

THE EVOLUTION OF REGIONAL INDUSTRIES IN TIMES OF CRISIS

A literature review for the ReDy project

Sigrid Jessen
Ina Drejer
Jacob Rubæk Holm

Aalborg University Business School

Centre for Research on Regional Dynamics and Disparities Working
Paper
Editor: Jørgen Goul Andersen
E-mail: goul@dps.aau.dk

Centre for Research on Regional Dynamics and Disparities is co-financed by the Obel
Family Foundation and the Faculty of Social Science, Aalborg University.

www.redy.aau.dk

Aalborg 2021

ISSN 2596-4208-2021-1

Extended summary

Even though the 2008 financial crises led to a doubling of the Danish unemployment rate, the real economic impact was comparably benign when comparing to other European countries in terms of employment (Dohlmann and Håkonsson, 2017). There is, however, clear evidence that some industries were impacted more than others. Particularly the industries in the construction and manufacturing sectors as well as financial services were hit hardest (Dohlmann and Håkonsson, 2017; Hansen and Winther, 2018), which was also observed in other countries - e.g. England (Lee, 2014), Wales (Sensier and Artis, 2016) and the EU (Fratesi and Rodríguez-Pose, 2016). The observation that the crisis affected some industries more than others leads to the reasonable hypothesis that regions were affected differently too, and an attempt to uncover what factors determine how a region's growth patterns are altered by economic crises and changes in market conditions. That is, how and why regional economies differed in terms of resilience to the crisis. In this paper, we have explored four interrelated dimensions that may delimit such regional differences: urbanization, local institutions, specialization and industry structure.

A simplified way to discuss the dimension of **urbanization** is by comparison of relatively rural and relatively metropolitan areas. In general, the literature shows that proximity to major cities (e.g. Hansen and Winther, 2018) has a positive relation to how well a region is performing in the event of a crisis. In continuation of this, it is seen that larger cities perform better than rural areas (Hansen and Winther, 2018), which can to some extent be explained by the industrial composition (as discussed in detail below). There are two main aspects of industrial composition of relevance here: Some industries tend to be generally more affected by crises than other industries (Hansen & Winther, 2013; Glaeser, 2005), and the industrial diversity, not least in terms of the supply of jobs, in cities tends to be greater compared to the rural areas, which means that redundant employees from industries hit by the crisis can more easily find a new job (Holm et al. 2017; Dohlmann and Håkonsson, 2017).

At the same time, the literature points in the direction that the stronger knowledge networks between firms and other actors, which are often found in the urban areas compared to the rural ones, do better in times of crisis (Boschma, 2015). Dawley et al. (2015), in the same thread, show how companies in the financial sector performed poorly if they were located in old industrial regions, compared to larger cities. The proposed explanation is the lack of knowledge networks.

Somewhat related to urbanization, Eraydin (2016) has shown in a Turkish context that **local institutions** matter, since regions located in proximity to universities and higher learning institutions are found to recover faster after external shocks. However, it should be noted that the study does not control for the tendency that universities are often found in the larger cities. Eraydin (2016) further found that the policy interventions undertaken in Turkish regions did not have the desired effect when the crisis hit. Regions that were locked

into a path dependent development trajectory were supported and remained in the path, and a one-size-fits-all mentality in policy making, which other studies have previously warned against, (e.g. Rodríguez-Pose, 2013) was to a large extent observed.

It has been speculated whether the **specialization/diversity** in a region influenced the extent to which a region would be affected by crises, as specialization could potentially result in regions suffering in times of crisis due to lock-ins (e.g. Boschma and Lambooy, 1999; Essletzbichler, 2007). Recent studies show that higher levels of industrial diversity lead to greater levels of resilience during times of crisis (Hansen and Winther, 2018). However, Holm and Østergaard (2015) show that too much diversity can imply few opportunities for cross-fertilization, and that companies therefore have difficulties learning from each other.

In relation to the firms-size aspects of **industry structure**, small and medium sized enterprises (SMEs) had a harder time recovering from the crisis in terms of employment at the same rate as larger companies (Westergård-Nielsen and Neamtu, 2012). This may be explained by the fact that SMEs have less favorable access to finance (Ughetto et al., 2019) and that this was only exacerbated during the financial crisis, with special consequences for innovative SMEs (Lee et al., 2015). On the other hand, Holm and Østergaard (2015) show that regional ICT industries characterized by small and young ICT companies were more robust in terms of employment during the financial crisis and grew more compared to regional ICT industries with a different structure.

