

# Regional economic instability and the dynamics of economic growth

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**Abstract:** This article has a theoretical character. It provides an overview of the most important publications and research outcomes regarding the relation between regional economic (in)stability and the dynamics of economic growth. As this field of research is relatively new, no systemized research methodology has been established yet. Hypotheses are tested with help of different tools. Often, the accessibility of statistical data on the proper level of aggregation limits empirical verification of theoretical assumptions. This paper aims to contribute to the formulation of further research concepts and empirical verification of hypotheses regarding regional (in)stability in Central and Eastern European countries.

*Keywords: economic stability / instability, dynamics of economic growth, regional economy*

JEL: O14, O18, O47

## 1. Introduction

The spatial differentiation of economic growth/development is a common phenomenon, which, according to most of the researchers, is increasing (see Tondl 2001; Jones 2002). When, following the ideas of Schumpeter, innovation is the main determinant of economic development, some countries and regions are excluded from participating in the competitive game of trade due to lack of opportunities to use innovations. Furthermore, as Domański (2012: 138) argues, a necessary condition for the use and application of innovations is increasing revenues. These revenues enable the implementation of landmark changes, allowing an economy to deal with different types of barriers and to introduce organizational and production innovations necessary to take full advantage of technological innovations. Due to low or negative growth rates, less

developed regions or countries do not fulfill this condition. As a consequence, the basis for research on developmental processes becomes more often a disequilibrium, which seem to be a permanent feature of open economic systems and is related to issues of (in-)stability. The assumption used in this article is that, in accordance with evolutionary theories, unstable dynamics is the engine of transformations, changes and development. While stability limits change, instability opens a new area of opportunities and contributes to the development of dynamic structures.

## 2. Instability and economic growth

Instability and its relations to economic growth/development had been of interest to many researchers, such as Essletzbichler (2007), Trendle (2004) and Baldwin et al. (2001). The basis of this research is founded in theoretical assumptions from biological sciences, in particular evolutionary theories, which are developed and applied in economic sciences. A thorough discussion was provided by Essletzbichler (2007), whose starting point is the statement that in ecology there exists a negative relationship between stability and heterogeneity. Stability exists when the functional diversity of individuals is reflected in the diversity of species in the ecosystem.<sup>1</sup> Transposing this idea to economic geography, a region can be assumed to be stable when possessing diversified sectors, where technological outlays and demand are strongly correlated, i.e., where the structure of demand and supply are almost identical. In this case, the existing industrial diversification does not protect the region from demand shocks or technological change. However, the diversification, understood as a set of alternative opportunities, increases the probability of preadaptation to the changing circumstances (Essletzbichler 2007: 208-209).<sup>2</sup> This implies that diversification is not a guarantee for increased growth. It rather creates a set of supporting conditions which in the short run stimulates adaptive

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<sup>1</sup> Essletzbichler draws this statement from Rammel and Staudinger (2002). This article, published in the *International Journal of Sustainable Development & World Ecology*, was an important contribution to the controversy whether the regularity and rules functioning in biological systems can be directly transposed to social and economic systems (see also Rammel and Staudinger (2004) and McIntosh and Jeffrey (2004)).

<sup>2</sup> Preadaptation - exaptation, features or characteristics which enable individuals of a species changing an ecological niche; the emergence in the population of new variants of characteristics may lead to its expansion or acquisition of new ones (e.g., as a result of a random confluence of the extreme values), while not significantly reducing their carriers' capacity to adapt to the current niche; preadaptation is also a feature that in the changed environmental conditions appears to be important in the new adaptive role (*Słownik terminów biologicznych PWN*, b.d.).

capacity, while in the long run not guaranteeing survival. Additional elements supporting diversity and rewarding relatively inefficient companies are the mentioned preadaptation and external shocks. For example, acquired abilities and accumulated resources only be effectively used in a new, changed environment. In this case, a less efficient company or branch of industry may become efficient and improve its competitive position as a consequence of changes in internal or external factors. This does not require extra investment outlays or organizational change. Thus, according to Essletzbichler (2007: 209), regions should rather use than eliminate disturbances and disruptions.

