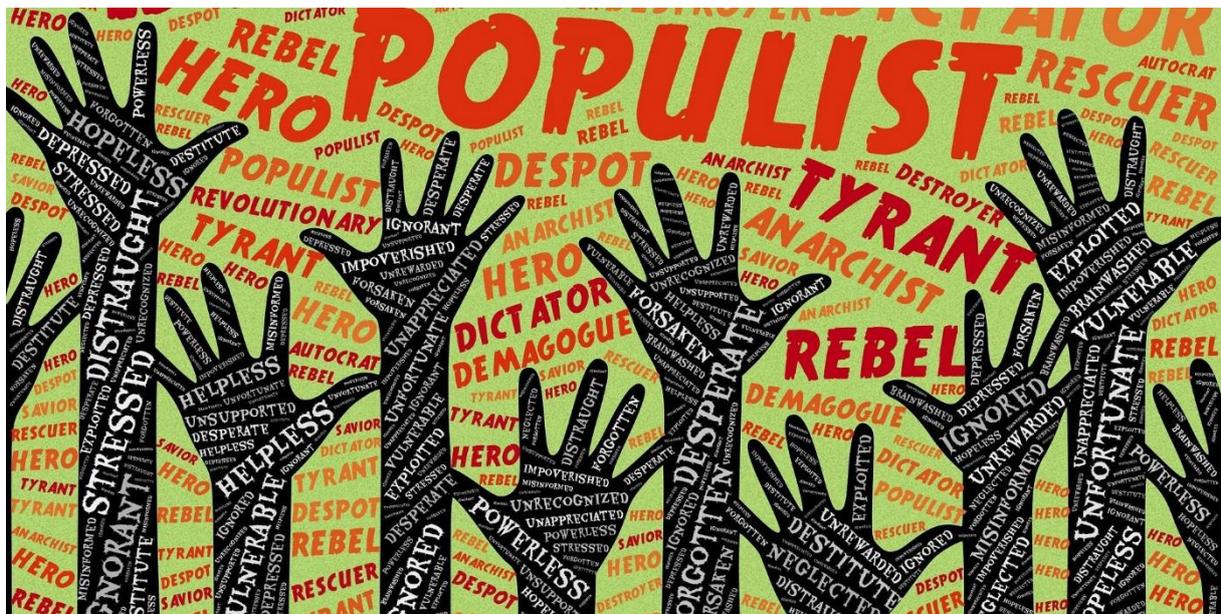


# The power to bite back.

*How a lack of FDI's can lead to populism in places that don't matter.*



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## Acknowledgement

*“The insight that economics impacts politics as much as politics impacts economics lies at the heart of political economy. This circle of causation is at the centre of research on the political economy of inequality. Democracy, political stability and executive constraints all appear to be more feasible in more equal societies. Public policies towards redistribution and human capital can make societies more equal.” (Glaeser, 2005).*

Before you lies a thesis that validates this quote. By creating a holistic model of Europe on the smallest scale possible, this thesis showed the impact of economics on politics and of politics on economics. By using spatial regression analysis in R, this thesis proved that FDI's increase both inequality between regions and within regions, that this inequality then helps fuel populism, but that FDI's do not directly influence populism.

Before you also lies a thesis that was heavily delayed. This delay had many reasons. One reason was the pursuit of a complete dataset of the European Union on a NUTS 3 scale covering more than 20 variables, which required a lot of manual, non-automated, work and some self-taught understanding of the Greek and Cyrillic alphabet. Another was the fact that this dataset should be analysed in R, a programming language I had very little experience with before starting the analysis. A less academic reason was the fact that during the first year not my thesis but my health was my first priority as I had been diagnosed with a malignant tumour that has never before been identified. Finally, working three days a week has also not allowed me to keep momentum on this project.

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## **Introduction**

Economic geographers seek to explain differences in space through measurements of economic outputs. By looking at Foreign Direct Investments (FDI's) or patent data, they can predict which regions will thrive and which will lag behind. Vice versa, they can look at regional characteristics and predict the size of FDI flows.