While the local conditions in terms of urbanization, institutions, specialization and industry structure shaped the impact of the 2008 financial crisis, an open and related question is to what extent it is possible to affect the impact with **policy**. Case studies such as e.g. Glaeser (2005) for Boston and Treado (2010) for Pittsburgh show how strong governance, as well as an understanding of the region's prehistory, can help regions change the preconditions for a region's growth conditions by diversifying into new activities. Approaches like Smart Specialization (E.g. Crespo et al., 2017) lean on these experiences. In the two mentioned case studies, emphasis is on "location, labor and legacy" in Pittsburgh's case and on human capital and path dependency in Boston's case, respectively, as an explanation of the two cities' success.

1. Introduction

This literature review surveys the literature on the longer-term economic impact of economic crises, with particular emphasis on the 2008 financial crisis and which factors can be associated with regional variations in this impact. This means that it is not a comprehensive literature review with a protocol for identifying all relevant contributions within a given area, but rather a relatively selective review using a snowball approach to explore the research on regional resilience to the 2008 financial crisis, while also including a number of contributions on the responses to crises in general.

Economic crises come in several forms. They can be relatively asymmetric, affecting some parts of the economy more than others, such as the burst of the dot-com bubble in 2000, or relatively more general such as the 2008 financial crisis, which to some extent affected the entire economy. Crises do not necessarily start as real economic crises with drops in aggregate economic output and increases in unemployment. The 2008 financial crisis was initially a financial crisis which then evolved into a sovereign debt crisis and real economic crisis. The Covid-19 crisis of 2020 started as a health crisis which then became a real economic crisis as health concerns disrupted the real economy.

Each crisis is unique in its symmetry and origin, and each region is different in its ability to withstand crises of different origins and asymmetries. This has motivated a number of research questions for Aalborg University's Obel Family Foundation-funded project on Regional Dynamics and Disparities (ReDy), which inspired this literature review:

- A. Why are regions affected differently by economic crises and changes in market conditions?
 1. To what extent are these differences determined by the region's historical industrial development?
- B. To what extent is it possible to actively influence the regional and local effects of crises and market conditions?
- C. What factors determine how a region's growth patterns are altered by economic crises and changes in market conditions that affect specific industries more than others? Special emphasis on:
 1. differences between urban and rural areas;
 2. whether the industrial structure is characterized by specialization or diversity;
 3. the importance of the regional business mix (for example, many large companies or many start-ups);
 4. the importance of local institutions, including places of education and other elements of the innovation system.

In line with the ReDy project, there will be a focus on Denmark throughout the literature review, with international comparisons when relevant. The following section discusses the concept of resilience in relation to crises. In section 3, we discuss, from a Danish perspective, the specificities of the 2008 financial crisis and the real economic crisis that ensued. Section 4 concludes.

2. Crisis and resilience

Discussions of the impact of crises often turn to the concept of resilience. This entails moving from the simple dichotomy of affected vs. not affected by a crisis to a richer approach focusing on how a region is changed by a crisis. Resilience is a concept that has gained popularity since the financial crisis, both in the academic and political sphere (Xiao et al., 2017). There are at least three major branches in the literature on resilience: an engineering-based, an ecological-based, and an evolutionary-based branch. The evolutionary branch originates from a relatively recent demand of, among others: Pike et al. (2010), Simmie and Martin (2011), Martin and Sunley (2015), Cainelli et al. (2019) to move beyond the ecology and engineering approaches to resilience, and develop a concept of resilience tailored for economic geography. This has resulted in a growing literature dealing with the regions' ability to develop new growth paths through industrial specializations, both during crises and outside crises (E.g. Crespo et al., 2017; Xiao et al., 2018). This review focuses on the evolutionary-based, economic geographical approach to regional resilience, with an emphasis on resilience in regard to labor market dynamics.

In the following, the main branches within the resilience literature and the current trends in the literature are briefly discussed, before addressing the geographical determinants of why and how regions are hit differently by external shocks. This is followed by a discussion of the extent to which it is possible for actors to influence the degree of resilience of regions.

