

How do various types of non-metropolitan regions react to economic shocks?

Jan Ženka (corresponding author)

Department of Human Geography and Regional Development
University of Ostrava Ostrava, Czechia

Ondřej Slach

Department of Human Geography and Regional Development
University of Ostrava
Ostrava, Czechia

jan.zenka@osu.cz, ondrej.slach@osu.cz

Abstract. There have been many studies focused on regional resilience and its particular determinants at regional level such as population size, industry mix, specialization/diversity, firm size structure, export orientation or institutions. Our research question is: which types of regions are more resilient: metropolitan or non-metropolitan regions, urban cores or hinterlands, peripheral, branch plant or single factory regions? These questions were examined in our case study of post-crisis (2009-2014) economic development of Czech city-regions. We propose a typology of city-regions based on particularities in economic structure, key actors and mechanisms of development. Eight main categories of Czech city-regions were distinguished: metropolitan cores, metropolitan hinterlands, medium-sized urban regions with metropolitan functions, peripheral city-regions, single factory city-regions dominated by a large domestic manufacturing firm, “ordinary” diversified industrial city-regions, lower and higher-tiered branch plant regions dominated mostly by foreign-owned manufacturing assembly plants. We conducted a quantitative analysis focused on differences among the above mentioned types of regions in the dynamics of post-crisis growth of value added and employment in agriculture, industry, construction and business services. Empirical results show that differences in resilience among particular types of regions were relatively small. Surprisingly, single-factory city-regions and higher-tiered branch plant regions exhibited the most rapid pace of recovery, while the metropolitan cores and hinterlands lagged behind significantly.

1. Introduction

There have been many studies focused on regional resilience and its determinants such as population size and density, specialization/diversity, firm size structure, industry mix, export openness or institutional framework. However, few is known about the question how various types of metropolitan and non-metropolitan regions react and adapt to economic shocks. By “reaction” we mean growth/decline of employment and value added as a consequence of a global economic recession. Resilient are those regions that were able either to maintain relatively stable employment and value added at times of economic slowdown or regions that were able to quickly recover from the recessionary shock. More specifically, we conceptualize resilience as “*the capacity of a regional or local economy to withstand or recover from market, competitive and environmental shocks to its developmental growth path, if necessary by undergoing adaptive changes to its economic structures and its social and institutional arrangements...*” (Martin and Sunley 2015, p. 13).

Which types of regions are more resilient: metropolitan or non-metropolitan regions, urban cores or hinterlands, peripheral, branch plant or single factory regions? We examined these questions in our case study of the post-crisis (2009-2014) economic development of Czech city-regions. For this purpose we propose a typology of city-regions based on particularities in economic structure, key actors and mechanisms of development. Eight main categories of Czech city-regions were distinguished: metropolitan cores, metropolitan hinterlands, medium-sized urban regions with metropolitan functions, peripheral city-regions, single factory city-regions dominated by a large domestic manufacturing firm, “ordinary” diversified



industrial city-regions, lower and higher-tiered branch plant regions dominated mostly by foreign-owned manufacturing assembly plants.

In the next section we aim to discuss briefly the most important theoretical arguments explaining why the above mentioned types of city-regions should vary significantly in their reactions to external economic shocks and dynamics of post-crisis economic development. Third section describes data sources and methods. Fourth section confronts the theoretical assumptions with empirical evidence from Czechia. Fifth section proposes conclusions and policy implications.

2. Theoretical departures

Let us start with a discussion of expected relationships between the population size/density and regional economic resilience in order to distinguish between possible reactions of metropolitan and non-metropolitan regions. Population and economic size/density are generally considered to be the key factors of regional economic resilience [1]. Metropolitan cores capitalizing on urbanization economies should be more resilient than non-metropolitan city-regions, because large diversified markets in metropolitan cores are expected to: i. reduce employment volatility through spreading the risk of a collapse of dominant firm/industry; ii. Allowing for efficient labour market matching [2]; iii. Support regional adaptability thanks to higher firms birth rate and innovation performance. On the other hand, metropolitan cores concentrate financial sector and new growing (but volatile) technology-intensive and knowledge-intensive industries that may increase economic instability at times of economic slowdown [1].

