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LABOUR MARKET RESILIENCE- COMPARATIVE EVIDENCE FROM ROMANIAN COUNTIES

Case Study

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Abstract

In economics, the concept of resilience illustrates the adaptability capacity of a system after an external shock. The goal of the empirical analysis presented in this paper is to investigate the labor market resilience of Romanian Counties relative to the economic crisis whose negative effects occurred since 2009. The counties are compared in terms of resistance or sensitivity to the shock, speed of recovery after the shock. These dimensions were assessed by means of statistical analysis of employment and unemployment rate evolution. With respect to the factors that could influence the trajectory of the system after a recessionary shock, this study discusses the correlation between different types of resilience and economic diversification.

INTRODUCTION

The concept of "resilience" is related to the capacity of individuals, regions, businesses, communities to cope with difficulties and adverse situations (Neenan, 2018; Zautra et al, 2010). It refers to the positive ability of systems to respond to shocks and recover after that. Resilience has been widely used in studies of engineering, psychology, economy and environmental research. The traditional approach considers resilience as the ability of the systems to maintain or restore an initial equilibrium state. More recent approaches are more focused on how systems adapt and move from one state into another, while resuming and improving their growth pattern. Previous studies showed that resilience appears in the presence of cumulative protective factors (Hedner et al, 2011).

At macroeconomic level, the labor market resilience was measured and compared across different countries with a special focus on finding the factors affecting it. The resilience is measured in terms of labor market outcomes such as: unemployment rates, changes in total earnings. The factors explaining the differences across countries regarding the capacity to adapt and respond to shocks are divided into institutional factors (unemployment benefit, active labor market policies, employment protection legislation, minimum wages, labor contracts) structural demographic factors (education and skills, migration, population structure) and socio-economic factors (industry structure, firm size, regional disparities) (Bigos et al, 2013).

Within a country, the regional disparities lead to different types of resilience. For example the exploration of regional resilience in US metropolitan areas highlighted four categories of resilience: stagnant, transformative, faltering and thriving. This classification compares how the value recorded by an indicator within a region position itself relative to the average value at country level before and after the shock. A region is considered stagnant if before and after the shock it was situated below average. The transformative regions are those regions changing the state from below average to above average. The regions maintaining the state above average are classified as thriving. The faltering category includes those regions moving from above to below average. The indicators used to reflect resilience are average real earnings per worker and middle income. Among the most important factors behind regional transformation is the ability to attract immigrants, retain manufacturing, and innovate a high-tech economy (Chapple & Lester, 2010).

A complete picture of regional resilience to a recessionary shock is obtained when different dimensions such as resistance, recovery and re-orientation are analyzed separately. The resistance reflects the sensitivity or vulnerability of a system to disturbances, the second dimension measures the speed and extent of recovery from a crisis and the last one should reveal the adaptation of regional economy in response to recessionary shock (Martin, 2011).

Analyzing the post-crisis economic performances of EU countries, Popescu and Lazar (2015) included Romania in the cluster of less performing countries. In Romania, the impact of the financial crisis was very strong in terms of duration of recovery and intensity. This statement is proved by the following facts: the decline duration following the crisis has expanded to over two years and the decline recovery assessed as returning to the pre-crisis levels lasted at least 4 years (Zaman & Georgescu, 2015; Zaman & Vasile, 2014). These findings are based on analyzing resilience with respect to GDP. The regional studies developed showed that the 42 Romanian counties exhibit different degrees of resilience. Therefore the investigation of GDP trajectory on the period 2004-2014 enabled the authors to classify the 42 counties according to the speed of the decline recovery assessed by the annual average GDP growth into high economic resilience group or reduced economic resilience group. In the first category are included 19 counties characterized by a positive average and the second category consists of 23 units with negative average. Another classification criterion was the size of the gap in percentage points (pp) that counties have to recover in order to achieve the GDP level of 2008. Three clusters were identified: low gap- up to 5 percentage points, medium gap- 5- 10 percentage points , high gap- over 10 percentage points. From the 23 counties not recovering GDP decline up to 2014, six have to recover more than 10 percentage points (Zaman & Georgescu, 2015). The study also revealed the fact that the counties in the third category also faced high and persistent unemployment rates. The speed of economic recovery after the crisis was also measured by the absolute or relative decline of the economy (captured by the evolution of GDP or employment) divided by the time span required to reach the pre-crisis level. This study revealed a non-significant correlation between resilience measured with respect to GDP and employment in terms of relative decline and speed of recovery at county level (Zaman & Goschin, 2015). The estimation of a spatial autoregressive model underlines that the ability to recover is higher for developed counties. An analysis developed for Romanian regions (NUTS II) investigated the regional resilience with respect to the business environment. Evolution of active economic agents and registrations of economic agents were used to show the impact of the economic crisis and to

