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BREXIT, THE MEDIATION STRATEGIES OF FOREIGN CORPORATE SUBSIDIARIES AND REGIONAL RESILIENCE

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ABSTRACT

The period leading up to Brexit in the UK has led to foreign corporate subsidiaries having to mediate uncertainties and upheaval, forming part of broader regional resilience tendencies. The roles of subsidiaries, their corporate contexts, global production network positions and regional coupling are all heterogeneous, meaning that responses are likely to be disparate. Utilising 'dynamic managerial capabilities' and subsidiary competences perspectives, this paper examines how subsidiaries have mediated Brexit and why certain actions are taken, and which is co-constituted with regional resilience. Twenty foreign subsidiaries within manufacturing sectors in the West Midlands and Wales are examined. In conclusion, the paper finds that Brexit mediation strategies have generally focused on seeking stasis through worst case no-deal planning and preserving existing supply chains, indicating the dominance of 'adaptation' forms of regional resilience.

BREXIT CORPORATIONS DYNAMIC MANAGERIAL CAPABILITIES SUBSIDIARY ROLE REGIONAL RESILIENCE

INTRODUCTION

The period leading up to Brexit, following the vote to leave in June 2016, has been characterised by political, regulatory and economic uncertainty and upheaval for firms, with much debate on how foreign corporations with subsidiaries in the UK will respond (Ebell and Warren, 2016; Dhingra et al., 2016). Brexit represents a potential threat to UK manufacturing sectors configured through global production networks that are significantly integrated into the EU Single Market, and where just-in-time production is critical (Bailey et al., 2017; Ijtsma et al., 2018; Bailey and Rajic, 2020). Of critical importance during the negotiation period were the considerable uncertainties regarding a future Brexit agreement (Bailey and De Propris 2017). A new tariff regime could have had a potential negative impact by producing frictions in the movements of goods and services, as well as costlier co-ordination, and thus detrimentally effecting the flexibility and efficiency of supply chains (Cumming and Zahra, 2016). Correspondingly, there is the potential for a decline in investment in manufacturing sectors as corporations move functions to EU countries in response to the uncertainties of the negotiation period and potential disruptions arising from a final agreement (Bailey and de Propris, 2017; Henry, 2019; Li et al., 2019).

Uncertainty and upheaval have the potential to lead to UK-based foreign subsidiaries reacting through various strategic actions and restructuring as a means in which to mediate such issues (Author, 2021a, 2021b; European Movement International, 2017; Holweg, 2019; Li et al., 2019; SMMT, 2019). Yet, the evolutionary development and role of subsidiaries, and their corporate contexts, global production network (GPN) positions and regional coupling are heterogeneous (Dawley et al., 2019; Yeung, 2016; Fuller, 2021). Given the diverse nature of the corporation and the particularities of regions, corporate responses to shocks are likely to be disparate (Blažek, 2016). Subsidiaries also form part of evolving regional economic paths and the 'regional resilience' to shocks. They are imbricated with the impact of initial shocks, as well producing and forming part of the regional 'adjustments' to such shocks (Martin and Sunley, 2015). Understanding how subsidiaries produce mediation strategies in response to the uncertainties generated by Brexit is thus critical. An important aspect of this is the elucidation for why such forms of corporate action occur, requiring a focus on the intricate decision making of subsidiary managers as they mediate Brexit. Furthermore, understanding the role of managerial strategies in mediating an event such as Brexit is critical because such actions have considerable impacts on host regions.

This paper examines the mediation strategies of 20 foreign subsidiaries located in Wales and the West Midlands of England during the political negotiation for a Brexit trade agreement, from mid-2016 to the second deadline of the 31st October, 2019. Emphasis is placed on why these subsidiary Brexit strategies have developed in the ways they have, and the types of change enacted. The paper analyses subsidiaries in machinery (incorporating SIC code 26), automotive, electronics and aerospace manufacturing sectors (see Appendix One). Within these sectors there are considerable Brexit challenges, one of the most significant of which relates to just-in-time supply chains that cross into mainland Europe. There is the potential for tariff costs, as well as much longer-term trends around disinvestment and relocation of operations to lower cost countries within the EU (Hendry et al., 2019; Holweg, 2019; Roscoe et al., 2020; SMMT, 2019; Author, 2021a).

Emphasis is placed on the spatially-configured decision-making agency of individual subsidiary managers, leading to the adoption of a 'dynamic managerial capabilities' perspective that is concerned with the role of 'human capital', 'managerial social capital' and 'managerial cognition' (Helfat and Martin, 2015). This is supported by consideration of the different roles and corporate and regional contexts of subsidiaries (MacKinnon, 2011). In conclusion, the paper finds that Brexit mediation strategies within the two areas and across all sectors, are predominantly focused on 'adaptation', seeking stasis and stability through worstcase no-deal planning, and preserving existing supply chains. However, Welsh subsidiaries that are far more reliant on competitiveness through low cost production, are relatively more limited in terms of mediation strategies when compared with subsidiaries in the West Midlands. The paper proceeds by, firstly, examining the literature on regional resilience and arguing for greater analysis of the intricate decision-making of actors. This is followed by an analysis of why particular decisions are taken by subsidiary managers as they enact change, and the importance of different corporate subsidiary roles. This provides the conceptual framework in which to analysis the 20 case study subsidiaries.

REGIONAL RESILIENCE, DYNAMIC MANAGERIAL CAPABILITIES AND SUBSIDIARY ROLES

Regional resilience, shocks and agency

Recent Evolutionary Economic Geography (EEG) accounts examine the impacts and responses to economic shocks within the context of regional 'resilience'. They emphasise how shocks and resilience should be understood in terms of the on-going ability of regions to enact new growth paths, with firm actors critical in such processes (Boschma, 2015). Here, there is an important issue around the relationship between 'adaptation' within growth paths, and 'adaptability' as the ability to develop new growth paths (Pike et al., 2009; Martin, 2012). Adaptability is critical in the longer term adaptive capacity of regions to develop new growth paths, but adaptation remains important as a means of 'absorbing' and mitigating shocks in the short term through previously deployed and existing strategies and actions (Pike et al., 2009). Given the increasing emphasis within EEG accounts for examining the capabilities and actions of actors, analysing the early comprehension and genesis of action by actors as they experience and respond to shocks is important (Fromhold-Eisebith, 2015).

For Bristow and Healy (2014), agency arises as the capacity to enact conscious thinking on potential actions and future scenarios, and develop and undertake plans and actions that seek to mediate shocks and uncertainties. Agents can undertake a number of cognitive actions, such as anticipating, predicting, responding and transforming (Bristow and Healy, 2014). There is scope to take this further by examining causal influences on these cognitive actions. Central to this is the understanding that experience, perception and judgement of uncertainties is very much a subjective process, meaning that the examination of how actors interpret uncertainties is critical.

