International Business is still Regional Business

THE INFLUENCE OF SUB-NATIONAL INSTITUTIONS ON THE LOCATION CHOICES OF MULTINATIONAL ENTERPRISES IN THE EUROPEAN UNION

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1. Introduction

'Brussels sets pace for global corporate tax floor' was part of a newspaper headline from an article published by The Financial Times at the end of 2022 (McDougall, 2022). The article detailed a directive approved by the Council of the European Union to put in place legislation that would lead to the implementation of a fifteen percent minimum corporate income tax by the end of 2023. It is planned to specifically target multinational enterprises [MNEs] who have their headquarters located in the European Union [EU] member states, and which have annual revenues of more than 750 million euros (European Commission, 2021a). This proposed legislation is part of a bigger effort made by the Organisation for Economic Co-operation and Development [OECD], together with the G20, to implement reform of international corporate tax systems in order to curb tax avoidance practices by multinational enterprises (United Nations Conference on Trade and Development [UNCTAD], 2022). This also involves improving the coherence and transparency of international tax environments, and make these systems altogether more fair for participating countries. At the base of this problem lay externalities associated with the digitalization of international trade and investment flows which has given multinationals the ability to use tax-havens to their advantage, allowing them to disconnect their profits form real economic activities and shift earnings to locations that offer the lowest corporate taxing schemes (Scott, 2023). The OECD's plan, called Base Erosion and Profit Shifting, outlines a two pillar approach trough which they hope to counter these practices of multinationals (OECD, 2021). Wherein the first pillar involves this partial re-allocation of taxing rights to the countries where value is created, while the second pillar revolves around the implementation of a global corporate taxation on the profits of 'bigger' multinational enterprise. Moreover, these plans are also associated with stopping countries' 'race to the bottom' (UNCTAD, 2022). Which is a socio-economic term, frequently used to critique globalization and mobile investments (Mosley, & Uno, 2007), putting forward the idea that countries and sub-national jurisdictions (like states, provinces, and cities) increasingly lower their labour standards, environmental standards, and taxes rates in order to attract or retain foreign direct investments [FDIs] that flow from MNEs (Olney, 2013). Ultimately this competition then progressively damages national or regional labour and business environments more and more, as locations seek to outcompete each other and become the most attractive location to subsidiaries and headquarters of foreign firms (Oatley, 2018). Somewhat recent examples of this are, the Dutch governments' bid to retain the HQ of Shell in the Amsterdam by lowering the country's dividend withholding tax (The Economist, 2018). As well as the competition among US cities and states to provide as favourable local conditions and invectives to be able to house Amazon's second national HQ (Bose, & Randall, 2017). In contrast, these steps made by the EU and OECD then form a unique effort that aims to provide legation which works against this competition through deregulation, to instead create a 'race to the top'. Which involves building competitive and more resilient legislations to deal with globalization issues, cut red tape, and reduce compliance costs (European Commission, 2021b).

What this development in essence shows the interplay between institutions and their effects in determining the location of multinationals' foreign activity. Which involves using the former to influence the latter. This interplay of institutions and multinationals on a broader level has become a central issue in the studies of International Business and Economic Geography (Peng, Sun, Pinkham, & Chen, 2009; Beugelsdijk, & Mudambi, 2013; Bailey, 2018; Mondolo, 2019). Which is to say that on the back of developments in economic (North, 1990) and sociological literature (Hodgson, 2006), the institutional lens has become an alternative perspective that is used to explain multinationals' location patterns throughout the world (Meyer, & Nguyen, 2005; Dunning, & Lundan, 2008a; Holmes, Miller, Hitt, & Salmador, 2013). Adding to the more 'traditional' literature wherein scholars focused on explaining these location patterns through factors like infrastructure, human capital, agglomeration economies, or market potential (Dunning, & Lundan, 2008b; Nielsen, Asmussen, & Weatherall, 2017). This additive perspective has essentially started to develop in the wake of North's (1990) seminal

work on institutional economics. Following which, research on MNEs and their FDIs began to build a bigger body of work seeking to understand the influence of institutions (Bénassy-Quéré, Coupet, & Mayer, 2007; Ali, Fiess, & MacDonald, 2010). Importantly, within this analytical lens institutions are conceptualized as a framework of humanly devised constraints and social rules that influence and structure human interaction in the arenas of politics, markets, and social situations (North, 1994; Hodgson, 2006). Accordingly, this interpretation shows how institutions are involved in virtually every instance of social interaction (Scott, 1995), with the proposed international corporate tax being a very specific instance of how institutions can be constructed to particularly try to influence international business. Moreover though, institutions are also made up of two distinctly different parts, namely formal and informal institutions (Helmke, & Levitsky, 2006). Wherein the former type involves legal rules, covering for example laws, regulations, or constitutions; as opposed the latter type which involves socially shared rules that are usually unwritten, of which examples include social norms, values, and traditions (Rodríguez-Pose, 2013). Literature has since developed a more comprehensive understand of how both forms have positive as well as negative effects on multinational location choices and subsequent performance of foreign owned subsidiaries (Chan, Makino, & Isobe, 2010; Fuentelsaz, Garrido, & Maicas, 2020). Which is to say that factors like protection of intellectual assets, the efficiency of the judicial system, or competition policy have been studied, and found to have an attracting effect on foreign direct investments (Comi, Grasseni, & Resmini, 2019; Papageorgiadis, McDonald, Wang, & Konara, 2020; Mariotti, & Marzano, 2021). Whereas factors such as corruption, higher taxation, or stricter business regulations have been associated with deterring FDIs (Globerman, & Shapiro, 2003; Holmes et al., 2013). Therefore, as institutions develop in place-specific ways due to underlying cultures and previously developed institutions (Tabellini, 2010; Rodríguez-Pose, 2013). Institutional endowments, just like resource, human capital, or market endowments, may then be viewed as location-based advantages which MNEs will seek out in order to internalize them for specific functions and advantages (Dunning, & Lundan, 2008a). The existence and use of tax-havens exemplifies this location-type advantage, which is based on conscious efforts in taxation policy (Beugelsdijk, Hennart, Slangen, & Smeets, 2010). However, the majority of formal and informal institutions that exist in countries are not specifically geared towards attracting or deterring multinationals (Oatley, 2018). But still MNEs will have to abide by them and take them into account when conducting their business abroad (Holmes et al., 2013; Peres, Ameer, & Xu, 2018). Which is to say that there is a wide array of institutions, from national business laws to entrepreneurial codes of conduct, that will influences foreign firms location choices. Altogether though, the most important and well studies ones are rule of law, political stability, and democratic institutions, deemed attractors; as opposed to corruption, taxation, and cultural distance, deemed deterrents (Bailey, 2018).

Finally though, there remains one question left unanswered in relation to the literature between institutions and multinationals' location choices: why study this relationship at all? And by extension: why would governments devise legislation to specifically target MNEs and their FDIs? Though these issues are more related to the standalone research subject on the impacts of inward FDI. The main idea of both governments and researchers is that the presence of foreign subsidiaries, together with the capital investments they make, causes key positive externalities towards the locations and countries that house them (Iamsiraroj, 2016). These externalities include factors such as, considerable job creation and human capital developments due to subsidiaries being generally larger firm units that require specialized knowledge inputs (Navaretti, & Venables, 2004; Ascani, & Iammarion, 2018). But also the upgrading of related industries and input-suppliers through the process of knowledge spill-over along the subsidiaries' value chains, which relates to another MNE hallmark of being generally more productive and innovative in comparison to domestic firms (Crescenzi, Gagliardi, & Iammarino, 2015). Taken together this means that, through development and diffusion of new inputs and technologies throughout host economies' production systems, inward FDIs lead to economic growth (Iamsiraroj, 2016). It then subsequently stands to reason that it is key to develop a better understand of how institutions work towards attracting FDIs, as to provide governments and policymakers with insights that may be used to develop institutions in such

a way as to attract multinational activity. Which, following Iammarino, and McCann (2013), provides potential host countries and regions with a viable option to create overall economic growth, as well as upgrade national or regional innovation systems.

However, despite increased academic attention towards the subject, along with the potential for policymakers to impact innovation and growth via developing an attractive institutional environment. There are still stringent literary gaps when it comes to the interplay between institutions and multinationals. This mainly comes down to the level at which institutional factors are analysed, as well as the relative underdevelopment of informal institutional determinants when compared to that of formal ones. The existence of both gaps is respectively argued by Hutzschenreuter, Matt, and Kleindienst (2020), and Mondolo (2019), who point out that both are essential avenues for future research. Therefore, in answering their calls, current research is conducted with the aim of better understanding the influence of sub-national (regional) institutional conditions on the location choices of multinationals enterprises. While simultaneously paying special attention to a specific type of informal institution that has been proposed to influence the location choice of multinationals as well: social capital (Mondolo, 2019). Wherein specifically the conceptualization of Putnam, Leonardi, and Nanetti (1993) is used to make the argument that this social phenomenon influences subsidiaries location choices and subsequent performance through the factors of interpersonal trust and social network relations (Zhao, & Kim, 2011; Lu, Song, & Shan, 2018). In addition to this, to then fill these research gaps, the regional institutional context of the European Union is used for empirical analysis. Not only because it has traditionally been one of the main attractors of global FDIs (Villaverde, & Maza, 2015). But also because form a methodological point of view, data and previously proposed measure for both regional formal institutions and regional stocks of social capital, have already been identified within related fields of research (Rodríguez-Pose, 2020; Muringani, Fitjar, & Rodríguez-Pose, 2021). Moreover, the cross-regional approach in the context of the tightly integrated EU, also allows for highlighting the effects of regional institutional variety over that of national institutions. Because as Basile, Castellani, and Zanfei (2009) show, within the EU context it is predominantly regions that compete within and across member states' borders to attract multinationals. Which is due to the process of European integrating, causing multinationals consider the EU as an integrated area that provides them with the opportunity to choose between preferred sub-national location characteristics and institutions. Then, keeping both aim and context in mind, current research is conducted in order to formulate an answer to the question:

"To what extent do regional formal and informal institutions influence the sub-national location choices of multinational enterprises across regions of the European Union in the year 2013?"

In order to formulate and answer to this question, first previous literature on the subject is discussed in Chapter 2 in order to formulate empirically testable hypotheses. This involves first establishing what institutions are, what both types of institutions are, and how they interact with each other. As to then explain their main functions which are central in the process of building economic development. Thereafter, the role of 'good' quality formal institutions in attracting MNEs is discussed. While ending this chapter with explaining the role of informal institutions, therein paying special attention to explaining the roles of bridging and bonding social capital. Following this, Chapter 3 then deals with methodological considerations. Starting with a short discussion on what 'regions' and the sub-national context represent. What their relevance is, and how this relates to multinationals. Thereafter operationalization of core concepts happens, which then allows for the introduction and justification of dependent, independent, and control variables that will be used in the empirical analysis. Subsequently rounding up with detailing the used statistical estimation methods that will be used to test proposed hypotheses. Results of estimation models are then discussed in Chapter 4, allowing the verification of falsification of proposed hypotheses. While also interpreting results in light of current literary understanding. To then end the thesis in Chapter 5 with answering the main research question, while also reflecting back and discussing obtained results in order to provide policy implications and to point out fruitful avenues for future research.

1.1 Academic relevance

Though already shortly addressed in the introduction, the literary relevance of current study is threefold. To start, the research stream that studies the location determinants of multinational enterprises has reached a level of maturity, reflected for example in the comprehensive review of Nielsen et al. (2017), or the work of Villaverde, and Maza (2015) on regional location choices of multinationals. Using factors such as infrastructure, human capital, production costs, or market potential, these studies build on Dunning, and Lundan's (2008a) OLI-paradigm to explain multinational enterprises' location patterns. More specifically, this involves a sub-stream in the research fields of Economic Geography and Internal Business that pay special attention to locational advantages (L-type factors) that are used to explain these patterns (Iammarino, & McCann, 2013). Wherein the previously named place specific assets, that are potentially key to a firms competitive advantage, are used as location determinants. Though again, owning to developments in economic Institutional Theory (North, 1990; 1994) and sociology (Hodgson, 2006; Helmke, & Levitsky, 2006), the institutional perspective has garnered more attention over the past decades as an addition to explaining multinational location choices. Leading Dunning, and Lundan (2008b) to incorporate the institutional context of locations into their paradigm. Which then means that, in combining insights from the fields of Economic Geography, International Business, and Institutional Theory, results of current study will contribute to, according to Bailey (2018), a still developing body of research.

Additionally, relevance is also derived from the insights and recommendations found in the studies of Beugelsdijk, and Mudambi (2013), and Hutzschenreuter et al., (2020). Wherein it is pointed out that the current body of work has an underdeveloped understanding of the influence of sub-national location determining factors. Following the idea that countries' sub-national context represents a heterogeneous landscape of demographic, cultural, institutional, and economic differences that multinationals are sensitive to and include in their location decisions (Beugelsdijk, & Mudambi, 2013). Together with the fact that often more similarity exists between sub-national locations of different countries than between sub-national locations of the same country (Castellani, Giangaspero, & Zanfei, 2014). In literature this has led to acknowledgement that the sub-national level, or regional level, is key to developing a better understanding of the location choices of multinational enterprises (Chan et al., 2010; Castellani et al., 2014; Hutzschenreuter et al., 2020). Stating that location choices based on national averages, or the assumption of spatial homogeneity, is unrealistic. Because host countries which may appear 'unattractive', can harbour highly attractive locations within them. Similarly holding for formal and informal institutional conditions, which due to their place-specificness vary from region to region (Rodríguez-Pose, 2013; Muringani et al., 2021). Thus in following these insights, current research aims to contribute to understanding the role of sub-national institutions as MNE location determinants.

Finally, relevance is also found in statements made by Mondolo (2019) and Kapas (2020). Who both ascertain that research on the relationship between institutions and multinational location choices has paid considerably more attention towards formal institutional location determinants then to informal institutional determinants. Moreover, in studies where informal determinants are addressed, this is usually accomplished by highlighting the negative effects of cultural differences between host and home country. Finding that increased cultural distance between both locations has been shown to have a negative relationship with inward multinational activities (Bailey, 2018). However, in strictly following Institutional Theory, culture and cultural distance is a rather limited, or even an erroneous, interpretation of informal institutions. In that, in following Helmke, and Levitsky (2006), and Hodgson (2006), informal institutions are based on shared expectations while in contrast culture is based on shared values. Which means both are related but not the same. Though this underrepresentation mainly comes down to the illusiveness of capturing informal institutions in measurable units (Mondolo, 2019). Which means that often cultural measures, like the Hofstede index, are used (Kapas, 2020). Still, current research seeks to align more with the shared expectation aspect of informal institutions. By using a novel interpretation of informal institutions in the form of

Putnam's et al. (1993) concept of social capital. Which has, apart from Zhao, & Kim (2011), not seen use as an MNE determinant. Which is contrasts the better understanding of the concept in a related field of research (see among others Beugelsdijk, and Smulders (2009), Peiró-Palomino (2016), or Muringani et al. (2021)). Where social capital has been established as a positive influence on (regional) economic development. In following these results, current research thus seeks to identified more potential informal institutional location determinants through the inclusion of social capital, by employing Social Capital Theory (Putnam et al., 1993; Putnam, 2000) and Social Network Theory (Burt, 2000).

1.2 Societal relevance

As discussed, the presence of foreign subsidiaries in host economies has positive impacts with regards to increased innovativeness and overall economic development (Iamsiraroj, 2016). This is especially the chase when foreign subsidiaries pursue knowledge-intensive and innovative activities in these host economies (Javorcik, Lo Turco, & Maggioni, 2018). Again, these positive impacts range from increased demand of skilled labour which overtime upgrades human capital inputs, to upgrading of domestic firms competences that operate in related industries as well as those that within the value chains of foreign subsidiaries (Crescenzi, Pietrobelli, & Rabellotti, 2014; Crescenzi et al., 2015; Cortinovis, Crescenzi, and Van Oort, 2020). Subsequently, in light of this evidence, countries and regions across the globe have devised policy to actively attract and compete with each other in order to attract foreign investors (Narula, & Pineli, 2019). Research of Crescenzi, Catalod, and Giua (2021) in this respect has shown how Investment Promotion Agencies across the EU, at both regional and national level, have a significant influence of inward FDIs towards respective promoted locations. Though this already shows the relevance of constructing policy that directly impacts MNE location choices. These promotion agencies represent just one specific avenue of how formal institutions may be used to impact inward FDI flows. Whereas, current research is still salient on the attracting effect of regional formal institutions quality in a more general sense. Which subsequently implies that the relevance of doing research on this relationship will provide regional governments with direct evidence of how 'other' formal institutions may be used to attract FDIs as well. Along the same vain, as there is currently no research as to how regional informal institutions might effect subsidiaries location choices. Results obtained in this research provide an additional understanding of how informal institution may complement efforts already made regional governments to attract FDIs. Though direct changes in informal institutions are hard to achieve given the robustness and incrementally changing nature of these types of institutions (Reed, 1996). Still, given the fact that informal institutions underly and legitimise formal institutions (Hodgson, 2006). The potential influence they have on attracting or deterring FDIs needs to also be taken into account when constructing regional policy. Once more, in the context of the EU, better understanding of the influence of regional institutions is also important when connected to the EU's Cohesion Policy (European Commission, 2012; Crescenzi et al., 2021). As this policy aims to fund economic development in lagging EU regions by spreading and extending the benefits of economic integration, through means of financing different types of projects in areas like infrastructure, firm support, or human capital promotion. All of which are also regional determinants of FDIs (Villaverde, & Maza, 2015). In the same sense, current research is able to identify the importance of specific facets of regional institutional conditions which may be used to inform the EU Cohesion Policy, and thus create economic development through regional institutions by inward FDI attraction.

2. Theoretical framework

Using both Institutional Theory and Social Capital Theory, what follows is a theoretical framework that explains how multinational enterprises respond to a heterogenetic landscape of formal and informal institutions. This starts with an understanding of institutions through the works North (1990; 1994) and Hodgson (2006). To define what they are, what forms they take, and how they work towards (regional) economic development in a broad sense. Thereafter allowing for the main research topic to be addressed linking formal and informal institutions to the location decision of multinationals, and finally theorizing how a specific subset of informal institutions, social capital as introduced by Putnam et al. (1993), may influence the location choices of MNEs.

2.1 Institutions, regional economic development, and multinational enterprises
In order to link regional institutions with location decisions of multinational enterprises, this first requires defining and developing an understand of both concepts. The OECD defines a multinational enterprise as a type of firm that owns a significant amount of shares, typically 50% or more, and thus has controlling power over at least one or several companies operating in a foreign country (OECD, 2008). Additionally what distinguishes multinational enterprise from a domestic firm is their undertaking of foreign direct investments, with the aim of establishing and maintaining long-term interest in a foreign country (Navaretti, & Venables, 2006; OECD, 2008). These long-term interests are either secured through mergers and acquisitions [M&A], which involves owning at least 10% of foreign firms ordinary shares and thus garnering a significant influence in the management of foreign firms. Or they are secured through 'greenfield investments', which involves creating fully owned new firms or plants. In both cases cross-border capital investments are made to create, acquire, or expand foreign subsidiaries, as the MNE undertakes FDIs (Navaretti, & Venables, 2006). Moreover, while multinational enterprises have other defining characteristics, for example they are typically larger in size (in terms of employees and turnover), more productive compared to their domestic counterparts, and their production networks are fragmented internationally (Navaretti, & Venables, 2006). These FDIs, and their resulting subsidiaries, are central to determining the effects of institutions, as they ultimately reflect the strategic decisions that were made by multinationals on whether or not to invest in specific sub-national locations.