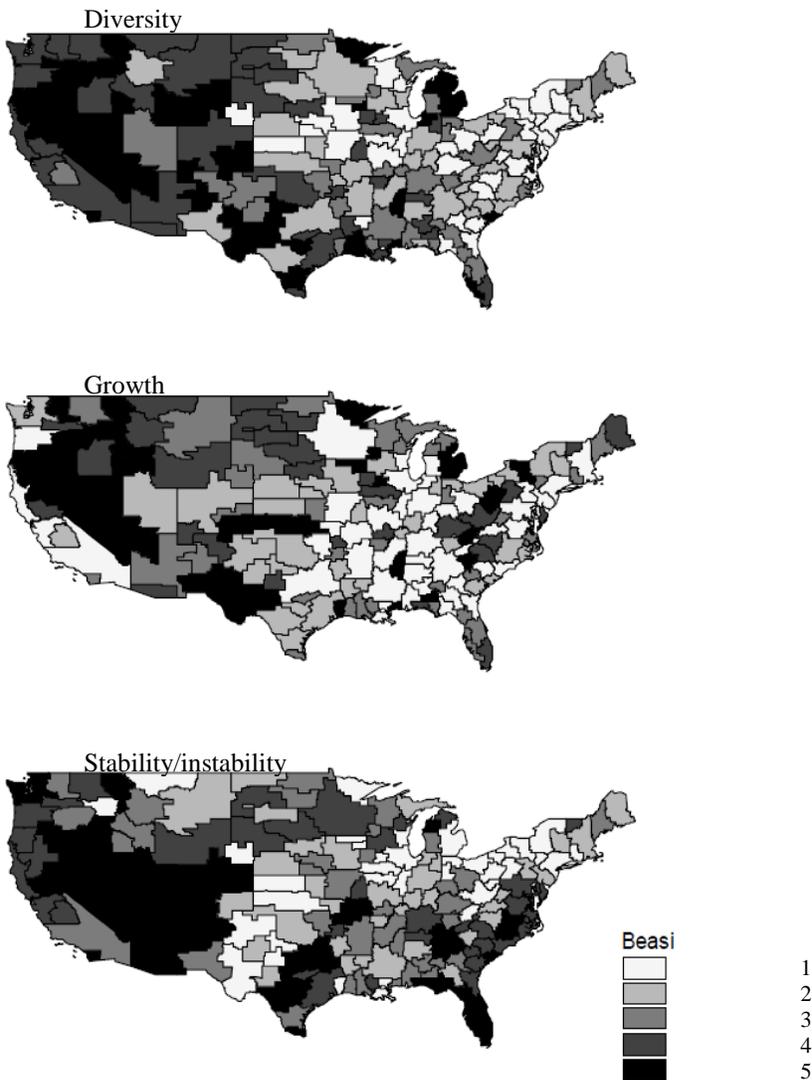
An additional argument for the statement that in ecology there exists a negative relationship between stability and heterogeneity is the set of determinants (conditions) of the development of ecosystems in a situation of disruption is presented by Ulanovitz. Ecosystem develops in such a way: (1) that a response to the possibility of the total using up of the resources is available, (2) the "fragility" of the system is protected, (3) their adaptive reactions and creativity are preserved, (4) the system retains its reliability (Matutinovitz 1992: 434, quoted in Essletzbichler 2007: 209). From the evolutionary point of view, a larger volatility of the environment will intensify the adaptation processes related to survival. Transposing this to economics, this means that companies, institutions, regions and countries are forced to look for a permanent compromise between short-term profits or benefits (adapted to actual conditions in order to achieve a local optimum) and long-term elasticity, in order to achieve the adaptive potential and capability to react to changes in technological paradigms, external shocks and industrial change. As Domański argues, for a system to be adaptive, it has to possess internal diversity or mechanisms enabling the creation of diversity in critical situations. In practice this may mean that a part of the costs related to the high risk of experimenting, creating and commercialization of new technologies can be treated as costs incurred due to the need to correct the adaptive capacity in order to increase the ability to deal with the challenges created by the company's innovative market activities (Domański 2012: 136). Thus, change and adaptive capacity are interdependent, increasing the effectivity and efficiency of the functioning of systems. Individual units being unable to adapt to the new conditions or the earlier adaptations (preadaptation), have reduced opportunities for functioning under the new conditions, which can result in their elimination or the need to find a niche. This excludes them from effective exchange of matter and energy, having their degradation or collapse as a consequence.

Research carried out by Essletzbichler is based on employment data in different states of the USA in the period 1975-2002 (data were collected and processed for 177 statistical units of the Bureau of Economic Analysis). The aim of the analysis was to show a negative statistical relationship between economic growth and stability, and a positive statistical relationship between industrial diversity and stability, applying spatial econometric methods. Regional stability/instability was measured as the variation of the annual rate of increase in employment in the different regions.