The financial crisis of 2008 made it evident that, due to the increased globalized structure of both regions and nations, economies have become more vulnerable to external events. The focus has paved the way for an extensive amount of literature on resilience (Xiao et al., 2017). However, the definitions and conceptualizations of resilience are continuously evolving within this literature. Several scholars have argued that the many approaches to resilience have blurred up the discussion, and that there is a need for a strong clarification (Meerow et al., 2016). As mentioned above, although there are several approaches, within social science there are roughly speaking three main branches within the resilience literature: the engineering-based, the ecological-based and more recently economic evolutionary geographical-based branch (Boschma, 2015).

The neo-classical, **engineering-based** concept of resilience focusses on the resilience of a system relative to an equilibrium setting. The equilibrium framework to resilience is measured as the economy's ability to

remain in and return to its equilibrium state after an exogenous shock and is often discussed as a contrast to eco-system resilience. This view has been criticized for making no reference to the need of structural change for long-term economic development (Simmie and Martin, 2010).

The **ecological-based** concept of resilience retains the emphasis on the equilibrium functioning of a system, but instead of focusing on returning to the initial equilibrium, there is an assumption of a multi-equilibria setting. In this approach, resilience means retaining the functioning of the system, while the organization of the system may be fundamentally and qualitatively changed (Holling, 1973). Reggiani et al. (2002), Martin (2012) and Zolli and Healy (2012) ect. take the development of regions and nations into account when discussing resilience. However, when applied in economic geography, this ecological approach to resilience only indirectly measures the importance of structural change as in Martin (2012) and Fingleton et al. (2012), but does not provide evidence on which structural change has occurred, what were its underlying determinants, and why different regions or nations show different degrees of resilience (Xiao et al., 2017).

The **evolutionary** economic geographical framework to regional resilience is a relatively recent framework within the resilience literature. It builds on the idea of regional resilience as an adaptive capacity (Pike et al., 2010; Martin, 2012), which has been adopted and adapted by several scholars (e.g. Boschma, 2015; Dawley et al., 2015; Holm and Østergaard, 2015; Xiao et al., 2018). The evolutionary framework suggests that one should consider an economy's long-term economic development. An economy is thus only resilient if it adapts to the structural change and manages to diversify into new growth paths. This it argued to be of importance for all regions, but especially in times of crisis. Therefore, a large part of the literature focuses on what makes a region able to diversify into new growth paths (Xiao et al., 2018).

2.1. The geographical determinants of resilience

Martin (2011), among others, has expressed the need for further research on the geographies of resilience and the geographical factors that affect the effects of crises in different regions. This has inspired different studies to look into how differing economic geographies affect how regions respond in times of crisis (e.g. Fingleton et al., 2012; Lee, 2014; Eraydin, 2016, Dawley et al., 2015, Martin et al., 2014). While there still are many missing pieces in the literature, the recent literature dealing with the geographical aspects of responses to crises can roughly speaking be divided into three themes: Demographic differences, Industrial differences, and Institutional differences.

Lee (2014) is an example of a study of the **demographic differences**. Lee (2014) investigated how the 2008–2009 recession affected unemployment in the 60 largest cities in Great Britain. In the study, a series of models are developed, where the initial characteristics of the cities in 2007 are used as explanatory variables against two measures of unemployment. It was found that the skill level of the population was a strong determinant

of how the city would be affected by the financial crisis. Cities with higher levels of high-skilled population were found to have more limited increases in unemployment rates compared to those with less skilled populations.

With respect to **industrial differences**, diversified regions are, in general, more likely to be struck by external shocks since their industrial bases consist of a broader range of industries that face the risk of being impacted by crises. However, more specialized regions risk being struck more severely if the dominating industries are affected adversely. In addition, more diversified regions should be more capable to withstand the consequences of sector-specific shocks, which will minimize the risk that an external shock will impact the economy as a whole (Boschma, 2015). Diodato and Weterings (2015) argue that regions with higher levels of industrial variety only perform better in times of crises, when regional industries are not strongly connected through input-output relations, otherwise the impact of a crisis on one industry may spill over to other industries. However, industries that are part of regional industry structures characterized by unrelated variety suffer from the lack of local embeddedness and are thus more likely to exit regions in general (Neffke et al., 2011). Balland et al. (2015) have furthermore showed that technological relatedness in regions has a positive impact on how regions responded during the financial crisis. Additionally, in the unfortunate event of a crisis hitting a region, studies have shown that regions with higher levels of skill relatedness would allow the redundant workers after a firm closing to be less impacted by the shock in the region and would more easily find new employment within the region (Diodato and Weterings, 2015; Holm et al., 2017). The skill relatedness minimized the destruction of human capital in a region as well as the outflow of workers to other regions.