compare the capacity of resistance and recovery among the eight regions (Iordan et al, 2015). Also, previous work identified which are the characteristics of the counties that could be taken into consideration when designing the Romanian regional policy (Davidescu & Strat, 2014).

EMPIRICAL ANALYSIS

The goal of our empirical analysis is to investigate labor market resilience of Romanian counties. First, the authors classify counties into stagnant, transformative, faltering and thriving according to unemployment rate evolution, following the method used for US metropolitan areas (Chapple & Lester, 2010).

After that, the dimensions of regional resilience were measured. The resistance of each county is assessed by a sensitivity index computed as the ratio of decline in employment in a county to the respective decline in the country as a whole (Martin, 2011). The recovery dimension was measured by the average employment growth rate. The reorientation dimension was captured by investigating employment structure by sectors. Since previous studies emphasized the correlation between adaptability and the diversity of region's economic structure (Martin, 2011; Robson, 2009; OECD, 2005) the information gathered in the last dimension was used to compute an Entropy index of economic diversity (Raj Sharma, 2008; Smith & Gibson, 1988). The correlation between economic diversification and the type of labor market resilience was investigated by correspondence analysis.

The findings presented in this paper are based on the analysis developed on county data provided by National Institute of Statistics in Tempo Database. The indicators included in the study are: employment by NACE, unemployment rate. The reasons behind this variable selection are as follows:

- The goal of the paper is to investigate labor market resilience;
- Previous studies emphasized that employment is a critical variable that take much longer to recover than other outputs (Zaman & Goschin, 2015).

The average value of the unemployment rate for the period 2006-2008 was used to find the state of a county before the crisis. In order to characterize the state of a county after the crisis, two intervals were used: 2010-2012 and also 2013-2016. The state of a county is given by the following rule:

$$c_i = \begin{cases} below, & if\ u_{Ro} > u_i \\ above, & if\ u_{Ro} < u_i \end{cases},\ i=1.,42$$

Where u_{Ro} is the average unemployment rate in Romania and u_i is the average unemployment rate in county *i*. This rule was applied three times for the three periods mentioned above. By comparing the state before the crisis with the position of each county in the first and in the second period after the crisis two categorical variables were built. The levels of this variables are those described in the previous section: stagnant, transformative, faltering and thriving. In the transformative group are included those counties that meet two conditions: (1) the unemployment rate was above national average before 2009 and (2) its state changed to below average in the periods after the economic crisis. The counties depicting such a behavior for the interval 2010-2012 are Braşov and Iaşi. In the next period two other counties that initially were stagnant, entered this group: Mureş and Caraş Severin.

The thriving counties are those characterized by the combination below-below. There are 12 counties included in this group according to the evolution in the years 2010-2012: Bihor, Bistrita Nasaud, Botosani, Cluj, Maramures, Satu Mare, Sibiu, Constanta, Ilfov, Bucureşti, Arad, Timişoara. Prahova county, classified initially as a faltering was added to this group according to its 2013-2016 evolution.

The faltering counties are those that exhibit the combination below-above showing a low level of resistance and a reduced ability of adaptation after the crisis: Neamt, Suceava, Tulcea, Vrancea, Prahova, Valcea. As mentioned in the previous paragraph, only Prahova county was able to recover in the next period.

In the stagnant group are included 22 counties meeting the combination above-above.