Over the previous 50 years, economic geographers have observed some key changes in the world. The previously dominant first and third world divide is less relevant as we now view the world through a more regional scope (de Pater, 2002). Although this was unthinkable 50 years ago, we now often view the future of peripheral regions in the first world as less hopeful than central regions in the third world (Rodriguez-Pose, 2018). In Edward Glaeser's homage to the city he notes that the abovementioned shift can be linked back to globalisation. Think of places like Detroit, where the car industry was outsourced to Asia and the city fell into decline and of cities like Bangalore that have grown into international intellectual hubs (Glaeser, 2011). Both the decline of the first and the rise of the latter can be linked back to shifts in the global economy.

As globalisation has shaped our world, we now look at it from a more regional perspective. We pay much attention to the regions that have succeeded, such as Silicon Valley, but we also look at the regions that have fallen behind. As described by Rodriguez-Pose (2018) cities are viewed as the future and the driving force behind prosperity. As many revitalisation projects have failed to make peripheral regions catch up, policymakers believe it is the best strategy to put all eggs in one basket and only focus on the biggest cities in the country. As a result, underperforming cities and peripheral regions are left out of the development scope. These underrepresented regions are 'the places that don't matter' (Rodriguez-Pose, 2018).

Although the future of these places that don't matter does not look bright according to academics, these places that don't matter also have the power to 'bite back'. People living in places that don't matter inevitably feel underrepresented. As a result, populist parties are often popular in these areas because they make the unrepresented feel heard (Rodriguez-Pose, 2020). This became most apparent during the US presidential election of 2016 and the Brexit referendum.

## **Research question**

The support for populist parties has doubled in Europe over the last 20 years (Henley, 2020). As mentioned before, the popularity of populist parties is often fuelled by rising inequality. So, to fully understand the rise of populism in Europe, we need to examine the underlying factors that shape places that don't matter. This research firstly aims to understand whether or not the rising interregional inequality, that has led to places that don't matter, is the root cause of the rising populist support. If so, it is also important to determine whether or not differences in FDI flows are the root cause of these inequalities.

To reach these goals, this study will look at the relationship between FDI's, inequality and populism. By doing so, it will be possible to see how these variables differ throughout Europe and how they influence each other. To realise the abovementioned research goals, the following research question and sub-questions have been drafted:

- To what extent can the rise in populism be explained by spatial differences in FDI's?
  - To what extent do FDI's affect inequality?
  - To what extent does inequality affect populism?
  - To what extent do FDI's directly affect populism?
  - To what extent does populism affect FDI's?
  - What other factors explain spatial differences in populism?

## **Relevance**

### *Societal relevance*

As described above, the rising interregional inequality that created the places that don't matter seriously changed society. Populist parties have gained voters among the inhabitants of places that don't matter. Quite often they do so by blaming a scapegoat for the inequality caused by globalisation. For example, support for Eurosceptic parties, which is a dominant flavour in populist movements, has doubled over the last 20 years (Henley, 2020). As a result, European integration is far from optimal and the United Kingdom has even left the European Union. As disparities within countries are still increasing, the support is only expected to increase (European Commission, 2017). Further research into how places that don't matter form and why their inhabitants tend to vote for populist parties could help understand the rise of populism better. This could in turn help build better policymaking people feel better represented.

### *Scientific relevance*

Because of the election of Trump and the Brexit referendum, there has been a lot of attention to places that don't matter. So far it has been acknowledged that populism is fuelled by inequality, which in turn can be accredited to globalisation. In short, there seems to be a consensus that less competitive regions attract fewer FDI's and are therefore poorer (Dunning, 2002). In turn, poorer regions tend to vote for populist parties more often (Spruyt, Keppens & van Droogenbroeck, 2016, p 8). The opposite reasoning could also be valid. Many scholars have proven that institutions matter for the attraction of FDI's (Comi et al, 2019). As the political climate can influence institutions, it can in turn also affect the amount of incoming FDI's. By analysing the relationships between FDI's, populism and institutions, this research can help understand whether only one reasoning is true, whether both are true and there is a negative feedback loop or whether none of the reasonings holds within the European context. Secondly, as this research will also look at the explanations for the popularity of populism in places that don't matter, this research will overlap with literature in the domains of politics and sociology. This holistic view could potentially create new insights.