When applying the evolutionary economic geographical (EG) framework, it is argued that it is of great importance that regions in general are able to develop new growth paths, but this especially holds true in times of crisis. A repeated line of reasoning within the EG literature is that specialized regions have less potential options for diversification and renewal of their industrial basis, which hence affects the regions' ability to diversify into new growth paths (see e.g. Boschma and Lambooy, 1999 and Martin and Sunley, 2006). Lee (2014) found that in 60 large cities in Great Britain, the cities specialized within financial services or manufacturing sectors showed higher rates of unemployment after the 2008-2009 recession. In a Danish context, Hansen and Winther (2018) investigated how Danish towns and regions were affected by the 2008 crisis (2008 – 2013) by among other things looking into industrial structure, city size and location. They found that the greater the industrial diversity in a town, the less the town was affected by the crisis. Furthermore, they found that towns dominated by either construction and manufacturing or specific service industries were hit hardest by the crisis. These results correlate with the findings from Great Britain (Lee, 2014), Wales (Sensier and Artis, 2016) and the EU (Fratesi and Rodríguez, 2016). In the British setting, similar results were

found showing that manufacturing sectors experienced larger increases in unemployment. However, these results also showed that cities with employment in financial services also suffered more. Whether a city has a specialized or a diverse economy was found to be of lesser importance than the industries in which the city is specialized (Lee, 2014). In terms of the industrial structure of the economy, Holm and Østergaard (2015) found that regions characterized by small and young ICT service companies were more adaptable in times of external shocks and grew more than regions defined by older and larger firms, while diversity and urbanization increased the sensitivity to the business cycle after the shock.

Regarding **institutional differences**, Eraydin (2015), instigating how different Turkish regions reacted under different forms of policy interventions when struck by external shocks, found that regions in close proximity to universities and higher knowledge institutions bounced back faster after being struck by shocks compared to those with limited or no access to universities. Recently, other studies have investigated the relationship between institutions (shaped from the framework of the varieties of capitalism literature) and their impact on regions ability to diversify industrially (Cortinovic et al., 2017). However, despite the increasing focus on the different geographical determinants' impact on the regional resilience and how regions respond in time of crisis, as of yet, several geographical aspects are still to this day unknown.

2.2. The potential for policy to influence the resilience of regions

Rodriguez-Pose (2013) argues that institutional interventions cannot be implemented successfully with a one-size fits all approach. A similar logic is being argued for in the study by Eraydin (2016), who concludes that instead of applying similar policies in regions that differ in terms of industrial basis and knowledge networks, it would be favorable to try to grasp the specific setting of each region. Case studies such as e.g. Glaeser (2005) for Boston and Treado (2010) for Pittsburgh show how strong governance, as well as an understanding of the region's prehistory, can help regions change the preconditions for growth by diversifying into new activities. Approaches like Smart Specialization (e.g. Crespo et al., 2017) lean on these experiences. In the two abovementioned case studies, emphasis is placed on "location, labor and legacy" in Pittsburgh's case and human capital and path dependency in Boston's case, respectively, as an explanation of the two cities' success. Both case studies show the great importance of a region's historical and industrial background, but also how individuals can help shape a more resilient regional context, among other things through diversification into related activities. Bristow and Healy (2014) follow the same line of logic in their study, when they argue that the role of agents is highly under-investigated.

