2015 and it reached 9.88458 trillion, increased by 43.8%. With China's economic and social development, the divorce rate is increasing across years. According to the social service business development statistical bulletin issued in 2017, 4.37 million couples filed for divorce by law, increased by 5.2 percent from previous year, of which 3.70 million couples registered for divorce and 0.669 million couples divorce's case got approved after courts mediating and making decision, an increase of 0.2 thousand percent points from previous years. Figure I show that

between 2008 and 2018, there is a faster increasing trend about china's crude divorce rate despite in 2018 there is slight decrease.

With regards to the individual couples, to end one relationship might benefit to both parties in the unhappy marriage, however, to have continuously rising divorce rate for a whole nation will impact the social stability.

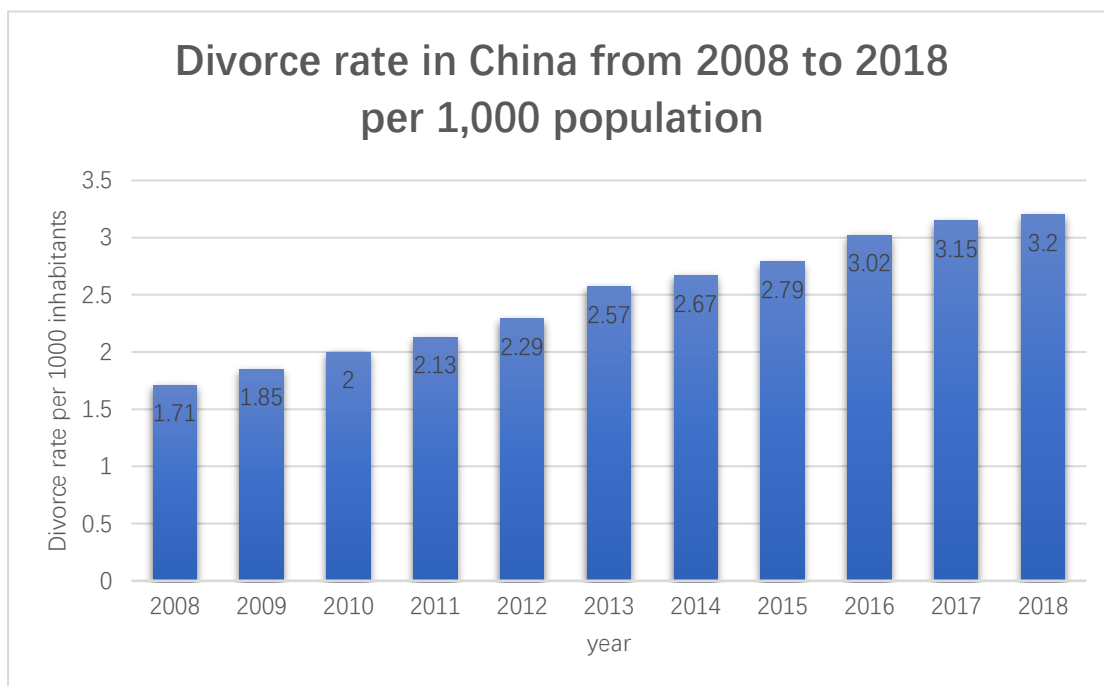


Figure 1 Divorce rate in China from 2008 to 2018 per 1,000 population

With regards to the reason of divorce, the domestic relevant works have harvested the abundant fruits. The reason for rising divorce rate can be classified into three perspectives, sociology, law and economy.

Some scholars argue from sociology perspective. Take shanghai as one example, education attainment, frequent, population mobility and cultural differences between ethnic groups are potential trigger for divorce. (Su and Cao 2018). Li (1997) and Wu (1991) attribute this to the women's enhanced independency. This could be explained as there will be higher expectation

with marriage when the female's education is improved, and the female group obtains financial independency. Some think the social tolerance spreading (Zhang, 2007) is one reason why divorce rate is increasing as divorce is not a stain as it used to be. The couple under unhappy marriage are brave to end the relationship. (Song, et al.2013). Zhu and Cai (2010) argues too much emphasis on the individualism and liberality, the change of social attitudes might be also one reason. Li (2014) even ascribed the divorce as the spread of the rapid development of the Internet. What is more, the number of kids in one family and the sex ratio also play a significant role about the rural divorce rate. (Gao, 2011)