### *Geographic relevance*

This study will look at the relationship between FDI's, inequality and populism. By doing so, it will analyse the whole European continent, on NUTS 3 level. By looking at the entire EU, this research can compare regions from the same country, but also regions separated by stateliness. By making an overview that is comparable to the entire continent, it will be possible to discover interesting patterns that exceed country borders. Moreover, it will also be possible to see how the interaction between these variables differ per country. Finally, looking at these variables on a NUTS 3 level will create a unique research that might find more detailed processes (Kilroy & Ganau, 2020).

## 1. Theoretical framework

The aforementioned research question forces us to get an understanding of three different worlds: the financial world, the political world and the (real) social world. Namely, we need to understand how regional characteristics influence the flow of capital and vice versa, how capital flows create certain narratives in politics and how these narratives influence people. This chapter will try to do so by first looking at economical phenomena such as multinationals and FDI's, then by looking at governmental institutions and their quality, then by looking at inequality and how this leads to places that don't matter and populism.

### 1.1. Multinationals

Even though multinationals (MNE's) have existed for more than 400 years, they have not gained much attention during most of this period. Before the 1960s, research was scarce as MNE's were not viewed as separate economic phenomena in scientific literature (Dunning & Lundan, 2008). Some research was done on the movement of capital over country borders, how country-specific factors could influence the presence of companies or how the internationalisation of industries fitted in neoclassical theory, but this was not done from an MNE perspective (Dunning & Lundan, 2008).

During the 1960s however, MNE literature developed thanks to the contributions of Hymer and Vernon (Dunning & Lundan, 2008). Hymer was critical of the existing works because they couldn't account for the effects of uncertainty, volatile exchange rates and transaction costs. Moreover, he argued that not only financial capital, but technological- and human capital also mattered. When trying to characterize MNE's, Hymer (in Dunning & Lundan, 2008, p. 84) argued the following:

*“For firms to own and control foreign value-adding facilities they must possess some kind of innovatory, cost, financial or marketing advantages - specific to their ownership - which is sufficient to outweigh the disadvantages they faced in competing with indigenous firms in the country of production”.*

This quote illustrates how Hymer believed that multinationals were not just companies that happened to operate in multiple countries, but that there was something inherently different about them. Hymer used the ownership advantages to characterise MNE's. Vernon, on the other hand, looked at how new theories such as the product cycle could explain why MNE's locate in certain places. He noted that firms start with producing solely for the home country, that they then start to export to foreign markets and eventually, if conditions are just right, move production to countries with lower production costs and have a competitive advantage (Dunning & Lundan, 2008, p. 85).

Johanson and Vahlne, founders of the Uppsala school, also saw the aforementioned pattern from Vernon but attributed the increase of resources to foreign markets to organisational learning and experience (Dunning & Lundan, 2008, pp. 91 - 92). The knowledge capacity of MNE's allowed them to reduce offset costs, thus explaining their globalized locations. The Uppsala school model covered both evolutionary and behavioural aspects. Most notably, they found a significant effect between the perceived proximity of foreign markets and the amount of MNE's (Dunning & Lundan, 2008, p. 92).

So far this chapter has discussed multinationals: enterprises that own or, in some way, control value-added activities in more than one country (Dunning & Lundan, 2008, p. 3).