The results of the research verified the mentioned hypotheses. Areas where the highest stability was observed are the Central Atlantic region including areas such as Philadelphia, New York and Rochester. The most instable (variable) regions are featured by extractive industries, such as Oregon, Texas and Wyoming. The most diversified regions are in the direct vicinity of large metropolitan areas – New York, Philadelphia, Dallas, Atlanta and Memphis. The fastest growing regions dominate in Florida and in the south-western part of the country. The lowest growth rates were observed in areas featured with outdated industries, such as Buffalo, Cleveland and Pittsburgh (Fig. 1). The most important conclusion of the research is that there seems to exist a strong relationship between diversity and stability on the one hand, and between instability and growth on the other hand (Essletzbichler 2007: 223).

These relationships create a practical problem. Economic stability is a phenomenon which is rather appreciated by regional administrators and politicians, while this goal may be included in development plans. In the process of investment in technical and social infrastructure the conditions for their future operation and functioning are taken into consideration, allowing to prevent so-called pitfalls of rapid growth (congestion, rising property prices, environmental degradation and over-investment). However, when stability is accompanied by an economic downturn, this can create a situation where future conditions become uncertain, while the potential demand for the infrastructural objects may decline (Essletzbichler 2007: 223-224). This in turn increases the uncertainty about the financial situation of potential investors, reducing their investment opportunities. The weaker economic potential may cause further fluctuations in the economic system, which, depending on their scale and scope, may lead to the appearance of different phenomena of instability in the system. Also the phenomenon of diversity cannot be easily translated into stability of the economic system. The measure of diversity used does not reflect the degree of functional dependency between different sectors. It is therefore possible that

in a certain region the value of the diversity index is high, while in reality branches are closely interconnected (clusters, narrow specializations, developed networks of subcontractors) reacting to a collapse in demand in a similar way.



**Fig. 1. Diversity, economic growth and stability in the USA in the years 1975-2002**

Source: Essletzbichler (2007: 216).

Similar research has been carried out for the Canadian economy by Baldwin et al. (2001) for the period 1976-1997. The authors used indices for labour productivity and the wage level, indices of concentration as well as indices of the change in the share of branches of industry in total industrial activity (these indices are used as a measure of the level of stability). There is a major role for the spatial dimension in the study of Baldwin et al. The analysed statistical

material allowed for the identification of relationships between different sectors of industry (their structure and diversity) in the central parts of Canada's largest metropolitan areas and their immediate surroundings, as well as in other parts of the spatial hierarchy. The results obtained by the researchers are identical with the observations of Essletzbichler. They confirmed the existence of a strong correlation between the regional level of diversity and stability, and found that more stable regions are characterized by lower average growth rates (see Baldwin et al. 2001; Brown 2012).

### 3. A model of regional instability

Trendle (2006) developed a theoretical model of regional instability in his work *Regional Economic Instability: The Role of Industrial Diversification and Spatial Spillovers*, covering the research presented above. In this model, regional instability is considered to be a function of: regional variables (demographical, variables related to the labour market), the structure of the regional industrial base (taking into consideration its diversity, growth and structural change) as well as so-called variables of spatial lags (presenting the economic influence of neighbouring regions).<sup>3</sup> The basic model of instability is presented in equation (1.1.):

$$(1.1.) \text{ INSTAB} = \beta_0 + \beta_1 L + \beta_2 I + \beta_3 S + \varepsilon$$

where:

$L$	function of the population of the region and the employment
$I$	structure of the regional industrial base
$S$	variable of spatial lag
$\beta$	estimated regression coefficient
$\varepsilon$	estimation error

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<sup>3</sup> Trendle (2006: 5) did not consider the employment in different branches of industry as well as the level of unemployment in this model. He argued that these factors do not provide important information regarding the stability of the branches of industry.

Trendle's detailed model is mainly based on variables related to the labour market (1.2.):

$$(1.2.) \text{ INSTAB} = \sum_{i=1}^T [(E_{it} - E_{it}^{Tr}) / E_{it}^{Tr}]^2 / T$$

where:

$E_{it}$  employment in region  $i$  at time  $t$

$E_{it}^{Tr}$  expected level of employment in region  $i$  at time  $t$  (calculated using the linear trend)

$T$  time period for which the estimate is the linear trend.