In relation to the corporation, strategy-making is far less rationalistic than assumed in the past and does not follow a logical route (Morgan and Kristensen, 2006). A key aspect of this is how actors interpret reality and produce decisions based on their cognitive construction of reality, but where their experiences from the past and contemporary spatially configured social relations have a role to play in such processes (Weick et al., 2005; Balogun et al., 2011). What this requires, therefore, is greater sensitivity to the cognitive, experiential and social factors influencing their perception of uncertainties and subsequent decision-making (Sharma et al., 2020). Following Bristow and Healy (2014) and MacKinnon et al. (2019), these processes are spatially configured within and through regions in which corporations are coupled. Subsidiaries also work through global production networks and 'organisational spaces' encompassing network relations stretching beyond the regions in which corporations are situated (Yeung, 2016; Faulconbridge, 2005). During periods of turbulence, maintaining supply chains and addressing uncertainties within host regions and broader institutional environments therefore becomes critical, demonstrating the importance of examining agency decision-making and their efforts at risk management (Golgeci et al., 2020; Hendry et al., 2019).

While accounts of resilience and broader evolutionary thinking increasingly seeks to elucidate the role of agency, a critical aspect of this is to explicate the (spatial) heterogeneity of the (unbounded) firm agency and how this impacts on responses to shocks, moving beyond a simple concern with decision-making to elucidate those complex spatial organisational processes that influence human actors and decisions. Most notably, the corporation is a highly convoluted heterogeneous organisational entity, working through various subsidiaries, with blurred boundaries, and configured by way of disparate socio-spatial relations (Edwards and Belanger, 2009; Faulconbridge, 2010). As the corporation is a heterogeneous relational entity, a range of processes constitute efforts at addressing uncertainties, such as through adjustments to costs and the enactment of new capabilities, and which make corporate strategies and actions convoluted (Fuller and Phelps, 2018). An aspect of this is greater explication of how the mediation of shocks are shaped by processes, actors and relations beyond the region, including the role of foreign HQs, and the broader corporate contexts and global production networks that subsidiaries work through (and as argued by Martin and Sunley, 2015). In this sense, there is a need to engage MacKinnon's (2011) argument's that it is critical to examine the different roles, capabilities and levels of autonomy of subsidiaries, and their corresponding relations with host regions (see, also Author, 2021c).

To summarise, understanding the mediation of uncertainties arising from shocks, and which forms part of the resilience of regions, requires an examination of the intricate decision-making of actors, whilst also analysing the organisational and spatial complexities of subsidiary roles and corporate arrangements. For this, we turn to the 'dynamic managerial capabilities' approach and the subsidiary typology of Cantwell and Mudambi (2005).

Agency and Dynamic Managerial Capabilities

Within evolutionary thinking more broadly, the ability of actors to undertake change is framed in terms of 'dynamic capabilities' (DC). This approach argues that constantly changing market and technological conditions require firms to periodically 'recombine and to reconfigure assets and organizational structures' so as to maintain 'evolutionary fitness' (Teece, 2007: 1335). Recent approaches have sought to advance such thinking by focusing on actors and their role in creating and mediating dynamic capabilities (Adner and Helfat, 2003). The response has been the conceptualisation of 'dynamic managerial capabilities' (DMC), encompassing the role and capabilities of managers in these processes. Adner and Helfat (2003) define these as 'the capabilities with which managers build, integrate, and reconfigure organizational resources and competences' (1012), as well as that of the external environment (see Harris and Helfat, 2013). Such an approach has proven to be important in explaining why managers make different decisions through three main processes in response to changing contextual conditions (Helfat and Martin, 2015).

Perception, thinking and decision-making underpin ‘managerial cognition’, which is influenced by spatially-configured social, cultural, political and institutional conditions (Helfat and Martin, 2015). An important task for actors is sensemaking of the perennial complexities and uncertainties of everyday life (Weick et al., 2005). Firm managers construct and are influenced by ‘cognitive frames’ that attempt to make *sense* of the uncertainties and upheaval generated in a constantly changing world (Hodgkinson and Healey, 2008). During periods of upheaval, actors revert to ‘schema-driven’ actions where specific perceptions, categories and schemes are applied that give meaning and form (Weick et al., 2005). This is accompanied by the devising of strategic plans through *seizing*, with these sensing and seizing processes constituting the actions of managers as they *reconfigure* capabilities (Helfat and Peteraf, 2014).

For Nadkarni and Barr (2008), the nature and depth of change within firms is influenced by the ‘causal logics’ of managers, which is a cognitive and subjective construction of causal links between environment and a perceived firm strategy, and which is configured through ‘cognitive frames’ (see also Hodgkinson and Healey, 2008). The latter is defined as filters that “admit certain bits of information into the strategizing process while excluding others”, producing subjective interpretations that drive strategic change (Porac and Thomas, 2002: 178). These cognitive frames are not understood to be rational, but are rather selective and biased interpretations and framing of considerable uncertainties, which form the basis of action through seizing and reconfiguring (Nadkarni and Barr, 2008). Such an approach therefore provides a conceptual framework for examining how subsidiary managers' construct particular cognitive frames that produce and constitute decisions seeking to mediate uncertainties.

Cognitive frames are interwoven with the 'human capital' constituting and producing actors. This includes the knowledge and skills of actors that are developed through previous experiences. These influence the cognitive framing undertaken by actors, and are important in positively impacting on strategic change (Helfat and Martin, 2015). This adheres to process thinking with its understanding of the interrelationship between the past, present and future in constituting the actions of actors (Weick et al., 2005). Utilising a dynamic capabilities approach, Wang et al. (2005) argue that the 'experience knowledge' accumulated by subsidiary management was critical in subsidiaries successfully adapting to the 1997 Asia economic crisis. In such episodes of uncertainty and upheaval, actors use experience knowledge to interpret uncertainties, seize responses and reconfigure organisations to take action (Helfat and Peteraf, 2014).

Finally, social networks are important in regional resilience and responses to shocks and uncertainties (Grillitsch and Asheim, 2018). This includes various non-firm actors that are critical in influencing the agency of firms through social networks (Trippl et al., 2020). Importantly, social networks generate stronger forms of adaptive capacity, such as through knowledge networks. This takes place through and within unbounded regional spaces, including by way of global production networks and intra-corporate networks (Bristow and Healy, 2014; Coe and Yeung, 2015; Kakderi and Tasopoulou, 2017). However, for Gong and Hassink (2017), social networks and capital have not been significantly examined in regional resilience accounts. Yet, deliberative relationship between foreign subsidiaries, embedded within multi-spatial corporations, and the regions in which they are located, are important.

Within DMC thinking, 'social capital' is important in influencing the decision-making of agents and generating change. Social capital refers to formal and informal networks and relations with other actors within and beyond the firm (Adner and Helfat, 2003). This has been broadly interpreted within economic geography and GPN studies by way of 'coupling' (Yeung, 2016). Corporations work through disparate forms of embeddedness with the supply chains, state actors and institutions in host regions, resulting in various forms of 'coupling' (Coe and Yeung, 2015). Correspondingly, regional and subregional state actors place great emphasis on developing relations with corporations, supporting them through various means, and assisting in mediating changing market conditions (Dawley et al., 2019). Critical in such processes of coupling are the dynamic deliberative relations between corporations and regional actors, since coupling is not a 'permanent arrangement' (Coe and Yeung, 2015: 174). It is here that the nature of the social capital characterising social relations has an important influence, not least because examining social capital alludes to potential frictions and ruptures between subsidiaries that are seeking to respond to the uncertainties and upheavals of Brexit, and regional actors seeking to ensure the continuing presence of corporations and GPNs within the region.