Metropolitan hinterlands capitalize on urbanization economies of neighboring metropolitan cores through the effects of borrowed size [3], which may foster their resilience at times of economic crises. Moreover, metropolitan hinterlands can benefit from cost-motivated relocations of firms from metropolitan cores. On the other hand, hinterlands are characteristic by a high shares of lower value-added business-to-customer services such as wholesale, retail, logistics and warehousing, therefore mostly pro-cyclical industries. Higher costs resulting from the proximity of metropolitan cores may cause relocations of manufacturing and routine services towards rural regions with even lower wages.

Sparsely populated peripheral regions cannot capitalize significantly on urbanization economies and tend to suffer from less efficient labour matching. However, there is no clear consensus on the question if peripheral regions should be more or less resilient compared to metropolitan and medium-sized urban regions. Peripheries can be surprisingly resilient thanks to their particular structural strengths: i. specialization in non-cyclical industries such as agriculture or food industry [4] ; ii. industrial diversity and fragmented firm size structure spread the risk [2] and avoid regional lock-in; iii. lower share of volatile industries, including the financial sector.

Single company regions are dominated by a large domestic firm or a foreign-owned firm that is locally embedded and has a long tradition of doing business in that particular region. Strategic non-production functions and decision-making competences are present. In some cases, the dominant firm is strongly tied to local suppliers: this type of regions is close to hub- and-spoke industrial districts [5]. Reactions of single company regions to external economic shocks may be ambiguous. On one hand, their dependence on a single key actor and tendency to lock-in makes them vulnerable. Exit of the key local company may lead to a vicious cycle of deindustrialization, unemployment and population loss [4]. On the other hand, large embedded firms are generally more likely to survive economic crises than small enterprises or foreign-owned branch plants.

Lower-tiered satellite platforms are dominated by a single or a couple of foreign-owned, locally disembedded manufacturing branch plants with no or very limited presence of strategic functions, decision-making competences and higher value-added activities. These regions tend to suffer by a “branch plant syndrome”, characteristic by limited job creation, lower skills, low wages and high probability of plant closures or relocations [6]. These regions should be theoretically threatened by an external economic shock more than any other type of (non) metropolitan regions. However, some satellite platforms can profit from good economic performance of parent transnational corporations. Higher-tiered satellite platforms that possess some strategic functions and decision-making competences should be more resilient, although they might be susceptible to high employment volatility.

Diversified industrial regions are very diverse in their industrial and firm size structure and also development path. Together they can be described as “ordinary regions” [7]: regions that exhibit average

economic performance, are not specialized in one particular industry and local firms do not form a local production system conducive for the creation and dissemination of knowledge. This group includes among others: i. Old industrial regions formerly dependent on mining and heavy manufacturing industries that were able to diversify their industrial base usually through the establishment of foreign-owned branch plants (mostly) in the automotive sector and supplying industries or routine business services [4]; ii. Tourist centres and spas characteristic by high share of services related to tourism industry (accommodation, food and beverage service activities, travel agencies) and, at the same time, significant share of manufacturing in total employment. It is difficult to anticipate how regions in this residual and highly heterogeneous group will react to an external economic shock.

Few is also known about resilience of medium-sized urban regions. These regions concentrate some metropolitan functions, which makes them similar to metropolitan cores. However, smaller urban size does not allow them to capitalize significantly on urbanization economies. Moreover, medium-sized urban regions show much higher rates of industrial specialization and their economy can be dominated by large firms, either domestic or foreign-owned. It is not clear if the post-crisis economic development of medium-sized urban regions will be 'somewhere between' metropolitan cores and non-metropolitan regions, or if their reaction will be closer to branch plant or single factory regions dominated by large firms or their subsidiaries.