However, oftentimes FDI's are used as a unit of measurement for MNE activity. Generally speaking, FDI's form a good measurement of the presence of MNE's in a certain location, but some fundamental differences need to be understood. Foreign Direct Investments (FDI's) are cross-border investments by a foreign company with at least a 10% ownership share (Barba-Navaretti & Venables, 2006). Looking back at the definition of multinationals, where control and ownership of foreign enterprises is key, it appears that FDI's represent MNE activity very well. FDI's grant control over foreign enterprises, which is the most important aspect of multinationals. However, FDI's are a biased measure as they can over- or underestimate multinational's activities depending on the type of FDI and the labour productivity of the subsidiary. FDI's aimed for tax evasion purposes, for example, generate no actual productive activity (Beugelsdijk, Hennart, Slangen & Smeets, 2010). Even with these differences taken into account, economic geographers still oftentimes use FDI data to say something about multinationals. This is because data on investments is more available than data on ownership and because investments are visible on a longer term whereas ownership can change quickly (Barba-Navaretti & Venables, 2006). In conclusion, FDI's are a good way to measure MNE activities, but it is important to keep in mind they are not the same.

#### 1.1.1. OLI paradigm

The second important contribution during the period of growing interest in the '90s came from Dunning, who bundled previous works from Hymer, Vernon and the Uppsala school into the OLI paradigm (Barba-Navaretti & Venables, 2006). This paradigm bundled several explanations of MNE characteristics and location choices. This paradigm helps explain when and where multinationals will choose to invest and how they organise their subsidiaries abroad (Dunning & Lundan, 2008, pp. 99 – 100).

More elaborately, Dunning noted that when the ownership (O) of products, assets or production processes can give a company advantages, it will be more likely that it invests abroad (Barba Navaretti & Venables, 2006). These advantages can originate from lower costs or higher value creation. Secondly, once deciding to invest abroad, the location (L) advantages (such as lower transport costs or favourable policies) can determine which country to invest in (Dunning & Lundan, 2008, pp. 99 - 100). Finally, the amount of market internalisation (I) advantages (such as greater organisational efficiency) can determine to which depth MNE's invest in their subsidiaries (Dunning & Lundan, 2008, pp. 99 - 100).

#### 1.1.2. The effects of FDI's

We can use the OLI paradigm mentioned above to theorize how a country or region is affected by FDI's, but also to theorize what affects FDI flows.

We start with the former. Countless studies have pointed out the importance of FDI's on countries or regions. First of all, it is an important source of capital for economic development, even when FDI's are only a fraction of GDP. FDI's bring in jobs, but can also bring more advanced technologies and stronger management capabilities (Zhu et al, 2015). Moreover, FDI's can have a multiplier effect, meaning that more jobs are created in supporting sectors. Many literary works have proven the effect of FDI's on a country's GDP. Kosztowniak (2014) proved this within Poland, Sengupta and Puri (2020) proved this for India and its neighbours and Agrawal and Khan (2011) proved this for China.

Besides contributing to a nation's GDP, FDI's also have a tendency to reshape the differences between urban and rural. As cities have better infrastructure and have lower entry costs, FDI's tend to favour the urban (Zhu et al, 2015). This means, that even if the national policy would treat urban and rural areas equally, the urban areas still receive more capital. Moreover, because the competition for FDI's is fierce, and the battle plays out in the urban playfield, national policy tends to focus on cities (Rodriguez-Pose, 2018). Therefore, we can argue that FDI's are the driving factor behind the neglect and decline of the rural periphery and the rise of intraregional inequality.

We then move on to the latter: the matters which can influence FDI's. Zhu et al (2015) point out many determinants that can influence the direction of FDI's, most of them related to institutional quality. Some noteworthy influential factors are access to markets, macroeconomic stability, political stability, efficient government, low levels of corruption, a well-educated labour force, quality infrastructure and cultural characteristics. On regional level infrastructure, access to logistics and transportation matter as well (Zhu et al, 2015, p. 9). Moreover, GDP also affects FDI's as it is used by MNE's to make strategic location choice decisions (Kosztowniak, 2014).