The first dimension of the regional resilience, measured by comparing percentage change in employment (2009/2008) at county level to that registered at national level highlighted the regions with a high sensitivity to recessionary shock. There are 18 counties in this situation given the sensitivity index greater than unity. Approximately 61% of these counties are stagnant according to the previous classification. From the transformative group only Braşov county also showed a low resistance. Figures 1 and 2 summarize the results obtained for the first two dimensions of resilience.

The second dimension representing the recovery is measured by the average employment growth rate on the two periods: 2011-2013 and 2014-2016. The scatterplot in Figure 1 suggests that there is a weak correlation between resistance and recovery, meaning that a high resistance to shocks does not necessarily involve a high speed of recovery.

The third dimension of the resilience deals with economic activity distribution among industries. Using employment as an indicator of economic activity, the entropy index, also called the Shannon

entropy index was computed as follows (Smith & Gibson, 1988):

$$Entropy = \sum_{i=1}^{n} s_i \ln(\frac{1}{s_i})$$

where n is the number of sectors and s_i is the share of economic activity in the ith industry. A higher entropy index is associated with greater diversification while a lower value indicates greater specialization. For 2008, the entropy index ranges between 1.74 (Teleorman) and 2.56 (Bucuresti). Figure 3 and Figure 4 illustrate how the sensitivity and the recovery dimensions are influenced by this measure of diversification, suggesting a positive impact of the economic diversification on recovery and a negative impact on resistance. The reorientation dimension of resilience should indicate the significant structural changes. The entropy index for the year 2011, considered to indicate the beginning of recovery, did not encounter major changes comparative to 2008. The highest variation was the one recorded for Caras Severin where the index declined from 2.15 to 2.08. This is a stagnant county, that has shown a relative high resistance to the crisis. Even if Caras Severin had a poor rate of recovery in the period 2011-2013, it has improved its recovery capacity in the period 2013-2016, becoming a transformative county. The most significant differences encountered in the 2016 employment structure, compared to 2008 are as follows: the share of Agriculture declined by 6.5 pp, the share of Financial and insurance activities increased by 3.3 pp, the share of the industry sector maintained constant with a slight increase in the manufacturing activities.

A visual representation of the correlation between resilience categories measured with respect to unemployment rate evolution and the diversification level was obtained using correspondence analysis. The counties were grouped into three clusters according to the values of the Entropy index as follows: low (Entropy index less than 2), medium (Entropy index ranging between 2 and 2.18), high (Entropy index greater than 2.18). Figure 5 summarizes the correspondence analysis results, emphasizing that a low level of diversification is associated to a faltering behavior meanwhile thriving and transformative counties are rather characterized by a high level of economic diversification.

CONCLUSIONS

The analysis developed in this paper investigates the labor market resilience in Romanian Counties by means of statistical analysis of employment and unemployment rate evolution. The analysis of the unemployment rate provided a classification of the Romanian regions into stagnant, transformative, faltering and thriving according to unemployment rate evolution. The study of the employment trajectory allowed the authors to estimate the sensitivity to the crisis and the extent of recovery after the crisis. With respect to the factors that could influence the trajectory of the system after a recessionary shoch, this study discusses the correlation between different types of resilience and economic diversification. The major finding was that counties depicting a higher diversification have a higher capacity of adaptation to external shocks than counties characterized by greater relative specialization**.**