To summarise, as with the arguments of Bristow and Healy (2014) and others (e.g. Martin and Sunley, 2015), the DMC perspective places actors as a key agent of change. However, there is need to further examine how the actions of subsidiaries are influenced by different corporate roles and HQ-subsidiary relations, and the varying degrees of 'coupling' with regions (Cantwell and Mudambi, 2005; MacKinnon, 2011).

The heterogeneity of the corporation

Accounts within organisational analysis have demonstrated the importance of understanding the heterogeneity of the corporation, with subsidiaries undertaking various roles in different regions (Morgan and Kristensen, 2006; Fuller, 2021). Cantwell and Mudambi's (2005) influential capabilities approach emphasises the importance of two broad types of subsidiary role, which should not be considered absolute positions but as tendencies that are evident in subsidiaries. Through such an approach it is possible to situate the actions of subsidiary managers, by way of DMCs, within the context of intricate corporate processes of divergent subsidiary roles, and differing degrees of 'coupling' with regions (Phelps and Fuller, 2016).

Subsidiaries with access to extensive resources, capabilities, and production relations with regional actors and assets that generate high value creation, are described as 'competence creating' (Cantwell and Mudambi, 2005). Such subsidiaries are engaged in research and design-related production activities, and are typically first tier suppliers within global production networks. Competence creating subsidiaries are those suppliers, or units of lead firms, where in the case of the former they have lower costs than lead firms and strong propriety capabilities, and the ability to mobilise the 'dynamic capabilities' that create innovation and production changes (Coe and Yeung, 2015). This inevitably leads to stronger forms of regional coupling, where subsidiaries require extensive relations with regional suppliers, state actors and institutions (MacKinnon, 2011; Coe and Yeung, 2015). In terms of extra-regional corporate relations, they also possess degrees of strategic and operational autonomy from the corporate HQ. This is due to their access to capabilities and resources, which leads to HQ's encouraging and allowing greater subsidiary autonomy for innovation (Cantwell and Mudambi, 2005).

In contrast, 'competence exploiting' subsidiaries are engaged in more routine tasks (e.g. assembly), often serving particular markets, and typically lacking substantial resources, capabilities and autonomy from the HQ (Cantwell and Mudambi, 2005). They are far more restricted in terms of their influence in global production networks, often possessing advantages stemming from low cost production, and conforming to second and third tier supplier types. They are typically situated within corporate positions where they lack autonomy, are subject to strong forms of extra-regional corporate 'integration' and control (leading to less scope for innovation), and are 'acquiescent' to HQ commands (Mudambi, 2011). This generates weaker forms of coupling with host regions, with relations often based on low cost production (MacKinnon, 2011; Coe and Yeung, 2015).

Rather than assuming that such subsidiaries and regions are condemned to their roles and supply chain positions, accounts within the organisational analysis and the global value chains literature demonstrate the importance of managerial subsidiary entrepreneurship as they respond and adapt to supply chain dynamics, and changing economic and institutional conditions (Balogun et al., 2011; Ponte and Sturgeon, 2014). As such, for both types of subsidiary there is a need to further explicate why and how they respond to economic shocks and uncertainties in particular ways.

To summarise, through a conceptualisation of the DMCs of 'cognitive frames', 'experience knowledge' and 'social capital' it is possible to examine why and how subsidiary managers respond to uncertainties, and which comes to influence broader forms of regional resilience and path changes. This approach is utilised with a framework examining the importance of different subsidiary roles and capabilities, and the regions in which subsidiaries operate.

RESEARCH METHODOLOGY

The analysis focuses on Wales and the West Midlands of England, both of which have high levels of manufacturing employment and regional output relative to UK averages (see Table 1). Many studies have highlighted how new customs arrangements in a Brexit agreement could substantially impact manufacturing sectors in these areas (see Chen et al., 2018; Holweg, 2019; SMMT, 2019; Lie et al., 2019; Author, 2021a). These are areas that have also traditionally hosted many foreign corporations, and where these are integrated with local suppliers and global production networks (Dimitropoulou et al., 2013; Bailey and Rajic, 2020). Furthermore, they are experiencing economic performance that is below the UK average, which suggests they would be more negatively impacted than wealthier regions during a turbulent exit period (see Table 1).

[TABLE 1]

Semi-structured interviews with senior managers tasked with Brexit planning at foreign owned subsidiaries is the main methodological approach. A database of foreign subsidiaries was produced through FAME, and then email and postal requests were sent to named contacts, with four rounds of send-outs between January and October, 2019. The Cantwell and Mudambi

(2005) typology of competence creating and exploiting subsidiaries was utilised in the selection of the case studies, with the sample frame designed to have a majority of competence exploiting subsidiaries because of the nature of these regional economies (see Table 1 and Appendix One). This involved the operationalisation of various dimensions of the typology in the selection process, including whether there is research related or assembly production, home-base augmenting or exploiting production arrangements, and the degree of hierarchical control (Cantwell and Mudambi, 2005). A further selection factor was to ensure that all case studies operate in the UK and EU markets.

Due to difficulties in gaining access to corporations, and the considerable upheaval taking place within subsidiaries as they address Brexit, it was only possible to undertake one interview at each subsidiary. One pilot interview was undertaken with the Chief Financial Officer of a foreign owned metal recycling subsidiary in the West Midlands. A total of 20 face to face senior subsidiary manager interviews were conducted, and these were recorded and analysed through NVIVO. Due to the considerable corporate sensitivities around the impact of Brexit, all case studies are anonymised. Interview questions centre on examining, firstly, the nature of subsidiary roles and relations with the HQ by utilising the competence exploiting/creating typology. Secondly, the impact of the upheaval and uncertainties generated by the Brexit vote is explored. Thirdly, there is examination of the role of the DMC concepts of 'cognitive framing' (e.g. Nadkarni and Barr, 2008), 'experiential knowledge' (e.g. Wang et al., 2005) and 'social networks' in Brexit mediation measures. During the interviews, it was critical to prevent interviewee bias through post-rationalisation, and requiring the interviewer to interrogate interviewee responses.

Finally, certain interview questions examined the role of 'managerial social networks' with host regional public sector organisations in Brexit mediation strategies. Interview questions explored the differences between economic development implemented nationally by the Welsh Government, and in the West Midlands where economic development is the responsibility of the West Midlands Growth Company (which works to the West Midlands Combined Authority city-region) and subregional Local Enterprise Partnerships (LEP). The latter are partnerships between firms, local authorities and other organisations. Interviews were conducted with officials at the Welsh Government (totalling 3), the West Midlands Growth Company (totalling 1) and one interview at each LEP where the case study subsidiaries are located (i.e. Coventry and Warwickshire LEP; Black Country LEP; and Greater Birmingham and Solihull LEP).