## 1.2. Institutions

As mentioned above, institutional quality has a lot of influence on FDI's (Dunning & Lundan, 2008; Zhu et al, 2015). Hall and Jones (1999) were some of the first who attributed importance to institutions when they asked themselves the question: "Why do some countries produce so much more output per worker than others?" According to them, these differences were related to differences in social infrastructure. By social differences they meant the institutions and government policies that determine the economic environment within individuals accumulate skills, firms accumulate capital and produce output (Hall & Jones, 1999, p. 84). Rodrik, Subramanian and Trebbi (2004) took this a step further when their study proved that the quality of institutions trumps the importance of geography and trade in determining income levels. Moreover, institutions are a critical factor driving MNE's location choice (Comi et al, 2019).

However, a dichotomy has to be made along the lines of Hall and Jones' work. Although institutions can refer to governmental or legal organisations, by institutions we also mean the general culture and unwritten rules of the region (Zhu et al, 2015). For this research, we will make a distinction between 'formal institutions': the governmental, fiscal and legal framework and 'informal institutions': the societal environment that shapes human interaction.

### 1.2.1. Formal institutional quality

As mentioned before, formal institutions relate to the way public institutions are set up. Formal institutional quality matters because it determines whether or not economic actors will be incentivised to invest in physical or human capital, technology or the organization of the production process (Comi et al, 2019). Relevant factors to take into account are how the legislative, executive and judicial branches are functioning and what kind of laws or rules follow from them.

To encourage FDI's, the legislative branch needs to be impartial, transparent and it needs to protect property rights (Globerman & Shapiro, 2002). This way, MNE's know what they can expect when they invest in a country and have the fewest risk on their investments. In the case of property rights, for example, there is a risk to invest in countries where legislation around property rights is weak. Therefore the protection of property rights is positively related to FDI's (Papageorgiadis et al, 2020). Moreover, there is a negative relationship between employment protection legislation and FDI's (Gross and Ryan, 2008). This means that countries or regions with stricter laws protecting their labour force receive fewer FDI's as these laws could cost MNE's.

For the executive branch, public institutions must be stable, credible, efficient and favour the free market (Globerman & Shapiro, 2002). As such, governmental quality is seen as one of the most important determinants of FDI's (Comi et al, 2019). The governmental infrastructure of a country helps to define its investment environment, and can thus create favourable conditions for economic growth (Globerman & Shapiro, 2002). Important determinants are the lack of corruption and bureaucratic effectiveness (Rodriguez-Pose et al, 2015).

For the judicial branch, court rulings must tend to favour the security of property rights and the enforcement of contracts (Comi et al, 2019). Furthermore, it is also important that these courts function efficiently. When studying the regional judicial (in)efficiency in Italy, Comi et al (2019) proved that a reduction of the average trial time by 100 days (the average trial takes 1.185 days in Italy) would lead to an increase of 2 MNE's per million

inhabitants. This number itself doesn't necessarily say us much, but the fact that the relationship turned out to be significant does.

### 1.2.2. Informal institutional quality

As formal institutions measure the functioning of the legislative, executive and judicial branches, informal institutions measure the overall business environment within a society. Informal institutions may be harder to grasp or measure, but some may argue that they are more important than formal institutions when it comes to attracting FDI's (Seyoum, 2011).

One of the first authors to view institutions not just as the functioning of its government was North (1990), who wrote: *"Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction."* This definition clearly illustrates what informal institutions are: the humanly devised constraints in a society that shape interaction. Early works on informal institutions looked at the 'level' of cultures and saw cultural distance as a limiting factor (Kapas, 2020). Recently, cultural distance is not simply seen as a limiting factor for FDI's as cultural distance doesn't always imply cultural conflicts. However, cultural distance can still mitigate the negative impact of poor institutional quality on FDI's (Kapas, 2020). Today, informal institutions include social norms such as trust, social networks, culture, religion and even the attitude towards liberalism (Mondolo, 2019). As such, populist regions and countries initially attract fewer FDI's as their political and business climate is viewed with uncertainty (de Sousa, Fernandes & Weiler. 2020).