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ANNEXES

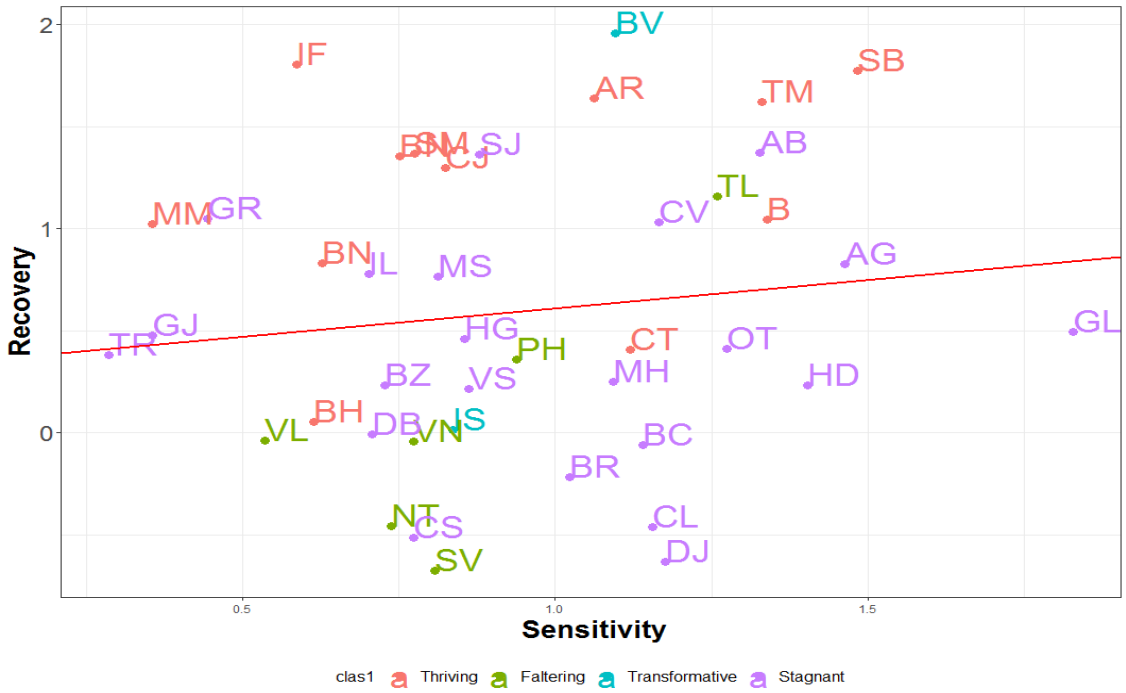

Figure 1. Regional resistance and recovery (2011-2013)

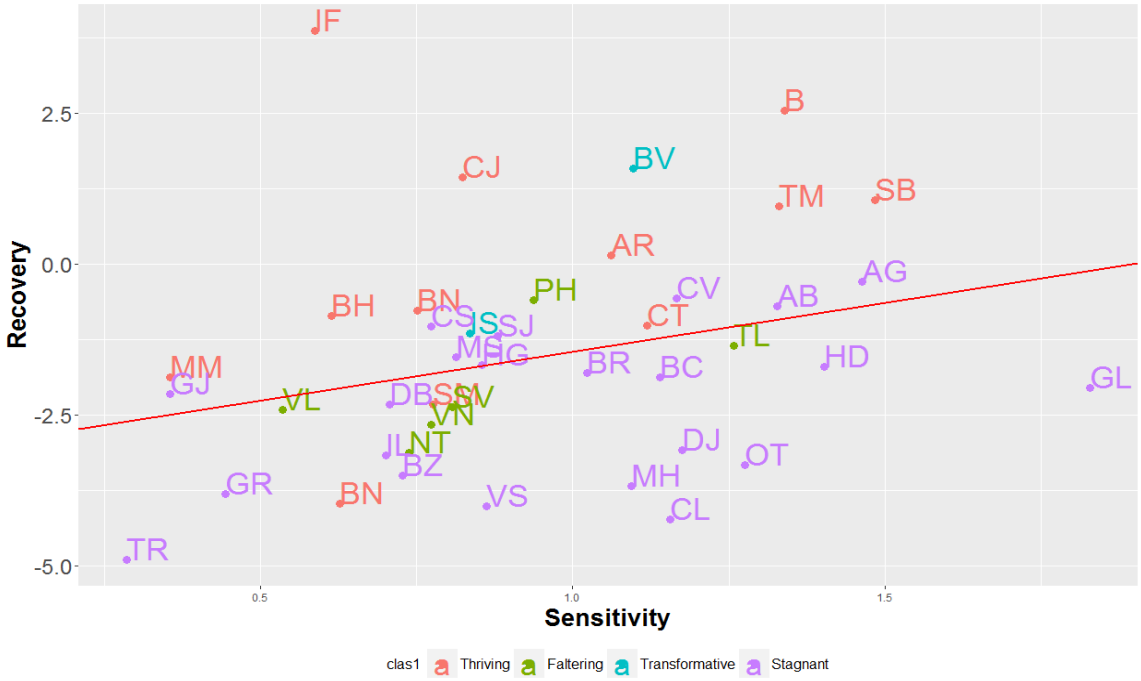

Figure 2. Regional resistance and recovery (2014-2016)