BREXIT, FOREIGN SUBSIDIARIES AND PRODUCTION NETWORKS

Adjusting costs, capabilities and markets in contingency planning for Brexit

Addressing uncertainties: Preparing for an uncertain no-deal

Endemic to the vast majority of subsidiaries and sectors has been the need to risk manage the uncertainty arising from the Brexit vote, and the problematic negotiation of an eventual withdrawal agreement, at the same time as ensuring continuing subsidiary competitiveness and performance (Bailey et al., 2017; Li et al., 2019) (see Table 2). One considerable concern was the possibility of a 'no-deal', involving a trading relationship that adheres to WTO tariffs and customs frameworks, but where there were considerable uncertainties regarding the impacts (Bailey and Rajic, 2020). This affected the vast majority of subsidiaries across each case study area, totalling 17, and included both competence creating and exploiting subsidiaries (see Table

3). Rather than this being purely related to the endogenous conditions and processes characterising regions, uncertainties and the concern around a ‘no deal’ are imbricated with extra-regional conditions. Those subsidiaries most effected have spatial relations characterised by substantial parts or important elements of their supply chains running into and through mainland Europe (involving more than 50% of their suppliers), or are selling products in the EU market, and thus potential costs and risks are substantial (see Table 2). Such levels of dependence and extra-regional spatial relations have strongly influenced the cognitive framing of problems and solutions by subsidiary managers.

[TABLE TWO]

[TABLE THREE]

In the case of competence exploiting subsidiaries, the cognitive frames constructed by subsidiary managers were constituted through the belief that changes to costs arising from a no deal could easily outweigh the corporate importance of subsidiary capabilities and that of host regions, which are often less significant within a corporation than for competence creating subsidiaries (author’s interviews). This takes place in both case study areas, suggesting that cost-based subsidiary production capabilities remain critical to their long term viability, most notably in relation to low cost labour (Bell et al., 2018). Importantly, subsidiaries have mandates to produce particular components within much broader global production networks, but where these tasks are typically duplicated at sister subsidiaries in other regions, or where the functions can easily be moved to other intra-corporate units in mainland Europe (author’s interviews).

No deal planning involves balancing short term operational sustainability in relation to costs, with safeguarding the long term market viability of the subsidiary. While subsidiaries typically consider various Brexit agreement trading scenarios, they have all produced cognitive 'causal logics' (Nadkarni and Barr, 2008) relating to a 'worst case' no deal scenario when planning for Brexit (Table 4). Given the breadth of potential impacts in the manufacturing sector (see, for example, Bailey et al., 2017), this produces a cognitive frame where there is a belief that all possible 'perceived' outcomes are addressed. The intention is to convey confidence that all uncertainties and risks are managed, despite the considerable administrative costs and unknowns associated with developing new capabilities (e.g. logistics) (see Table 2). No deal planning is characterised by causal logics where it is framed as an indemnity to be written off in the event of it not occurring. The costs of such planning are out-weighed by the need to construct risk management that managers believe ensures the long term feasibility of operating in each case study area for certain parent companies. Such framing takes place at competence creating and exploiting subsidiaries in both areas (see Table 2 and 3), suggesting that costs have the potential to outweigh capabilities, even for those subsidiaries with advanced capabilities.

[TABLE FOUR]

The development of additional capabilities to mediate a potential no deal has been notable at subsidiaries where managerial causal logics and cognitive framing is intensely informed by corporate values and norms of strong risk management and low market exposure to uncertainties, and suggesting the importance of extra-regional corporate knowledge. The culmination of these broader spatial relations are major differences between Wales and the West Midlands. The development of capabilities is particularly notable at all four competence exploiting subsidiaries within broadly defined machinery sectors in the West Midlands. Here, there have long been competitive pressures around costs and threats to market share in the UK and EU. Subsidiaries rely on cost-reduction strategies in the region, rather than extensive capabilities for high value production and innovation, leading to cognitive framing on the importance of maintaining cost advantages, but where there is a belief that such aims are achievable. Thus adaptation responses to shocks within the region have been paramount, focusing on new capabilities in logistics, finance and compliance management, and contingency planning with suppliers around maintaining supplies and costs (see Table 2).

In all but one case, Brexit mediation strategies are being led by subsidiaries, indicating that subsidiary autonomy within the case study area is important, but that the cognitive frames are also partly derived from broader corporate values of strong risk management. This is a situation that differs with subsidiaries in Wales where there is far less autonomy for all competence exploiting subsidiaries, leading to a lack of impetus for these cognitive frames, irrespective of whether corporate risk management strategies are important. A lack of autonomy, embedded within extra-regional corporate relations, is therefore related to much greater 'vulnerability' to the Brexit shock and resulting uncertainties, and lack of 'robustness' through adaptation.

In relation to the West Midlands, one particular example is that of M8, a competence exploiting subsidiary operating in the agricultural machinery sector, employing c.400 workers, and serving the European market. Whilst traditionally a site of manufacturing, broader structural changes involving the transfer of manufacturing operations to lower cost sites in 2002-03, has left it possessing corporate support functions for the European, African and Middle Eastern markets. The Brexit strategy, which is led by the subsidiary, has focused on new organisational procedures for tariffs and customs, and moving the finance management team to Luxemburg.

The basis of this approach, and the legitimacy for managing the Brexit process, comes from the subsidiary management cognitively framing Brexit as a substantial and uncertain set of processes, which relies upon mediation based on their 'local' experience knowledge. However, this cognitive framing requires strong adherence to broader corporate values of strong risk management, characterised by widespread Pan-European deliberations between different teams, since European supply chains are managed from the site. Such cognitive framing is further used by the subsidiary management as a means of directing efforts to coordinate action. In this sense, Brexit is enveloped into a social construction of the world by senior managers, by way of cognitive framing, requiring particular forms of new action based on Pan-European cross-functional teams, and with participation involving between 50 and 100 staff members. The perceptions and framing of a post-Brexit world is one that is based on a 'fictitious' construct in a cognitive landscape where managers have no 'experience knowledge' of such an event (Wang et al., 2005). The fictitious construct is then framed as a discourse to be conveyed to the workforce in the case study area, so as to ensure organisational practices were configured to a no deal world and as a means in which to risk manage uncertainties at the subsidiary.

The sense of producing strong organisational direction and control through a focus on no deal cognitive framing should not be overstated, as a 'world' of extra-regional complexity and uncertainty disrupts efforts to control through discursive constructs (Boltanski, 2011). All subsidiaries have experienced recessions and economic downturns arising from events such as the 2008 financial crisis, but they lack 'experience knowledge' of potential customs delays and overall costs relating to a no deal. This suggests there are significant regional/extra-regional knowledge limitations for managing risks and enacting changes to costs and capabilities. Such issues come to constitute the extent of regional 'vulnerability', and impact on the mediating strategies that have been developed (Author, 2021b). The financial costs of Brexit contingency planning are amplified by the lack of knowledge on the final agreement, as the managing director of M2, an oil lubricant machinery manufacturer predominantly working in the automotive sector, argues: "you cannot make sufficient contingency for… to plan for every eventuality" (M2, author's interview).