Moreover, many authors also note that informal institutions also affect formal institutions. Holmes, Miller, Hitt and Salmador (2013, p. 554) state: *"Drawing on theory identifying culture as an important aspect of informal institutions, we have argued that culture provides a foundation on which a country's formal institutions develop."* Therefore informal institutions not only have a direct impact on FDI's, but some informal institutional qualities also have an impact on FDI's through formal institutions.

### 1.3. Inequality

In paragraph 1.1.2., we have discussed how FDI's can create inequality. But what is inequality precisely? And how is it defined? In this paragraph, we will look deeper into inequality. For this research, we will look first at some general theories about inequality, before diving deeper and looking at the inequality between different regions (interregional inequality) and the inequality between people within one region (intra-regional inequality).

#### 1.3.1. General inequality theories

According to the Oxford dictionary, inequality concerns the *“unfair difference between groups of people in society; when some have more wealth, status or opportunities than others.”* (Oxford Learner's Dictionaries, 2021). As the Oxford Dictionary rightly notes, inequality is about more than just income or wealth. However, inequality is usually measured through economic data due to its availability (Glaeser, 2005). Other interesting variables besides income are employment rate and the share of people with a (university) degree. Rietveld (1991) showed that these often tell a different story and need to be added to research to better understand the divide between the affluent and the poor.

In Glaeser's work on inequality (2005), he noted four interesting facts. First of all, unequal regions are less likely to have (democratic) governments that enforce property rights. Secondly, inequality and redistribution of wealth are negatively correlated, meaning that more equal places are better in redistributing wealth. This might sound obvious, but it is not known whether redistribution affects inequality or vice versa. Thirdly, ethnic heterogeneity and inequality are highly correlated. This can be explained by differences in educational heritage or because ethnic heterogeneity limits the redistribution of wealth (Glaeser, 2005). Finally, when the average income in a region increases, inequality first rises. This phenomenon is called the Kuznets 'inverted U' curve and is caused by the changes in industry developing countries experience and by the politics behind the redistribution of wealth. As the national income increases, almost all governments start to take a more active role in the redistribution of wealth, either directly or via investments in living standards, healthcare and education (Glaeser, 2005). However, some recent studies have pointed out that after the decline of inequality some regions experience a second wave of divergence. This might be because ICT technologies have given those with more analytical and interactive skills an advantage (Tello et al, 2019).

#### 1.3.2. Interregional- and intra-regional inequality

When talking about inequality, we are comparing certain (groups of) people with other people. In geography, we therefore have two different ways of looking at inequality: interregional and intra-regional inequality. Interregional inequality is the inequality between regions. Interregional inequality is high in countries where one part of the country thrives and the other doesn't, such as Italy. Intra-regional inequality is the inequality between people in the same region. This kind of inequality is high in regions where the gap between the poor and the super-rich is high, such as Paris.

Interregional inequality is the most important form of inequality for this research, as it is the inequality most exploited in populist narratives (McCann & Argiles, 2021). For example, the narrative used by the pro-Brexit parties was that only the 'wealthy metropolitan elites' were

profiting from the EU membership (McCann & Argiles, 2021, p. 9). This paradigm is not unique to the British isles. In the Netherlands, for example, this elite are the people living in the Amsterdam canal belt or the elite in the Hague running the country. Gómez-Reino claims that the positioning of 'the people' against 'the elites' is intrinsic to the ideology that populist parties exhibit (2019). As the world is spikey, money flows to certain areas more than others. Interregional inequality is therefore related to the competitiveness of a region. And as FDI's tend to prefer the urban, they contribute to the inequality between urban and rural regions. In most countries, governmental interference limits the diverging character of FDI's (Zheng & Zhao, 2007).