But unlike the definition of multinational enterprises, the concept of institutions does not allow for a concise and commonly agreed upon definition. Following North's (1990; 1994) foundational work on institutional economics, linking countries' economic development to the workings of institutions. In his view institutions are analogous to the 'rules of the game' in competitive sports, where written rules work together with implicit constraints to facilitate playing. Using this institutional economic lens, institutions can be defined as: *'the humanly devised constraints that shape human interaction'* (North, 1990, p. 3). Where through the limiting nature of institutions, a framework for human exchange and interaction is created that prescribes what individual agents or organisations (like firms or political parties), as 'players of the game', cannot do when trying to achieve their economic, political, or social goals. Moreover, according to North (1990; 1994) institutional systems are made up of three parts: formal constraints, informal constraints, and both their enforcement mechanisms. Formal constraints come in the form of universal, codified, and transferable rules. These formal 'rules' encompass constitutions, laws, or regulations, but also concepts like rule of law, property rights, contracting, and monitoring systems (North, 1990; Rodríguez-Pose, 2013). Thus as multinational firms cross borders to pursue new business opportunities, they are faced with different formal constraints. Reflected by for example host countries' business related laws which ultimately impose limits to MNEs' potential activities. Operating in conjunction with formal constraints are informal constraints, which encapsulate shared values, social norms, codes of conducts, and other non-written rules (North, 1990; 1994). Wherein, MNEs are faced with unique tacitly understood business cultures that too limit certain business activities in host countries. As for example MNE products and services need to conform to host country norms

and values. Finally, enforcement of both these constraints also form a key part to effectively working institutional systems. Which, according to North (1990; 1994), involves creating compliance of individuals and organisations to exchange and pursue goals within a set framework. This is done through effective monitoring mechanisms and punishment, where violators are faced with violation costs in the form of legal and/or social repercussions. Enforcement is key in modern-day economic markets as they are dominated by complicated and non-repeated impersonal exchanges (North, 1990). Which without costly monitoring, self-enforcement of agreements, or development of interpersonal trust, allows for opportunistic behaviour and thus suboptimal exchange outcomes (Fukuyama, 2000; Acemoglu, & Johnson, 2005). Effective enforcement thus seeks to nullify potential gains from political, economic, or social exchanges outside formal and informal constraints. Once more, for multinational firms this means violation of for example contrasts may result in financial punishment through legal persecution, whereas the breaking of tacit business codes may result in being ostracized from business collaborations by host country firms. All taken together, a country's specific institutional system provides a framework wherein multinationals have to abide by specific limitations as they decide whether or not to settle in the host country. It is a this point key to mention that implemented institutions and changes in institutional systems are by no means inherently economically efficient or societally desirable (North, 1990; Eggertsson, 2005). As political parties, dominating national and regional business, or other key actors with societal or economic bargaining power, keep in place or reconfigure institutions that are effective in meeting their own needs and aspirations. This means that the institutional structures they create and transform have to potential to be economically and socially unproductive. This is caused by incomplete information and erroneous subjective models of actors that do not lead to incremental institutional change towards efficient outcomes (North, 1990; 1994). As only in some cases do efficient institutions create efficient economies, which requires the objectives of those with bargaining power to align with what is economically and socially productive. This explains why in some contexts nations have prospered by putting effective institutions in place, while others have failed copying productive institutional structures (Dunning, & Lundan, 2008b).

North's (1990) definition of institutions is however not universally accepted, and a more recent view on what institutions are and how they work comes from Hodgson in which he defines them as: *'systems of established and embedded social rules that structure social interactions'* (Hodgson, 2006, p. 18). Similarly pointing to the structuring effect institutions create in political, economic, or social exchanges, yet not through 'constraints'. Instead stressing the importance of social rules which function as costumery normative injunctions, meaning they dictate actors to do Y in circumstance X, or not do Y in any circumstance. These rules are, like North's (1990) constraints, made up of both norms of behaviour and legal rules. Which only can be considered institutions as associated informal and formal rules become of habit to follow, and when they are either tacitly or explicitly known within society (Hodgson, 2006). Which ultimately is to say that all institutions are social rules, but not all rules are institutions. In the case of informal rules, they become embedded into society through the process of generational social transmission involving cultural heritage (Greif, 1994; Fu et al., 2004). Whereas formal rules become established through legitimisation by underlying informal rules (Hodgson, 2006). Allowing them to become routinized as they are reproduced and defused throughout societies, to then influence human behaviour (Powell, 1991; Tolbert, & Zucker, 1996). Though these formal and informal rules seem similar to North's (1990) formal constraints and informal constraints, a key difference is that social rules do not merely constrain. Instead social rules constrain and enable behaviours and exchanges, opening up new choices and actions (Hodgson, 2006). As for example the institution of language, and the system of rules that goes along with it, allows actors to communicate and collaborate. In a similar sense multinational firms may find new opportunities through a host countries' specific set of social rules systems, like tax-havens or lax enforcement of taxation laws, which ultimately influences their location decision.

In addition to understating the enabling aspect of institutions, North's (1990) idea of institutions also confines the definition of institutions to only legal rule systems,

overemphasising the role of legal rules in human exchange (Hodgson, 2006; Rodríguez-Pose, 2013). This stems from an unclear distinction between the 'formal' and 'informal' realms, where to North formal means legal yet informal in not specified to mean illegal or non-legal (Hodgson, 2006). Next to there being an unclear distinction between 'rules' and 'constraints' when connected to formal and informal. In that formal rules and constraints do exist to North but informal rules do not exist, thus suggesting that rules are a special kind of formal constraints. Taken together creates the idea that: *'If all rules are formal, and institutions are essentially rules, then all institutions are formal'* (Hodgson, 2006, p. 11), effectively excluding of informal rules form the category of institutions, and downplaying the power of these types of rules in moulding of human behaviour. Furthermore, this also overlooks the reliance of legal systems on informal rules, as not everything is stipulated in contracts, and they too function through non-written rules and norms (Fukuyama, 2000). This all comes back to the idea that mere codification is insufficient to make a formal rule affect social behaviour, because it might be socially acceptable to ignore it (Hodgson, 2006). Thus when analysing the location decision of MNEs it is key to incorporate both informal as well as formal rules to get a wholistic understanding of the influence of institutions. Moreover, using Hodgson's definition also allows theoretical support for a clear distinction between 'formal institutions' and 'informal institutions', which is connected to his distinction of 'established legal regulations' and 'embedded non-legal rules' (Mondolo, 2019). A differentiation which also comes from Helmke, and Levitsky (2006, p. 5), where formal institutions are *'created, communicated and enforced through channels that are widely accepted as official'*, as opposed to informal institutions which are *'socially shares rules, usually unwritten, that are created, communicated and enforced outside officially sanctioned channels'*. Importantly, they also state that informal institutions are not synonymous with culture, as informal institutions have a narrower scope and are defined in terms of shared expectation rather than shared values (Helmke, & Levitsky, 2006). In that, shared expectations among actors are not necessarily based on broader societal culture. Additionally, though they are defined differently, is not to say that formal and informal institutions are parallel sets of rules, instead they very much interact and mutually influence each other too (Chakraborty, Mukherjee, & Sarani, 2015).

Having an understanding of what institutions are. The next step is to understand how they work towards creating economic development, and by extension, how influence the location choices of multinational enterprises. In this respect literature is more congruent on the issue, as they attribute three key functions to institutions. To start, the already discussed incentive-disincentive framework institutions provide for individuals and organisations, have the potential to create economic growth (Oliver, 1997). As modern-day market exchanges still involve social interactions where actors with competing interests have to transact with each other (Granovetter, 1985). Both formal and informal institutions are central to defining what economic goals are legally and normatively allowed to be pursued (North, 1994). The resulting framework that exists, or as it changes, then directly effects what types of economic activities come into existence. Which when applied to firms means that their existence is based on the pursued of profitable activities provided by the institutional framework surrounding them (North, 1990). Thus in cases where institutions would be hallmarked by insecure property rights, poorly enforced laws, and unsupportive business cultures, then firms engaging in rent-seeking and opportunistic behaviour would come into existence. Applied to multinational firms, it then stands to reason that host countries' formal and informal institutional framework partly determine if subsidiaries come into existence.

In addition to this, another function of institutions is to reduce uncertainties which results in less transaction costs involved in economic exchanges creating more productive economies (North, 1990; Fukuyama, 2000). This relates to the ability of institutions to create consistent expectations of actions and behaviours for actors involved in economic exchanges (Hodgson, 2006). Something which is either accomplished through authoritative means, involving government backed enforcement of legal rules (Scott, 1995). Or through societal norms and sanctioning (North, 1990), added by creating consistency and coordination through fostering of interpersonal trust (Knack, & Keefer, 1997; Fukuyama, 2000). Taken together, less uncertainties translates into market exchanges where less recourses are tied up in resolving

concerns surrounding imperfect information, asymmetries in power relations, or negotiations and monitoring costs, as to then ultimately create more productive economic environments (North, 1990; Knack, & Keefer, 1997; Fukuyama, 2000). The study of Papageorgiadis et al. (2020) relates this function of institutions with multinationals, as host countries with effectively working intellectual property rights regimes, where formal and informal institutions surrounding intellectual property work together, ultimately reduce uncertainties surrounding expropriation of intellectual assets.

Lastly, institutions foster economic development through building adaptive capacity aiding in periods of shocks and greater economic or political changes (North, 1990; 1995). As actors and organizations learn to interacting within an institutional system they acquire the necessary knowledge and skill to economically succeed within it. Thus through learning by doing (multinational) firms develop routines and coordination skills which makes them competitive in a given institutional environment (Meyer, & Revilla Diez, 2015). Yet institutional environments are not static and they evolve based on social, economic, or political developments (North, 1990). In turn, formal institutions may be forced to change in the short-term to address new societal problems (DiMaggio, 1988). Whereas informal institutional change to fit changing cultural norms which happens incrementally over the long-term (Reed, 1996). Adaptive capacity is built when in the face of these changes or shocks, institutional systems evolve in such a way that they push actors and organisations to invest in future knowledge or skills to better fit future needs and thus become more competitive (North, 1990). Generally speaking the implementation of new regulations fostering the development of human capital, in combination with a culture favouring openminded problem-solving, creates for example an institutional environment where firms are incentivised to pursuing innovative activities. In doing so institutions help countries and regions to adjust and react to changes. Accordingly, the study of Völlers, Yavan, and Franz (2021) shows the case of Turkey, in which German multinational enterprises have been faced with a changing institutional environment and institutional risks. Where on the formal institutional level Turkey has been in political and economic turmoil. Subsequently forcing MNE managers to rely on the compensatory effect of informal institutions, in form of having to employ informal channels of contact to key political and economic actors. Which helps them to quickly adapted to formal institutional changes, and helps them to navigate the country's uncertainties to ultimately secure FDI investments.

Taking all these facets of institutions together, it can be recognized that institutions play an central role in creating economic development (Rodrik, Subramanian, & Trebbi, 2004). Which by extension means they also represent location-based advantages (L-type) which multinationals are able to use in their pursuit of economic goals, based on the idea that 'good' institutions provide a stable political and economic environment that supports market exchanges which is reliable, predicable, and protected (Dunning, & Lundan, 2008a; 2008b). Meaning locational institutional configurations represent potential increases or decreases to costs and subsequent profitability of multinationals foreign operations, which then ultimately influences their location decisions (Root, & Ahmed, 1978). This also recognizes the place-specificness of institutions, in that institutions not only shape their surrounding social, political, and economic environments, but are also shaped by that same environment (Tabellini, 2010). Meaning that as institutions evolve through time and space they become place-specific, sharing common features across territories but also developing place distinctive characteristics unique to every territory (Gertler, 1997; Rodríguez-Pose, 2013). This creates national or regional institutional path dependence, where institutional changes occurs in different places underlying different social, political, and economic developments which build upon the already established formal and informal institutions (North, 1990; Dunning, & Lundan, 2008a). Importantly, this makes sub-national units like regions a key unit of analysis when it comes to measuring institutional influences, as regions house distinctive institutional systems that provide the three aforementioned functions (Crescenzi et al., 2014). Affecting not only regional economic development trajectories (Rodríguez-Pose, 2013), but again by extension also location decisions of multinational enterprises (Hutzschenreuter et al., 2020).

2.2 Formal institutions and MNE location choices

Having addressed the broad relationship between regional institutions and multinational enterprises, now the central issue of this study can be addressed. Starting with the role formal institutions play in the attraction of multinational operations, one is presented with a topic that is well documented in current literature as exemplified by the literature reviews of Nielson et al. (2017) and Kapas (2020), or the meta-analysis of Bailey (2018). The relationship formal institutions have with the location choices of MNEs can be presented as a cost-factor. Strong formal institutions, and the discussed benefits they provide, translate into less costs of foreign operations; as opposed by poor formal institutions, which increase uncertainty, act like a tax to foreign operations (Globerman, & Shapiro, 2003; Buchanan, Le, & Rishi, 2012). This means formal institutional quality ultimately influence the location of foreign subsidaries (Ali et al., 2010). Studies covered in these reviews consistently show that development of 'good' formal institutions, which includes aspects like the protection of property rights (Khoury, & Peng, 2011), the quality of competition policies (Mariotti, & Marzano, 2021), or allowing for internalization of cost-saving types of production (Meyer, & Nguyen, 2005). All increase the profitability of foreign operations and attracts more inward FDIs to host countries. While 'bad' formal institutions result in the reverse, as factors like corruption (Globerman, & Shapiro, 2003), political instability (Asiedu, 2006) or the threat of government expropriations of investments (Henisz, 2000; Azzimonti, 2018) all create uncertainty and unpredictable environments which leads to more costs involved in monitoring and transacting. Thus deterring FDIs towards the affected host countries. This altogether means that formal institutions of a host economy are of particular importance to a multinational when it designs its foreign market entry strategies (Peng et al., 2009).

Looking a specific conceptualizations of formal institutions. The study of Holmes et al. (2013) breaks down countries' formal institutional environments into regulatory, political, and economic institutions, representing the established order of laws and governmental oversight within which businesses operate. Regulatory institutions represent governments' oversight on activities of domestic and foreign organizations, intended to reduce uncertainty and standardize practices (North, 1990). Political institutions involve rules and standards surrounding political processes and power division, through which formal institutional change is enacted, and which is key to creating stability and predictability of the evolving institutional environment (Powell, & DiMaggio 1991). Finally, economic institutions involve rules and standards that determine the availability and value of financial resources and support capital investments, represented by a countries monetary system (Lucas, 2003). Holmes et al. (2013) find that regulatory institutions which exercise greater control over multinationals' activities are negatively related to inwards FDIs. Underpinning the idea that MNEs typically value formal institutional arrangements that promote free trade, open markets, and business friendly environments instead of institutions which tightly control activities (Globerman, & Shapiro, 2003). Going on, Holmes et al. (2013) find that democratic political institutions actually negatively influence inward FDIs. Though autocratic power structures are theorized to be unattractive to MNEs as they represent uncertainty and produce rapid, unexpected, and major shifts in policy (Chan, & Makino, 2007). Given the finding, it is instead theorized that autocratic political institutions might allow for firms to leverage their investments with fewer constraints, transparency, and accountability, and democratic institutions may limit the ability of governments to provide special treatment for MNEs (Holmes et al., 2013). This resonates with North's (1990; 1994) idea that effective institutions are not inherently societally desirable, as in place-specific contexts where MNEs together with governments officials represent actors with bargaining power that keep in place or reconfigure institutions to meet their own goals. The final finding is that economic institutions that promote capital investments by domestic firms over that of MNEs are negatively related with inward FDIs (Holmes et al., 2013). Based on the idea that governments which use fiscal policies to provide capital to domestic firms often lack the funds to provide similar incentives to MNEs, as use of budget deficits and borrowing is not unlimited. Taken together, this establishes that 'good' formal institutions from the perspective of multinational enterprises revolves around locations with regulatory and economic institutions that promote foreign competition instead of a focus on the protection of

domestic firms (Holmes et al., 2013). Together with offering economic freedom and flexibility of resource deployment in order to gain access to local resources. Similarly Meyer, Estrin, Bhaumik, & Peng (2009) also conclude that when economic and political agents are in place that enforce legal rules, but also help as market intermediaries, and also work together with government related judicial and regulatory bodies. This results in transparent markets and lower costs of contract enforcement, giving MNEs better access to local resources, obtaining locational advantages and encouraging market entry. But if formal institutions fail to promote less costly market exchanges the burden of uncertainty reduction, prevention of opportunistic behaviour, and the allowing of MNEs to access location advantages falls on informal institutional systems instead (Peng et al., 2009).

This positive effect of strong formal institutions is also present in more recent studies, yet it is often dependent on other factors as well. Mariotti, and Marzano (2021) for example study countries' competition policies, a specific kind of formal institution. The role these policies play centres around ensuring effective market competition through removing market entry barriers, preventing abuse of dominant market powers, and blocking excessive market concentration. Which in the case of MNEs levels the playing field for foreign competition and secures their market entry. As subsidiaries are shielded from market dominating domestic incumbent as well as protected against discriminatory government intervention (Rugman, & Verbeke, 1998). Mariotti, and Marzano (2021) subsequently find that when MNEs perceive effective enforcement of competition policy has been introduced, FDIs towards these countries increase. Moreover, they show that the positive effect of well enforced competition policies on inward FDIs is amplified by other aspects of countries' formal institutional configuration, specifically in cases when countries are characterized by low societal trust. Here low trust requires compensation via other formal routes. Mainly through the presence of high quality regulatory institutional environments [RIE], representing all overarching government policies and rules, that allow for efficient contracting, facilitate market exchange, and allow for business development (Radaelli, & De Francesco, 2013). Thus again supporting the idea that formal institutions, conceptualized by both competition policy and supporting high-quality RIE, matter to the location decisions of multinational firms.

Though the study of Fuentelsaz et al. (2020) nuances the idea that strong formal institutions always result in multinationals entering a host country. As they found that on their own, countries with high quality formal institutions actually deter foreign market entry. Instead showing that when formal institutions are measured as a moderator on the negative relationship between cultural distance and likelihood of market entrance, only then do stronger formal institutions have a positive relation with MNE entry. Concluding that if cultural distance increases between host and home country then MNEs are faced with more liability of foreignness, which can be counterbalanced when strong formal institutions are in place. This liability involves difficulties on the side of MNEs to transfer key knowledge and routines towards subsidiaries, making them less productive (Zaheer, & Mosakowski, 1997; Chang, Chung, & Moon, 2013). Which is made even worse by high information costs when trying to identifying business opportunities because of unfamiliarity with social and business norms (Jiang, Holburn, & Beamish, 2014). This can be mediated by strong formal institutions which offer reliable intermediaries facilitating access to information and advice on market opportunities, serving to reduce information and negotiating costs as well as reduce opportunistic behaviour of customers or suppliers (Fuentelsaz et al., 2020). But the authors also suggest that the aversion to strong formal institutions can be industry specific. As MNEs within certain sectors may find it more attractive to enter countries with governments that have discretionary policy-making capabilities, in order to negotiate advantageous conditions that make entry more profitable (García-Canal, Guillén, 2008). The sector-specific preference multinationals have for stronger or weaker formal institutional is also presented in the study of Li, and Zhou (2017). Who provide evidence that in cases where MNEs, which own subsidiaries that operate in the manufacturing industry, are faced with strong pollutions regimes in home or other host countries. These firms will look to low-wage countries with lax environmental standards and poor environmental regulatory quality in order to 'off-shore' the polluting parts of their production process. They additionally provide evidence for the idea of institutional arbitrage, in

which less capable MNEs, technologically or otherwise, find it hard to confirm to costly and challenging environmental standards. Meaning they are more pressed to choose between formal institutional environments. Picking host countries with environmental legislation that is most cost-effective, while also acknowledging that this brings with it coordination costs and regulatory risks due to those same host countries lacking formal institutional environment. Similar evidence is found in the context of Europe by Ascani, Crescenzi, and Iammarino (2016), who study the location choices of European MNEs wanting to expand into new European Union [EU] member states and neighbouring EU states. They conceptualize formal institutions as host countries' economic institutions covering areas of labour and business regulations, legal aspects relevant to market transactions, and weight of government intervention in host countries' economies. Their findings generally suggest that high quality economic institutions are strongly associated with attracting greenfield FDIs. Yet they also find a heterogeneity of MNEs' location preferences based on the sector or function of potential subsidiaries. Stating that: *'It is plausible that some MNEs tend to prefer locations with weaker economic institutions because they aim at bypassing or eluding transparent market mechanisms when undertaking business operations abroad'* (Ascani et al., 2016, p. 412-413). Some MNEs for example seek out weaker economic institutions to exploit monopolistic market-position opportunities. Moreover, they for example also find that MNEs operating in knowledge intensive services prefer host countries with effective contract enforcement, as opposed to MNEs in less-knowledge intensive services which do not have such preferences. This studies then together show that strong formal institutions do not universally constitute 'good' formal institutions that positively influence the location choices of MNEs. Instead, sectoral preferences and specific FDIs goals, play an important role in the relationship between formal institutional environments and MNE location choices.

