

## **A Regional Analysis of Divorce Rates**

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### **Abstract**

*This paper focuses on determining the impact of regional economies on localized divorce rates in Tennessee. Panel data is used to estimate a spatial fixed effects model for 95 counties in Tennessee over the period 1998 to 2007. Since local economies do not fully account for all living conditions of its residents, particular attention is given to how aggregated, county-level factors in the regional economy, such as unemployment rates, per capita income, number of religious establishments, impact divorce rates in the local economy. After controlling for spatial dependence, the results show that divorce does not rise with job loss, suggesting that economic downturns encourage divorce postponement. However, divorce is negatively correlated with income, adding support to the belief that money, or the lack thereof, is responsible for marital woes. Our measure of religion shows higher divorce rates in counties with greater representation of religious establishments.*

**Keywords:** regional economics, divorce, spatial dependence

**JEL Codes:** R10, R11, J12

**Sociology Classification Codes:** 1941, 6144

### **1. Introduction**

The topic of divorce is controversial and continues to attract attention in the general media and academic literature. Of particular interest, especially during a period of economic downturn, is the role of the macro-economy on divorce rates. Although there are many micro-level reasons why couples divorce, it is the goal of our paper to examine the role of the regional influences on the local economy using county-level data. In our analysis, we examine how characteristics in surrounding counties such as unemployment, per capita income, and religion impact divorce rates in local economies over the period 1998 to 2007. Because counties can be contiguous in their geographies, it is necessary to control for spatial dependence. We present a spatially lagged dependent variable model that controls for spatial relationships to reduce measurement error.

The impact of the business cycle on divorce has been analyzed in the sociological and economic literature. Particular attention has been given on how macro-economic and socio-economic characteristics influence divorce (Charles & Stephens 2004, Glenn & Shelton 1985). Goldstein (1999: 413) examines the trend of divorce in the United States and finds that divorce rates have experienced a steady rise until 1980, and finds that divorce rates plateau after 1980, remarking that “the plateau in divorce rates observed since 1980 marks a break in the more than a century-long rise in divorce rates.”

More recent measures of divorce patterns report that the national divorce rate in 2008 was 8.2 (per 1000 population, U.S. Census). In Tennessee for the same year, the divorce rate was 4.3 percent, with much variation in the rate among the counties in Tennessee. The decision to divorce is primarily one that takes place at the individual level where the involved parties engage in a benefit cost decision. Analyzing this decision process warrants consideration of many interrelated factors and theory underlying the marital contract. Becker (1977) provides an economic framework when he examines the marriage decision as one that compares the gains from marriage to being single. Similarly, he examines the divorce decision by comparing the gains from staying married to divorce.

Divorce may originate with a single spouse or both, and may be asymmetrical in information. The factors influencing divorce change over time from direct and indirect events impacting the marital situation. Further, the strength of and spacing between the decision's inception and completion add variation to the final decision to end the marriage. Changing circumstances and discrete events over time, both external and internal to the relationship, may also play a role. Many of these aforementioned factors are internal, such as family structure, income, and personal interactions. It can be argued that they remain relatively within the control of the parties involved, and therefore may play the largest role in the divorce decision. However, external factors, such as fluctuations in the national and/or regional business cycle over time, are outside the family's immediate control. Their influence may be less direct but worth examining as potential significant factors in determining the trend of divorce. It is the goal of this paper to examine the potential influence of these external factors.

Past studies have attempted to measure the impact of the macro-economy on divorce. White (1990: 904) examines the macro-structural determinants of divorce and question whether trends can be entirely explained at the micro-level. Breault & Kposowa (1987: 556) remark "in principle, this does not mean that aggregate-level analyses are any less useful than individual level studies." But they further point out that because many factors that intimately affect divorce cannot be adequately observed in aggregate studies, "the study of divorce at the aggregate level cannot, therefore, yield definitive results, such studies can only be suggestive." Our paper analyzes the impact of the economy on divorce for Tennessee counties from 1998 to 2007. Specific attention is given to how aggregated, county-level factors such as unemployment rates, per capita income, number of religious establishments, and regional economy impact divorce rates.