Intraregional inequality is typically greater in the western world (McCann, 2020). Intraregional inequality might seem less important when talking about populism as populist movements often create a narrative along regional lines. As such, intraregional inequality, inequality within those regions is less useful in this narrative as it is harder to create two opposites. Although it might be used less frequently in the political discourse, Lenzi and Perucca (2021) claim that this type of inequality is equally important in the creation of (political) discontent and therefore on populism. FDI's can increase intraregional inequality because not everyone benefits from FDI's equally. Company owners and shareholders benefit more from FDI's than an employee (Artelaris, 2021).

#### 1.4. Places that don't matter

So far we have concluded that MNE's are companies that, through their investments, are trying to gain more control, gain more market access or to internalize their costs. Therefore these investments are risk-averse and favour places that are the most likely to realise a return on their investment (for example through the security of property rights, a well-skilled labour force or quality infrastructure). This results in the uneven distribution of FDI's over space, where the most competitive regions receive the highest share of FDI's (Iammarino & McCann, 2015). The world is spikey.

As a result, FDI's increasingly focus on the urban areas, as they generally have better infrastructure, labour forces and linkages. And even between cities there is fierce competition for FDI's. Only the most competitive cities can keep up with this global competition (Zhu et al, 2015). Rural areas and cities with a less diversified economy or less complex knowledge have fallen into economic decline (Rodriguez-Pose, 2018). To keep up with this global competition for FDI's, national governments and investment promotion agencies (IPA's) focus on a few cities. For example, since the 1980s there has been a widespread belief among UK business groups, policy-makers and politicians that London is the motor of the country and therefore crucial for the success of the entire country. As a result, it received the majority of all public investments (McCann & Argiles, 2021). As IPA's focus on the main cities, rural areas and less attractive cities are left out and receive little funding (Rodriguez-Pose, 2018). Without funding and investments, inequality rises. Although inequality is declining on a European level, both interregional and intraregional inequalities are increasing on a country level (Kilroy & Ganau, 2020; McCann, 2020). This trend has created the "places that don't matter". As mentioned before, investment mainly focuses on the places with the greatest potential for economic growth and development. Some investment also focuses on the poorest places that need to be saved from absolute poverty. All places that fall in neither category, don't matter to policymakers (Rodriguez-Pose, 2018). Rodriguez-Pose describes this process during an interview with the Council of Europe Development Bank in the following quote:

*"Many other territories have fallen between the cracks, including cities and regions in long-term decline. These were neither large nor dynamic enough to attract investment, nor were they poor enough to warrant attention. In a way, they had become places that didn't matter: they were forgotten, neglected or considered incapable to redress decline." (Rodriguez-Pose, 2020).*

So as a result, populism has taken hold in places that don't matter (Rodriguez-Pose, 2018). As inhabitants of these places are underrepresented, they often voice their discontent at the ballot box. They do so by voting against the status quo, often on a populist party. They do so because these parties give them a voice to show their discontent with the increasingly unequal distribution of wealth, attention and opportunities. This creates "Geographies of discontent": the dissatisfaction of individuals who live and feel stuck in regions that don't have a bright economic future (Rodriguez-Pose, 2020). The term geographies of discontent arose when scholars compared the geography of UK productivity patterns and the Brexit voting patterns (McCann and Argiles, 2021). This includes both rural territories that have stagnated for long periods and cities and that, as a result of globalisation, have experienced economic decline (Rodriguez-Pose, 2020).