More nuance also comes from the research of Papageorgiadis et al. (2020) studying host countries' intellectual property right regimes. They too stress the importance of considering both formal and informal institutional underpinnings of these regimes, as this ultimately determines the costs and risk of using the legal system when trying to extract economic value out of intellectual assets. Based on Hodgson's (2006) idea that formal and informal institutions have to harmonize in order to achieve specified outcomes. The case is made that comprehensive and coherent legislative arrangements of property rights only translates into low transaction costs, compensation in case of theft, and lower risk of infringement, in cases where unwritten rules used by enforcement agents legitimize and support these formal legal rights (Papageorgiadis et al., 2020). Which is reflected in their findings, as countries with strong formal legal rights that underpin intellectual property right systems do not attract significantly higher levels of FDIs themselves. But only together with the positive moderating effect of informal enforcements mechanisms, do intellectual property right systems attract significantly more FDIs. Showing that though strong formal institutions, that protect MNEs competitiveness through restraining imitation of MNE products and technologies, are important in strategic considerations of multinationals. They are not the only determining factor when it comes the location choices of MNEs, something which is discussed later in addressing the role of informal institutions. In addition to this, Romero-Martínez, García-Muiña, Chidlow, and Larimo (2019) also provide evidence that institutions distance negatively influences location choices, but for perspective of formal institutional distance. In that liability of foreignness also exists in cases where MNEs from developed home countries are faced with high formal institutional risks, creating problems because of less developed or incomplete regulatory, political, or economic institutions (Meyers et al., 2009). Romero-Martínez et al. (2019) find that as formal institutional differences between home and host country rise, this negatively influences likelihood of settlement by MNEs. Reflecting the idea that unfamiliarity with foreign formal institutions arrangements, exemplified by a host country's distant regulatory contexts, incurs adaptation costs in order to make cross-country business process conform to local standards (Slangen, & van Tulder, 2009). Which causes problems of organizational conflicts and inefficiencies (Hitt, Li, & Xu, 2016), and thus deters locating in these 'distant' host countries.

Finally, taking a broad conceptualization of formal institution, based on the idea that MNEs have a wholistic view on institutional factors (Hamlin, & Stemplowska, 2012). Contractor, Dangol, Nuruzzaman, and Raghunath (2020) examine how multinationals consider all regulatory dimensions, and their specific influence during different stages of the subsidary life-cycle, when deciding whether or not to enter a host country. Therein showing how MNEs consider the role of formal institutions at the stages of: initial entry, subsequent operations and profit capture in the host country, and when exiting. They too find support for the idea that countries with better rule-of-law are more likely to be favoured by MNEs, while also finding that country with regulations which ease cross-border trade attract more FDI inflows. Meaning better contract enforcement and ease of trade are crucial factors for the location decisions of FDIs, as they directly impact profit capture and profit appropriation by multinationals (Contractor, et al., 2020). Additionally they provide evidence for the idea that MNEs are willing to make trade-offs along formal institutional dimension (Ostrom, 2010). In showing how for example MNEs are more willing to accept higher entry barriers in return for better contract enforcement in the operational stage, as this allows better profit capture from foreign subsidiaries. Therefore this study again stipulates the importance of strong formal institutions, be it at different stages of subsidiary life-cycle, to the attractiveness of host countries in the eyes of MNEs.

Thus altogether these more recent studies, though with nuance, still show that countries' formal institutional environments are poised to provide key functions that involve the reduction of uncertainties, incentivisation of foreign investments, and allowing of effective foreign competition. Where a combination of political, regulatory, and economic institutional environments directly or indirectly effect the strategic considerations of multinationals in search of markets, strategic resources, and other foreign benefits that can be capitalized upon. Making the quality of formal institutions an important determinant in MNEs' location choices, especially in developed countries (Peres et al., 2018). Similarly, moving to the regional scale, here too the importance of formal institution in attracting FDIs can be found. Where, in one of the few studies that looks at formal regional institutions, Comi et al. (2019) show how Italy's regional judiciary systems, and the degree to which laws are efficiently enforced, translates into different inward FDIs across municipalities. Their results showing that in municipalities where contract enforcements is poor, measured by how long trails take, significantly less foreign firms settle as opposed to municipalities which do exert efficient jurisdiction. Meaning the quality of the judicial and contractual environment that foreign firms operate in, involving contract enforcement (Grossman, & Helpman, 2005) and protection of intellectual property rights (Naghavi, Spies, & Toubal, 2015), determines how long resolvent of legal issues takes. Subsequently if efficiently is low, MNEs incur costs of not being able to proceed with operations, this results in unattractive regional settlement locations. Moreover, this attracting-effect of quality regulatory institutions on a regional level seems to also hold for economic institutions. Here Du, Lu, and Tao (2012) find that in general economic institutions across Chinese regions promote MNE entry along several avenues. In that, regional government intervention positively influences FDI inflow, suggesting that local bureaucrats extend help through maintaining a good business environment for MNEs which promotes entry. While also finding that good regional property rights protection also enhances MNE entry, something which is essential to MNEs pursuing innovation and competitiveness (Du et al., 2012). As opposed to higher degrees of regional governmental corruption, which is again strongly associated with MNE entry aversion. As corruption creates inefficiencies in markets as well as in resource allocation making MNEs incur additional costs for production and management (Wei, 2000).

Thus to sum up using Bailey's (2018) meta-analysis, political stability, rule of law, and democratic institutions all prove to have positive relationship with inward FDIs. This suggests that host countries with 'good' formal institutions do appear to be attractive settlement locations. Whereas corruption, tighter regulatory systems, and higher taxation rates have a strongly negative relationship with FDI attraction. Meaning 'bad' formal institutions deter to settle in affected host countries. Translated to the regional context of the EU, this results in the following hypothesis:

Hypothesis 1: The presence of higher quality formal institutions in a given region of the European Union has a positive association with the number of foreign subsidiaries in that given region.

2.3 Informal institutions, social capital, and MNE location choices

While not as well researched as the relationship between formal institutions and inward foreign direct investments (Mondolo, 2019). The effect informal institutions have on the location choices of multinationals is contingent on the idea that these institutions play an key role in coordinating economic activity via mechanisms of trust, reputation, and (business) network relations (Putnam et al., 1993; Knack, & Keefer, 1997; Putnam, 2000; Beugelsdijk, & Van Schaik, 2005a; Seyoum, 2011; Zhao, & Kim, 2011; Mondolo, 2019). High trust, or the willingness to make oneself vulnerable to another person's actions (Bohnet, 2010), helps establish mutual expectations of regular and honest behaviour (Knack, & Keefer, 1997). Consequently within market exchanges this reduces uncertainty and decreases the need for protection and external enforcement, lowering transaction and information costs, and leaving firms with more surplus from efficient exchanges (Fukuyama, 1995; Beugelsdijk, & Van Schaik, 2005b). Additionally trust enhances impersonal market exchanges, as business relations are not compromised by fraud or deceit but built upon a cooperative environment (Putnam et al., 1993; Seyoum, 2011). This critically helps firms with identification of investment opportunities and access to resource and knowledge inputs (Johanson, & Vahlne, 2009; Dearmon, & Grier, 2011). Next to this, reputation is an intangible firm asset that enhances contract enforcement and creates accountability, as business partners and suppliers abide by their contractual obligations wanting to safeguards future business interactions (List, 2006; Seyoum, 2011). Moreover, as no contract can possibly specify every continency that may arise during business relations, reputation and trust prevent parties form taking advantage of unforeseen loopholes; thus not only lowering the costs of contract enforcement, but also increasing firm flexibility as certain amount of good will is afforded by exchanging parties (Fukuyama, 2000).

Applying these ideas in the context of FDI flows, Seyoum (2011) finds that host countries with high quality informal institutions, measured as high levels of trust and reputation, are significantly more likely to attract FDIs. In fact to an even greater extent than the positive effect standalone of formal institutions. Thus stressing the importance of strong informal institutions in host countries, as they are integral to the development of trust-based cooperative business relations between domestic firms and MNEs. The importance of these business relations lies in curbing opportunism towards MNEs, and allowing access potentially operation-critical information and knowledge flows (Johanson, & Vahlne, 2009; Seyoum, 2011). As they then ultimately decrease costs of foreign operation while also providing opportunities for strategic-asset seeking MNEs to strengthen ownership advantages by entering into networks which provide new capabilities and knowledge flows only accessible for network insiders (Burt, 2000; Zhao, & Kim, 2011; Lu et al., 2018). Additionally, Méon, and Sekkat (2015) find that trust is a substitute for formal institutions when it comes to attracting FDIs. Because in cases where host countries are characterized by low quality formal institutions they find that high generalized trust has a positive relation with FDI inflows, and vice-versa. Supporting the idea that trust can solve problems of opportunism, and uncertainties as well as act as an incentive in a similar sense to the role of formal rules (Helmke, & Levitsky, 2006). But informal institutions can also be supportive of formal institutions, as apparent from the discussed study of Papageorgiadis et al. (2020). In that good quality formal legal rights only have a positive influence on the location choices of MNEs, in cases where unwritten rules support and legitimise them.

Final insight on the relationship between informal institutions and FDIs comes from the meta-analysis of Mondolo (2019), covering 22 studies dealing with the issue. Here, as there are different conceptualizations of informal institutions across incorporated studies, a broad differentiation is made between the informal factors of trust, social networks, corruption, informal labour markets, and culture. The results of the meta-analysis show that informal institutions matter in attracting inward FDIs, specifically the closely related factors of trust and social networks have a significant positive relationship with FDIs inflows. Her findings then not

only supports the previously discussed economic relevance of trust and related benefits of trust-based business environments to multinationals' operations. But she also introduces the relevance of social networks in this context. Wherein, when social ties, developed through repeated interaction (Inkpen, & Tsang, 2005), are open to participation of multinationals. This fosters inward FDIs by providing foreign investors with the opportunity to establish contacts in organisations with various backgrounds and professions (Zhao, & Kim, 2011). Together these functions of trust and social networks form essential part of another type of informal institutions (Bjørnskov, 2006), which is discussed next: social capital.

Defined by Putnam et al. (1993) as *'those features of social organizations, such as trust, norms and networks that can improve the efficiency of society by facilitating coordinated actions'* (p. 167). Social capital theory stipulates that social ties, developed through interpersonal and interorganizational relationships, represent resources that can be accessed or mobilized to meet certain goals (Coleman, 1990; Inkpen, & Tsang, 2005). Reflecting this, social capital is commonly regarded as a beneficial social feature that enhances economic performance of regions and countries through facilitating cooperative action based on trust and social ties, providing the previously discussed exchange supporting advantages of lower transaction costs (Putnam et al., 1993; Fukuyama, 1995; Rodríguez-Pose, 2013; Muringani et al., 2021). Moreover, social capital theory involves Social Network Theory which argues that through specific network configurations, with at either ends structural holes (Burt, 1992) and network closure (Coleman, 1990), individuals and organizations are provided with advantages related to knowledge and information flows as well as resource mobilisation (Burt, 2000; Zhao, & Kim, 2011). Where access is granted based upon the specific network position firms, individuals, or in this case multinationals hold within the greater networks of society and market exchanges. Extrapolating from Social Network Theory (Burt, 2000), this means that on the one hand MNEs are faced with dense social networks hallmarked by strong internal relations when they enter new markets and societies. Wherein these types of networks provide social capital through network closure, which is a result of sanctions that make it less risky for ingroup member to trust one another. Supporting ingroup exchange and information flows, as strong internal ties provide reliable communication channels and protect from outside exploitation by ousting violators of shared norms (Coleman, 1990). While on the other hand, MNEs are also faced with social networks hallmarked by more distance weaker ties within those same newly entered markets. These types of networks provide social capital through structural holes, where few ingroup members have outgroup relations connecting otherwise not interacting groups, providing them with information brokerage opportunities as well as being informed first. These bridging relationships bring with them access to nonredundant information sources that are additive to ingroup information flows, specifically giving actors with networks rich in structural holes a competitive advantage of knowing, having hand in, and controlling exposure to business opportunities (Burt, 1992; 2000). Though ultimately Burt (2000) provides empirical evidence that structural holes argument is associated with more performance enhancement than the closure argument. Taken together theories lend themselves well to putting forward the idea that the informal institution of social capital can have an influence on the location decisions of MNEs through providing specific advantage, but potentially also disadvantages, as they seek to interact within new regional markets and societies.

In strengthening this idea is the fact that, like Institutional Economics (North, 1990), Social Capital Theory, specifically its conceptualization in macro-sociological theory as introduced by studies of Putnam et al. (1993), Fukuyama (1995), and Putnam (2000), has also seen use as explaining (regional) economic development. Where social capital aggerated to an above individual level characteristic, affecting the wider society within which it is lodged, has been found to have a positive influence on economic growth at both national (Knack, & Keefer, 1997; Beugelsdijk, 2005b), as well as at regional levels (Muringani et al., 2021). While also being found to be a driver in developing regional innovation systems (Aragón, Iturrioz, Narvaiza, & Davide Parrilli, 2017). Still, in both cases to varying degrees of success due to remaining inconclusive results (Westlund, & Adam, 2010; Echebarria, & Barrutio, 2013). More important to the current research topic however. There is also evidence to suggest that this type of informal institutions, theorized as providing social resources through interpersonal trust

and associative activities, influences the location decision of multinationals at a national. This is show by Zhao, and Kim (2011), who conceptualize social capital in the form of trust and associative activities that together form nations' social capital endowment. That subsequently influence countries investment environments (Granovetter, 1985). This relates back to role of trust reducing uncertainties and making transactions more efficient, fostering cooperation and creating stable business environments (Putnam et al., 1993). While associative activity, seen as the tendency of people to be actively involved with organizations through membership (Knack, & Keefer, 1997), provides MNEs with contact opportunities to individuals and organizations of various backgrounds and professions. Forming bridges to alternative sources of timely market information that help in opportunity identification (Johanson, & Vahlne, 2009) and decrease liability of foreignness (Zhao, & Kim, 2011). As well as providing access to specific skills and other critical resources (Zajac & Westphal, 1996; Burt, 2000) Which is to say that social networks may be employed by MNEs, representing a locational asset. Their findings support the importance of social capital to MNEs, as high levels of social trust are positively related in to inward FDIs. While also providing support that associative activity has a positive influence on FDIs, though stronger when interacting with good quality regulatory institutions. This means that the presence of rich social capital in a country affords it both competitive and comparative advantages, that will attract foreign investments (Zhao, & Kim, 2011).

Additionally, Lu et al. (2018) finds that high levels of regional social trust are also associated with more productive foreign subsidiaries in the affected regions. Their explanation of how this works is of note, in that social trust acts like bridging social capital connecting foreign subsidiaries with local firms (Putnam et al., 1993). Stating that subsidiary performance is increased due to social trust lessening the effects of liability of outsidership. Which is a result of being able better to tap into local network relations which provides cooperation and information advantages (Johanson, & Vahlne, 2009). Something which is critical to foreign entrants as they typically do not occupy a position in local networks prior to their entry, yet being a thing that is needed to survive and prosper in foreign markets (Cantwell & Mudambi, 2011). Moreover as this hinges on the willingness of local firms to bridge the relationship with foreign entrants, accepting outsiders into their local networks and sharing local resources and opportunities. High social trust is needed as regional societies characterized by this are generally more accepting of outsiders (Lu et al., 2018). At this point referring back to Contractor, et al. (2020), in that MNEs wholistically consider all institutional factors during different stage of subsidiary life-cycles. The evidence from Lu et al. (2018), on how social trust and social capital influences subsidiary performance, suggest that these informal institutional factors are also incorporated into the location decisions of MNEs. Supporting the idea that a positive relationship between high regional stocks of social capital and likelihood of MNE entry exists.

But there is also literature that acknowledges that social capital can have detrimental effects (Olson, 1982; Coleman, 1990; Burt, 2000). This involves too much network closure creating conformity bias and lock-in, where homogeneous and tightly knitted communities are hostile to outsiders, while being less exposed to new information. From this perspective it means that strong social networks create insider-outsider problems, together with nepotistic practices which block economic exchange and progress (Crescenzi, & Gagliardi, 2015). Olson (1982) refers to this as 'distributional coalitions'. Which create benefits for members, but impose disproportionate costs on the wider society by hinder economic growth and engaging in rent-seeking activities, while also fighting over the distribution of economic output. Exemplified by lobbies, interest groups and other groups and organizations which impose costs to society as a whole (Knack, & Keefer, 1997). This means that as social capital then embodies both positive and negative effects on economic exchanges, literature proposes a distinction between bonding and bridging social capital (Putnam et al., 1993; Putnam 2000; Van Oorschot, Arts, & Gelisson, 2006; Beugelsdijk, and Smulders, 2009; Cortinovis, Xiao, & Boschma, 2017; Claridge, 2018; Muringani et al., 2021). Here bonding social capital refers to dense social networks characterized by strong network closing ties between homogenic members involved in similar knowledge and information flows. Which helps resource mobilization and provides access to tested knowledge, but only to the benefit of those belonging to such close groups

(Coleman, 1990). As opposed to bridging social capital, which is characterized by social networks that are key to providing new information, containing structural holes and weaker ties that connect across heterogenic communities and groups (Burt, 2000). Coming back to the studies of Zhao, and Kim (2011) and Lu et al. (2018), this line of thinking suggest that: bridging social capital provides MNEs with the opportunity to engage in relationships with individuals and firms that provide nonredundant knowledge flows and help mobilise firm critical resources. Which all plays into MNEs getting access to strategic assets, and granting them competitive advantages. Thus representing a positive influence on the location choices of MNEs. As opposed to bonding social capital. Which inhibits MNE access to localized knowledge, representing a barrier to entry, and thus a negative influence on the locations choices of MNEs. Resulting in the following hypotheses:

Hypothesis 2a: The presence of higher stocks of bridging social capital in a given region of the European Union has a positive association with the number of foreign subsidiaries in that region.

Hypothesis 2b: Whereas, the presence of higher stocks of bonding social capital in a given region of the European Union has a negative association with the number of foreign subsidiaries in that region.

2.4 Conceptual model
Based on the theoretical framework and resulting hypotheses the following conceptual model was developed. Highlighting the expected location determining effects on foreign subsidiaries of both formal and informal regional institutions. Not that, in comparison with other studies like Seyoum (2011), Papageorgiadis (2020), or Mariotti, and Marzano (2021), the interaction effects between formal and informal institutions are not studied. As this would widen to scope of the study too much. Therefore the following model is constructed:

Figure 1. Conceptual model derived from literature and proposed hypotheses
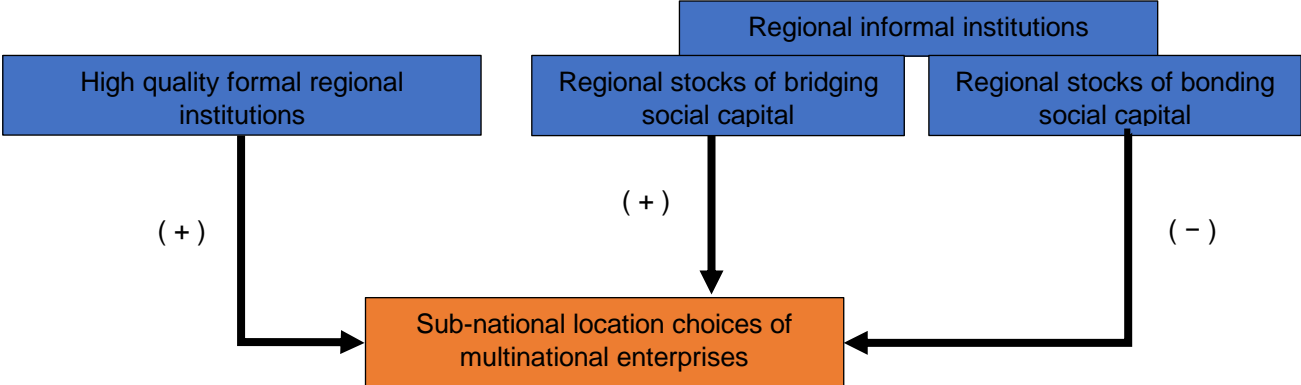
3. Methodology and data

Having discussed literature that suggest there is a positive relationship between regional formal institutions and location choices of multinationals, as well as opposing influences when it comes to bonding and bridging social capital. Addressed in this section is the research design that will be used to analyse and make specific statements about the proposed relationships between regional institutions and MNE sub-national location choices. This centres around putting forward a regional grouping scheme, the operationalisation of core concepts, introduction of used variables and used methods, and then finally present the constructed models used to test hypotheses. Again, all in order to measure to what extent regional formal and informal institutions influence the sub-national location choices of multinational organisations across European regions.