3. The 2008 financial crisis in Denmark

This section presents a brief overview of the financial crisis of 2008 and its effects on the Danish economy with a special emphasis on impacts on unemployment. The crisis of 2008 was closely tied to the global banking system. In the years prior to the crisis, a global trend of housing booms could be observed. Often loans had been issued to individuals that normally would not be seen as credit-worthy, with the prediction that the increasing house prices would cover possible uncertainties, such as if the individual suffered from unemployment. However, as house prices began to decline in the United States, this way of conducting business proved flawed. Due to the complexity of the global loaning system it became unclear which banks were impacted by the falling housing prices. This resulted first in an unwillingness from the banks to loan to each other, and subsequently in an unwillingness to issue loans to businesses and individuals, which caused many businesses to fail and the unemployment rate to skyrocket. So, while the recession had been several years in the making, the impact of the recession became evident in 2008. By mid-2009, GDP per head in the European Union had diminished with 5% compared to its peak in the fourth quarter of 2007. The unemployment rate increased from 7% to 11% in the years from 2007 to 2013. (Fratesi and Rodríguez-Pose, 2016). In Denmark, the effects of the 2008 crisis were not as severe as in other countries in terms of impact on the unemployment rate, e.g. compared to the US, the UK, Spain and Ireland, where the housing booms had been the highest (Lee, 2014). Denmark was, however, not untouched by the recession. Especially the construction and industrial sectors suffered the strongest relative consequences from 2007 to 2012 (Dohlmann and Håkonsson, 2017). Interestingly, Dohlmann and Håkonsson (2017) found that the impact of the recession differed in different geographical contexts, e.g. urban and rural municipalities, both in terms of sectorial closures and unemployment rates. Across industries the main share of the firm population can be found in the urban municipalities, compared to the medium sized and rural municipalities, and the workplaces in urban municipalities also tend to be larger. This means that eventhough the share of workplaces or jobs lost during a crisis is similar across regions, the differences in absolute number of workplaces and jobs involved entail not just quantitative but qualitative differences in the problems and policy responses.

In terms of individual effects, it was found that the urban municipalities had the lowest share of individuals becoming unemployed after a firm closing compared to both rural and medium-sized municipalities (Dohlmann and Håkonsson, 2017). The urban municipalities overall did better due to the industrial specialization within the construction and manufacturing that were dominant in the rural and medium-sized municipalities compared to the urban municipalities. However, it is noteworthy that the study only focuses on the absolute number of firms, i.e. on firms that suffered from closure, where it could be imagined that

the firms in the same period of time would be downsizing in number of employees, although not closing. The effects from potential downsizing would not show in this study, unless the entire firm would end up closing down within the time period studied. In a study by Hansen & Winther (2018), different geographical sizes, including smaller towns, were analyzed in order to understand differences in employment growth following the 2008 crisis until 2013 and its shock to the overall Danish economy. The analysis was based on register-based micro-data from Statistics Denmark. The relationship between employment growth in specific towns, town size, regional location and towns' industrial structures were all factors taken into consideration. It was found that, first of all, the size of the geographical context plays a role, since the larger the town, the better the town performed. The second finding was related to the industrial diversity, where it was found that the greater the industrial diversity in the town, the less the town was affected by the financial crisis. Third, towns dominated by either construction and manufacturing or specific service industries were hit hardest by the crisis. Fourth, the regional locations of towns and their proximity to a larger town or city are important for employment growth in times of crisis, which is showed by the fact that towns in close proximity to larger urban areas performed better in terms of impact on the employment when the crisis struck in 2008.

On a more general note, the study furthermore showed that in the 2007 – 2012 time period there were more firm closures than firm openings. Following the same line of logic, more layoffs can be observed in connection to firm closings relative to jobs created in relation to new firms starting. Intermediate and rural municipalities were struck the hardest in terms of layoffs connected to firm closures, and especially those employed in the construction and industrial sectors would be prone to losing their jobs when the firm closed.

3.1. SMEs in relation to the financial crisis and regional resilience

Studies have found that small and medium sized enterprises were to a higher extend challenged in terms of acquiring financing compared to larger firms (Ughetto et al., 2019). In the same line of reasoning it was found that it in particular was difficult for more innovative firms, which were found to be more risk-taking and thus more unreliable as loan takers (Lee et al., 2015). In a Danish context, it was found that the smaller firms in Denmark struggled more to begin creating jobs again after the financial crisis of 2008 (Westergård-Nielsen and Neamtu, 2012). On the other hand, Holm and Østergaard (2015) show that regions characterized by small and young ICT companies were more robust in terms of employment during the crisis following the burst of the ICT bubbles in the early 2000s and grew more compared to regions with a different industrial structure.