Li (2014) noticed that when studying the influencing mechanism of the high divorce rate in China, whether it is difficult for judicial implementation has a significant impact on the divorce rate. To be specific, the more difficult, the lower the divorce rate. For example, since 2003, the implementation of the "divorce freedom" in the marriage registration regulation, the crude divorce rate has been increasing dramatically. In 2004, the crude divorce rate was 2.5 ‰ which was doubled compared with 2003 which was 1.03 per mile (thousand percent). Some report from economic perspective that the rising divorce rate is due to the housing policy changes. For example, "home-purchase restrictions "has impact on the urban divorce rate. As this clearly increased the couple number of divorces as the residents could obtain more opportunities of house investment after divorce. (Fan, 2016). Gao (2011) did the research about the rural data and found out working away from their hometown by farmers had produced a major influence on the changes of their family relations and it was one reason for rising divorce rate in rural areas.

It seems the majority research is mainly carried out in terms of sociology and less in terms of economical and empirical study. Also, there is one traditional view about the urbanization on the divorce rate, it is assumed that the divorce rate in cities is surely higher than that in the rural areas. It might not easy to conclude just by running the time series data without considering other factors. This paper will test whether the development of urbanization will increase the divorce rate( see Figure 1), the unemployment rate is used as the main economic variable which is widely talked abroad, for example Tumin and Qin ( 2017) did the research to examine how unemployment before or during separation affects the divorce decision. Val and Marce'n(2017) examine the role of the business cycle in divorce.

Figure 1. Trends in China's divorce rate



Figure 2. Trends in China's urbanization rate, unemployment rate and crude divorce rate.

There are five parts about this paper, first is introduction; second is literature review; third one is econometric model and data source explanation; fourth our is empirical analysis using China's different areas panel data; fifth one is the conclusion.

## 2.Literature review

### 2.1 Literature review about the urbanization on the divorce rate

Urbanization, the marked tendency along with advanced is regarded as the vital measurements scale for modernization in a region or a nation. (Zhang, et al, 2014).

In countries with mature market economic systems, urbanization has undergone a relatively slow development state, but china is still in a period of rapid transformation, the urbanization process has significant change from 18% in 1978 to 56% in 2015. (Yang, 2017) Meanwhile, the social issues arise. One main issue is the rising divorce rate. For example, the fifth and sixth population census refers in 2010, the urban crude divorce rate is higher than the rural divorce rate by 0.56% and in 2010 it is higher than that by 0.73%.

With regards to the relevant research about the correlation between urbanization and divorce rate, Ye (1997) reported there was a significant correlation between urbanization and divorce rates by using a lot of empirical evidence. Nowakowska and Obraniak (1990) analyzed different settlement units in Portland and concluded the higher the urbanization level, the higher the divorce intensity. Hizy (2015) adopted the probability sample of 300 counties in the united states from 1970 to 1980 and suggested urbanization was a strong and important factor of divorce rate, the higher level of urbanization leading to higher divorce rates.

Why the urbanization rate is influencing the divorce rate? There has been profound impact of urbanization including the smaller family size (Xu, 2001), family division of labor (Meng, 2000), more tolerance with divorce (Meng, 2000) (Liu, 2001) (Song, 1998), higher population mobility ( Zhu and Cai, 2010). All of this factor works together to increase the

risk of divorce. For example, compared with the countryside, the city has higher population density and bigger marriage market, which reduces the searching cost of marriage and increases the temptation to opt for divorce, this will result in the fragility of marriage. (Gautier, 2009) (South et al, 1995)