3.1 The sub-national context and institutions
Following the idea that countries' sub-national context represents a landscape of demographic, cultural, institutional, and economic differences that multinationals are sensitive to, and actively include in their location decisions (Beugelsdijk, & Mudambi, 2013; Hutzschenreuter et al., 2020). Where within-country institutional variation is created by the implementation of regional policies and through place-specific interpretations of national-level rules, as well as through place-specific differences in normative or cognitive aspects that underly regional formal institutional configurations (Meyer, & Nguyen, 2005; Chan et al., 2010; Rodríguez-Pose, 2013). This results in specific sub-national institutional environments that seem to affect both the regional location decisions of multinationals, exemplified by the findings of Comi et al. (2019). As well as subsequent performance of foreign subsidiaries located in different regions, exemplified by findings of Li, and Sun (2017). Then in order to measure the extent to which sub-national formal institutions and social capital effect multinational sub-national location patterns, the choice is made to analyse Europe's sub-national institutional environment by collecting regional data on European Union [EU] member states. With the idea of constructing a sub-national space where MNEs are faced with different levels of formal institutional quality as well as changing stocks of social bonding and bridging capital. As to then use the resulting regional location patterns of foreign subsidiaries to measure the influence of regional institutions.

   Justifying the choice of using the EU context is partly based on findings of Basile et al. (2009). Showing that the European Union represents a specific context, where due to the process of European integration, regions within and across national borders directly compete with each other to attract FDIs. Here the development of the single market with free movement of people, goods, and capital, the introduction of the Euro, and also other facets of European integration, has resulted in the blurring of nationals border. Causing multinationals to consider the EU as an integrated area, and providing them with the opportunity to choose between preferred sub-national location characteristics and institutions. This process, together with the last two enlargements of the EU, are also part of the explanation why the EU has traditionally been one of the world's main recipients of global FDIs (Villaverde, & Maza, 2015). Which is all to say that using a cross-regional approach in the context of the tightly integrated EU, then allows for highlighting the effects of regional institutional variety over that of national institutions (Hutzschenreuter et al., 2020). Furthermore, this context choice is also driven by the data rich environment the EU represents, allowing access to various regional datasets for constructing dependent, independent, and control variable datasets. Respectively collected and maintained by Bureau Van Dijk's Orbis database, the Quality of Government Institute together with European Value Systems Study Group, as well as European Statistical Office [Eurostat] together with the Annual Regional Database of the European Commission's Directorate General for Regional and Urban Policy [ARDECO].

   But before these variables are introduced methodological considerations surrounding the use of current regional grouping scheme should be discussed, as it defines what regions represent in this research. Following insights from Ascani (2018) and Hutzschenreuter et al.

(2020), using the EU context lends itself well for putting forward a regional grouping scheme that allows for the comparison of regions' institutional environments. This involves using the EU's Nomenclature of Units for Territorial Statistics, or NUTS regions, representing a hierarchical classification of statistical areas which are partly based on administrative borders (Eurostat, 2022a). Using these NUTS regions falls into the administrative perspective, meaning 'regions' are defined along politically determined boundaries, representing sub-national units in the form of for example states or provinces (Hutzschenreuter et al., 2020). More specifically NUTS2 regions were used, as their boundaries coincide with institutional boundaries based on their definition as: *'basic regions for the application of regional policies'* (Eurostat, 2022a). Therefore allowing for regional comparison, as these type of regions form coherent parts of an EU member states with each their own region-specific internally homogenous formal institutional aspects (Hutzschenreuter et al., 2020). Or put differently, in this grouping scheme a NUTS2 border represents a discontinuity in the EU's sub-national institutional space, which MNEs seem to be sensitive to pre- and post-investment (Santangelo, Meyer, & Jindra, 2016; Ascani, 2018). Further solidifying the use of the this grouping scheme is its general application in other studies that too examine interaction between the EU's sub-national environment and location determinations of multinational activity (Gauselmann, & Marek, 2012; Crescenzi et al., 2014; Villaverde, & Maza, 2015; Castellani, Meliciani, & Mirra, 2016; Cortinovis et al., 2020). Moreover, from a data driven point of view, the use of NUTS2 regions represented the lowest level for which formal institutional data was available based on the level of detail used by the Quality of Government Institute (Charron, Dijkstra, & Lapuente, 2015). Whereas, from a methodological point of view, the choice of using this scheme was also driven by the fact that data integration from the dependent, independent, and control data-sources was only possible because they all employed NUTS regions.

Applying this grouping scheme to construction of the EU's regional informal institutional space, based on those same insights from Hutzschenreuter et al. (2020), seems however sub-optimal. In that, unlike formal institutions, social capital is not strictly homogenous within specified NUTS2 boundaries, which may lead to empirically biased results as social networks extends over regional borders (Rutten, Westlund, & Boekema, 2010). Imposing the potential conundrum where, everything else being equal, it may be the case that some MNEs settle in NUTS2 regions generally high in bonding social capital. While in reality these MNEs were attracted to a localized cross-regionally connected social network cluster high in bridging social capital, which would align with proposed hypotheses. Thus seemingly requiring a more disaggregated level of analysis. However, methodologically speaking, social capital is a hard concept to measure due to it being complex phenomenon involving social networks, trust, and social norms, that operate at the individual level but also on higher levels, like local communities, regions, and countries (Van Oorschot, Arts, & Gelissen, 2006). Still, though lower level regional schemes might seem necessary, the regional scale seems to be where social capital processes affect economic development more directly (Malecki, 2012). Which reflects the ideas of Putnam et al. (1993) and Fukuyama (1995), in that social capital is conceptualized as having a public side where aggregated above individual level relations and participation in civic organisations are a property of regions and countries. It is through aggregated networks relations, building a regional mix of bonding and bridging social capital with accompanying benefits or complications, that economic outcomes are effected (Malecki, 2012; Muringani et al., 2021). Thus rather than examining micro-level social networks, it is the aggregated regional stocks of social capital at the regional which are presumed to effect MNE location choices. Therefore, in common with other studies that examine regional stocks of social bonding and bridging capital (Beugelsdijk, & Van Schaik, 2005b; Beugelsdijk, & Smulders, 2009; Cortinovis et al., 2017; Muringani et al., 2021). The use of NUTS2 (or even NUTS1) regions represents a compromise between using the lowest level possible at which social capital could be measured employing the scarce resource that is the European Value Studies [EVS] (EVS, 2022). While acknowledging that in order to operationalize subnational geographies of informal institutions this requires the use of administrative regions as a proxy instead of actual social network boundaries (Ascani, 2018). This ultimately reduces the risk of regional heterogeneity becoming overtly problematic (Beugelsdijk, & Smulders, 2009), while at the same time being sensitive to

the idea that social capital is not bound to NUTS2 region borders (Rutten, Westlund, & Boekema, 2010). Additionally, as in one region both social bonding and social bridging networks do exist next to each other (Muringani et al., 2021), it is still expected that the dominating network characteristics of a region determine foreign subsidiaries settling patterns.

3.2 Data sample

Based on the regional grouping scheme, together with data availability for dependent, independent, and control variables, the study sample comprises a total of 246 NUTS2 regions, one NUTS1 region, and seven NUTS0 countries. In wanting to include as much locations as possible, making obtained results more generalizable than those coming from studies that use specific regional samples (Hutzschenreuter et al., 2020), countries containing no sub-national levels were still included in the sample and coded at the NUTS0 level. These were the Baltic states together with the smaller countries of Cyprus, Luxembourg, and Malta. All of which in terms of independent and dependent variables were comparable to other NUTS2 regions (Charron et al., 2015; Cortinovis et al., 2020; EVS, 2022). At the same time, Finland and Croatia were excluded together with overseas territories of France, Portugal, and Spain, due to either dependent or independent variable data being unavailable. Additionally, due to data misalignments as a consequence of NUTS2 borders being redrawn over the years (Eurostat, 2022a), Ireland was included yet re-aggregated at country level. While the NUTS2 regions of Inner London and Outer London that were re-aggregated to the NUTS1 region London. Table 6 in the Appendix provides an list of included regions with corresponding NUTS codes, with NUTS0 countries and NUTS1 region in bold. Altogether this represents a similar procedure as was used by Villaverde, and Maza (2015), where data availability of alternative regions drove use of higher NUTS levels. Moreover, the mixing of different levels of disaggregation due to data limitations is common practice in studies focused on European regions (Akçomak, & Ter Weel, 2009; Peiró-Palomino, 2016)

Subsequently, the dependent dataset is constructed containing the number of foreign owned subsidiaries, established through both M&A and greenfield foreign direct investments, per included NUTS region or country (*MNE_count*). But due to limited access to longer time series, current dependent dataset only reports regional subsidiary count for the year 2013. The variable is derived from data compiled, refined, and geo-coded by Cortinovis et al. (2020), but originally stems from Bureau Van Dijk's Orbis database. Which contains detailed information at firm level on sector of operation, number of employees, registration date, ownership structure, and last available year (for more information on the Orbis database see Kalemli-Ozcan, Sorensen, Villegas-Sanchez, Volosovych, and Yesiltas (2015)). Next to subsidiary count the dependent dataset additionally includes a sectoral breakdown per sampled region, providing information in which two-digit NACE (Rev. 2) industry these subsidiaries primarily operated in (Eurostat, 2008). Note though that the broader NACE industries of agriculture, forestry, and fishing (A), financial and insurance activities (K), public administration and defence; compulsory social security (O), Education (P), Human health and social work activities (Q), arts, entertainment and recreation (R), activities of households as employers; (T), and activities of extraterritorial organisations and bodies (U) are all not included in this sectoral breakdown. Meaning foreign subsidiaries that potentially operated in these broader industries are excluded from present the study. Still, in total 251,366 foreign subsidiaries that were active across 68 different two-digit NACE industries are included in the analysis. Table 7 in the Appendix provides codes of included industries.

However, using the number of regional subsidiary as the dependent variable to measure the influence of a variety of potential location determinants has some disadvantages associated with it. This has to do with the fact that a strong regional presence, or a high number of subsidiaries in a NUTS2 region, does not provide any information on the actual amounts invested in these subsidiaries (Villaverde, & Maza, 2015). Nor does it provide any bearing on the economic relevance of these firms to the respective regional economy or to their multinational owners, as no value-adding activity of subsidiaries is expressed (Beugelsdijk et al., 2010; Castellani et al., 2014). As a consequence, most researchers instead elect to use inward FDI flows or stocks at regional or country level in order to analyse the location

determining effects of formal and informal institutions (Seyoum, 2011; Holmes et al., 2013; Nielsen et al., 2017; Contractor et al., 2020; Papageorgiadis et al., 2020; Mariotti, & Marzano, 2021). Still the use of 'number of foreign firms per region or country' has advantages too (Casi, & Resminin, 2010; Crescenzi, Pietrobelli, Rabellotti, 2016). As reflected by the use of this measure in other studies dealing with MNE location determinants (Gauselmann, & Marek, 2012; Crescenzi et al., 2014; Castellani et al., 2016; Comi et al., 2019; Romero-Martínez et al., 2019). The particular use of the Orbis database for example allows access to data on subsidiaries that were established both through M&A and greenfield investments. This has the advantage of subsequent analysis results not being skewed towards one specific type of investment (Castellani et al., 2016). Additionally, the dependent variable is directly observed and not indirectly interpolated by "regionalization" of national data. Circumventing potential distortion issues that may arise as these top-down methods implicitly assume that the sensitivity of FDIs to variables like employment or regional value added, which are indicators used to estimate the regional distribution of national FDIs, is constant across foreign firms regardless of sectoral specific preferences (Casi, & Resmini, 2010). But most importantly, the use of regionalized and regional FDI data does often also not allow for a sectoral breakdown of flows and stocks (Villaverde, & Maza, 2015; Kottaridi, Louloudi, & Karkalakos, 2019). Which then does not allow for the observation of sectoral preferences towards regional institutions, representing a key oversight of previous analysis based on precedent set by Ascani et al. (2016). As paying attention to industry specific preferences nuance analytical findings.

Furthermore, the use of FDIs stocks and flows is not without problems too. As according to Beugelsdijk et al. (2010), one runs the risk of under- and overestimating the amount to which inward FDIs flows and stocks actually contribute to MNE subsidiary value-added activities. Stating that FDI flows only measure cross-border financial flows and do not measure the true extent to which these flows are used for investments in buildings, machina, or equipment. Where for example in the case of a host country being a tax haven, allowing MNEs to circumvent high taxation by moving capital to holding subsidiaries (Beugelsdijk et al., 2010). Here inward FDI flows do not generate much value-adding subsidiary activity, thus ultimately FDI stocks overestimate real world activities. This ties into another advantage of using the number of subsidiaries per region which is specific to the current topic. Wherein remembering North's (1990) idea that 'bad' institutions have a quality to them too. The mere presence of 'unproductive' or 'insignificant' foreign subsidiaries may still be a partial reflection of the regional formal and informal institutional environment. As for example the regional presence of a 100 'unproductive' subsidiaries besides 25 'productive' ones, might be due to that specific region having a mix of both weak formal institutions as well as access to natural resources. Meaning that in any case, irrespective of high or low FDI flows or stocks, the institutional environment has an influence on the geographical dispersion of multinational activities. This makes the number of foreign subsidiaries a more appropriate unit of analysis, when looking at the location strategies of MNEs, than the value invested in subsidiaries, (Crescenzi et al., 2016). Because the choice of a specific region is largely independent form the amount of capital invested or the size of the new foreign plant (Casi, Resmini, 2010; Sutherland, & Anderson, 2015).

3.3 Explanatory variables

To measure the extent to which multinationals are drawn to regions with higher quality formal institutions, this side of the EU's institutional landscape draws on data from the European Quality of Government Index [EQGI] which is constructed by Charron, Dijkstra, and Lapuente (2014). At the request of the European Commission this comprehensive subjective quality of government index has been produced in four waves (2010, 2013, 2017, and 2021), and has seen use in several studies as the main indicator of institutional quality across European regions (Rodríguez-Pose, & Garcilazo, 2015; Santangelo et al., 2016; Cortinovis et al., 2017; Rodríguez-Pose, 2020). The index is based upon sixteen survey questions, where respondents were asked to rate public services (education, healthcare, and law enforcement) that are often financed, administered, or politically accounted for by sub-national authorities, at either regional, county, or local level (Charron et al., 2014; 2015). It provides a general

picture on the regional provision of these public services, where citizens' perceptions and experiences were used to measure three key interrelated 'pillars' of regional government performance, expressed by the *impartially* index, the lack of *corruption* index, and the *quality* of governance index. Respectively capturing the extent to which people were treated impartially, without corruption, while receiving quality services that were delivered in an effective manner. Answers were aggregated from the individual level to the regional level, giving a single index for both NUTS1 or NUTS2 regions with higher scores representing better regional formal institutions. Specifically for this analysis, the explanatory dataset (*EQI_INDEX*) is constructed using the 2013 index scores (Charron et al., 2015), instead of the 2010 index scores (Charron et al., 2014). Driven by the fact that the 2010 wave only sampled 172 NUTS1 and 2 regions with around 200 respondents per regions, as opposed to the 2013 wave which sampled 206 NUTS1 and 2 regions with around 400 respondents per region, thus offering more detailed regional accounts. Though this potentially introduces causality problems as independent and dependent datasets now cover the same year. Running contrary to the common procedure of introducing explanatory variables with one-year lag in order to minimise the impact of simultaneity between investment decision and regional institutional conditions (Casi, & Resmini, 2010; Spies, 2010; Holmes et al., 2013). This is largely nullified due to the characteristics of institutions, in that regional variations in government quality are relatively stable over time in accordance with their path-dependent nature and resistance to transformations (Tabellini, 2010; Rodríguez-Pose, & Garcilazo, 2015; Rodríguez-Pose, 2020). Meaning this explanatory variable is time-invariant under the assumption that formal institutional scores did not change significantly for prior years, which is the same reasoning employed by Cortinovis et al. (2017), and Ascani (2018).

What remains is to resolve some problems with data misalignment, due to the fact that not for every EU country the EQGI was sampled and scored at NUTS2 level. Instead index scores were only available for a mix of 206 NUTS1 and 2 regions, but not for the required 246 NUTS2 regions, one NUTS1 region, and seven NUTS0 countries. This specifically involves the EQGI scores for Belgium, Germany, Greece, Hungary, the UK, and Sweden. Which are only available at NUTS1 level in the 2013 wave, due to limited sampling at NUTS2 level in some countries, together with the application of specific sampling procedures involving the use of 'politically relevant regions' at NUTS1 level in other countries (Charron et al., 2015). As a result of this, in order to construct an aligning explanatory dataset, NUTS1 region index scores for these specific countries require disaggregation to their corresponding lower level NUTS2 regions. Where for example the EQGI score of Germany's 'politically relevant' NUTS1 region DE1 is also applied to the lower level NUTS2 regions DE11, DE12, DE13, and DE14. Similarly, as Slovakia was not sampled in the 2013 survey at sub-national level at all, in this case included national level index scores could be disaggregated for the country's two NUTS2 regions. While for the Baltic countries, Cyprus, Ireland, Luxembourg, and Malta again included national level index scores are used. Whereas for the NUTS1 region of London no further steps were necessary.

When it comes to constructing the informal side of the EU's regional institutional landscape, involving the operationalization and measuring of social capital. One is faced with a challenge as a variety measures have been proposed (Ahlerup, Olsson, Yanagizawa, 2009). This is due multifaceted nature of social capital, being a construct that provides a terminological umbrella for grouping together a variety of social phenomena each with their own operationalizations (Van Oorschot et al., 2006; Forte, Peiró-Palomino, & Tortosa-Ausina, 2015). As in current study specifically Putnam's et al. (1993) definition of social capital is used. When finding measures for it, according to analysis of Bjørnskov (2006), it is key to acknowledge that social capital cannot be captured in a single indicator. Instead it needs to be inferred from three independent facets: generalized trust, social norms, and associational or network activity. Where each facet represents an indicator that captures how social capital affects (regional) economies and societies in distinctly different ways. As a consequence, and in building on the studies of Knack, and Keefer (1997), Van Oorschot et al. (2006), Beugelsdijk, and Smulders (2009), Peiró-Palomino (2016), Cortinovis et al. (2017), and Muringani et al. (2021), here focus is on the latter facet of social capital. Meaning social capital is

operationalized at the regional level, where aggregated network relations and resulting benefits and complications are used to explain the location patterns of foreign subsidiaries. More specifically, the structural dimension of how people and organizations associate with each other, differentiating between social bonding and social bridging capital, are used as explanatory variables based on seminal contributions of Olson (1982), Coleman (1990), and Putnam (2000). This involves measuring the way people associate within specific groups regionally, where at either ends social capital is produced through strong ingroup relations forming homogeneous groups (bonding), or through weaker outgroup associations forming heterogeneous groups (bridging).

With this in mind, in order to measure regional stocks of bonding and bridging social capital across European regions data from the EVS database is used. This database contains individual level data on social attitudes and values at the regional NUTS1 and 2 levels, collected through surveys taken every nine years spanning the period from 1981 to 2020 (EVS, 2022). In building on the approach used in the studies of Knack, and Keefer (1997), Beugelsdijk, and Van Schaik (2005b), Beugelsdijk, and Smulders (2009), Cortinovis et al. (2017), and Muringani et al. (2021), here data from the 2008 survey is used to construct the two social capital explanatory variables. Which specifically involves the use of item number five from the survey questionnaire, in order to measure the associational facet of social capital. Where respondents were specifically asked about their passive (belong to) or active (volunteer for) participation in fourteen different civic organizations, with the question: '*Please look carefully at the following list of voluntary organisations and activities and say which, if any, do you belong to/are you currently doing unpaid voluntary work for?*' (EVS, 2010, p. 2-3). From subsequent regional accounts social capital can then be proxied. As this item captures regional social networks, and the social capital therein, extrapolated from peoples' involvement in civic life. Though with the added note that, based on insights from Beugelsdijk, and Van Schaik (2005), only respondents that did unpaid voluntary work for organizations are included in current analysis. As, with a lack of measures that show intensity of involvement, it is assumed that social capital is captured best by looking at active participation only.