From a political point of view, it is evident that SMEs are lacking the same strength as larger firms to withstand external shocks. This could e.g. also be seen in the response prior to Brexit, where the Danish government

announced that they would be ready with a supporting act for SMEs in the wake of a potential “hard Brexit” that could impact SMEs more dramatically compared to larger firms, due to SMEs’ limited manpower when trying to cope with the legal consequences. Recent evidence also suggests a difference among SMEs in the impact of the Covid-19 crisis, as SMEs located in rural regions are struggling more during this crisis (SMV Danmark, 2020). Juergensen et al. (2020) argue that differences among SMEs mean that they have been impacted differently by the Covid-19 crisis and that policy must move beyond one-size-fits-all SME policy, and design responses that target the different challenges for innovation, internationalization and networking faced by SMEs depending on industry and region. SMV Danmark (2020) in particular point to weaker networks for SMEs in rural regions, and the fact that SMEs in such regions relatively more often belong to the tourism industry, as a possible explanations for the more severe impact of the Covid-19 crisis.

4. Conclusions

In this literature review we have gathered evidence on regional resilience regarding the 2008 economic crisis. In section 1, the following research questions from the ReDy project on Regional Dynamics and Disparities were presented:

- A. Why are regions affected differently by economic crises and changes in market conditions?
 - 1. To what extent are these differences determined by the region's historical industrial development?
- B. To what extent is it possible to actively influence the regional and local effects of crises and market conditions?
- C. What factors determine how a region's growth patterns are altered by economic crises and changes in market conditions that affect specific industries more than others? Special emphasis on:
 - 1. differences between urban and rural areas;
 - 2. whether the industrial structure is characterized by specialization or diversity;
 - 3. the importance of the regional business mix (for example, many large companies or many start-ups);
 - 4. the importance of local institutions, including places of education and other elements of the innovation system.

It is beyond doubt that the impact of the crisis exhibited spatial variation. The main source of this variation was determined by local industry structure, which means that history plays a large role in explaining spatial differences in the impact of the crisis. Case studies suggest, however, that it was possible to mediate the effects of the crisis with policy. There is no generic policy for increasing regional resilience towards crisis.

Instead, policies need to be specifically tailored to place specific factors, to the local human capital and to the historical development of the local economy. While this may be a discouraging message for policy makers seeking an easy solution to countering crises, it is also an encouraging message as it implies that the impact of crisis is not preordained, and useful policies do exist for qualitatively different regions. Formulating such policies requires a detailed study of the region in question and can benefit from case studies of policy experiences in similar regions.

While policy can thus mediate resilience, there are a number of place specific factors that affect resilience and thus the conditions for formulating policy. These factors include urbanization, local institutions, diversity vs. specialization, and the industry structure in terms of business demographics.

It appears that urbanization increases the resilience of a regional economy towards crisis. This is partially because higher levels of human capital contribute to make the regional economy more adaptable, but the relationship between urbanization and resilience is likely to be confounded by the other abovementioned factors. Relatively urban regions tend to be more economically diversified, to be home to larger firms and to host universities and other educational institutions and other large public sector organizations, all of which make these regions more resilient.

Diversity makes a regional economy more resilient as diversity naturally spreads risks. This positive effect of diversity on resilience is in particular strengthened if the diverse economic activities are interrelated in terms of labor demand and/or the applied knowledge, which makes the regional economy more able to shift between activities and hence more adaptable. Diversity also positively affects resilience because regions with a greater diversity in economic activities are the regions where new industries and new growth paths are more likely to emerge. Hence such regions are comparably more likely to be the home of the new growth sectors emerging after a crisis.

The most consistent result regarding the relationship between a region's business demographics and resilience is that the presence of larger firms increases resilience, but it is unclear whether this is because large firms are more adaptable, or because their large resources allow them to weather crises better. On the other hand, there is also some evidence indicating that a large share of young firms (ie. a high rate of entrepreneurship) can make a regional economy more resilient, which is consistent with entrepreneurship making the regional economy more adaptable.

Resilience and the economic crisis following the Covid-19 pandemic

The economic crisis following the Covid-19 pandemic is unlike other crises experienced recently and it can thus be risky to speculatively predict how and which regions will be affected. On the one hand, expansive fiscal policy increased private consumption in a time where personal services, cultural activities, travel etc.

were mostly closed down. The increased consumption was thus mainly target at goods; often imported durables such as electronics and domestic appliances. This benefited the wholesale and retail business. On the other hand, much personal consumption shifted from brick and mortar stores to the internet, which, all other things being equal, had a negative impact on retail, and a positive impact on logistics companies. While the demand for imported goods increased international trade, there is also evidence of disrupted global value chains leading to increased demand for domestic suppliers.