## ***2. Past Empirical Research***

The academic literature focusing on divorce and the possible determinants of divorce is extensive and broad in approach and methodology. Although this paper's focus is on aggregated socioeconomic characteristics as potential influences on divorce rates, many studies have attempted to isolate the relationship between divorce and socioeconomic characteristics. The following literature review attempts to examine past work in our paper's area of focus.

One of the goals of our paper is to examine how aggregated measures of income and unemployment potentially influence divorce rates. Charles & Stephens (2004) find that divorce risk rises with job loss. Their findings show that although divorce risk rises with job loss, it does not move with disability. Breault & Kposowa (1987: 555) examine the relationship between unemployment, median income, and church membership and divorce rates for 3,111 U.S. counties, and find that "urbanity, church membership, and population change" are the most important factors in divorce. But less significant relationships between median family income and divorce were found.

The role of religion in the marital contract has been discussed and analyzed extensively. Church membership, as measured in church membership rates for U.S. counties, was found to be negatively correlated and significant with the rate of divorce (Breault & Kposowa, 1987). The authors point to the increased focus of religion as "an important source of social integration," and cite several studies that find religious attendance important to the marital outcome (Glenn & Supancic, 1984, Fergusson, Horwood, & Shannon, 1984). Trent & South (1989: 394-397) conduct a cross-sectional study for countries and find that religion, as measured as percentage of population classified as Roman Catholic, is not significant on divorce rates, and remark "the range of influence of religion on societal-level divorce rates is no doubt large and difficult to ascertain." The authors attribute the non-significant finding to potential selection bias, as they excluded some countries from their study with large catholic populations that do not report divorce data. Although our paper does not provide a comprehensive evaluation of religion in divorce, an attempt is made to measure a religious effect by including a variable for the number of religious establishments by county in the model.

Since our analysis uses panel data to measure the attributes most associated with divorce, it is worthwhile to examine how past studies have used this type of data. Studenmund (2011: 526) defines panel data, or longitudinal data, as data that combines “time series and cross-sectional data in a very specific way.” He continues to emphasize the advantages of panel data by commenting that such data sets “provide insight into analytical questions that can’t be answered by using time series or cross-sectional data alone.” Ideally, a longitudinal data set on individuals over their entire life span that measures a matrix of individual and socioeconomic factors suspected of affecting divorce would provide quality information on why divorce happens. However, many studies in the past have used longitudinal data to investigate divorce. Friedberg (1998) used panel data across states over 20 years to study the impact of divorce law on divorce rates and finds, after controlling for state-to-state variation and time effects, divorce rates would have been less if states had not implemented unilateral divorce policy between the period 1968 to 1988. South (2004: 759) employs panel data from the Panel Study of Income Dynamics (1969 to 1993) to examine the effect of neighborhood socioeconomic status on divorce. Their findings indicate that the risk of marital dissolution falls with the length of the marriage and for homeowners (compared with renters). In a study conducted by South & Spitze (1986: 583) using the National Longitudinal Survey, they find that a wife’s education reduces the chance of divorce early in marriage but works to increase it as the marriage endures. The authors also report that home ownership and the couple’s age at marriage influences divorce at different variations throughout the marriage.

Our paper estimates an econometric model that measures the impact of the regional economy on divorce. Specifically, we look at the role of surrounding counties on divorce rates in the local economy in Tennessee, with an emphasis on unemployment. Stronger local economies tend to have greater economic growth and development. The unemployment rate is often used to measure the role of the economy. However, past research suggests the unemployment rate alone does not provide a true measurement of the robustness of the local economy (Bartik & Eberts 1999). The authors concluded that other features of the local labor market – employment growth rates and some industry mix variables – need to be included in the measurement of the robustness of the local economy. As an alternative, Goetz, Tegegne, Zimmerman, Singh & Debertin. (1999) used the unemployment rate, job growth, and retail employment to measure the strength of the local economy in Kentucky.