Provided with this operationalization of social capital, the next step is to then specifically capture the bridging an bonding dimensions of regional social capital, by building on the techniques applied in the studies of Beugelsdijk, and Smulders (2009), Peiró-Palomino (2016), Cortinovs et al. (2017), and Muringani et al. (2021). This step involves the splitting up of the fourteen civic organisations related to survey question five, into two groups according to organisations' potential for rent-seeking behaviour. Based on insights from Putnam et al. (1993) and Olson (1982). Where organisations generally characterized by inclusive social networks and heterogeneous membership, are categorised as 'Putnam' groups. But organisations generally characterized by exclusive social networks and homogeneous membership, are categorized as the 'Olson' groups. Here membership in Putnam groups is generally associated with enhanced intergroup trust and cooperation, which ultimately has positive effects on economic outcomes (Putnam et al., 1993). But membership in Olson groups is generally associated with rent-seeking behaviour and acting like distributional coalitions, which ultimately has negative effects on economic outcomes (Olson, 1982). Respectively this results in the bridging dimension of regional social capital being captured by regional scores of active participation in organisations such as cultural groups, youth work, religious groups, and eight others organisations, constituting the Putnam groups. While the bonding dimension of regional social capital is captured by regional scores of active participation in professional associations, political groups or parties, and trade unions, constituting the Olson groups. With Table 8 in the Appendix providing a detailed overview of how the fourteen organisation were split. Following this, in order to produce these two explanatory variables, regional stocks of bonding (*Bond_R_SC*) and bridging (*Brid_R_SC*) social capital are calculated using the number of people that work as a volunteer in at least one organization belonging to each set of groups, divided over the total respondents in a region. Meaning if region X with 100 respondents had 30 people actively participating in Putnam groups, and 20 people actively participating in Olson groups. The respective regional shares would be 30 percent and 20 percent. With the added note that this approach does not consider exclusive active

participation, as in reality people and regions have a mix of both bonding and bridging social capital at the same time (Muringani et al., 2021). Furthermore it needs to be noted that, since significant time lag exists between the EVS 2008 survey data and foreign subsidiary regional count data from 2013, both social capital variables are considered time-invariant again. Justified by their path-dependent nature too (Tabellini, 2010; Peiró-Palomino, 2016).

3.3 Controls

At this point several controls need to be introduced into the analysis to bolster the explanatory power of results. This is because regional presence of foreign subsidiary is not determined by formal and informal regional institutions alone. Instead, as the studies of both Casi, and Resimini (2010) and Villaverde, and Maza (2015) show, in the context of European regions a variety of regional factors are documented as having a location determining effect on foreign subsidiaries as well. Thus by identifying and quantifying these regional factors, representing 'other' L-type advantages which multinationals are drawn to (Dunning, & Lundan, 2008). This will ensure that subsequent results do not overstate the location determining effects of institution, and instead appropriately capture their standalone effects on subsidiary location choices. Accordingly by building on determinants introduced by Basile et al. (2009), Casi, and Resimini (2010) and Villaverde, and Maza (2015) together with controls employed by Holmes et al. (2013), Nielsen et al. (2017), Bailey (2018). Several location based control factors are constructed which proxy facets of host regions' economic, business, and technological environment. Importantly, these were all proven to be significant in determining either FDIs inflows or foreign subsidiary location, at both national and regional levels. Note though that these studies supply a large number of location determining factors that could be used as controls, but in order to prevent problems of multicollinearity among control variables (Villaverde, & Maza, 2015; Nielsen et al., 2017), only strictly relevant controls are included.

To start, in order to control for the effects of regional market demand and regional average income, the proxy of regional gross domestic product per capita (*GDP_PC*) is used. Based on the idea that market-seeking multinationals invest in regions with the goal of maintaining or gaining access to sizable regional or national markets (Resmini, 2000; Dunning, & Lundan, 2008a). This proxy has proven to be a location determining factor based on findings of Bénassy-Quéré et al. (2007), Villaverde, and Maza (2015) and Nielsen et al. (2017). All finding a significant positive relationship between GDP per capita and inward FDIs at both national and regional level. On top of this however, Bailey (2018) argues that it is necessary to include at least two out of three controls that proxy national or regional economic conditions (GDP, GDP per capita, or population). Because as his findings show, their inclusion significantly moderates the effects of institutional factors on inward FDIs. Thus in addition to using GDP per capita, regional population density (*POP_DENS*) is also included to control for regional economic and demographic conditions. This variable proxies the actual regional market size, which is a distinctly different facet of the regional economy according to analysis of Villaverde, and Maza (2015). The use of this control is justified based on findings of Resmini (2000), and Balise et al. (2009), showing a significant positive relationship between population or population density and MNE location choices. Additionally, according to Castellani et al. (2016), population density can also be used to proxy the significant positive effect of urbanization externalities and agglomeration economies on inward FDIs. While as a final control for regional economic conditions, used by Buchanan et al., (2012), Villaverde, and Maza (2015), and Cortinovis et al. (2017), regional gross fixed capital formation (*INVEST*) is used to proxy the local investment climate. Which is a measure used to express the expenditure on produced tangible or intangible assets involved in the production process. But on top of signalling a health investment climate, which significantly attracts more inward regional FDIs (Villaverde, & Maza, 2015). It may also signify at a larger regional presence of firms, or the regional presence of productive firms. Which according to Nielsen et al. (2017), both have a significant positive relationship with inward FDIs, at least at country level. In a similar vein Buchanan et al. (2012) argue that, as domestic investor receive more information about a host country's or region's investment environment than foreign investors. MNEs may deal with this information asymmetry by using domestic investments as signals about the state

of the host economy. Therefore higher levels of regional fixed capital formation will crowd-in foreign direct investments, that act upon this signal.

Next to regional economic conditions, the quality of region's physical infrastructure is also regarded as a location determinant for multinational activity (Loree, & Guisinger, 1995; Dunning, & Lundan, 2008a; Nielsen et al., 2017). This is based on the idea that physical infrastructure is an enabler of business activity by ensuring the movement of goods, services, and employees within and across nations and regions (Davis, Desai, & Francis, 2000; Villaverde, & Maza, 2015). To then control for regions' physical connectivity, the kilometre amount of road networks per thousand square kilometres (*INFRA*) is used as a proxy. Where high values indicate high motorway density and thus higher market accessibility, which according to Nielsen et al. (2017) is associated with more inward FDIs. The reason for using only data on road networks is that NUTS2 level data on rail and waterway networks contains too many missing values to be of value as a control. Next to this, based on insight from Dunning, and Lundan (2008a), it is also key to control for regional human capital endowments. Because this type of capital is specifically sought out by combination of resource-seeking and asset-seeking multinationals. Where the former type of MNE locates abroad in order to access quality labour inputs to strengthen productivity advantages. While the latter type of MNE locates abroad in order to gain ownership-advantages over localized human competences. Seeking to develop technological or managerial capabilities that both aid with the creation of tangible or intangible firm assets. In the context of the EU, findings of Casi, and Resmini (2010) confirm the relevance of regional human capital to multinational operations. While also being underpinned by the analyses of Villaverde, and Maza (2015) and Nielsen et al. (2017), finding that more advanced human capital has a significant positive effect on national and regional inward FDIs. So in order to control for a skilled regional labour pool, the share of regional population between the ages of 25-64 that completed upper-secondary and post-secondary (*HC_SEC*) and the share of regional population between the ages of 25-64 that has completed tertiary education (*HC_TERT*), are both used to proxy regional human capital endowments. Then finally, in order to also capture the technological facet of regional endowments, and control for the extent to which multinationals are drawn to localised knowledge spill-over from indigenous firms and other local knowledge sources (Mariotti, Piscitello, & Elia, 2010; Papanastassiou, Pearce, & Zanfei, 2020). The proxy of regional research and development spending as a percentage of gross domestic product (*R&D_EXP*) is used, based on previous implementation of this measure by both Crescenzi et al. (2014) and Villaverde, and Maza (2015). Who find a significant positive relationship between regional MNE presence and higher regional R&D spending.

All these control variable have been take form the Eurostat regional database, while both data on regional GDP per capita and gross fixed capital formation were taken from the ARDECO database. As before, Table 8 in the Appendix provides an overview of these controls.

3.4 Empirical strategy

Having gone over the operationalization of all relevant variables, this final section aims to provide an overview of the methods used to test the validity of the three proposed hypotheses. Using combination of standard Ordinary Least Squared [OLS] and Poisson estimation methods, one General Model and two Derived Models are constructed. Used to ascertain if there is a significant relationship between, on the one hand the number of foreign subsidiaries per region, and on the other hand regional formal institutional quality and the dominating regional share of either types of social capital. Moreover, in the General Model a gradual approach is used where step by step more variables are introduced into analysis to disentangle the specific effects of explanatory variables. Whereas the Derived Models incorporate the two-digit NACE industry breakdown, used to control for industry specific settling patterns across EU regions, and test if and to what extent industry specific regional location patterns can be explained through sub-national institutional factors. The latter, precedented on previous findings of Ascani et al. (2016), Li, and Zhou (2017), and Ascani (2018).

At this point it should be noted that due to a skewed distribution of some variables across sampled regions, assessed via visualization of residuals, logarithmic transformations

(natural logarithm) have been applied to the dependent dataset (*MNE_count*), social capital variables (*Brid_R_SC* and *Bond_R_SC*), and to several control datasets (*GDP_PC*, *POP_DENS*, *INVEST*, *INFRA*, and *R&D_EXP*). Which is a common procedure to ensure a more normal distribution of variables, needed to pass the linearity assumption involved in using OLS and Poisson methods (Castellani et al., 2016; Mariotti, & Marzano, 2021; Muringani et al., 2021). Next to this, the research setting should be addressed once more involving the use of cross-sectional data instead of panel data, as this ultimately effects the extent to which current research results are able to be generalized (Hsiao, 2007). Critically, current dependent dataset does not contain a time series observations due to limited data access. This makes obtained results less powerful as temporal changes of MNE location preferences cannot be taken into account (Nielsen et al., 2017). Though this approach will mean that results of subsequent analysis should be handled with care, due to the time-invariant construction of independent variables this is more mitigated (Nielsen et al., 2017; Ascani, 2018).

Moving to the statistical models themselves. The General Model *(1)* is used to test H1, H2a, and H2b is:

(1)
$$\ln(MNE\_count_i) = \alpha + \beta_1 EQI\_INDEX_i + \beta_2 \ln(Brid\_R\_SC_i) +$$
$$\beta_3 \ln(Bond\_R\_SC_i) + \beta_3 \ln(GDP\_PC_i) + \beta_4 \ln(POP\_DENS_i) +$$
$$\beta_5 \ln(INVEST_i) + \beta_6 \ln(INFRA_i) + \beta_7 HC\_TERT_i + \beta_8 HC\_SEC_i +$$
$$\beta_9 \ln(R\&D\_EXP_i) + \varepsilon_i$$

Here MNE_count_i, depicts the log number of foreign subsidiaries in region i for the year 2013. Note that this is the total number of foreign subsidiaries, meaning here the dependent variable is not linked to specific industries. Next to this α denotes the intercept value. EQI_INDEX_i refers the formal institutional quality of region i, used to test H1. Whereas $Brid\_R\_SC_i$ and $Bond\_R\_SC_i$ represent the log regional share of bridging and bonding social capital, used to respectively test H2a and H2b. Variables three up until nine represent the previously discussed control variables, of which all were logged apart from both human capital variables. Finally ε_i denotes the error term. Because of missing values for notably the variables *GDP_PC*, *INVEST*, *INFRA*, and *R&D_EXP* it should to be noted that the number of valid observations for this model is only 149 and not the total initial sample of 254 regions. This issue is addressed in the robustness checks of results for the General Model in the next chapter.

The two Derived Models are constructed differently. Partly because of the fact that the dependent variable is count data, but also due to the fact that the dependent variable in these models contains a considerable number of zero observations. This is to say that, as dependent dataset contains discrete and non-negative values, a more appropriate econometric model relies on the application of a Poisson distribution (Castellani et al., 2016). However, the main problem of using a standard Poisson regression for the Derived Models is that mean and variance are not equal, causing the results to be biased because of overdispersion. In the case of Derived Model *(2)*, which controls for industry specific regional settling patterns. The splitting up of regional subsidiary counts along 68 different two-digit NACE industries causes the dependent data to contain a lot of zero count observations. Meaning, in contrast to the General Model which could rely on a somewhat normal distribution of the dependent variable. In this case, there are a considerable amount of regions that do not contain any foreign subsidiaries in specific two-digit industries. Therefore, following Loeys, Moerkerke, De Smet, and Buysse (2012), the Zero-Inflated Poisson [ZIP] method offers a solution to dealing with 'overdispersion' caused by excess zeros. With these types of models importantly consist of two parts. The count component, wherein a Poisson regression is ran over part of the data that contains no excess zeros (but not no zeros). Together with the zero component, wherein a logistic regression is ran over the excess zeros in order to calculate the probability of their existence. With regards to Derived Model *(2)*, in order to control for subsidiaries' regional location patterns, a dummy variable is used based on the 68 different two-digit NACE industries included in the independent dataset. $\delta Dummy\_IND$ denotes this variable with the reference industry being the two-digit NACE industry 10 'manufacture of food products'. For each region subsidiary count was broken down along 68 sectors, where for example Austria's AT11 region

contained 24 foreign subsidiaries that operated in 'Wholesale trade, except of motor vehicles and motorcycles', which is sector 46. While the rest of the regions' 86 subsidiaries operated in 'other' industries. Following this example, then the dummy variable for this region would take a 1 if subsidiaries operated in industry 46, but a 0 if subsidiaries operated in the 66 'other' industries (excluding the reference category). This process is repeated 67 times for each region, and would result in the inclusion of 67 additional regression coefficients in the table for this model. But in order to maintain an overview, only the highest and lowest dummy regression coefficients were included and discussed in order to exemplify their respective interpretation. Note that in this case *MNE_count* is not logged beforehand, because as part of the ZIP regression the natural log of the dependent count variable is taken. All in all this results in the following model,:

(2)
$$log(MNE\_count_i) = \alpha + \beta_1 EQI\_INDEX_i + \beta_2 \ln(Brid\_R\_SC_i) + \beta_3 \ln(Bond\_R\_SC_i) + \beta_4 \ln(POP\_DENS_i) + \beta_5 \ln(INVEST_i) + \beta_6 \ln(INFRA_i) + \beta_7 HC\_TERT_i + \beta_8 HC\_SEC_i + \beta_9 \ln(R\&D\_EXP_i) + \delta Dummy\_IND_i + \varepsilon_i$$

The second Derived Model *(3)* is constructed to specifically look at the industry sensitivities, building on theory and techniques employed by Swart, and Kinnie (2003), Ali et al. (2010), Ascani et al., (2016), and Crescenzi et al. (2021). They all point to the fact that foreign subsidiaries (and domestic firms) from different sectors have different proclivities towards, and different interactions with, formal institutions and social capital. Which warrants analysing the preferences of high-technology manufacturing together with knowledge-intensive services [KIS], as opposed to the proclivities of low-technology manufacturing together with less knowledge-intensive services [LKIS]. Meaning these industry-groups are regressed and compared next to each other, to establish if potential regional institutional proclivities can nuance the findings of the General Model *(1)*. These divisions of industry groups are taken from Eurostat (2016). They are based on the two-digit NACE industry codes where for example high-tech manufacturing refers to sector *21* and *26*, respectively the 'manufacturing of pharmaceutical products' and 'manufacturing of computer, electronic and optical products'. The complete division is found in Table 7 in the Appendix, with the accompanying model being:

(3)
$$log(MNE\_count_{i,high}) = \alpha + \beta_1 EQI\_INDEX_i + \beta_2 \ln(Brid\_R\_SC_i) + \beta_3 \ln(Bond\_R\_SC_i) + \beta_4 POP\_DENS_i + \beta_5 HC\_TERT_i + \beta_6 HC\_SEC_i + \beta_7 \ln(R\&D\_EXP_i) + \varepsilon_i$$

Note first that several controls were excluded from this model since the choice was made to analyse the full range of regions, partly the buff the number of high-tech manufacturing subsidiaries. The exclusion of these variable may however also be justified by looking at the results of Ascani et al. (2016) and Castellani et al. (2016), wherein these types of industry groupings are more sensitive to innovation related regional endowments than factors like market potential or good quality road infrastructure. Therefore, the variables *GDP_PC*, *INVEST*, and *INFRA* where excluded from these models. Additionally, the minor noticeable difference in is the inclusion of $high$ as opposed to low, as well as KIS as opposed to $LKIS$. Representing these respective industry groupings. Also as before, due to the dependent dataset contain may zero observations, ZIP regression are used for this estimation model too.

4. Results

Having introduced dependent, independent, and control variables as well as the statistical model used to test proposed hypotheses. This chapter consists of two sections, wherein the first section deals with descriptive statistics of included variables. While also going into the visualization of subsidiary location patterns across the EU, as well as depicting the EU's sub-national institutional landscape. Whereas the second section deals the with results of estimation models, to subsequently verify or falsify hypotheses. This includes presentation and discussion of results from the General Model. But also, in wanting to bring nuance to the results of the main analysis, contrasting them with the results from the Derived Models. Because as will be shown, in finding contradictory results to established literature (see Bailey (2018) for overview), the following results uncover exceptions to the general rule that 'good' institutions are always a significant positive determinant of MNE location choices. As well as uncovering the need to further disentangle the relationship between foreign subsidiary location choices and their industry specific preferences towards regional (informal) institutions.

4.1 Descriptive statistics

The summary statistics for all variables are presented in Table 1. It should be noted that, although some variables were log transformed to deal with skewed distributions, here data is presented before log transformation as this entails more meaningful interpretation of values. In fact, the skewed nature of some variables is reflected when looking at both the location and dispersions measures. But to start, the first noteworthy aspects of summary statistics lies in the number of observations. Reflecting the fact that for some controls and explanatory variables data was missing. More specifically in the case of physical infrastructure data, this was not available for many German regions, the whole of Greece, Poland, and Portugal, as well as two Italian regions. Though in light of the scientific relevance of this variable, representing a key FDI determinant (Holmes et al., 2013; Nielsen et al., 2017), it was still included. The exact reason for missing values is unknow, but in some countries there is no legal precedent for collecting this type of data as instead it was collected on a voluntary basis (Eurostat, 2021). Additionally, R&D data was not available for the Netherlands and two German regions due to this data being confidential (Eurostat, 2022). Yet again, this control was still included based on scientific relevance of the variable representing an established proxy for regions technological endowments (Crescenzi et al., 2014; Villaverde, & Maza, 2015). One major contributor to the existence of missing values involves the United Kingdom. Represent a special case where due to the country leaving the EU, accordingly both the Eurostat database as well as ARDECO database no longer maintain records for the UK. Moreover, this issue could not be overcome due to the fact that the UK's statistical office does not employ the NUTS regional grouping scheme when it comes to regionalized data, therefore it could not be used to supplement the control dataset. Meaning specifically for the variables GDP per capita, gross capital formation, and physical infrastructure, data was missing for sampled regions of the UK. Still, the country was not removed from analysis because data for explanatory variables could be obtained. Later, when it comes to the robustness checks of obtained results, these issue are addressed again. Finally, both bridging and bonding social capital variables also contain some missing values. Which is due to the fact that for some reason no interviews for the EVS 2008 were conducted in the regions DEB2, FRM0, ITH1, and UKM5.