This has resulted in the use of considerable resources in planning for the most commonly perceived threats at M2. Actions at M2 include the "modelling of what we think would be a worst case delay at customs, and then we kind of placed orders for that", but where the modelling is simply based on the physical space to store components, transport timings and an estimate of how long customs checks would take (M2, author's interview). A large volume of components are transported to M2 from mainland Europe each day, to produce around 500 different products, which are sold in the UK and EU markets. The level of contingency planning when dealing with such a breadth of products is therefore considerable and is impossible to fully undertake. In this sense, cognitive framing is strongly informed by experience knowledge of existing production costs and capabilities (including physical space), as managers seek to reduce uncertainties and the complexities of the world, but is not and cannot be informed by experiences of a comparable event that has never taken place before. There is however a strong divide between subsidiaries in Wales and the West Midlands. The latter's greater autonomy for enacting adaptation strategies, across both competence exploiting and creating subsidiaries, is accompanied by access to more extensive corporate resources for Brexit preparation (Table 2). In contrast, it is only the competence creating subsidiaries in Wales that are in such a position, with the consequence that cognitive frames and strategies are far less extensive at competence exploiting subsidiaries.

The role of regional state and quasi-state actors

Social networks and capital are important in managing uncertainties and turbulence during Brexit, but where this relates to extra-regional forms of support (see, for example, Hendry et al., 2019) (see Table 2). Subsidiaries in both regions utilised private consultants, operating throughout the UK, in areas such as law, regulations and logistics. This typically involved seeking advice and support for issues relating to specific legal and regulatory requirements for importing and exporting goods. Beyond this, sectoral forums have been in active dialogue with case study subsidiaries, including the Welsh Automotive Forum, the West Midlands section of the Automotive Council UK, and nationally through sector bodies such as the Society for Motor Manufacturers and Traders, and MakeUK. Extra-regional social networking through these organisations have provided support to subsidiaries, but was limited to the provision of general guidance on managing post-Brexit customs bureaucracy through particular events. In this sense, the social capital is by way of membership of these national organisations.

For all subsidiaries in Wales and the West Midlands there is a contrasting position where they have been utilising UK central government guidance on Brexit planning, but have received no major support from the Welsh Government, or economic development agencies in the West Midlands. This is not to suggest there has been no dialogue, but that during a period preparing for a no-deal exit there is very little short-term regional support that can be provided in terms of preserving cost levels, developing capabilities, maintaining market share or managing potential risks such as supply chain disruption. In Wales there is an established, regionalised account manager system providing regular links between corporations and the Welsh Government. The Welsh Government have undertaken targeted and bespoke support during the Brexit negotiation period, however, it has faced constraints in terms of the scope and scale of support, which is interwoven with the broader processes of devolution. Their Brexit support programmes have been constrained, first, by a lack of information from the UK central government on what was taking place with the negotiations and potential outcomes, making it difficult to advise firms. Correspondingly, it became a very ambiguous situation for firms in terms of whether the Welsh or UK Governments were the relevant body to contact when encountering issues. Such a situation was produced and compounded by UK Government departments not fully understanding the role of devolved administrations, meaning that the Welsh Government was not fully part of the dialogue around these issues and the production of guidance.

One such example of a lack of subnational state involvement is that of W3, an aerospace competence exploiting subsidiary that forms part of a large corporation with multiple divisional subsidiaries across the UK. The size of the corporation, and level of exposure to supply chain and trade disruption has meant that Brexit planning is largely HQ-led. A Pan-European corporate group of senior managers are managing the Brexit process, guided by priorities set by the overarching corporate HQ. On the one hand, the Group guides the operational Brexit mediation strategies of the subsidiary (e.g. deliberations with suppliers), with the subsidiary devising plans that are then signed-off. For W3, there is very little that the Welsh Government can presently do in relation to supporting the subsidiary as the main issues lie with national regulations and the supply chain. On the other hand, the corporate UK chief executive is regularly engaged in discussions with the UK government as the primary negotiating and regulatory body, with the "Welsh government kept in the loop with what we are doing, but they are not negotiating on behalf of the United Kingdom" (W3, author's interview). It is within this context, and at this point up to actual Brexit, that devolved state authorities such as the Welsh Government struggle to engage and support foreign subsidiaries. As argued by W8, a first tier machinery supplier: "I know they have a helpline and a website giving help. It's well intentioned, but they are struggling with a UK government that is completely incoherent, there is no plan. It's difficult for them to do anything that is really helpful" (W8, author's interview).

Relations between corporations and state/quasi-state economic development agencies in the West Midlands is disparate. Local Enterprise Partnerships (LEPs) do not operate a formal 'account manager' brokering system to link with corporations. Instead, they rely upon local authority account managers who are concerned with more generic issues (e.g. road infrastructure) and are small in number (c.4 managers per local authority). As they are focused on general matters, and have very limited business support expertise, they are not of significant benefit to corporations that have specific legal and regulatory issues requiring advice (LEP manager, author's interview). There is a broader sub-regional account management system run by the West Midlands Growth Company (WMGC), which is the overarching inward investment body for the sub-region, and is funded by local authorities and the West Midlands Combined Authority. Investor development at a small number of large strategic firms are the main aims of the WMGC, but where they only have eight account managers covering the subregion. WMGC also tends to be more focused on specific policy initiatives and public sector investments (e.g. new HS2 rail network), or supporting individual corporations where further investment is taking place.

Beyond this, there is a regionalised account manager system for large corporations run through the national system of the Department for International Trade (DIT) (nationally totally 2,000 firms). Foreign corporations within this strategically important network have been able to go straight to national account managers, with the partnership manager providing intermediary support to corporations by way of UK-wide services. LEPs, WMGC and local authorities have monthly meetings with the DIT partnership manager on issues being discussed with corporations in the sub-region, but these largely involve potential investment opportunities and only relate to a small number of strategically important corporations in the region. The culmination of this is a lack of regional state interaction with foreign owned subsidiaries.

Pursuing new markets and capabilities

The uncertainties during the Brexit negotiation period had the potential of negatively impacting on corporate investment into the UK, irrespective of investment life cycles (Bailey et al., 2017; Bailey and De Propris, 2017; Henry, 2019). Only three subsidiaries (M2, M4 and M5) are addressing Brexit by overtly investing and improving capabilities as a means in which to fulfil expanded and new roles, increase 'robustness' and 'recoverability', and provide potential new growth paths through future adaptability (see Table 2 and 3). These are all located in the West Midlands, all of which operate in the automotive sector, but include both competence creating (M2) and exploiting (M4 and M5) roles. A defining feature of these subsidiaries is the role of senior managers in cognitively framing the critical importance of possessing the autonomy, capabilities and powers in which to mediate Brexit, and which was used to lobby for such capabilities from the HQ.