A few studies have focused on marriage in Tennessee, and attempt to measure how divorce varies by rural-urban designations. Woodrow, Hastings & Tu (1977: 26) find that “rural males and females marry earlier and in greater proportions than urban males and females...and rural marriages are less likely to be dissolved through divorce than urban marriages.” Glenn & Shelton (1985: 650) show that marital dissolution is higher for certain regions of the U.S. (West, South, Central, Mountain, and Pacific regions). They report that “residential movement in the United States have contributed to marital dissolution,” and remark that a “high level of residential movement is likely to increase the probability that persons with dissimilar backgrounds will marry.” Finally, the authors explain this high rate of marital dissolution in high movement regions by arguing that relationships in these areas are likely to be based on “superficial, easily observed characteristics rather than those most relevant to the outcome of marriages.”

### **3. Methodology**

Data is obtained from the Department of Tennessee Health Statistics on divorce rates for 95 counties in Tennessee over the period 1998 to 2007. This data is merged with Tennessee county-level data on unemployment, personal income, and number of religious establishments. Overall, the data set consists of 950 county-level observations for the state of Tennessee over a 10-year period.

#### **3.1 Measures**

In order to measure the impact of the socioeconomic characteristics on divorce, we introduce a spatial econometric model. The general form of the model includes the dependent variable that is the “divorce rate per 1000 population” for 95 counties in Tennessee. Using this measure is generally consistent, with some variation therein, of methods undertaken in past studies (Trent 1989, Breault & Kposowa 1987). The independent variables include county-level measures for per capita income, unemployment rate, and number of religious establishments. A brief discussion of these variables will follow in the next paragraphs. Per capita income is an aggregated measure that is included to test for an association between a county’s income level and divorce rate. The question addressed here is whether county divorce rates change with county income levels.

Charles & Stephens (2004: 490) report that earnings shocks associated with a spouse's unemployment may affect the chance of divorce. Since this paper does not include micro-level data, no specific inferences can be made on the exact role of our per capita income measure. At the micro-level, family income levels likely explain the truest effect on divorce. And the role of income in divorce will depend on whether divorce is generally a normal or inferior good. However, including the aggregated variable may give insight on whether the prevalence of divorce varies with a county's income.

The unemployment rate is an aggregated measure of a county's unemployment rate. The impact of this variable on divorce rates depends on several factors. Whether divorce moves with or against unemployment may depend on how many family members experience unemployment, which in turn determines the magnitude of the income fall. There is also the consideration of how long the members are affected by unemployment, and how this translates to the degree of strain in a marriage.

The role of religion, as measured in our model as number of religious establishments per county, is investigated as it relates to divorce. Trent & South (1989: 395) hypothesize that "given the Catholic Church's proscription of divorce, we expect this variable to be inversely related to divorce." Charles & Stephens (2004: 507) report that "sharing the same religion has a particularly strong effect on marital stability." Overall, finding a correlation may only point to a related, underlying cause that the model is not fully accounting for. For instance, counties with higher numbers of religious establishments may also emphasize amenity factors consistent with some particular trend of divorce rates.

### 3.2 Spatial Dependence

An important component of the data analysis in our paper is controlling for spatial dependence. Because counties in the state are contiguous to one another, it is necessary to control for spillover effects that may bias the empirical results and cause spatial measurement errors (Anselin & Bera: 238). Isard, [Azis, Drennan, Miller, Saltzman & Thorbecke \(1998\)](#) describe this phenomena as "spatial dependence," which briefly defined, represents the presence of serial correlation in cross-sectional data. The techniques used to address it arose from the desires of practitioners to "deal with the problems caused by spatial autocorrelation in cross-sectional data (Anselin & Bera: 238). These authors further emphasize that the focus on spatial dependence has grown from regional economics into fields such as environmental economics and agriculture. This paper addresses the concept of spatial dependence by conducting formal procedures to diagnose and correct if necessary the problem of spatial autocorrelation. This will improve the quality of the empirical results by reducing potential bias in the coefficient estimates. In the following paragraphs, these steps are explained and a final model is presented.

When modeling spatial panel data, spatial dependence can be present in a spatially lagged dependent variable (spatial lag model), in the error term (spatial error model), or a combination of the two (spatial Durbin model). An important goal of our paper is to determine which model is appropriate. In addition, procedures have been developed to determine the existence of location and/or time specific fixed or random effects within spatial panel data.