Table 1. *Descriptive statistics.*

Variable	*N*	Min.	Median	Mean	Max.	S.D.	C.V.
Foreign subsidiary count	254	0	374.000	989.630	17,604.000	1890.835	1.911
Formal institutional quality	254	0	59.118	53.902	81.653	17.411	0.323
Bridging social capital	250	0	18.584	21.750	83.333	15.997	0.736
Bonding social capital	250	0	3.333	4.184	47.826	4.771	1.140
GDP per capita (x thousand)	218	3.618	25.341	25.260	90.027	13.388	0.530
Population density	254	3.400	132.900	343.332	7260.700	752.781	2.193
Investments (x million)	218	304.760	6,423.410	10,135.540	141,985.000	13,114.890	1.294
Physical infrastructure	165	0	23.000	30.079	179.000	28.576	0.950
Tertiary education	254	11.400	27.400	27.850	54.200	8.784	0.315
Secondary education	254	15.500	46.800	48.110	76.000	13.537	0.281
R&D expenditure	240	0.060	1.285	1.560	8.560	1.233	0.791

Looking at the summary statistics for the number of foreign subsidiaries per region, what stands out is the considerable differences between median (374) and mean (989.630). This together with a high coefficient of variation (1.911) indicates that there are few regions housing considerably high numbers of foreign subsidiaries, whereas most regions house only few foreign subsidiaries. The skewed nature of the explanatory variable is visualized in Figure 1, showing that most multinationals tend to locate in capital regions and larger urban centres, like London (17,604), Bucureşti (13,821), Praha (7913), Île-de-France (7471), Lombardia (7318), or Düsseldorf (3274). These spatial patterns have also been found in the earlier works of Casi, and Resmini (2010) or Crescenzi et al. (2014), and accordingly literature has put forward the idea that MNEs' attraction towards urban centres stems for the location determining effects of agglomeration economies (Basile, Castellani, & Zanfei, 2008; Goerzen, Asmussen, & Nielsen, 2013; Crescenzi et al., 2016; Nielsen et al., 2017). Where at either ends of a literary debate, agglomeration economies, and the potential advantages for MNEs therein, arise either through co-location of firms belonging to the same or related industries (Krugman, 1991). Or they arise through the characteristics of global cities (Beaverstock, Smith, & Taylor, 1999). Without going too much into this topic, the first strain of literature suggest that clustering of firms for the same industry creates the potential for knowledge spill-over from which multinationals stand to benefit. Clustering creates specialization externalities as tacit competences from related sectors flow across agglomerations through imitation, personal networks, and job market turnover (Porter, 1998). Moreover, the co-location and dense linkages of suppliers and customers provides access to relevant input and output linkages (Krugman, & Venables, 1996). This means that when MNEs locate in agglomerations specific to their industry, they gain access to things like technological externalities, more stable labour markets, intermediate goods, production services, skilled manpower, and benefits from knowledge spill-over between adjacent firms (Devereux, Griffith, & Simpson, 2007; Nielsen et al., 2021). On the other hand, the second strain of literature suggests that agglomeration economies exists due to the hallmarks of global cities and their subsequent attraction of firms that are not necessarily in de same sector (Beaverstock et al., 1999). Here multinationals are drawn to these types of urban centres as they can benefit from a cosmopolitan environment that helps them overcome the liability of foreignness (Nielsen et al., 2017). Additionally, global cities also provide foreign firms with access to connections that stretch both local and global markets, allowing them to connect to critical local or global input and output linkages, while they also provide both domestic and foreign firms with advanced producer services (Goerzen et al., 2013). Apart from capital regions, other areas of higher concentration also include Romania, parts of Slovakia, Germany's southeast and Ruhr area, the western part of the Netherlands, northern Italy, Cataluña, and finally the regions around London. Additionally the countries of Ireland, Estonia, and especially Latvia house a considerable number of foreign subsidiaries, which is to be expected when having to analyse them at country level. In contrast to this, the more marginal

regions are located in the northern parts of the Netherland and Sweden, the eastern parts of Germany and Poland, and the southern parts of Belgium and Italy. Next to this, outside of the capital regions of Bulgaria, France, Greece, Hungary, and Spain foreign subsidiary presence seems to diminish considerably too.

Figure 2. Foreign Subsidiaries across the European Union, 2013
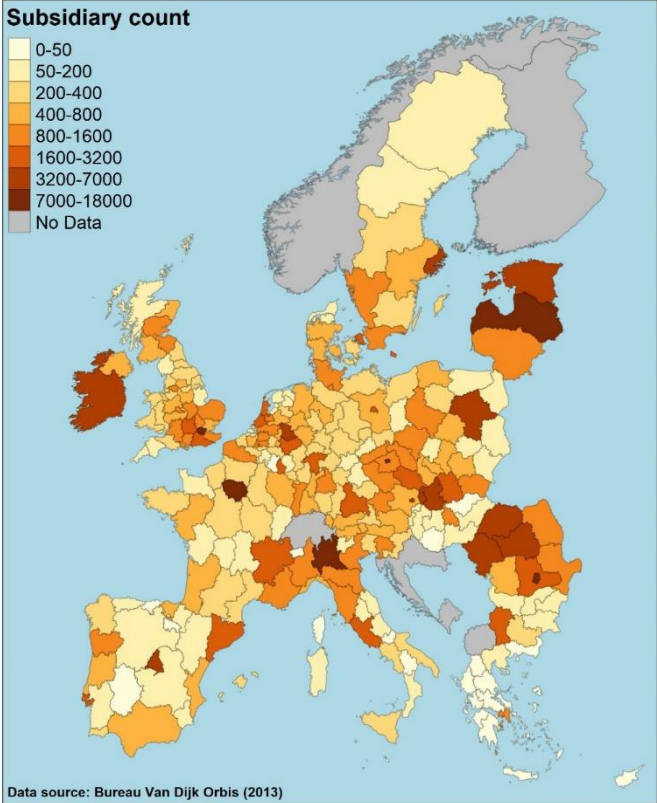
Moving to the first explanatory variable, it is of interest to note that out of all the variables, sampled regions' formal institutional quality is the only variable for which the median (59.118) is higher than the mean (53.902). As the difference is minor, together with a low coefficient of variation (0.323), this indicates that formal institutional quality follows a relatively normal distribution across regions of the European Union. Where there are only slightly more regions with very low index scores than regions with very high index scores. Having mapped the 2013 EQGI in Figure 2 this distribution of few very high scoring, mostly average scoring, and again few very low scoring regions is found. However the spatial concentration of this distribution is very distinctive. In the sense that some countries show significant within-country spatial concentration of higher and lower index scores besides each other, while other countries exert more even scores for regions' formal institutional quality. These regional patterns, upon basic comparison between Figure 1 and Figure 2, already show that there is merit to the call of both Beugelsdijk, and Mudambi (2013) and Hutzschenreuter et al. (2020) to investigate regions sub-national characteristics. Because based on this crude comparison of foreign subsidiary location patterns, and the distribution of EQGI scores among EU regions, some relationship between both variables can be detected. Where regions with higher (lower) quality formal institutions generally seem to house more (less) foreign subsidiaries, though notable exceptions like Romania and Slovakia still exist. Next to this, more specific regional patterns in Figure 2 are also found, they are partially based on the spatial analysis performed by Charron et al. (2015), where broadly four groups can be identified. The first group includes the high preforming regions of the Scandinavian countries and the Netherlands, as well as Luxembourg. In contrast, the second group encapsulates the lower preforming regions which are located in the eastern part of Europe, specifically concerning the regions of Romania,

Bulgaria, and Greece. The third group consists of average scoring regions in countries like Austria, Germany, France, and the UK. But also regions in countries like the Czech Republic, Hungary, Spain, or Portugal. The final group consist of countries with specific within-country regional differences in formal institutional quality. For example Belgium, where the larger NUTS1 region of Flanders scores significantly higher than the larger NUTS1 region of Wallonia. Or Italy, where the top two NUTS2 regions Trento and Bolzano are more comparable to the average scoring German or Austrian regions, while the rest of the country is more comparable to lower scoring Romanian regions.

Figure 3. European Quality of Government Index, 2013.
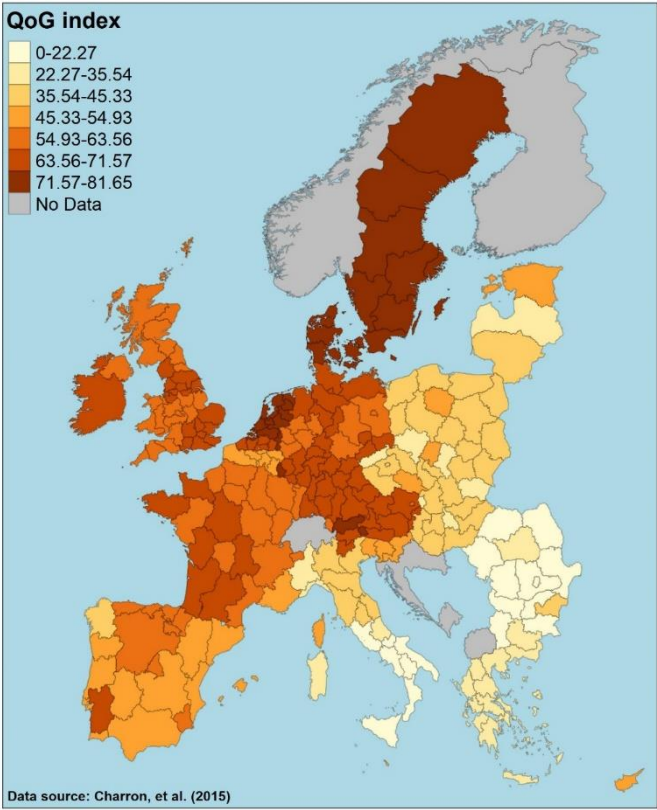
As for the bridging social capital variable, though both the median (18.584) and mean (21.750) are not that far apart. Indicating that there are few regions where shares of bridging social capital peak. What is more noticeable for this variable however is the considerably scattered distribution of data as reflected by a considerable average deviation from the mean. Which is to say that with a value of 15.997, the standard deviation is almost as big as the average regional share of bridging social capital. Alongside this, the fact that the highest measuring region has an 83.333 percent participation in social bridging networks. These datapoints indicate that there are regional outliers in combination with a negatively skewed distribution of data. Or in other words, there seem to be few regions with significantly higher shares of bridging social capital, as opposed the majority of regions with average or below average shares of this type of social capital. While also leaving some 'in-between' regions. Having mapped out regional shares in Figure 3 this assumption is generally confirmed. In that especially northern and southern Italian regions, and to a lesser extent regions of the Lowlands, Denmark, and some German regions, seem to represent the few higher preforming regions that are rich in bridging type social networks. Opposed by to the majority of EU regions which only contain average or below average shares of these type of social networks. Where specifically eastern and south-eastern EU regions located in in countries like Bulgaria, Poland, and Romania, are among the lowest preforming regions. While southern EU regions in the Iberian peninsula, also fall into this category.
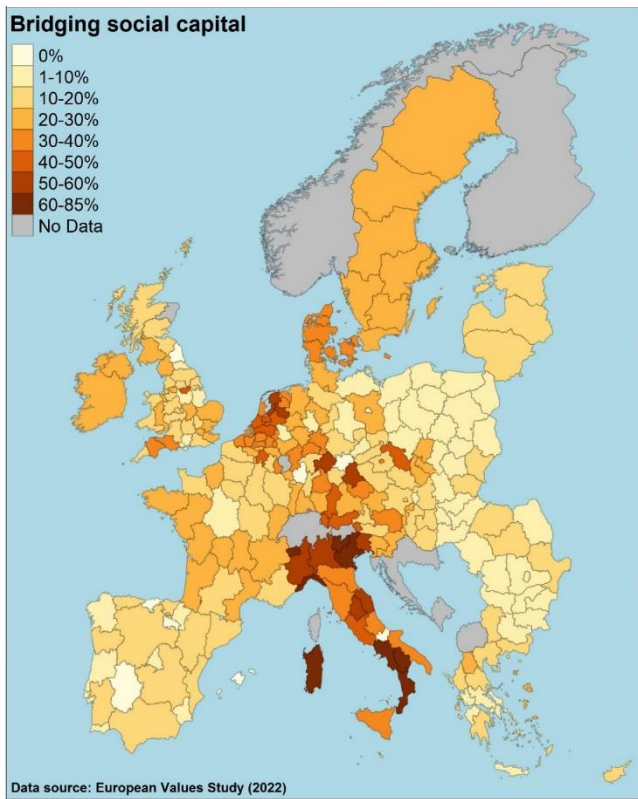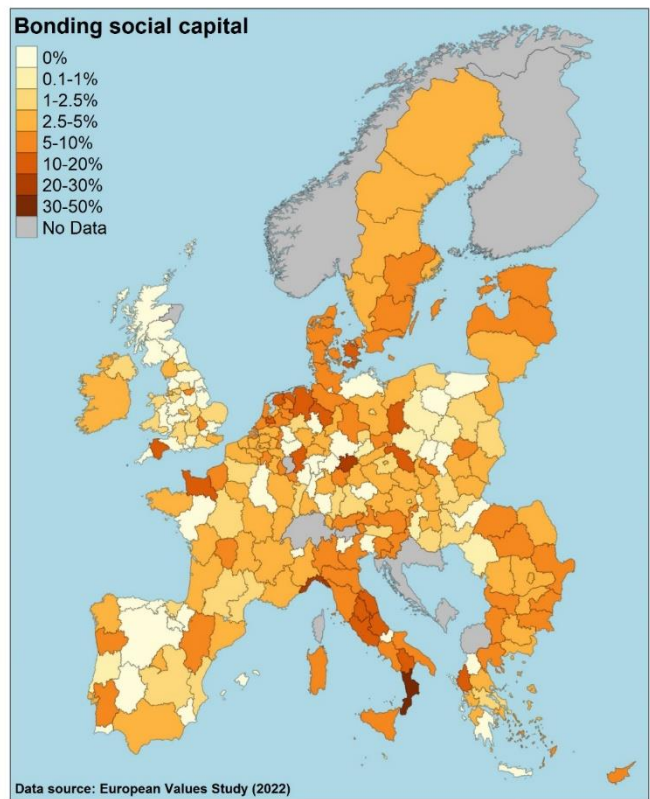
Figure 4. *Bridging social capital networks, 2008*   **Figure 5.** *Bonding social capital networks, 2008*

Bridging social capital
- 0%
- 1-10%
- 10-20%
- 20-30%
- 30-40%
- 40-50%
- 50-60%
- 60-85%
- No Data

Data source: European Values Study (2022)

Bonding social capital
- 0%
- 0.1-1%
- 1-2.5%
- 2.5-5%
- 5-10%
- 10-20%
- 20-30%
- 30-50%
- No Data

Data source: European Values Study (2022)

When it comes to the final explanatory variable, the general trend of values for regional shares of bonding social capital seem to largely be an elevated trend from the previous variable. Though with the noticeable exception that in general the EU is richer in bridging type social networks that bonding type social networks. This elevated trend implies that, while on the one hand the median (3.333) and mean (4.184) are considerably lower and again not that far apart for each other. On the other hand the average deviation from the mean (4.771) is even high than the mean itself, next to fact that the maximum value is much higher (47.826) too. This then not only suggest more or more extreme regional outliers. But also, when comparing the coefficients of variation for bridging (0.736) and bonding (1.140) social capital variables, that altogether bonding type data is even more spread out and more negatively skewed than bridging type data. Then when looking at the final map in Figure 4 these ideas are reflected, as here only three regions, Calabria, Liguria, and Oberfranken, that fit into to the top two categories (30-50%) of bonding type social networks. While the majority of countries and regions fit only in the average, below average, or even zero, categories. Another important distinction between both variables is that, whereas in Figure 3 spatial patterns were still distinguishable. In Figure 4 no such pattern can be detected outside of the high concentrations in Italian regions. Where especially the NUTS2 region of Calabria stands out containing significantly higher stocks of bonding type social networks (47.826) compared to the rest of the EU regions. A vague concentration of above average scoring regions is detectible in northern Europe, around the northern regions of the Netherlands and Germany. But for the zero, low, and average scoring countries and regions no such spatial concentrations can be pointed to. What is interesting to note though is that the spatial distribution of bonding and bridging social capital is relatively similar in the case of Italy, where regions high in bridging social capital are generally also the regions high in bonding social capital. Though this patterns is only noticeable in Italy as well as for some dispersed regions, it still provides some evidence to the idea put forward in the study of Muringani et al. (2021). Where the existence of regional bridging social capital is partially depended on the degree of bonding social capital in a region. Which also aligns with the findings of Echebarria, and Barrutia (2013), who state that is the interaction and mixing of both types of social capital in the regional context which produces better socio-

economic outcomes. As, according to Burt (2000), high bridging but low bonding social capital results in networks that lack internal consistency, and do not contain effective sanctioning or verification mechanisms. Whereas low bridging and high bonding results in the creation of network islands that do not support interaction with outsider information and resource flows, while low levels of both leads to amoral individualism or rent-seeking behaviour.

Table 2. *Pearson correlation coefficients.*

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. MNE_count										
2. EQI_index	.139**									
3. Brid_R_SC	.154**	.232***								
4. Bond_R_SC	.075	-.083	.447***							
5. GDP_PC	.246***	.751***	.420***	.072						
6. POP_DENS	.503***	.198**	.126*	-.029	.387***					
7. INVEST	.696***	.417***	.299***	.071	.621***	.499***				
8. INFRA	.152	.409***	.239**	-.004	.608***	.600***	.497***			
9. HC_TERT	.276***	.507***	.016	-.176*	.505***	.358***	.409***	.424***		
10. HC_SEC	.164**	-.106	.016	.108	-.255***	-.127*	-.064	-.403***	-.396***	
11. R&D_EXP	.358***	.551***	.235***	.030	.680***	.340***	.621***	.500***	.469***	-.010

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Table 2 shows the pairwise correlation between all the variables, and as discussed logarithmic transformations have been applied here again. It can first and foremost be reported that none of the correlation scores in this matrix are worryingly high ($r > |0.9|$). Which beforehand rules out problems of multicollinearity. What stands out next is that all explanatory variables have we weak positive correlation with the independent variable, though only regional's formal institutional quality and share of bridging social capital have statistically significant correlation, with respective correlation coefficients of *r = 0.139* and *r = 0.154*. Still, from a theoretical point of view, recalling the studies of Ascani et al. (2016), Santangelo et al. (2016), or Li, and Zhou (2017), this weak relationship might be due to industry specific interactions with institutions. Next to this though, for all control variables, except density of regions' road infrastructure, a significant positive correlation with the regional number of foreign subsidiaries is found. However the strength of this relationship varies considerably. As such, regions' share of population that has completed tertiary education or upper and post-secondary education, together with regional GDP per capita, all have only a weak relationship with MNE_count. Respectively, these variables have correlation coefficients of *r = 0.276*, *r = 0.164*, and *r = 0.246*. Opposing these are regional population density (*r = 0.503*) and gross fixed capital formation (*r = 0. 696*), which have a strong correlation with the number of foreign subsidiaries, respectively having a covariance of 25.3% and 48,4% with the independent variable. Based on the studies of Villaverde, and Maza (2015) and Castellani et al. (2016) these latter coefficients were to be expected. Though the weak correlation of region GDP per capita and MNE_count is surprising, as it is exactly contrary to what may be expected based on literature (Bénassy-Quéré et al., 2007; Nielsen et al., 2017; Bailey, 2019; Papageorgiadis et al., 2020). But as GDP per capita has also seen use as an indicator for higher labour costs in host economies, and it has subsequently been found to have a significant negative relationship with inward FDIs (Ascani et al., 2016; Fuentelsaz et al., 2020). This may explain the low correlation coefficient between the pair. Other than that, GDP per capita does have a very strong positive relationship with regions formal institutions quality (*r = 0.781*), similarity to findings of Bénassy-Quéré et al. (2007). Which relates back to North's (1990) original idea that good institutions lay at the foundation of economic development, and regional economic development is in part caused by, but also causes, higher quality formal institutions. Which help built trust, lower transaction costs, and promote entrepreneurship (Rodríguez-Pose, 2013). The quality of regional governments also has a significant positive relationship with bridging social capital, population density, gross fixed capital formation, motorway infrastructure, tertiary education attainment, and regional R&D expenditure. These signs and correlations among these variables are as

expected, based on findings of Charron et al. (2014; 2015) and Cortinovis et al., (2017). Suggesting that the improvement of regional formal institutions quality has associated with it a host of economic, innovative, and even social effects (Rodríguez-Pose, 2013; Rodríguez-Pose, & Garcilazo, 2015). In common with the finding of Muringani et al., (2021), bridging and bonding networks show a significant strong correlation with each other ($r = 0.447$), which explains 20% of the covariance between both variables. This again supports the idea that bonding and bridging social capital are not exclusive to each other, as people do operate in both types of social networks (Rutten et al., 2010). Moreover, this association also shows that bonding social capital is necessary for the formation of bridging social capital (Stroper, 2005; Stroper, 2013; Echebarria, & Barrutia, 2013). The final interesting note it that bridging social is positively correlated with all proxies of regions' economic and technological facets, in contrast to bonding social capital which altogether has no correlation with these proxies. This supports the idea that it is predominantly bridging social networks which aid in regional economic development and regional innovation networks (Putnam, 2000; Beugelsdijk, & Smulders, 2009; Crescenzi, & Gagliardi, 2015; Muringani et al., 2021).