Subsidiaries are subsequently leading the development of Brexit mediation strategies, indicating that autonomy and capabilities are critical to such restructuring. More broadly, they possess general operational autonomy, with HQs setting quarterly targets based on market data, but with subsidiaries having the devolved responsibility for pursuing market opportunities, meaning that such cognitive viewpoints and framing was already endemic within the corporations. The basis of this is the HQ view that market and capabilities development is the task of those operating within individual markets, GPNs and host regions, not by distant corporate HQs. Control and coordination by HQs is therefore limited to financial data, because "whether things are going right or wrong is ultimately evident in the financial reporting" (M4, author's interview).

On the one hand, this indicates the critical importance of the extra-regional spatial relations with HQs. On the other hand, the regional assets of the West Midlands support the development of subsidiary capabilities, and are imbricated with cognitive frames in ways that are not evident at subsidiaries in Wales. Most notably, for M2, M4 and M5 the West Midlands provides critical labour market capabilities, particularly that of engineering skilled labour, managerial capabilities, and proximity to supply chain partner firms (author's interview). In the case of M5, the corporation produces components for and installs conveyance systems for final assembly within car plants. Investment in the West Midlands and the development of the M5 arises from close proximity to suppliers and customers, and access to the labour force. For the subsidiary managing director, location within the West Midlands 'gives some advantage in relation to our customers, having an established setup here in the West Midlands', not least because of the investment going into new models at corporations such as Jaguar Land Rover, as well as those beyond the region (author's interview). This has led to substantial investment in new machinery and related engineering capabilities, but where such adaptation is interwoven with the broader cyclical investment life cycles of OEM firms.

Subsidiary managers also utilise 'experience knowledge' in their efforts to develop capabilities

(Table 4) (Wang et al., 2005). The most important instance of this is M4, a subsidiary primarily focusing on assembling a final product for the UK and Irish markets, in this case the chassis for heavy vehicles used in the public and private sectors, with the HQ in Germany. Situated within the eco-technology division and with a subsidiary turnover of £35 million per annum, M4 has incorporated additional responsibilities within their existing supply chain through progrowth cognitive framing of the subsidiary, but in a way where the aim is to ensure the corporate HQ can consistently see the overt benefits of such a process. This ambition has been welcomed by the corporate HQ, and is indicative of the benefits arising from Brexit where subsidiaries are able to use it for re-evaluating their commercial position and operations.

The longer-term value capture trajectory of the subsidiary is therefore critical, rather than treating responses to Brexit as a singular event in time (Coe and Yeung, 2015; Phelps and Fuller, 2016). When the subsidiary manager was brought into the firm in 2007, the unit was making losses of around £1m per year because of the costs associated with producing limited volumes for a national market, and with high labour costs. This led to him transferring manufacturing to lower cost Eastern Germany, with M4 focusing on marketing, sales, assembling of a final customised product, and after-care services, a set of tasks that were considered congruent with the regional capabilities of the West Midlands.

Having reversed the fortunes of the subsidiary by making it profitable, the parent company has developed confidence in the abilities of the subsidiary manager, meaning they were willing to let the subsidiary have responsibility for Brexit planning. M4 has subsequently developed a new initiative where a mainland European sister subsidiary will assemble the product and transfer it as a total unit to the UK, overcoming the potential tariff costs. For the subsidiary managing director, as creator and leader of the initiative, the rationale for this approach is one in which it is about having full control over the value creation process and increasing value capture. This is a psychological disposition embedded within his engineering experience and cognitive perspective: "My philosophy as an engineer is, just get it right first time, that's means controlling all the processes" (M4, author's interview). This approach stems from his extraregional experience knowledge in working in similar US plants where the lead producer controlled the whole process.

Mediating Brexit through production networks: maintaining existing supply chains

There are a range of subsidiary management efforts at maintaining the productivity, efficiencies and flexibilities of supply chains, largely within a context of highly uneven responses by supplier firms to regulatory changes (Bailey and De Propris, 2017). These measures are enveloped within the cognitive framing outlining above, and represent adaptation forms of change (Tables 3 and 4). Actions include developing new capabilities in logistics and compliance, such as contingency planning with suppliers and customers on issues relating to tariffs and customs (e.g. legal status of contracts such as in 'delivery and duty' terms), and expanding the workforce and capabilities in logistics, compliance and finance (e.g. software systems). There has also been risk management contingency planning with UK and mainland European suppliers to ensure there is no substantial disruption to supply chains, and typically involving formal contract negotiations. Such planning is widespread at competence exploiting Welsh subsidiaries, but not the case with equivalent subsidiaries in the West Midlands. This demonstrates, first, the far greater dependence on EU-based suppliers for Welsh subsidiaries within the context of subsidiary competitive advantages based on cost reduction. Second, and related to the above, there is relative lack of capabilities for maintaining supply chains compared with subsidiaries in the West Midlands, with such issues being at the forefront of subsidiary manager's thinking and actions (See Table 2).

Actions have also involved moving beyond simple formal no-deal contingency planning with suppliers, to working through and developing stronger social relations as a means of managing risks, and maintaining cost levels and access to supplier capabilities. Importantly, spatial social relations stretch to suppliers across the UK and mainland Europe, rather than being clustered within Wales or the West Midlands. A large majority of Welsh competence exploiting subsidiaries, and all West Midlands competence creating subsidiaries are engaged in this process, with the latter relating to developing further capacities as a means of staying competitive (see Table 2). Of critical importance in this process is the ability to work through formal and informal social networks with suppliers, typically arising because of long term relations with these suppliers, as well as strong interconnections between them and other parent company subsidiaries in various GPNs. This has produced far closer working relations with a reduced number of core suppliers so they are ready for a possible no deal scenario, and that they are confident in the case study subsidiaries and future contracts.

The importance of social networks arises because, firstly, there is significant vulnerability to cost increases arising from a potential no deal or unfavourable trade agreement, and which is prevalent for Welsh subsidiaries but far less the case in the West Midlands (author's interview). Secondly, subsidiary managers have sought to improve the efficiency of production networks in a way that projects forward by locking a limited number of socially proximate key suppliers into longer term relations. This demonstrates the importance of extra-regional spatial relations for firm constituting and influencing the resilience of the case study areas. The intention here is to utilise close social relations to stabilise existing spatially configured production networks and reduce potential cost increases. The aim of the latter is to also support further efficiency drives if extra costs (e.g. tariffs) potentially need to be internalised rather than passed on to customers, which will effect market competitiveness. Thirdly, maintaining strong supplier social relations is driven partly by the substantial costs associated with introducing new suppliers, meaning that preserving relations with present suppliers has been at the forefront of mediation strategies. Such framing and actions represent efforts at the continuation of a status quo, and perceived stability during a period of significant institutional and regulatory upheaval and uncertainties.