## 2.2 Literature review about the unemployment on the divorce rate

Previous research about correlation between unemployment and divorce rate could be classified into two types, the first perspective is stress, from this angle, the correlation is positive. For example, South (1985) found a significant positive relation between divorce rate and unemployment rate. Lazarus and Folkman (1984) showed economic hardship creates stress, and the demands of the financial challenge will go beyond the capacity to tolerate. This will explain why stress from unemployment will harm the quality of marital relationship. Another study which was conducted in 1990 finding the economic stress would be likely to make them think about divorce by using the sample of farmers in Nebraska. (Johnson and Booth, 1990). Also, being unemployed which was a strong predictor of perceived economic hardship, this would result a low happiness about marriage status, as there would more marital conflict and problems, the consequence might be more frequent thoughts of divorce. (Amato et al, 2007) Some researchers have examined how the husband's unemployment impacted on the divorce rate, the studies showed husbands unemployment would make the divorce rate risk even higher. Preston and McDonald (1979), Lewin (2005).

Another perspective is cost associated with divorce, which means the correlation is negative. Amato and Beattie (2011) supported this argument that divorce rate drops with increase in unemployment, as shown using the panel data across 50 states from 1965–2005. During

hardship period, couples might prefer to stay in the marriage as unemployment and the relevant cost might help them improve their relationship. (Amato and Beattie, 2011). It can be proved through two intense fluctuations of divorce rates in twentieth century in the United States. The rate hit a low at 1.3‰ in 1933 and a peak at 4.3‰ in the postwar year 1946. (Zhang and wang, 2014)

As Wilcox (2009, p. 9) proposed, ‘Most couples did not think twice about financial situation and then went to the divorce court, however, when they happen to have hardship times, they would appreciate for the economic and social support from the marriage and this will therefore improve their relationship and finally stay in the marriage. ‘

### 3. Econometric model and data sources

#### 3.1. Econometric model

This paper mainly uses the macro factor to examine how the urbanization and unemployment rates impact on the divorce rate. Panel data is used here as the advantages of panel data shows: constructing and testing more complicated behavioral hypotheses (Ben-Porath ,1973); greater capacity for capturing the complexity of human behavior than a single cross-section or time series; controlling the impact of omitted variables (MaCurdy’s ,1981); uncovering dynamic relationships (Nerlove, 2002). (Hsiao, 2007)

With the regards to the explanatory variable of the model, they are divided into two sets, targeted and control variables. The model is as follows:

$$Div_{i,t} = \beta_0 + \beta_{pv}TV_{i,t} + \beta_{cv}CV_{i,t} + \lambda_i + \varepsilon_{i,t}$$

where I and t represent region and year.  $div_{i,t}$  here means the crude divorce rate in each



province or area  $i$  in year  $t$ .  $\varepsilon_{i,t}$  is the residual.  $\lambda_{i,t}$  here show the fixed effects for unobserved time invariant variables such as ethnic group percentage.

And for the divorce rate, here is to use the crude divorce rate to calculate using the following formula:

Divorce rate = (yearly divorced couples of / average annual population) \* 1000 ‰

The crude divorce rate is defined by China's Statistical Yearbook before 2007 as the share of couples with marriage breakup in the average annual population which is higher than the actual divorce rate. (Zhang et al. 2014).

$TV_{i,t}$  is the targeted variable, in this paper it includes two variables unemployment and urbanization rate. From the description of China's National Bureau of Statistics, the unemployment rate in urban areas refers to the ratio of the number of the registered unemployed persons to the sum of the number of person employed in various units ( minus the employed rural labor force, re-employed retirees). And urbanization rate refers to the urban population among the whole population.

$CV_{i,t}$  represents the controlled variables based on the previous scholar's research, they are CRD, ODR, Sex 15, ln (PGDP) and Fam. What is more, lagged effects about unemployment rate is also created in this model to examine whether the unemployment has instant impact on the divorce.

According to the interpretation of China's National Bureau of Statistics, Per Capita Gross Domestic Product (pGDP), a major indicator, mirrors the economic development in a region. (Wang & Zhang, 2014) It measures the degree of social and economic development.

The average household size refers to the family size. ODR (Old Dependency ratio) which refers to the ratio of the elderly population to the working-age population, expressed in %, reflecting the number of children for every 100 working-age people. CDR (Children Dependency Ratio also called children dependency coefficient, refers to the ratio of the children population to the working-age population, express in % ), reflecting the number of old people for every 100 working-age people.