4.2 The impact of formal and informal institutions on host region selection

The results of the General Model are reported in Table 3 showing unstandardized regression coefficients, standard errors, and their associated confidence intervals. Because a gradual approach was used, regression *(4)* reports the results of the full model. Whereas, regression *(1)* reports the results between regional subsidiary count and regional formal institutional quality. Regression *(2)* reports how regional subsidiary count is explained through both social capital variables. Then finally, regression *(3)* includes all explanatory variables without controls. Altogether these regression models are all statistically significant as shown by the F-statistics, but comparatively the fit of regression *(4)* is the highest with an AIC of 387.79. Whereas the runner up regression *(3)* has an AIC of 926.45. For the first two regressions both Adjusted R^2 are rather low, respectively 0.015 and 0.016, which is to say that formal institutional quality as well as regional social capital only explain variation of subsidiary count across sampled regions to a small extent. While the General Model explains 63.8% of the regional variance of the number of foreign subsidiaries across the European Union. Inspecting the coefficients, results in regression *(1)* show support for H1, in that higher formal institutional quality has a significant positive association with the number of subsidiaries in a given region. Or in other words, one can expect that regions with better formal institutions will attract significantly more foreign subsidiaries than regions with lower quality formal institutions. Which is in congruence with earlier literature as exemplified by the findings of Bailey (2018). Next to this, when considering the effects of both bridging and bonding social capital on the location choices of multinationals While controlling for each other, only bridging social capital has a significant positive association with the number of subsidiaries in a region. Whereas a negative association between bonding social capital and the location choices of multinational could not be found, thus supporting H2a but not H2b.

Yet there is more, because when the regression *(3)* and full model *(4)* are ran, all proposed hypotheses are falsified. As when controlling for the effect of bridging and bonding social capital, regional formal institutional quality becomes insignificant in regression *(3)*. Which is vice-versa also the case for bridging social capital. But more importantly, when controlling for regional endowments, formal institutional quality becomes a statistically significant negative explanator of regional subsidiary count. While bridging social capital becomes insignificant and bonding social capital stays insignificant. Taken together, this counterintuitively means that as formal institutional quality increases in a given region, while regional conditions are kept constant, the number of subsidiaries in that particular region decreases. This finding then aligns more to those of Holmes et al. (2013). Where if (regional) formal institutional quality increases, this also entails for example stricter regional regulations that MNEs have to abide by. Which ultimately deterrers MNEs for settling in these locations. Subsequently, applied to current research results this then means that: multinationals in general will want to avoid regions with stronger formal institutions, and instead look for regions with similar endowments that importantly have lower quality formal institutions. Which implies

some sort of trade of between forgoing less transaction costs, lower uncertainty, and better contract enforcement, for better regional economic conditions. Which is more similar to the results of Contractor et al. (2020). But also to those of Garci-Canal, and Guillén (2008), in that host countries (or regions) with weak institutions open up opportunities for MNEs to leverage their economic or technological power to negotiate advantages conditions making entry more profitable. Still, it is key to take into account two things when interpreting this finding. Firstly, the independent variable is blind to the sector of operations of sampled subsidiaries. Meaning the heterogeneity of industry specific preferences towards specific regions in general, but also toward regional institutions, is overlooked in the General Model (Spies, 2010; Ascani et al., 2016; Fuentelsaz et al., 2020). Therefore, even though MNEs in general are expected to be more attracted to EU regions with lower quality formal institutions that higher ones, sector specific tendencies are likely to colour this finding. Which could explain the particularly high number of subsidiaries in Romanian regions (Figure 1) in the face of low EQGI scores (Figure 2). Reflecting the potential that MNEs in this country could be presupposed to look for, and settle in, regions with lower quality formal institutions. Similarly, the insignificant effects of both types of social capital could also be industry specific. Where, in building on the ideas of Malecki (2012) and Crescenzi, and Gagliarda (2015), social capital is generally associated with better performing regional innovation systems. Which in relation to multinationals, allows for the expectation that knowledge intensive foreign subsidiaries are sensitive to regional stocks of bridging and bonding social capital. Whereas other industries, that rely less on knowledge, are expected to show no such preferences for regional social network (Swart, & Kinnie, 2003). Secondly, these findings might also reflect the strong effects of country outliers, for example the aforementioned case of Romania. The inclusion of which might produce these unexpected findings.

When it comes to controls, both regional population density and human capital endowments have a significant positive relationship with the independent variable, bolstering the findings of Villaverde, and Maza (2015) and Casi, and Resmini (2010). While to an even greater extent, judging from the Beta-coefficients in Table 9 of the Appendix, regional fixed capital formation has the biggest significant positive relationship with the number of foreign subsidiaries in a given region. Which altogether is to say that, keeping all other variables constant, multinationals are generally attracted to larger regional markets, where the population in generally well educated, and a healthy regional investment climate exists. Taking into account both the findings of Castalleni et al. (2016) as well as Buchanan et al. (2012), the positive effect of *POP_DENS* and *INVEST* can also suggest that MNEs are drawn to agglomeration economies, and the crowding-in effect of domestic investors. In contrast though, regional road infrastructure has a negative effect on the attraction of foreign subsidiaries which is contrary to expectations (Holmes et al., 2013), yet this is a result also found by Spies (2010). While finally regional market potential as well as regional technological endowments are not associated with the number of regional subsidiaries, which again is surprising in light of findings of Villaverde, and Maza (2015). This insignificant association of *R&D_EXP* is according to Crescenzi et al. (2016) to be expected though, again due to industry specific tendencies. Where MNEs only value regional innovative performance if hosted subsidiaries are used for the purposes of R&D, design, or development. Otherwise, if MNEs are technological laggards or altogether require less knowledge inputs, they are less interested in locating in technologically advanced regions. Therefore, because the latter group is more present in current dependent data, this cases this variable to be insignificant.

Table 3. *The effect of regional institutions on regional subsidiary count.*

Independent variable	(1)	(2)	(3)	(4)
(Intercept)	5.233 ***	5.146 ***	4.709 ***	-6.576 ***
	(0.314)	(0.327)	(0.404)	(0.942)
EQI_INDEX	0.012 *		0.011	-0.023 ***
	(0.006)		(0.006)	(0.007)
Brid_R_SC		0.265 *	0.194	-0.058
		(0.123)	(0.129)	(0.122)
Bond_R_SC		0.014	0.065	0.093
		(0.128)	(0.130)	(0.116)
GDP_PC				0.171
				(0.253)
POP_DENS				0.300 ***
				(0.087)
INVEST				1.019 ***
				(0.103)
INFRA				-0.253 *
				(0.095)
HC_TERT				0.055 ***
				(0.012)
HC_SEC				0.049 ***
				(0.006)
R&D_EXP				-0.253
				(0.285)
N	254	250	250	149
Adjusted R^2	0.015	0.016	0.025	0.638
F Statistic	4.953	3.023	3.144	27.102
	[0.027]	[0.050]	[0.026]	[0.000]

Note: Standard Errors are in parentheses. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. All partial regression coefficient are unstandardized (B).

4.3 Robustness of the General Model

In order to assess the robustness of results additional regression are ran for the General Model. To start, due to an increase of the standard error of *EQI_INDEX* in regression *(3)*, this points to collinearity with some other variable. Recalling Table 2 and the findings of Bénassy-Quéré et al. (2007), this is with the variable *GDP_PC*. Because as these authors state, GDP per capita has both an ambiguous effect on inward FDI, as well as a positive correlation with formal institutional quality. Meaning that the correlation between regional formal institutional quality and number of subsidiaries in a region, could also just stem from the impact of institutions on GDP per capita. However the exact relationship is somewhat confusing since *EQI_INDEX* is a negative predictor. Though following the findings of Ascani et al. (2016) and Fuentelsaz et al. (2020), GDP per capita may in fact also act as a negative predictor. Proxying higher wage levels which on its own is also linked to higher formal institutional quality (Bénassy-Quéré et al., 2007). Then if both are deterrents to MNE activity, but they also exert collinearity. Excluding either GDP per capita or formal institutional quality would likely yield a better model, as such regression *(5)* is ran excluding *GDP_PC*. Next to this, as addressed in the methodology, there is considerable amount of missing values for the *INFRA*, and to a lesser extent *R&D_EXP*, reducing the number of valid observations of the General Model to 149. Additionally, this is also caused by missing data for the UK in the variables *GDP_PC* and *INVEST*. Thus in order test what happens to the association of explanatory variables if these variables are excluded, and previously unsampled regions are include. Two additional regressions, *(6)* and *(7)*, are ran in order to test the robustness of results obtained in the General Model. Regression *(6)* shows regression coefficient without the *INFRA* variable and *R&D_EXP* variable, while for regression *(7)* is without the *INFRA* variable together with the *GDP_PC* and *INVEST*. Finally, the outlier Romania is left out in regression *(8)* in order to assess potential changes in results. The results of these robustness checks are given in Table 10 of the Appendix, where regression *(3)* is included for comparison of results from the General Model.

When excluding regional GDP per capita from the analysis, minor but important changes are noticeable. To start formal institutional quality remains significantly negative, though the regression coefficient is lower. But more importantly the standard error is also lower, which indicats that collinearity is removed by excluding *GDP_PC* from the analysis. Additionally, the fit of the overall model is better, as regression *(4)* has an AIC of 387.79 while regression *(5)* has one of 385.92. In total this warrants the exclusion of GDP_PC form all subsequent analysis due to the insignificance and collinearity issues of the variable. Following this, disregarding region's infrastructural and technological endowments. Regression *(6)* shows no considerable changes in regression coefficients or confidence intervals. Only in regression *(7)*, when the controlling effect of regional fixed capital formation is excluded and thus the UK is included into the sample, then formal institutional quality has an insignificant association with the number of subsidiaries in EU regions. While, with all other variables being constant, regional R&D expenditure becomes significantly positive. Which would suggest that in this country more subsidiaries are established to with the goal of seeking out innovative environments as to then tip the significance of the variable. Finally in regression *(8)*, even with the exclusion of Romania the significant negative effect of formal institutional quality remains. While both social capital variables remain insignificant too. Therefore, overall these checks support the falsification of all three proposed hypotheses.

4.4 Regional institutions and subsidiaries' industry specific tendencies

Moving to the results of the Derived Models, Table 4 reports the results of the ZIP regression for Derived Model *(2)*. Looking at the highest and lowest regression coefficients of the industry dummies, one is able to identify that MNEs operating in the wholesale trade are most attracted to regions of the European Union, whereas MNEs operating in the mining of coal and lignite are least attracted. A finding which ultimately holds even when changing to different reference groups. More importantly however, when inspecting regression coefficient in the count component of ZIP regression. It is shown that even when controlling for regional location patterns, and while keeping all other variables constant, regional formal institutional quality

remains to have a significantly negative association with the number of foreign subsidiaries in a region. Thus again underpinning the idea that what 'good' institutions are is a matter of perspective (North, 1990), as in general subsidiaries in the context of the EU favour regions with lower quality governments. Forgoing higher quality formal institutions that will reduce uncertainty, aid in the protection of property rights, and support unbiased market competition (Bailey, 2018). This falsification of H1 implies then that more weight is put on negative aspects of higher formal institutional quality which includes things like, stricter regional legal rules (Holmes et al., 2013), or less sway in regional governmental decision making (Garci-Canal, & Guillén, 2008). Wherein, the majority of sampled subsidiaries seem to want to forgo regions with higher quality formal institutions and settle in regions where they can use weaker formal institutions as a competitive advantage. Much like the 'off-shoring' of pollutive manufacturing parts of MNEs global value chains in the study of Li, and Zhou (2017), or bypassing transparent market mechanisms as stated by Ascani et al. (2016).

However, the logit regression in Table 4 (right column) is able to provide some nuance to this finding. Because the straightforward conclusion that making regional formal institutional quality worse will linearly lead to more foreign subsidiaries in regions is illogical. Not only because this would have determinantal socio-economic consequences for regions in general (Rodríguez-Pose, 2013), which by extension again would lead to less inward FDIs in itself (Globerman, & Shapiro, 2003; Ali et al., 2010; Bailey, 2018). But when applying the findings of Kurul (2017) in reverse, it is more likely that a non-linear relationship between regional formal institutional quality and MNE location choices exists. Because as shown by significant negative coefficient of *EQI_INDEX* ($b = -0.013$) in the logistic regression. This results implies that: an increase in regional formal institutional quality reduces the probability that regional subsidiary count is zero, while controlling for regional conditions and regional location patterns. Or in other words, this points to a non-linear relationship where at some point formal institutional quality is 'high enough' that is will not attract significantly more subsidiaries to the region. As to instead deter them because of stricter formal institution that inhibit MNE flexibility (Contractor, et al., 2020). Moreover, if formal institutional quality would have a truly negative association, a positive coefficient for the variable should be expected. Similarly to the variable *INVEST* which does have positive linear relationship with regional subsidiary count. Though this result is only an implication as the logistic regression only predicts 'excess zeros' not actual zeros.

Moving on to other results, both social capital variables exert a statistically positive association with the number of regional foreign subsidiaries in this model. Meaning that if regional participation in either types of social network increases, everything else being constant, subsequently more subsidiaries will tend to settle in these regions. Though these results confirm H2a but reject H2b, this finding is more akin to the findings of Zhao, and Kim (2011) and Lu et al. (2018). Where increases in regional associational activity, which is neither bridging nor bonding per se, has a positive influence on inward FDI while also increasing the performance of subsidiaries in affected regions. Which is to say that for MNEs in general, bridging and bonding social capital do not have opposing relationships. But instead a potentially complementary one when it comes to attracting regional multinational activity (Storper, 2013). Where, similar to the mixing effect of social capital in regional innovation systems (Echebarria, & Barrutio, 2011), it is the combination of both types of regional social networks that provide MNEs with opportunities to contact individuals and organizations of various backgrounds and professions (Coleman, 1990; Mondolo, 2019). As both provide them with the means to connect to alternative sources of timely and tested market information that helps with opportunity identification (Johanson, & Vahlne, 2009). Which then results in decreased liability of foreignness as foreign firms are able to tap into regional business networks (Zajac & Westphal, 1996; Zhao, & Kim, 2011). Looking at controls, the influence of regional endowments is largely the same as in regression (4), with the only noticeable difference that regional technological endowments have statistically negative association with the number of foreign subsidiaries in a region.

Table 4. *The effect of regional institutions with industry dummies.*

Independent variables	COUNT COMPONENT	ZERO COMPONENT
(Intercept)	-8.709 ***	7.460 ***
	(0.052)	(0.757)
EQI_INDEX	-0.023 ***	-0.013 ***
	(0.000)	(0.003)
Brid_R_SC	0.123 ***	0.119
	(0.006)	(0.065)
Bond_R_SC	0.157 ***	0.046
	(0.005)	(0.061)
POP_DENS	0.266 ***	-0.287 ***
	(0.003)	(0.050)
INVEST	0.843***	-0.945 ***
	(0.004)	(0.057)
INFRA	-0.279 ***	0.207 ***
	(0.004)	(0.048)
HC_TERT	0.072 ***	-0.043 ***
	(0.000)	(0.006)
HC_SEC	0.045 ***	-0.040 ***
	(0.000)	(0.003)
R&D_EXP	-0.785 ***	-0.109
	(0.012)	(0.151)
Dummy_IND = 46	2.891 ***	-1.729
	(0.023)	(1.137)
Dummy_IND = 5	-3.263 ***	4.043 ***
	(0.307)	(0.956)
N		9,708
Log *L*		-93386.1

Note: Standard Errors are in parentheses. *** $p < 0.001$; **$p < 0.01$; * $p < 0.05$. Reference category is 2-digit NACE 10. Other industry dummies are included but coefficients are not given.

As for the final model, Table 5 reports the findings of Derived Model *(3)*, broken down into four different ZIP regression in order to look for industry specific preferences towards explanatory variables. In short, these results establish that there is merit to the choices made by Ali et al. (2010), Crescenzi et al. (2014), Ascani et al. (2016), and Castellani et al. (2016) to look at specific industries, or compare groups of industries, when analysing location determining effects of specific factors. Because current findings show that there are distinguishable differences in industry preferences towards at least regional informal institutions. To start though, across all industry groups regional formal institutional quality has a negative association with the number of foreign subsidiaries. As all coefficients of *EQI_INDEX* are statistically significant and negative, therefore again H1 is not supported. The exact cause of this negative association for each groups is not explicitly stated in literature, but as before there is precedent of this finding is earlier studies (Holmes et al., 2013; Fuentelsaz et al., 2020). For example Ascani et al. (2016) find that property rights protection is only important to a minority of high-tech manufactures, as they suggest that MNEs operating in these sectors might strategically exploit weaker enforcement of property rights to facilitate learning and upgrading from domestic firms. Which can be viewed as an extension of the finding that MNEs locate near domestic companies if the latter enjoy a significant comparative advantage in the relevant sector (Mariotti et al., 2010). Subsequently allowing them to to exploit and internalize localized knowledge spill-over and develop internal assets and competences. Moreover, since this relationship is moderated by formal institutional quality (Li, Zhang, & Sun, 2018), weaker formal institutions could increase the chance and volume of knowledge spill-over for subsidiaries in KIS and high-tech manufacturing. Yet at the same time, following theory established by Papageorgiadis et al. (2020), this would leave innovation driven MNEs themselves also open to expropriation and copying in places where the protection of IPR is weak. Similarly, but unrelated to knowledge spill-over, the negative association between number of foreign subsidiaries in LKIS and low-tech manufacturing with formal institutional quality might be because of stronger business and labour regulations associated with higher formal institutional quality (Holmes et al., 2013). Which represent and obstacle to these industry groups of lower level sophistication, as they seek flexible labour and business environments (Ascani et al., 2016; Contractor et al., 2020). Thus deterring these types of MNEs from regions with higher EQGI scores.

However, unlike all previous models, this model does show support for both H2a and H2b. In that, when it comes to subsidiaries operating in KIS and high-tech manufacturing, the respective attracting and deterring of both types of social networks can be confirmed. Reflected by the fact that the number of subsidiaries in these industry groups in a given regions, has a statistically significant positive association with the regional share of bridging social capital. With respective regression coefficients of $b = 0.185$ and $b = 0.169$ (p<0.001). As opposed to the significant negative association with regional shares of bonding social capital, with respective coefficients of $b = -0.058$ and $b = -0.098$ (p<0.001). These results may then be viewed as an extension of Social Network Theory (Burt, 1992; 2000), wherein structural holes (bridging social capital) are associated with more performance enhancement while the network closure argument (bonding social capital) has negative effects associated with it. Which it so say that regional social networks that bridge connections between groups of individuals and organisation provide knowledge intensive subsidiaries with access their to required knowledge inputs from domestic firms and other sources of localized knowledge (Mariotti et al., 2010; Jindra, Hassan, & Cantner, 2016). A process which is opposed by the effects of regional social networks that are characterised by network closer (Coleman, 1990). Which are more likely to hamper and potentially even ostracize these subsidiaries in the search for local embedding and knowledge (Olson, 1982; Crescenzi, & Gagliardi, 2015). Meaning it is bridging social capital that helps KIS and high-tech manufacturing subsidiaries with identification of investment opportunities and access to locally embedded resources, specialised inputs, and localized information flows (Johanson, & Vahlne, 2009; Dearmon, & Grier, 2011; Meyer, Mudambi, Narula, 2011). Which subsequently makes regions that house higher shares of bridging social networks more attractive to these types of MNEs. While regions that are dominated by bonding social networks deters these MNEs from settling.

Table 5. *The industry specific effects of regional institutions.*

Independent variable	(KIS)	(LKIS)	(HIGH)	(LOW)
(Intercept)	-1.829***	-0.369***	-0.498*	1.063***
	(0.052)	(0.031)	(0.198)	(0.095)
EQI_INDEX	-0.022***	-0.028***	-0.012***	-0.019***
	(0.000)	(0.000)	(0.001)	(0.001)
Brid_R_SC	0.185***	0.210***	0.169***	0.167***
	(0.008)	(0.005)	(0.031)	(0.017)
Bond_R_SC	-0.058***	0.047***	-0.098***	-0.026
	(0.007)	(0.005)	(0.028)	(0.015)
POP_DENS	0.343***	0.374***	0.251***	0.013***
	(0.004)	(0.002)	(0.017)	(0.010)
HC_TERT	0.086***	0.067***	0.021***	0.027***
	(0.001)	(0.000)	(0.003)	(0.002)
HC_SEC	0.025***	0.025***	0.008***	0.008***
	(0.001)	(0.000)	(0.002)	(0.001)
R&D_EXP	-0.277***	-0.206***	0.499***	-0.588***
	(0.013)	(0.009)	(0.053)	(0.033)
N	4130	3279	460	2464
Log *L*	-64630.22	-172035.3	-2244.22	-10874.38

Note: Standard Errors are in parentheses. *** p < 0.001; **p < 0.01; * p < 0.05. For the logistic regression part of the ZIP regression (ZERO COMPONENT) see Appendix Table 11.