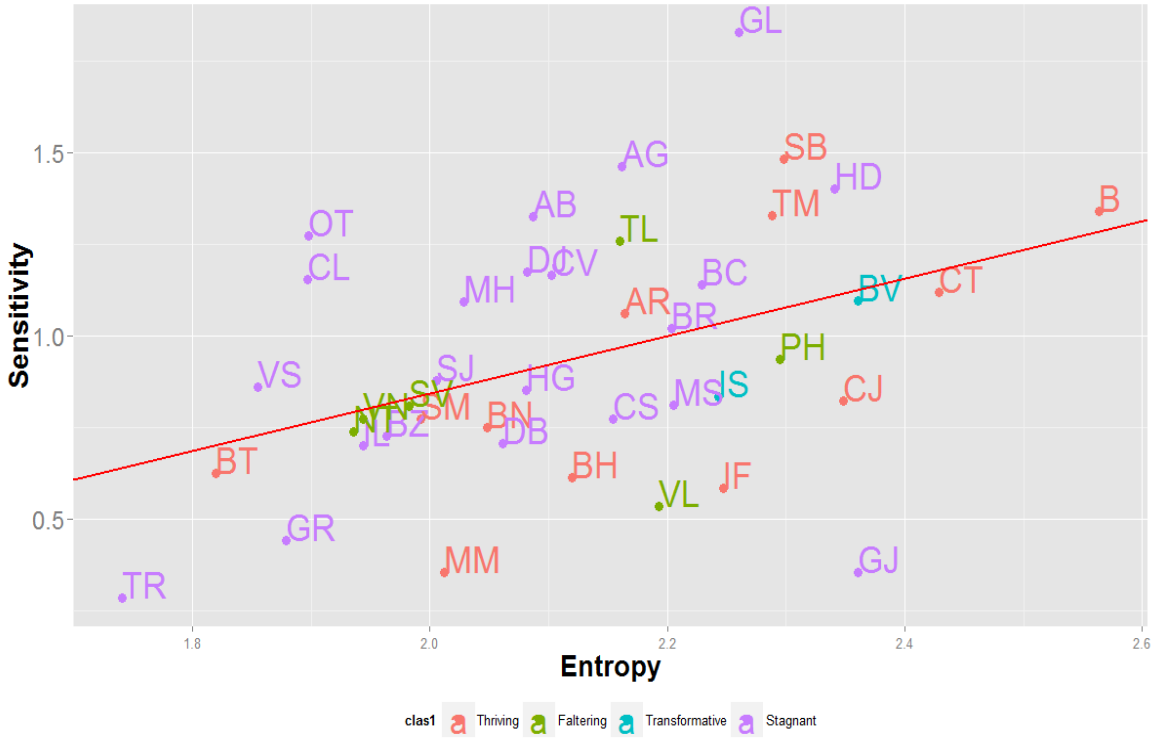

Figure 3. Resistance and diversification

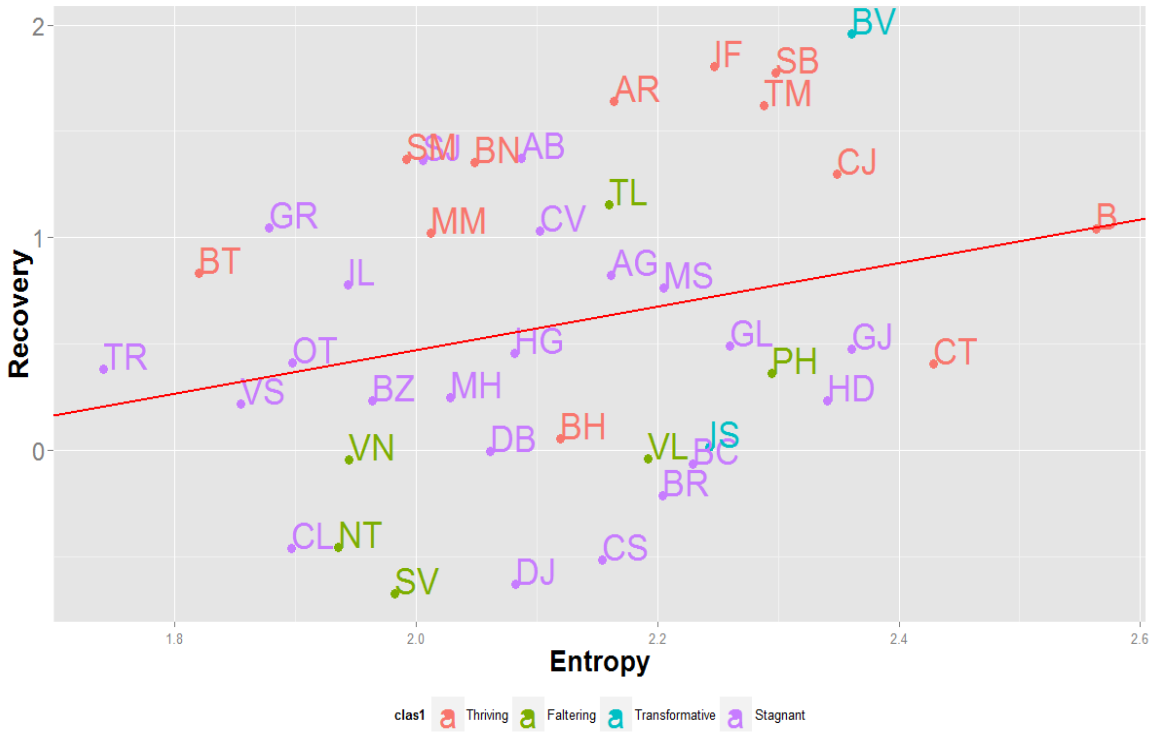