As for the gender ratio, use female population index as 100 to calculate.

Table 1 and table 2 respectively list the descriptive statistics of all the variables and coefficients. See table 1 and it concludes the maximum, the minimum, the mean. We can clearly know the standard deviation is very small except the ODR and CDR, it means the distribution of these variables is relatively concentrated and the relative probability of outliers is relatively small. We also know the max divorce rate is 46.71 % in northeast region, the reason why this area has highest divorce rate is that low fertility which leads to a higher proportion of the only one child in the marriage- age population in northeast region; the higher urbanization rate of northeast China, higher education attainment of female population; the higher percentage of minority groups; the higher mobility and so on. (Li,2018)

See table 2, from the coefficients of all the variables, there seems no serious multicollinearity issues. The coefficient of urbanization rate and crude divorce rate is 0.295, which says the urbanization rate might has positive impact on the crude divorce rate. And there is negative correlation between family size and divorce rate. The correlation between unemployment rate and crude divorce rate is positive and this shows there might be positive impact for unemployment on the divorce.

Table1. Statistical description of variables (1999-2018)						
Variable	Defination	Unit	Mean	Min	Std.Dev	Max
Div.	Crude divorce rate	%	14.977	8.104	4.9	46.71
Urban	Urban population ratio	%	3.615	0.608	1.73	5.62
Unemployment	Urban unemployment rate	%	3.517	1.681	2.33	15.74
Ln (PGDP)	Logarithm of per capita GDP	CNY/person	10.022	0.927	6.64	13.25
ODR	Old people dependent rate	%	49.734	14.995	21.31	89.6
CDR	Child dependent rate	%	104.587	3.685	94.92	120.43
Sex ratio	Female=100		12.646	2.829	5.51	22.69
Fam	Average family size	Person	3.212	0.372	2.33	4.33

Table 2: pairwise correlation between variables								
Variables	-1	-2	-3	-4	-5	-6	-7	-8
(1) div	1							
(2) unemploy	0.095	1						
(3) Fam	-0.157*	-0.116*	1					
(4) ln (PGDP)	0.396*	-0.287*	-0.024	1				
(5) Urban	0.295*	-0.181*	-0.038	0.713*	1			
(6) Sex15	-0.174*	-0.159*	-0.154*	-0.143*	-0.066	1		
(7) odr	0.184*	-0.236*	0.086	0.470*	0.255*	-0.251*	1	
(8) crd	-0.328*	0.085	0.064	-0.725*	-0.748*	0.299*	-0.373*	1

\* shows significance at the .01 level

### 3.2. Data sources

We compiled data on unemployment rates, urbanization rate and divorce rates for each of the 23 provinces, 4 municipalities directly under the central government plus one autonomous region on the mainland except Tibet from 1999 to 2018. Tibet is not included as there is seriously missing data about unemployment rate. Crude divorce rate for each region is used in this paper and calculated using the following equation by obtaining the yearly divorced couples and average annual population for each region from China Statistician's National Bureau of Statistics.

Divorce rate= (yearly divorced couples of / average annual population) \* 1000 ‰

We also use this source to collect the data about CDR, ODR, urbanization rate, per capita GDP, family average size and gender ratio and the interpretations about these variables, see table (1) in the above.

#### 4. Empirical study

In order to examine how the urbanization and unemployment rate impact on the divorce rate, this paper use the panel regression to analyze the relevant data. Considering there might be the causal effect between divorce rate and unemployment, this means it might work for divorce rate impact on the unemployment rate. Instrument variable is applied in the regression estimation model. The variable number of kids seem to have negative impact on the divorce rate, due to the data availability, here to replace the number of kids with the family size as the instrument variable. this is because children normally would live with the parents and the number of total family is the size of family. Someone might argue that the elders might also live together with the couples, this might be true for small percentage of the family, mostly they only occasionally come to visit their kids rather than live together permanently.

Model 1.1-1.2 both adopts the 2SLS model to analyze the relevant variables, the difference is that model 1.2 have four lagged unemployment rate variables. What is more, the endogeneity test and first stage test which is about the instrument variable relevance are applied here.