In addition to this, while the attraction effect of bridging social capital extents to all types of industry groups, given the significant positive coefficient of *Brid_R_SC* in all regression of Table 5. Regional shares of bonding social networks only have a significant positive association with the number of subsidiaries operating in less knowledge-intensive services. Which indicates that particularly this group of multinationals experiences some sort of benefit in relation to Olson type groups that others do not. Which makes them, though still to a lesser extent than bridging type social networks, also more likely to settle in regions that have higher regional shares of this type of social network. Though the exact mechanisms behind this positive association would require further research, it does show that there is a substitutional effect of both types of social capital for these types of MNEs as regions having dominating shares in either are attractive settling locations (Storper, 2013). While finally, only H2a could be verified for low-tech manufacturing subsidiaries, as their numbers did not have any statistically signification association with bonding type social networks. Or in other words, they are more attracted to regions with higher share of bridging social capital, while not being

particularly deterred or attracted by higher share of bonding types social networks in a potential host region.

Finally when it comes to controls, all groups have a positive association with population density. Which, following Castellani et al. (2014), and Ascani et al. (2016) is partially to be expected, in that market-seeking multinationals (LKIS and low-tech manufacturing) are interested in larger regional demand. While the positive association for KIS and high-tech manufacturing is more likely to indicate attraction to agglomeration economics and the potential for knowledge spill-over (Mariotti et al., 2010; Castellani et al., 2016). While in similar sense, both types of human capital have a positive association with all types of foreign subsidiaries. Which means subsidiaries of all industry groups are attracted to educated regional labour pools. Even if there is a noticeable difference between subsidiaries operating in services as opposed to those in manufacturing, the former having a more pronounced positive association with human capital. Moreover, there is also no evidence to suggest that there is necessarily a difference between knowledge intensive versus knowledge extensive foreign subsidiaries, which is more implied in literature (Ascani et al., 2016). Rounding up, for all but high-tech manufacturing, a negative association in between regional technological endowments and number of subsidiaries is found, which is surprising in the light of findings in literature (Siedschlag, Smith, Turcu, & Zhang, 2013; Crescenzi et al., 2014). It is however not a unique finding, as a similar result is found by Spies (2010), thought no specific theoretical reasoning is given. Then bundling all these results, the idea that industry specific preferences towards institutions colour the findings of the general relationship between MNEs and regional institutions can be partially supported. In that it mainly applies to informal regional institutions, while the overall negative association between regional number of subsidiaries and formal institutions remains significant. Still, falling back on the finding of Kurul (2017), likely a non-linear relationship is at the core of this later relationship.

5. Conclusion and discussion

In light of the efforts made in Economic Geography and International Business to develop a better understanding of how the institutional environments of host economies effect the location choices of multinational enterprises around the world. Thereby providing an alternative lens to the analytical toolkit that is aimed at finding and explaining location determining factors of international business activities. Current research findings contribute to this larger body of work by exploring the, until now, underdeveloped influence of regional formal and informal institutions. While at the same time also incorporating into analysis the novel influence of social capital, as conceptualized by Putnam et al. (1993). Providing an distinctively different interpretation of informal institutions other than culture or cultural distance. This was achieved by analysing the specific context of the European Union, which represents a distinctive environment where regions directly compete with each other to attract multinationals (Basile et al., 2009). Subsequently allowing for highlighting the influence of regional institutional conditions over that of national institutions, while also proving to be a useful area of analysis from a data driven point of view due to the data rich regional environment the EU represent.

Accordingly, putting together these highlights. By enlarge current analysis results mostly challenge, and provide important nuance to, established findings in the field of institutional location determinants. More specifically, when it comes to regional formal institutions. Wherein current literary understanding establishes that higher quality formal institution generally works towards attracting multinationals (Bailey, 2018). Instead current study results showed that, across all employed estimation models, regional formal institutional quality was repeatedly found to have a negative association with the number of foreign subsidiaries in EU regions. A finding which even holds when looking at subsidiaries that require knowledge as a key input. Which is surprising given the fact that literature establishes that these types of MNEs are most vulnerable to spill-over effects of intangible assets toward domestic competitors, meaning they stand to gain most from improvements in the quality of regional formal institutions (Papageorgiadis et al., 2020). This altogether implies that MNEs forgo better regional formal institutions, that they may deem to strict, to instead settle in regions where the quality of regional governments is lower but regional endowments are the same. An overall still not unique finding though, as evidenced by the studies of Holmes et al. (2013), Ascani et al. (2016), and Fuentelsaz et al. (2020). In following Li, and Zhou (2017), there could also be an alternative explanation to this negative association. In that there exists some level of regional formal institutional arbitrage. Where less capable MNEs, technologically or otherwise, which aim to settle in the EU. Will find it hard to confirm to costly and challenging higher quality regional formal institutional standards, present in otherwise alluring regions. As a result of which, while keeping in mind that the EU represents an integrated area where MNEs choose between regions (Basline et al., 2009), these less capable MNEs will be pressed to choose between subpar formal institutional environments. Picking host regions that are most cost-effective, providing some formal institutions benefits while also taking into account that this brings with it coordination costs and regulatory risks due to those same host regions lacking formal institutional environments. This may then be reflected in results by the statistically negative association. One final alternative explanation that is also worth mentioning, as is actually has some specific results associated with it. Is to point to a non-linear relationship between regional subsidiary count and regional formal institutional quality. Wherein based on the findings of Kurul (2017), it may be the case that there is an inverted U-shape where at some point additional improvements in formal institutional quality actually deter more subsidiaries from settling as regional conditions are too strict.

Next to these results, the overall influence of regional informal institutions is more mixed. Wherein building on literature about the associational facet of social capital, differentiating between social networks that create social capital either through bridging and

bonding social networks (Cortinovis et al., 2017; Muringani et al., 2021). Which respectively were theorized to have attracting effects on MNE activity, next to deterring effects on MNE activity. It was found that only when regional location patterns were accounted for, or when specific industry groups were compared. Then both types of social capital were significantly associated with regional subsidiary counts. Which in other words means that in general the sub-national location choices of multinationals were not influenced by this type of informal institution. To then instead show the empirical importance of differentiating between industry specific preferences when determining the effects of regional informal institution. As specifically knowledge requiring subsidiaries' location choice do seem to be significantly affected by the positive influence of bridging social capital, as opposed by the negative influence of bonding social capital. Which then further validates, among other studies, the empirical techniques of Ali et al. (2010), Crescenzi et al. (2014), Ascani et al. (2016), and Castellani et al. (2016).

Putting all findings together in order to provide an answer to the main research question, this then means that: overall the quality of regional formal institutions negatively influence the sub-national location choices of multinational enterprises; whereas informal institutions display no such general relationship, as only when regional location patterns or industry of operations are taking into account, then social capital has mixed effects that both negatively and positively influence sub-national location choices. These findings then have some challenging policy implications. As unlike the proven method of devising specific regional policies that aim to promote regional attraction of inward FDIs (Crescenzi, 2021). Current results suggest that improvements of regional governmental quality actual have a negative effect on inward activity of international businesses. Or at least, this is the case for regions which already meet a certain level of regional governmental quality. Beyond which improvements only lead to MNEs being deterred from settling. Though one could argue that this may be an erroneous conclusion, as current dependent data does provide a bearing on value-added activities of sampled subsidiaries. But as a counter to this idea, the very fact that this relationship also holds for KIS and high-tech manufacturing subsidiaries proves as much. Moreover, as bridging social capital was found the be an effective location determining factor. It may then be suggested to improve regional participation in bridging social networks. But in general, effecting informal institutional change is a challenge of its own, due to embedded and incrementally changing nature of these types of institutions (Reed, 1996; Tabellini, 2010). Nonetheless, one avenue that might be fruitful to achieve this goal is employing the European Social Fund Plus, as part of the EU's Cohesion Policy. A policy directive that already aims to create a socially inclusive EU society, while also promoting active participation in civil society (European Commission, 2021c). This plan may then lend itself well as a platform to for example creating public-private meeting groups open to foreign firm participation. Stimulating the important process of foreign subsidiaries embedding themselves in the local context (Meyer et al., 2011).

Overall there are also some limitation to current research findings which may prove to be avenues for future research. This starts with recognizing that current analysis is only based on cross-sectional data, importantly effecting the power of results as changes in institutional preferences are not captured (Nielsen et al., 2017). Future research should thus aim to include longer time series, while in general also further developing understanding of the influence of regional (institutions) conditions on the location choice of multinationals (Hutzschenreuter et al., 2020). Which may be challenging when using inward FDI stock or flow data (Casi, & Resmini, 2010: Villaverde, & Maza, 2015), but nonetheless necessary in light of current findings. Furthermore, though the EGQI represents a unique and scarce empirical recourse that allows for measuring specifically the quality of regional governments. It nonetheless provides a limited scope on the influence of regional formal institutions, as shown by Holmes et al. (2013), Bailey (2018), and Comi et al., (2019) who provide additional (regional) formal

institutional factors which may affect sub-national MNE location choices. Thus setting the stage for future research to find and determine the effect of additional measures that proxy other facets of regional formal institutions. Moreover, the implication that there may be an inverted U-shape relationship between regional subsidiary count and regional governmental quality. It should be handled with care as the specific estimation method used is not well suited to test for this kind of relationship (Loeys et al., 2012). Though it does invite future research to employ methods to investigate if such a non-linear relationship exists. Where improvements of for example (regional) regulatory institutions at some point becomes a negative influence, and instead other factors like formal institutional flexibility are required. Thus altogether supplementing the research results of Kurul (2017). Finally, sectoral preferences of institutional location determinants require incorporation in future analyses. Something which has shown to be relevant in past research (Crescenzi et al., 2014; Ascani et al., 2016). While again current findings show how this incorporation lead to more nuanced findings on the influence of institutional determinants. This all it to say that the EU represents a data rich sub-national environment which offers many different avenues to construct both novel formal and informal institutional datasets. Finding and employing them for empirical analysis would greatly deepen current understanding of institutional determinants of multinationals' foreign activities. Intern providing additional insights which may be used in policy to strengthen (regional) innovative potential as well as aid economic growth, through foreign subsidiary presence.

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Appendix

Table 6. List of included regions.

List of NUTS2 regions (NUTS 2010 classification)									
AT11	**CY0**	DE73	**EE0**	ES52	HU10	ITI2	PL34	SE23	UKG3
AT12	CZ01	DE80	EL11	ES53	HU21	ITI3	PL41	SE31	UKH1
AT13	CZ02	DE91	EL12	ES61	HU22	ITI4	PL42	SE32	UKH2
AT21	CZ03	DE92	EL13	ES62	HU23	**LT0**	PL43	SE33	UKH3
AT22	CZ04	DE93	EL14	FR10	HU31	**LU0**	PL51	SI01	**UKI**
AT31	CZ05	DE94	EL21	FR11	HU32	**LV0**	PL52	SI02	UKJ1
AT32	CZ06	DEA1	EL22	FR12	HU33	**MT0**	PL61	SK01	UKJ2
AT33	CZ07	DEA2	EL23	FR13	**IE0**	NL11	PL62	SK02	UKJ3
AT34	CZ08	DEA3	EL24	FR14	ITC1	NL12	PL63	SK03	UKJ4
BE10	DE11	DEA4	EL25	FR15	ITC2	NL13	PT11	SK04	UKK1
BE21	DE12	DEA5	EL30	FR16	ITC3	NL21	PT15	UKC1	UKK2
BE22	DE13	DEB1	EL41	FR17	ITC4	NL22	PT16	UKC2	UKK3
BE23	DE14	DEB2	EL42	FR18	ITF1	NL23	PT17	UKD1	UKK4
BE24	DE21	DEB3	EL43	FR19	ITF2	NL31	PT18	UKD3	UKL1
BE25	DE22	DEC0	ES11	FR20	ITF3	NL32	RO11	UKD4	UKL2
BE31	DE23	DED2	ES12	FR21	ITF4	NL33	RO12	UKD6	UKM2
BE32	DE24	DED4	ES13	FR22	ITF5	NL34	RO21	UKD7	UKM3
BE33	DE25	DED5	ES21	FR23	ITF6	NL41	RO22	UKE1	UKM5
BE34	DE26	DEE0	ES22	FR24	ITG1	NL42	RO31	UKE2	UKM6
BE35	DE27	DEF0	ES23	FR25	ITG2	PL11	RO32	UKE3	UKN0
BG31	DE30	DEG0	ES24	FR26	ITH1	PL12	RO41	UKE4	
BG32	DE40	DK01	ES30	FR27	ITH2	PL21	RO42	UKF1	
BG33	DE50	DK02	ES41	FR28	ITH3	PL22	SE11	UKF2	
BG34	DE60	DK03	ES42	FR29	ITH4	PL31	SE12	UKF3	
BG41	DE71	DK04	ES43	FR30	ITH5	PL32	SE21	UKG1	
BG42	DE72	DK05	ES51	FR31	ITI1	PL33	SE22	UKG2	

Source: European Commission, 2011

Table 7. List of included two-digit NACE (Rev. 2) sectors.

High-tech manufacturing (in bold) + Knowledge-intensive services		Low-tech manufacturing (in bold) + Less knowledge-intensive services		Other industries	
21	72	**10**	47	5	29
26	73	**11**	49	6	30
50	74	**12**	52	7	33
51	75	**13**	53	8	35
58	78	**14**	55	9	36
59	80	**15**	56	19	37
60		**16**	68	20	38
61		**17**	77	22	39
62		**18**	79	23	41
63		**31**	81	24	42
69		**32**	82	25	43
70		45	95	27	
71		46		28	

Source: Eurostat, 2008

Table 8. Overview of regional variables

Table 8. *Overview of regional variables*

Variable	Meaning	Definition	Source (year)
Dependent variable			
MNE_count	Number of foreign subsidiaries per region	Logged subsidiary count	Bureau Van Dijk (2013)
Explanatory variables			
EQI_INDEX	Regional formal institutional quality	EU regional QoG index scores	EQGI (2013)
Brid_R_SC	Regional share of bridging social capital (logged)	Participation in voluntary association that encourage relationships between dissimilar or unfamiliar people, termed Putnam groups: ● Social welfare organisation ● Religion related organisations ● Cultural activities ● Local community action ● Human rights groups ● Environmental groups ● Youth work ● Sport clubs ● Women's organisations ● Peace movements ● Health organisation	EVS (2008)
Bond_R_SC	Regional share of bonding social capital (logged)	Participation in voluntary association that encourage relationships between similar or familiar people, termed Olson groups: ● Labour unions ● Professional organisations ● Political parties	EVS (2008)
Control variables			
GDP_PC	Regional gross domestic product per capita (originally in thousands of euros at current market prices)	Logged GDP over regional population	ARDECO (2013)
POP_DENS	Regional population density	Logged persons per square kilometre	Eurostat (2013)
INVEST	Regional investments (originally in millions of euros current market prices)	Logged gross fixed capital formation	ARDECO (2013)
INFRA	Regional physical infrastructure	Logged kilometres of road networks per thousand thousand square kilometres	Eurostat (2013)
HC_TERT	Regional human capital (ISCED levels 5-8)	Percentage of total regional population aged 25-64 that completed tertiary education	Eurostat (2013)
HC_SEC	Regional human capital (ISCED levels 3 and 4)	Percentage of total regional population aged 25-64 that completed upper secondary and post-secondary education	Eurostat (2013)
R&D_EXP	Regional research and development expenditure	Logged R&D spending as a percentage of GDP	Eurostat (2013)

Table 9. *The effect of regional institutions on regional subsidiary count – standardized coefficients.*

Independent variables	(1)	(2)	(3)	(4)
(Intercept)	5.898 ***	5.913 ***	5.913 ***	6.090 ***
	(0.096)	(0.097)	(0.096)	(0.069)
EQI_INDEX	0.215 *		0.185	-0.424 ***
	(0.097)		(0.102)	(0.125)
Brid_R_SC		0.233 *	0.171	-0.050
		(0.109)	(0.113)	(0.106)
Bond_R_SC		0.012	0.055	0.073
		(0.109)	(0.111)	(0.091)
GDP_PC				0.106
				(0.156)
POP_DENS				0.328 ***
				(0.096)
INVEST				0.980 ***
				(0.099)
INFRA				-0.286 **
				(0.107)
HC_TERT				0.490 ***
				(0.105)
HC_SEC				0.723 ***
				(0.094)
R&D_EXP				-0.102
				(0.115)
N	254	250	250	149
Adjusted R^2	0.015	0.016	0.025	0.638

All continuous predictors are mean-centred and scaled by 1 standard deviation. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Independent variables	(4)	(5)	(6)	(7)	(8)
(Intercept)	-6.576 ***	-6.454 ***	-5.949 ***	-0.367	-6.662 ***
	(0.942)	(0.923)	(0.657)	(0.653)	(0.857)
EQI_INDEX	-0.023 ***	-0.020 ***	-0.020 ***	-0.009	-0.015 **
	(0.007)	(0.005)	(0.005)	(0.006)	(0.005)
Brid_R_SC	-0.058	-0.035	-0.107	0.131	0.003
	(0.122)	(0.117)	(0.094)	(0.109)	(0.107)
Bond_R_SC	0.093	0.095	0.156	0.118	0.087
	(0.116)	(0.116)	(0.096)	(0.112)	(0.107)
GDP_PC	0.171				
	(0.253)				
POP_DENS	0.300 ***	0.308 ***	0.237 **	0.582 ***	0.289 ***
	(0.087)	(0.086)	(0.076)	(0.081)	(0.080)
INVEST	1.019 ***	1.039 ***	1.075 ***		0.976 ***
	(0.103)	(0.099)	(0.086)		(0.091)
INFRA	-0.253 **	-0.241 *			-0.161
	(0.095)	(0.093)			(0.089)
HC_TERT	0.055 ***	0.055 ***	0.025 *	0.043 ***	0.059 ***
	(0.012)	(0.012)	(0.011)	(0.013)	(0.011)
HC_SEC	0.049 ***	0.047 ***	0.034 ***	0.034 ***	0.046 ***
	(0.006)	(0.006)	(0.005)	(0.007)	(0.006)
R&D_EXP	-0.253	-0.219		0.563 *	-0.109
	(0.285)	(0.280)		(0.261)	(0.258)
N	149	149	215	236	141
Adjusted R^2	0.638	0.640	0.614	0.361	0.681

Table 10. *Robustness of General Model.*

Note: Standard Errors are in parentheses. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. All partial regression coefficients are unstandardized (B).

Table 11. *The industry specific effects of regional institutions – zero component*

Independent variable	(KIS)	(LKIS)	(HIGH)	(LOW)
(Intercept)	4.594***	4.052***	6.088*	2.984***
	(0.312)	(0.349)	(1.090)	(0.359)
EQI_INDEX	0.009**	-0.001	0.009	0.017***
	(0.003)	(0.003)	(0.010)	(0.004)
Brid_R_SC	-0.174***	-0.148**	-0.048	-0.025
	(0.047)	(0.056)	(0.171)	(0.061)
Bond_R_SC	-0.070	-0.112	-0.129	-0.059
	(0.048)	(0.060)	(0.173)	(0.062)
POP_DENS	-0.505***	-0.518***	-0.753***	-0.217***
	(0.040)	(0.049)	(0.152)	(0.046)
HC_TERT	-0.046***	-0.019**	-0.053*	-0.035***
	(0.006)	(0.007)	(0.021)	(0.007)
HC_SEC	-0.018***	-0.025***	-0.029**	-0.036***
	(0.003)	(0.003)	(0.009)	(0.004)
R&D_EXP	-0.421***	-0.578***	-1.352**	-0.659***
	(0.116)	(0.152)	(0.458)	(0.151)
N	4130	3279	460	2464
Log *L*	-64630.22	-172035.3	-2244.22	-10874.38

Note: Standard Errors are in parentheses. *** $p < 0.001$; **$p < 0.01$; * $p < 0.05$. For the Poisson regression part of the ZIP regression (COUNT COMPONENT) see Table 6.