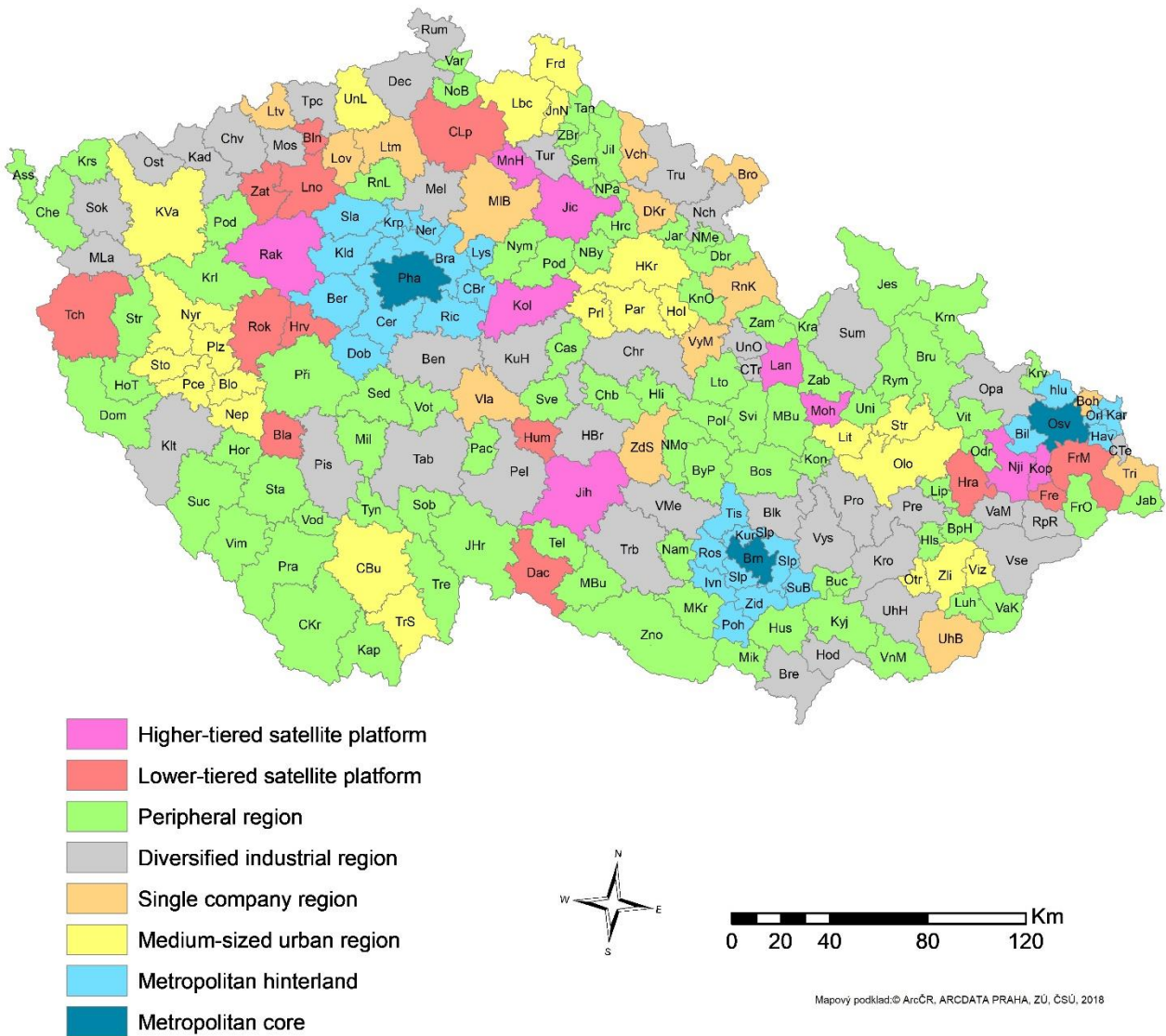
Based on above mentioned discussion our research question is which types of regions improved their economic performance and which of them lagged behind in the post-crisis period 2009-2014?