Social networks are mechanisms in which to deliberate with key suppliers beyond simple market contracts and transactions, but this is not to suggest that informality and trust overwhelm market forces during economic and regulatory upheaval. What it does represent more broadly is the endemic 'multipolar' power relations now common within GPNs, and situated beyond regions, which has significant impacts on the role and importance of social networks in Brexit mediation strategies (Ponte and Sturgeon, 2014). Limits to social networks include instances where certain suppliers have declined to give quotes for new contracts, or limiting supplies under existing contracts for subsidiaries until there was greater clarity regarding the Brexit trading agreement. Such issues have been particularly evident at competence exploiting subsidiaries in both areas but is far more prevalent in Wales. The latter is important in relation to low value added components or large orders, and with the actual size of the subsidiary and broader corporation not translating into 'power over' suppliers.

One particular example is that of W4, a competence exploiting subsidiary with responsibility for manufacturing cables for the UK and Irish markets. The subsidiary manager notes that while the corporation is the "biggest [anonymised] manufacturer in the world" with a UK subsidiary turnover of £550 million a year, market power, 'duty of care' (as embedded within supplier legal contracts), commercial interests and goodwill towards them are not enough to ensure continuing supplies from all suppliers leading up to the Brexit deadlines (W4, author's interview). As the managing director argues: "some suppliers have basically refused to deliver in the Brexit date… Britain is not the centre of the world, they have a huge number of countries within the European Union and outside the European Union to take care of" (W4, author's interview). The response of W4 has been to increasingly source from sister subsidiaries within the corporation, both within and beyond mainland Europe, and to use extra-regional logistics consultants to draw-in capabilities. The former does represent greater costs than using external suppliers, but this is outweighed by the benefits of ensuring continuing supplies and manufacturing during the period of uncertainty leading up to the March and October 2019 deadlines.

The major impetus for these actions largely came from the extra-regional experiential knowledge and social networks of the UK managing and finance directors. They have both spent a great deal of time working at sister subsidiaries in Europe (with the managing director being from Italy), and accumulating knowledge on their capabilities. This is combined with having developed strong social networks with relevant subsidiary managers at these sister subsidiaries, some of which lie beyond the immediate corporate division. In relation to the use of logistics specialists, the perception of the uncertainties of the final agreement drove this strategy, along with the recognition that the subsidiary was not organisationally competent in this area.

CONCLUSION

Building upon recent arguments for focusing on the role of actors in regional resilience, this study utilises Dynamic Managerial Capabilities (DMC) and subsidiary competences approaches to examine foreign subsidiary responses. There are limitations to such a qualitative study that is based on a small sample size of subsidiaries and managers. Generalising results are therefore problematic given the unique corporate and global production networks in which subsidiaries are situated, but it does present results on what are intricate and idiosyncratic processes and actors (Coe and Yeung, 2021). Most notably, the paper finds that Brexit mediation strategies were generally focused on seeking stasis and stability across different manufacturing sectors and types of subsidiary in Wales and the West Midlands. They form part of regional 'adaptation' responses within existing growth paths rather than dramatic changes through 'adaptability' (see Table 2). In policy terms, this suggests the need for subnational state bodies to focus on short term assistance for reducing uncertainties, rather than being concerned with promoting innovation and change in response to episodes of substantial uncertainty and upheaval.

A broad range of strategies have been adopted by subsidiaries, but where the DMCs of 'cognitive framing', 'experiential knowledge', and 'social capital' with suppliers are all of notable importance in producing subsidiary responses. These DMCs have underpinned four main Brexit mediation responses. Firstly, subsidiaries were preparing for a no-deal, with this produced through cognitive framing that seeks to reduce levels of uncertainty by managing worst case scenario risks. This is a significant trend across both case study areas and all manufacturing sectors, demonstrating that uncertainties generate risk management to ensure stability and maintain cost levels. Nonetheless, subsidiaries in Wales are far more based on low cost production, with corresponding limited forms of corporate autonomy and capabilities. The scope of their responses to the shock of Brexit have therefore been far less comprehensive. This suggests insufficient development of the capabilities for contributing to the regional robustness in which to address future shocks or enact new growth paths (Table 2).

The broader implications for regional policy are such that agencies need to facilitate stability through knowledge transfer from central government, where regulatory and institutional decisions are being made, to regional governance actors and firms. As argued by scholars such as Dawley et al. (2019), policy actions require multi-scalar institutional working and actions, suggesting the need for joint working between regional and nation states, as well as close relations between regional authorities and subsidiaries. Such actions have the potential of reducing levels of policy and regulatory uncertainty for actors within regional economies. At the same time there is a need for regional policies to support the longer term development of capabilities that assist low cost production subsidiaries in managing uncertainties and adapting to changing circumstances (Martin and Sunley, 2015). Such policies can include financial aid permitting subsidiaries to invest in new capabilities that mitigate uncertainties, such as capabilities in logistics and compliance management.

Secondly, only a small number of subsidiaries, located in the West Midlands and on upward value capture trajectories, are pursuing new markets and capabilities. Here, subsidiary autonomy is combined with cognitive framing around the need for subsidiary control, and the experiential knowledge of subsidiary managers. The broader implications are for these subsidiaries to promote greater regional 'resistance', 'robustness' and 'recoverability', and potential new growth paths in the West Midlands (Table 2). Promoting more advanced forms of adaptation requires regional bodies to support subsidiaries in acquiring greater decision making autonomy in the medium to long term, which provides the basis for action during economic shocks. Building upon international business studies accounts of subsidiary entrepreneurship in acquiring greater autonomy, policies should support the development of regional capabilities that can be employed by subsidiaries in developing 'distinctive' capabilities, which can be utilised in negotiations with HQs to procure greater autonomy and intra-corporate competition for investment (Cantwell and Mudambi, 2005; Fuller, 2020). This contributes to regional 'robustness' by facilitating revenue generation rather than cost cutting responses to crisis, and includes workforce upgrading programmes, facilitating collaborations, and public-private investment in new technologies (MacKinnon, 2010; Martin and Sunley, 2015; Phelps and Fuller, 2016).

Finally, a number of Welsh competence exploiting and West Midlands competence creating subsidiaries are seeking to maintain existing production networks, with the former attempting to develop capabilities in this area. Social networks with suppliers are critical for managing risks, maintaining costs, and accessing suppliers. Nonetheless, there are vulnerabilities within these social networks arising from the uncertainties of Brexit, with suppliers imposing harsher requirements on certain subsidiaries. For regional policy makers, this indicates the need for interventions geared towards supporting subsidiaries in developing stronger forms of social capital with existing and potential new suppliers. Boschma (2015) argues that this relates to the critical importance of spatially proximate regional 'knowledge networks' between firms, which can support technological collaboration and knowledge transfer in the development of subsidiary capabilities. However, there is a critical need to ensure that 'lock-in', which hinders 'robustness' and path changes, does not develop through closed networks. For regional organisations, it is a case of ensuring such networks are open and tied into alternative actors through 'bridging strategies' (Crespo et al. (2013), benefitting subsidiaries in terms of links with new suppliers and collaborators.