As for tests of endogeneity, null hypothesis: variables are exogenous. The results show

Robust Score  $\chi^2(1) = 18.2112$  ( $p=0.0000$ )

Robust regression  $F(1,583) = 38.5891$  ( $P=0.0000$ )

So, the null hypothesis is rejected.

The result for Instrument variables test shows the partial R-Sq. is 0.0029 which is not that high but still it shows to some extent the family size can explain it does have impact on the divorce rate.

Model 2.1 and 2.2 use the fixed effects and random effects to conduct parameter estimation.

Model. Model 3.1 and 3.2 add the four lagged effect about unemployment rate. All the regression results are listed in table 3. Show the coefficients for unemployment rate are -17.09 and 79.99 respectively, considering the magnitude is overestimated especially in the model 1.2, it does not reflect the actual situation about the relationship between employment rate and divorce rate, that is why this model will be only listed for reference.

By comparing the model 2 and model 3, we find out the estimation results seem similar but as lagged effects of unemployment rates are not included in model 2 and whether the unemployment rate has lagged effects will not be obtained from this model, we prefer the model 3. By looking model 3, after doing the Hausman test, the p-value is 0.9745 which implies the null hypothesis is not rejected. This means the random effects is superior to fixed effects which is the model 3.2. What is more, by comparing the two models, the magnitude of coefficient becomes smaller, take the example of unemployment rate. By looking the model 3.2 (see table 3), fourth column shows the unemployment rate doe significantly affect the divorce rate in a negative way. One percent increase with the unemployment rate, the divorce rate will decrease by 5.342 per mile. Actually this estimation is still pretty high as in this paper, the data about education level, population density and kids number, for example are not included in the model due to the data availability, that is why the coefficients of unemployment rate is higher than the

previous scholar's research finding which shows is around 1.1491. (Zhang, et al, 2014). But it still can tell us the negative impact of unemployment rate on the divorce rate which is consistent with the result with some Chinese scholar (Zhang, et al, 2014) and American scholar. This finding proves the strong support for "a cost of divorce" perspective and suggests that a high rate of unemployment decreasing the rate of divorce. (Amato, et al, 2010). This also holds in China with the development of economics, the divorce is costly with respect to the higher living costs, higher raising costs of children, this all make the troubled couples hesitant and reluctant to incur these costs.

Next is per capita gross domestic product (PGDP), which examines the economic development of one region. Scholars in the previous studies implies the ever-increasing unemployment rate might be attributed to the China's fast-paced economy. (Li, 1993). Some American scholar had the same conclusion (Glick & Lin, 1986). Yang (2017) explained by improving the national's domestic product, the concept of marriage freedom seems more popular and the divorce rate might be increased, too. In this paper, the result is consistent with these research studies. The per capita GDP significantly influence the unemployment rate, by one percent increase with the per capita GDP, the divorce rate might increase by 0.005484 per mile (thousand percent), here it has the same issue as the unemployment due to the other variables missing in the model, the magnitude is higher than that of others' research result.

Next is the urbanization rate. it does not have significantly impact on the divorce rate. Yang (2017) concluded that the impact of urbanization on social divorce rate is significantly influential, she also specified the impact only existed in the developed region by migrations

flowing, while the impact was very small in the undeveloped region. Zhang et al (2014) proved there was no significant impact. In this paper, the conclusion is consistent with the latter result. This might be the reason for variables selection, when including more variables related to the urbanization rate, the result might be different.

With regards to the gender ratio, in this paper, it also is significant influential on the divorce rate. Trent and South (1989) concluded about in India the impact for the gender ratio on the divorce rate and found out higher sex ratios, indicating a relative undersupply of women, were associated with low divorce rate. In China, Xu and Ye (2002) based on provincial macro data finds out the higher gender ratio means there are oversupply with males and this increases the possibilities of female divorce, as in the majority region, the population of male group is two or three times of female group, that is why it is harder for divorced male to remarry compared with divorced female, to some extent this will limit the choice for married male, this increases the divorce risk in regions with a higher proportion of male population. In this paper, the result supports this conclusion. Also, the higher male ratio refers to the married group with younger age, as life expectancy of female is normally longer than that of male, when older married female is not inclined to remarry when they divorce. This might also explain why the higher ratio for male will result in higher divorce rate.