3. Material and methods

For delimitation of metropolitan regions we depart the approach introduced in the OECD publication "*Redefining Urban*" (2012). Metropolitan regions are defined as densely populated urban cores with more than 50,000 inhabitants that are merged with surrounding municipalities, from which 15 or more percent of employed residents commute to the nearest urban core [8]. Only three metropolitan regions in Czechia were thus delimited: the largest cities (Praha, Brno, Ostrava) and their commuting hinterlands (Fig. 1).

Regional economic data covering employment and value-added for the period 2009-2014 were obtained from the database of the Czech Statistical Office [9,10]. Data were aggregated for the municipalities with extended competences and 2-digital NACE rev. 2.0 industrial taxonomy. The database does not cover all industries of the Czech economy. Statistical data are available for the agriculture and forestry, manufacturing, construction and most of business services [11]. Total regional employment and value added were calculated only for industries for which there were data available; these numbers do not represent the whole bunch of local economic activities. We focused on measurement of one dimension of regional economic resilience: renewal of the regional economy in the period 2009-2014 [12]. Degree of renewal was measured by the changes in relative economic performance of city-regions in the period 2009-2013. For the year 2009 all city-regions were ranked according to their value-added per capita, the same was conducted for the year 2013. In the next step we subtracted rankings in 2009 from 2013 rankings and distinguished between regions that improved their relative economic performance from other regions that lost ground in 2009-2013 post-crisis development.

Fig. 1 Typology of regions



Sources: CSO 2009; CSO 2014

4. Results

Our empirical results are based on the analysis of 2009-2014 changes in regional employment and value added. Two spatial levels were considered: i. groups of regions delimited by aggregation of microregional economic data (metropolitan cores and hinterlands, medium-sized urban regions, satellite platforms, single company regions, peripheral and diversified industrial regions) – see Table 1; ii. microregional level. In contrast to our expectations, no significant spatial reallocation of economic activities in the post-crisis period occurred. Metropolitan cores increased their share in total employment only slightly. Higher-tiered satellite platforms performed even better in terms of employment growth, while the single company regions reported the highest (and only) increase in value added. At the same time, there were rather minor differences among all remaining groups of regions. Changes are more apparent when measured by value added. Metropolitan cores and especially hinterlands surprisingly developed worse than expected, being surpassed by the single company regions and satellite platforms. Diversified industrial regions showed the highest increase in value added and even rural regions outperformed their metropolitan counterparts.

Tab. 1 2009–2014 employment and value-added growth

	Employment		Value added		Value added per employee	
	2014	Index	2014	Index	2014	Index
Metropolitan cores	643771	104	61041	95	94	91
Metropolitan hinterlands	143158	95	12076	84	84	88
Medium-sized urban	354395	96	28228	80	79	83
Single company regions	131306	93	14870	113	11	122
Peripheral regions	288173	93	19735	68	68	73
Lower-tiered satellite	92555	100	91980	99	99	100
Higher-tiered satellite	101659	109	91330	90	89	83
Diversified industrial	373436	92	27149	73	72	79
Czechia	2128452	98	18143	85	85	87

Notes: Index = index of 2009-2014 growth in % (2009=100)

Sources: CSO 2009; CSO 2014

At microregional level it is difficult to find a regular spatial pattern of economic growth or decline (see [4] for details). Some quasi-regularities are present, though. No metropolitan cores and almost no regions in metropolitan hinterlands exhibited significant increase in employment, value added and productivity (value added per employee). The group of the fastest economically growing regions consists mainly from the singly company regions and satellite platforms, both lower and higher tiered. Majority of regions that showed successful post-crisis renewal share one common feature – dominance of large firms or branch plants either in the automotive or heavy manufacturing industries.