To conclude, future research examining the regional responses to shocks should take greater account of the motivation and genesis of the decision-making of actors. A DMC approach emphasises the importance of multi-faceted human actors, whilst focusing on why particular decisions are taken by complex and idiosyncratic actors, situated within organisationally and spatially complex corporate and global production arrangements. However, there are limitations with the approach taken in the paper that arises from this overt focus on the agency of corporate subsidiaries and with an emphasis on contemporary actions. There is less concern with the historically constituted geographical political economies influencing and setting the conditions and contingencies in which subsidiaries operate (Dawley et al, 2019). Such processes involve greater consideration of the particular conjunctures of structural processes, actors and the spatial relations in which actions are taken (Pike, 2005). Therefore, advancing a DMC approach requires utilisation with a geographical appreciation of how actors are co-constituted with the porous and unbounded regional economies in which they are situated and the broader (spatially-configured) political economies of capitalism (Werner, 2016).

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Table 1: Case study area attributes

Indicator	Wales	West Midlands	UK average
Population (2017)	3,125,165	5,860,706	66,040,229
GVA (2017)	£62,190m	£133,128m	1,819,754m
Annual GVA total growth (1998-2017)	3.1%	3.7%	3.6%
GVA per hear (2017)	£19,899	£22,713	£27,555
Annual growth in GVA per head (1998-2017)	2.7%	2.6%	3.0%
Manufacturing as a % of total employment (2017)	11.1%	12.2%	8.8%
Manufacturing as a % of regional output (2017)	14.5%	18.0%	10.2%

Source: Office for National Statistics (2017) *Regional economic activity by gross value added (balanced), UK: 1998 to 2017*. Newport: ONS.

Table 2: Summary of main results

Case study	Challenges for subsidiaries	Actions by subsidiaries	Potential regional resilience outcomes
West Midlands Competence exploiting	Negative consequences of a 'no-deal' scenario • Cost, efficiency and flexibility issues relating to working through EU supply chains and markets • Costs could outweigh importance of subsidiary capabilities • Functions could be transferred to sister subsidiaries • Subsidiary managers lack 'experience knowledge'	Cognitive frames to manage a worst case scenario 'no deal' Adaptation measures only given limited capabilities • New logistics, finance and compliance management capabilities (e.g. IT systems, new managers) • contingency planning with suppliers	Adaptation measures: • further increasing regional resilience for reducing the impact of shocks ('resistance') • maintain existing growth paths • do not significantly contribute to potential new growth paths
Competence creating	Negative consequences of a 'no-deal' scenario • Cost, efficiency and flexibility issues relating to working through EU supply chains and markets • Costs could outweigh importance of subsidiary capabilities • Subsidiary managers lack 'experience knowledge' Pursuing new markets and capabilities Maintaining existing supply chains	Cognitive frames to manage a worst case scenario 'no deal' Adaptation measures undertaken: • New logistics, finance and compliance management capabilities (e.g. IT systems, new managers) • contingency planning with suppliers Mediation of Brexit shock through adaptability actions pursuit of investment for new roles and capabilities • investment in new machinery and related engineering capabilities (M2, M5) • Restructuring of production (M4) New capabilities in logistics and compliance • contingency planning with suppliers and customers • expanding the workforce and capabilities in logistics, compliance and finance	Adaptability actions contribute to the resilience of regions by: • reducing the negative impacts of shocks • increasing 'robustness' and 'recoverability' • providing potential new growth paths
Wales Competence exploiting	Negative consequences of a 'no-deal' scenario • Limited subsidiary autonomy in mediating Brexit • Cost, efficiency and flexibility issues relating to working through EU supply chains and markets • Costs could outweigh importance of subsidiary capabilities	Limited cognitive frames to manage a worst case scenario 'no deal' • Restricted autonomy to develop adaptation capabilities • Limited access to corporate resources New capabilities in logistics and compliance	Lack of 'robustness' through adaptation measures, potentially negatively effecting: • existing growth paths • the antecedents of new path changes

	• Functions could be transferred to sister subsidiaries Maintaining existing supply chains	• contingency planning with suppliers and customers • expanding the workforce and capabilities in logistics, compliance and finance	
Competence creating	Negative consequences of a 'no-deal' scenario • Cost, efficiency and flexibility issues relating to working through EU supply chains and markets • Costs could outweigh importance of subsidiary capabilities • Subsidiary managers lack 'experience knowledge'	Cognitive frames to manage a worst case scenario 'no deal' Adaptation measures only given limited capabilities • New logistics, finance and compliance management capabilities (e.g. IT systems, new managers) • contingency planning with suppliers	Adaptation measures: • further increasing regional resilience for reducing the impact of shocks ('resistance') • maintain existing growth paths • do not significantly contribute to potential new growth paths

Source: Author's survey.

Table 3: Subsidiary roles and Brexit mediation strategies

	Wales		West Midlands		
Primary focus of the Brexit mediation strategy	**Competence exploiting (n=7)**	**Competence creating (n=3)**	**Competence exploiting (n=7)**	**Competence creating (n=3)**	**Total**
No-deal planning - Capacity building for logistics, finance and compliance	7	2	5	3	17
The role of regional state and quasi-state actors	0	0	0	0	0
Pursuing new markets and capabilities	0	0	2	1	3
Maintaining existing supply chains	5	1	2	3	11

Source: Author's survey.

Table 4: Dynamic managerial capabilities and Brexit mediation strategies

Primary focus of the Brexit mediation strategy	*Dominant Dynamic Managerial Capacities*		
	Cognitive frames	**Experiential knowledge**	**Social networks**
No-deal planning - Capacity building for logistics, finance and compliance	17	0	0
The role of regional state and quasi-state actors	0	0	0
Pursuing new markets and capabilities	3	3	0
Maintaining existing supply chains	0	0	11

Source: Author's survey.

Appendix A: Case study subsidiary attributes

Subsidiary	Subsidiary role	Sector	Supply chain position	Turnover (£ millions, 2019)	Employees (2019)
West Midlands					
M1	Exploiting	Machinery	2nd tier	448.8 (UK)	130
M2	Creating	Machinery/Automotive	1st tier	25.0	90
M3	Creating	Machinery	OEM	41.0	161
M4	Exploiting	Automotive	OEM	25.3	44
M5	Exploiting	Automotive	1st tier	33.3	129
M6	Exploiting	Electronics	2nd tier	545.0	500
M7	Exploiting	Automotive	2nd tier	2.0	20
M8	Exploiting	Machinery	2nd tier	405	410
M9	Exploiting	Automotive	1st tier	11.6	81
M10	Creating	Machinery	1st tier	27.9	161
Wales					
W1	Exploiting	Automotive	1st tier	10.8	112
W2	Exploiting	Automotive	2nd tier	5.71	21
W3	Exploiting	Aerospace	1st tier	615.0 (UK)	1400
W4	Exploiting	Electronics	1st tier	428.0	1028
W5	Exploiting	Automotive	2nd tier	5.99	55
W6	Creating	Machinery	OEM	10.0	29
W7	Exploiting	Electronics	OEM	3.7	20
W8	Creating	Machinery	1st tier	17.7	141
W9	Exploiting	Machinery	1st tier	106.0	209
W10	Creating	Machinery	1st tier	6.2	47