The last two variables are cdr and odr. It is easier to understand higher percentage of children dependency rate will result in lower divorce rate due to the increasing raising costs of children and responsibility for children, the couples are hesitant to get divorced when they have kids to take care.. crd is proved it significantly affect the divorce rate in a negative way which is consistent with the traditional overview. While for odr, it has positively impact on the divorce

rate significantly, this might attribute to the higher burden or pressure when having old parents or parents' intervention into the children's marriage life, the more conflicts the family will have, especially when they live together, this will increase the risk of divorce.

In the model 3, the lagged effects are not significant and even lag4 is significant, it is hard to differentiate whether it is the unemployment rate or other reasons resulting in the divorce in four years. With longer period sample data, the lagged effects could be identified.

Table 3: Estimation result of rising divorce rate using panel data.

VARIABLES	(1.1) 2SLS	(1.2) 2SLS	(2.1) FE	(2.2) RE	(3.1) FE	(3.2) RE
unemploy	-17.09*** (5.577)	79.99 (63.21)	-5.585** (2.809)	-5.686** (2.778)	-5.236** (2.349)	-5.342*** (2.322)
lnGDP	6.908*** (1.462)	10.24* (5.799)	5.412*** (0.932)	5.415*** (0.916)	5.374*** (1.084)	5.484*** (1.130)
Urban	0.0630 (0.0520)	-0.0279 (0.106)	0.00925 (0.0349)	0.0112 (0.0343)	0.0122 (0.0441)	0.0158 (0.0426)
Gender ratio	0.273 (0.219)	0.702 (0.750)	0.176*** (0.0642)	0.171*** (0.0639)	0.241** (0.0987)	0.225** (0.107)
odr	0.622** (0.293)	0.706 (0.610)	0.830*** (0.114)	0.817*** (0.112)	0.948*** (0.150)	-0.883*** (0.155)
crd	-0.274* (0.142)	-0.0997 (0.205)	-0.265** (0.105)	-0.261** (0.103)	-0.141 (0.0915)	-0.140 (0.0907)
lag1		-76.87 (62.38)			4.093 (2.757)	4.230 (2.797)
lag2		8.456 (8.469)			1.076 (1.486)	1.166 (1.564)
lag3		-1.501 (4.974)			-0.0178 (1.242)	-0.0348 (1.287)
lag4		6.621 (5.225)			1.549** (0.611)	1.538** (0.612)
Constant	-162.6*** (59.13)	-231.4 (175.7)	-95.64*** (24.98)	-95.15*** (24.82)	-98.91*** (32.37)	-99.04*** (34.26)
Observations	599	595	599	599	595	595
Number of nr			29	29	29	29
Hausman test			Chi-square test value P-value	6.76 .3437	Chi-square test value P-value	3.26 .9745

Notes: standard errors are within brackets. \*, \*\* and \*\*\* represent significance above 10%, 5% and 1%, respectively. The coefficients without \* mean no significance in the regression.



## 5. Conclusions

This paper adopts the panel data of each region in China from 2000 to 2018 and examine how the unemployment rate influence the divorce rate under the process of urbanization. The results refer there is negative correlation between unemployment rate and divorce rate which supports the cost of divorce. To be specific, one percent increase with the unemployment rate, the divorce rate will decrease by 5.342 per mile. The urbanization rate is not significant in the result which does not mean it does not influence the divorce rate as due to the data availability, the relevant variables which is closely with the urbanization rate such as population mobility, education attainment, population density are not included in the model. The per capita GDP significantly influence the unemployment rate, by one percent increase with the per capita GDP, the divorce rate might increase by 0.005484 per mile (thousand percent)..CDR and ODR are both significant in the result, one is negatively correlated, and one is positively correlated. The gender ratio is also proved to significant as higher gender ratio means there are oversupply with males, and this increases the possibilities of female divorce. Lagged effects are not significant which might due to the data range selection, with larger interval data in the future studies, this can be examined future whether in China, the unemployment rate indeed is influencing the divorce rate instantly.

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