Figure 4. Reccovery (2011-2013) and diversification

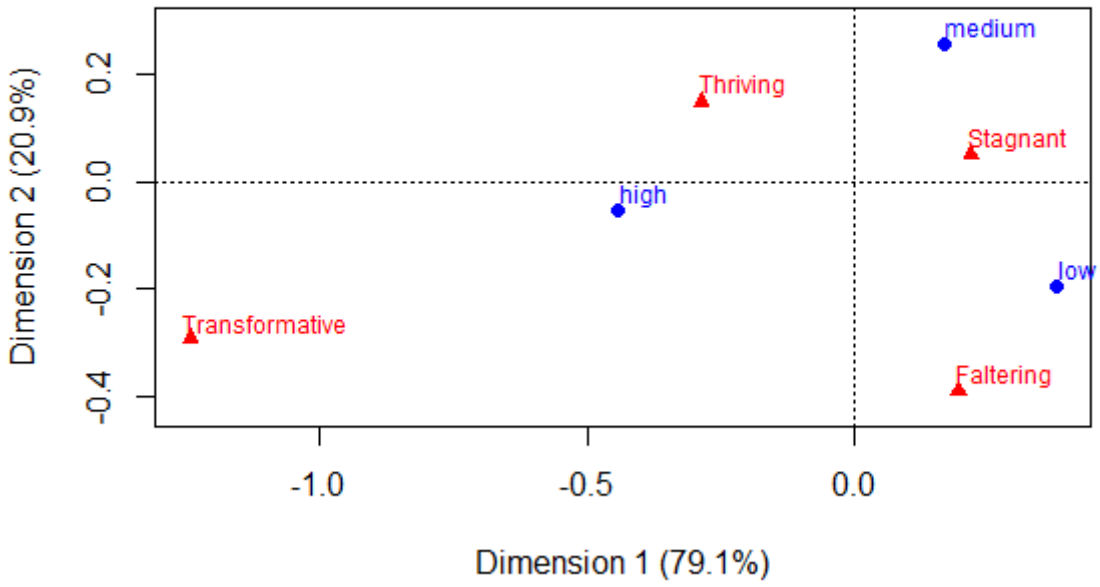

Figure 5. Correspondence analysis