Quarantine coupled with expansive fiscal policy increased the demand for home improvement goods and services which benefitted parts of the retail business as well as the construction sector in general. The construction sector also experienced increased demand as a direct consequence of government investments as part of the expansive fiscal policy.

There are thus a number of reasons to believe that more urban regions will be more resilient to the economic crisis caused by the Covid-19 pandemic as well as reasons to believe that they will be less resilient. Such regions have a relatively large share of public sector employees, whose jobs are relatively secure during the crisis. On the other hand, urban regions are home to the private and cultural services most adversely affected by crisis, and to shopping malls and pedestrian streets that were negatively affected by the shift away from brick and mortar stores. Internet based stores, on the other hand, have their warehouse facilities across all types of regions. Manufacturing is often located outside the main urban centers, but it appears that the effect on any specific manufacturing firm will be highly idiosyncratic as it depends on the specific goods produced by the firm and the firm's place in global value chains. Finally, while the travel industry struggled during the crisis, there was increased demand for holidays outside of the domestic urban areas. While SMEs in the tourism industry in rural regions have fared particularly badly during the crisis, it is unclear if there were other positive effects on the regional economies of the more rural regions from the increased demand for holiday homes; not least as the tourists' consumption spending was low during the holiday.

References

- Balland, P.A., Rigby, D. and R. Boschma (2015). The technological resilience of cities. *Cambridge Journal of Regions, Economy and Society*, 8:167-184.
- Boschma, R. and Lambooy, J. (1999). The prospects of an adjustment policy based on collective learning in old industrial regions. *Geojournal*, 49(4):391–399.
- Boschma, R. (2015). Towards an evolutionary perspective on regional resilience. *Regional Studies*, 49(5):733–751.
- Bristow, G. and A. Healy (2014). Regional resilience: an agency perspective. *Regional Studies*, 48(5):923-935.
- Cainelli, G., Ganau, R., & Modica, M. (2019). Does related variety affect regional resilience? New evidence from Italy. *The Annals of Regional Science*, 62(3):657-680.
- Cortinovis, N., Xiao, J., Boschma, R., and van Oort, F. G. (2017). Quality of government and social capital as drivers of regional diversification in Europe. *Journal of Economic Geography*, 17(6):1179–1208.
- Crespo, J., Balland, P., Boschma, R., and Rigby, D. (2017). *Regional Diversification Opportunities and Smart Specialization Strategies*. Directorate-General for Research and Innovation, European Union: [https://doi:10.2777/133737](https://doi.org/10.2777/133737).
- Dawley, S., MacKinnon, D., Cumbers, A., & Pike, A. (2015). Policy activism and regional path creation: the promotion of offshore wind in North East England and Scotland. *Cambridge Journal of Regions, Economy and Society*, 8(2):257-272.
- Dawley, S. (2013). Creating new paths? Offshore wind, policy activism, and peripheral region development. *Economic Geography*, 90(1):91-112.
- Diodato, D. and A.Weterings (2015). The resilience of regional labour markets to economic shocks: Exploring the role of interactions among firms and workers. *Journal of Economic Geography*, 15(4):723-742.
- Dohlmann, C., and D. Håkonsson (2017), *Hvem flytter, når lokale arbejdssteder lukker og mennesker mister deres arbejde?*. Kraks Fond Byforskning, Copenhagen.
- Eraydin, A. (2016). Attributes and characteristics of regional resilience: Defining and measuring the resilience of Turkish regions. *Regional Studies*, 50(4):600-614.