5. Discussion and conclusions

We found that spatialities of the post-crisis economic development correspond only partially with our theoretical assumptions. Metropolitan cores showed relatively stable and successful economic development, which corresponds to the theoretical assumption that regions with large and diversified markets capitalize on the portfolio effect stabilizing local economy [13]. Diversified metropolitan cores grew slower than most of specialized non-metropolitan regions dominated by large manufacturing firms or branch plants and metropolitan hinterlands performed economically worse than expected. No large scale commercial suburbanization from the cores to their hinterland was identified, especially not for higher value-added services. Results correspond

rather to the finding of Monsson [14] that metropolitan cores “push” the negative effects of recessionary shocks to their hinterlands. Perhaps surprisingly, satellite platforms and single company regions – potentially highly vulnerable by their dependence on a single economic unit - experienced relatively successful economic development.

Our paper and related research (see [4]) demonstrated large differences in trajectories of renewal at microregional level. Surprisingly, microregions dominated by large foreign-owned companies – theoretically the most vulnerable units – showed surprisingly high resilience in the period of (post)crisis economic development (despite relatively high levels of unemployment volatility). Even more unexpected result was slightly better economic performance of lower-tiered satellite platforms compared to higher-tiered satellite platforms.

These findings suggest that regional reactions to external economic shocks are primarily driven by economic performance of individual large companies rather than by specific regional contexts, assets and mechanisms. Most importantly, regional resilience in small open economies like Czechia seems to be primarily influenced by extra-regional factors. While any regional policies have to consider particularities of industrial structures, actors and mechanisms of local development in various types of regions, strategic coupling between the needs of transnational corporations and regional assets and also building of external knowledge pipelines should be supported across regional contexts.

Acknowledgement

This work was supported by the Czech Science Foundation through a research grant ‘Paths development in traditional industries in old industrial regions in Czechia: governance, actors, institutions and leadership’ (18-11299S).

5. References

- [1] Davies S 2011 Regional resilience in the 2008-2010 downturn: comparative evidence from European countries *Cambridge Journal of Regions, Economy and Society* **4** 369-382
- [2] Dissart C J 2003 Regional Economic Diversity and Regional Economic Stability: Research Results and Agenda. *International Regional Science Review* **26** 423–446
- [3] Phelps N and Ozawa T 2003 Contrasts in agglomeration: proto-industrial, industrial and post-industrial forms compared *Progress in Human Geography* **27** 583-604
- [4] Ženka J, Pavlík A and Slach O 2017 Resilience of metropolitan, urban and rural regions: a Central European perspective *GeoScape* **11**
- [5] Hassink, R and Markusen A 1996. Sticky Places in a Slippery Space: A Typology of Industrial Districts *Economic Geography* **72** 293-313
- [6] Sonn, J and Lee D 2012 Revisiting the branch plant syndrome: Review of literature on foreign direct investment and regional development in Western advanced economies. *International Journal of Urban Sciences* **16** 243-259
- [7] Hassink R 2007 The Strength of Weak Lock-Ins: The Renewal of the Westmünsterland Textile Industry. *Environment and Planning A* **39** 1147-1165
- [8] OECD 2012 Redefining Urban: a new way to measure metropolitan areas. New York, OECD.
- [9] CSO 2009 December *Annual survey of economic subjects in selected production industries for the year 2009* Czech Statistical Office: <http://www.czso.cz>
- [10] CSO 2014 December *Annual survey of economic subjects in selected production industries for the year 2014* Czech Statistical Office: <http://www.czso.cz>
- [11] NACE 2019 *Statistical classification of economic activities in the European Community* Eurostat: <https://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF>
- [12] Martin R 2012 Regional economic resilience, hysteresis and recessionary shocks. *Journal of Economic Geography* **1** 1–32.

- [13] Frenken K, Oort Van F and Verburg T 2007 Related Variety, Unrelated Variety and Regional Economic Growth. *Regional Studies* **41** 685–697
- [14] Monsson K CH 2015 Resilience in the city-core and hinterland: The case of Copenhagen *Sage Journals* **30** 191–214

Reproduced with permission of copyright owner. Further reproduction prohibited without permission.