Based on the econometric model, Trendle pointed at some methodological issues regarding research on the relation between stability/instability and regional economic development. This in particular concerns the sample size. In most cases, the sample size is of course dependent on available statistical data. However, according to the author, the most spatially diversified units should be analysed. Much research focused on metropolitan areas and their direct surroundings. The inclusion of agricultural regions or regions with a large extraction industry would provide a more complete picture. Furthermore, he points at the opportunities created by the application of econometric modelling for analysing spatial distribution of phenomena of instability (Trendle 2006: 775).

The research presented and the outcomes of this research have theoretical, methodological and practical implications. Above all, the positive verification of the theoretical relationships should be emphasised. Economic growth, stability and diversity create a chain of interrelated connections. The nature of these relationships is difficult to capture based on statistical data. However, the individual relationships between factors have become clear in different investigations. There exists a positive correlation between the level of diversity of the sectoral structure of economic activity (or, in a narrower sense – industry) and regional stability of the economic structure. The higher the level of diversification, the more stable the structure. As the scientists carrying out the research presented above emphasised, while this is beneficial for local politicians and administrators, this does not guarantee spectacular economic performance. Stability of the industrial structure has a direct, negative relation with the rate of economic growth. More stable regions tend to grow, on average, more slowly than regions featured by phenomena of instability. This creates a challenge for policy makers, as they need to continuously monitor and identify different developmental processes in the region, in order to be able to react by way of short-term developmental policy.

In principle, systems with a high level of instability and low sectoral diversification of the economy can, according to Domański (2008), be considered as systems of high complexity. Within these systems chaotic behaviour with a non-linear character occur, which makes the prediction of reactions in the future more difficult. Such systems are very sensitive to the impact of external as well as internal factors. Domański explains this with the fact that these systems can exist in two possible states, which at the beginning may be close to each other, but through time may move away from each other in an exponential manner, leading to substantially different conditions in the long-term. Systems characterised by a high level of instability in a dynamically changing environment are open to continuous influence of different factors that easily may change its structure. This impact of such influence is not always predictable and identifiable. However, summarising the presented research on developed countries, in most cases the instability of the structure of the economic system was related to increased economic growth. Relating to the Schumpeterian conception of dynamics of economic development, it can be argued that such a situation is not only desirable, but also a necessary condition for further development. It creates a beneficial climate for innovations to be created and implemented in more fragile structures.

#### **4. Concluding remarks**

An unambiguous assessment of different relationships is difficult. While neo-classical economic thought rather supports the increase in stability, Schumpeterian and evolutionary economists would rather argue this would lead to reduced economic growth. However, a drawback of the presented research is the lack of a broader, not necessarily economic, analytical framework. For example, the social effects of observed relations are not considered in any of the discussed models. There is a lack of information whether increased economic growth in regions with instable economic systems lead to increased income inequalities, increased inequality of wealth, or appearance of areas of economic and social exclusion. Although systems characterized by instability may be more “inclined” to change in many areas, as Gowdy (1985) already observed, some particular elements may be eliminated due to low adaptive efficiency. This may reduce the effectiveness of the functioning of the system, and eventually lead to its degradation.

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***NIESTABILNOŚĆ GOSPODARKI REGIONALNEJ A DYNAMIKA WZROSTU  
GOSPODARCZEGO***

*Streszczenie*

Niniejsze opracowanie ma charakter teoretyczny. Jest przeglądem najważniejszych publikacji i wyników badań z zakresu powiązań między stabilnością/niestabilnością gospodarki w układzie regionalnym a dynamiką jej wzrostu gospodarczego. Jest to zagadnienie stosunkowo nowe, które nie doczekało się jeszcze usystematyzowanych procedur badawczych. Formułowane hipotezy są testowane za pomocą różnych narzędzi. Częstym ograniczeniem w empirycznej weryfikacji założeń teoretycznych jest dostępność danych statystycznych na odpowiednim poziomie agregacji. Zaprezentowany przegląd literatury może stanowić przyczynek do formułowania dalszych koncepcji badawczych i empirycznej weryfikacji hipotez w odniesieniu do gospodarek krajów Europy Środkowej i Wschodniej w ich układzie regionalnym.

**Słowa kluczowe:** stabilność/niestabilność gospodarki, dynamika rozwoju gospodarczego, gospodarka regionalna  
JEL: O14, O18, O47