The start of this exploratory process begins with estimating a standard ordinary least squares (OLS) with no spatial components and without fixed effects. The Lagrange Multiplier (LM) test for a spatially lagged dependent variable and for spatial error autocorrelation along with robust LM-tests test for the existence of one type of spatial dependence conditional on the other are performed. Results suggest spatial dependence is present in both the spatial lag and the spatial error, and the hypothesis of "no spatial dependence in the OLS model" is rejected. Alternative models are investigated next.

Our study is concerned with location impacts on divorce rates in the Southeast United States. In particular, this region is synonymous with the "Bible Belt". It is hypothesized that the spiritual foundation of this region would support family ties values and therefore establish a relative reluctance to file for divorce. As such, we believe that a spatial fixed effect is warranted to capture this effect, and therefore incorporate this into the next model. After controlling for the spatial fixed effect, the LM-tests reject the hypothesis of no spatial dependence in the spatial lag. However, the LM-tests fail to reject the hypothesis of spatial dependence in the error term. As a result, it appears that it is appropriate to model divorce rates using a spatially lagged dependent variable with spatial fixed effects. In this model we also measure the impact of surrounding counties (regional influence) on the local economy (each individual county).

#### 4. Results and Discussions

Table 1 presents the spatially lagged dependent variable model, and expresses the relationship of localized divorce rates as a function of regional characteristics (surrounding counties) that include unemployment rates, per capita income levels, and number of religious establishments. When the regional influence, as measured by the economies of surrounding counties, is accounted for, the coefficients generate statistical significance for unemployment and per capita income. The unemployment rate has a negative sign indicating lower divorce rates in localized counties with higher unemployment rates in surrounding counties. Our data suggests that job loss is not encouraging divorce, implying that couples may be postponing divorce in an economic downturn. This result is consistent with past literature that finds divorce to be procyclical. Our finding on per capita income, however, shows a negative correlation between the incomes of surrounding counties and divorce rates in the local economy. This result can be explained in a few ways. First, because of the aggregated nature of the data, the micro-level impact of income on the family may not be fully captured. Second, job loss that is connected with rising unemployment does not immediately and necessarily equate to a significant income reduction, as households may have access to alternative sources of income (i.e., savings, endowments, unemployment insurance). Therefore, we argue that unemployment may be the more effective measure of the immediate effect of an economic downturn on divorce.

A positive relationship exists between divorce rates and the number of churches per 1000 individuals. This suggests church ties are supporting divorce or the increase of church-going population supporting divorce.

As expected, the spatially lagged dependent variable indicates divorce rates in a county in dependent on the divorce rates of its neighbors. In other words, divorce becomes socially acceptable as more of my neighbors become divorce. The results here indicate that divorce in the county depends on the unemployment rate and per capita income of surrounding counties. From a regional perspective, this makes since the local county may not account for all factors and conditions influencing divorce for local residents.

#### 5. Conclusion

Because of the aggregated nature of the data, causal conclusions cannot be made strictly from our empirical results. Accomplishing such a feat empirically would, at the very least, require a micro-level longitudinal study that controls for the relevant socioeconomic characteristics. However, as an extension of this paper, advanced data analysis may shed light on these causal issues. Additional considerations for this paper include examining how characteristics such as immigration, family size and make-up, the “rural” effect, and density for marital counseling services impact divorce rates by county. For instance, is there evidence for stronger social ties in rural geographies as opposed to metropolitan? Or does the number of children in a family impact the divorce decision?

Overall, the results provide valuable insight on the factors contributing to divorce patterns over time. By distinguishing between the effects of local and regional economies, the behavior of divorce can be better understood in the realm of spatial geography. The finding that unemployment in surrounding counties influences divorce rates in local economies emphasizes the interplay that exists within a dynamic, regional economy. Contributing factors to divorce are both internal and external to the parties involved. This paper demonstrates that it is worthwhile to consider external regional influences when measuring the impact of socioeconomic characteristics on divorce.

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**Table 1: Spatial Lagged Dependent Model**

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Variable	local effects	regional effects
unemp	-0.023783 (0.613377)	-0.228904 (0.001117)
percapinc	0.000057 (0.239472)	-0.000291 (0.000000)
religious	0.000027 (0.026052)	0.000009 (0.692759)

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