- Essletzbichler, J. (2007). Diversity, Stability and Regional Growth in the United States, 1975-2002, in: K. Frenken (ed.), *Applied Evolutionary Economics and Economic Geography*. Edward Edgar: Cheltenham: 203-299.
- Fingleton, B., Garretsen, H., & Martin, R. (2012). Recessionary shocks and regional employment: evidence on the resilience of UK regions. *Journal of regional science*, 52(1):109-133.
- Fratesi, U. and Rodríguez-Pose, A. (2016). The crisis and regional employment in Europe: what role for sheltered economies?. *Cambridge Journal of Regions, Economy and Society*, 9:33–57
- Glaeser, E. L. (2005). Reinventing Boston: 1630-2003. *Journal of Economic Geography*, 5(2):119– 153.
- Hansen, K., and Winther, L. (2018). Employment growth in Danish towns and regions since the crisis: industrial structure, city size and location, 2008–2013. *Geografiska Annaler: Series B, Human Geography*, 100(3):244-262.
- Hansen, H. K. and Winther, L. (2013). Virksomheder, erhverv og arbejdsmarkeder. In Groth, N. B. and Fertner, C. (eds.) *Stationsbyer i dag*, 107–119. Prinfo, Aalborg.
- Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecological Systems* 4:1–23.
- Holm, J. R., Østergaard, C. R. and Olesen, T. R. (2017). Destruction and reallocation of skills following large company closures. *Journal of Regional Science*, 57(2):245–265.
- Holm, J. R. and Østergaard, C. R. (2015). Regional Employment Growth, Shocks and Regional Industrial Resilience: A Quantitative Analysis of the Danish ICT Sector. *Regional Studies*, 49(1):95-112.
- Juergensen, J., Guimón, J., & Narula, R. (2020). European SMEs amidst the COVID-19 crisis: assessing impact and policy responses. *Journal of Industrial and Business Economics*, 47(3):499-510.
- Lee, N. (2014). Grim down South? The determinants of unemployment increases in British cities in the 2008–2009 recession. *Regional Studies*, 48(11):1761-1778.
- Lee, N., Sameen, H., & Cowling, M. (2015). Access to finance for innovative SMEs since the financial crisis. *Research policy*, 44(2):370-380.

- Martin, R. (2011). The Local Geographies of the Financial Crisis: From the Housing Bubble to Economic Recession and Beyond. *Journal of Economic Geography* 11:587–618.
- Martin, R. (2012), Regional economic resilience, hysteresis and recessionary shocks, *Journal of Economic Geography*, 12:1–32.
- Martin, R and Sunley, P. (2015), On the notion of regional economic resilience: conceptualization and explanation. *Journal of Economic Geography*, 15(1):1-42.
- Martin, R. and Sunley, P. (2006), Path dependence and regional economic evolution. *Journal of Economic Geography*, 6(4):395-437.
- Meerow, S., Newell, J. P., & Stults, M. (2016). Defining urban resilience: A review. *Landscape and urban planning*, 147:38-49.
- Neffke, F., Henning, M., and Boschma, R. (2011). How do regions diversify over time? Industry relatedness and the development of new growth paths in regions. *Economic geography*, 87(3):237–265.
- Pike, A., Dawley, S. and Tomaney, J. (2010), Resilience, adaptation and adaptability. *Cambridge Journal of Regions, Economy and Society*, 3:59–70
- Reggiani, A., De Graaff, T., & Nijkamp, P. (2002). Resilience: an evolutionary approach to spatial economic systems. *Networks and Spatial Economics*, 2(2):211-229.
- Rodríguez-Pose, A. (2013). Do institutions matter for regional development?. *Regional studies*, 47(7):1034-1047.
- Sensier, M., & Artis, M. (2016). The resilience of employment in Wales: through recession and into recovery. *Regional Studies*, 50(4):586-599.
- Simmie, J. and Martin, R. (2010). The economic resilience of regions: towards an evolutionary approach. *Cambridge Journal of Regions, Economy and Society*, 3(1):27–43.
- SMV Danmark (2020). *Smv'erne: Covid-19 rammer beskæftigelsen hårdt*. Temaanalyse. SMVDanmark, Copenhagen.
- Treado, C. D. (2010). Pittsburgh's evolving steel legacy and the steel technology cluster. *Cambridge Journal of Regions, Economy and Society*, 3(1):105–120.

- Ughetto, E., Cowling, M. and Lee, N. (2019) Regional and spatial issues in the financing of small and medium-sized enterprises and new ventures. *Regional Studies*, 53(5):617-619.
- Westergaard-Nielsen, N. and Neamtu, I. (2012). How are firms affected by the crisis and how do they react? *IZA Discussion Papers*, 12(6671):1–28.
- Xiao, J., Boschma, R., and Andersson, M. (2017). Resilience in the European Union. *Economic Geography*, 16(8):1–37.
- Xiao, J., Boschma, R., and Andersson, M. (2018). Industrial diversification in Europe: The differentiated role of relatedness. *Economic Geography*, 94(5):514–549.
- Zolli, A., & Healy, A. M. (2012). *Resilience: Why things bounce back*. Hachette UK.