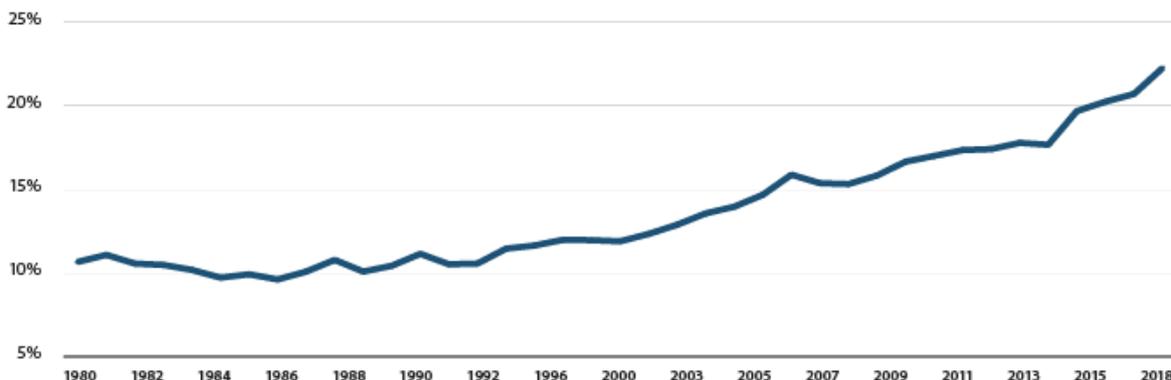
## 1.5. Populism

Populism has always been around. It was first articulated by Aristotle, who described Phaleas' view on the distribution of wealth to be populist: looking at the interests of the citizens (Kuzminski, 2008). It became a more prominent movement during the late Roman Republic, which was divided between the Populares and the Optimates: those who favoured the people and those who favoured the aristocrats (Stockemer, 2019). In recent history the term was popularised at the end of the 19<sup>th</sup> century by three separate movements: the People's Party in North America, the Narodniki in Russia and the Boulangists in France (Akkerman, 2003; Stockemer, 2019). In the 20<sup>th</sup> century, the movement disappeared from stage as the more radical movement of fascism emerged. The populist movement slowly re-emerged after the second world war. This chapter will look at the current form of populism. This chapter will first answer the question what populism is, after which it will look at the different types of populism.

### 1.5.1. What is populism?

As mentioned before, the populist movement slowly re-emerged after the second world war. By the 1980s most European countries had some right-wing party that showed strong populist elements (Stockemer, 2019). However, their successes were slim and are in stark contrast with recent successes of populist movements (Bergh & Kärnä, 2020). As figure 1.1. shows, the support for populist movements has doubled in the last 20 years (Henley, 2020).

Figure 1.1. The average share of votes for populist parties in Europe.



Source: CAP, 2019.

So what is populism? Although the term is often used in politics and media, it is an essentially contested concept (Mudde & Kaltwasser, 2017, pp 2 - 3). It can mean either radical-right wing or radical left-wing, but is only used by people to describe their opponents. Even the most prominent examples of what most people consider to be populist, such as Marine Le Pen or Viktor Orbán never call themselves populist. Even though some academics, therefore, consider it to be just a *Kampfbegriff* (a battle term to denounce opponents) or consider it to be too vague, we can still dissect some of the core concepts and ideology (Mudde & Kaltwasser, 2017, p. 9).

First of all, at the root of populism is the construct of 'the people'. This is the group the populist movement claims to represent. This group can be created along regional lines (such as 'the Heartlands'), on socio-economical lines (such as 'the common folk') or on ethnic lines (such as 'the *real* Dutch people'). This 'us' versus 'them' narrative can help

create a shared identity and can mobilise those who are appealed to the narrative (Mudde & Kaltwasser, 2017, pp 9 – 11). The second concept is what lays at the other side of the ‘us’ versus ‘them’ narrative: the elite. The elite are portrayed as those out of ‘the people’ and are the ones with political power and better socio-economic status. Where the people are morally pure, the elite are portrayed to be corrupt. The final concept is that of the *volonté générale* or general will. Although different philosophers give different explanations of the general will, the general will incorporates not only the interest of the elite but of all people. Populists believe that because the elite does not work towards the general will, but towards their own interests, they are can maintain their better position in society (Mudde & Kaltwasser, pp. 11 – 14).

As mentioned before, populism lost significance in the 20<sup>th</sup> century because of the rise of fascism. It is important to note that these two concepts should not be intertwined. Although populist political figures are sometimes called fascists by their opponents, and although court rulings have even sometimes permitted this use, these two movements differ more than they have in common (Berman, 2016). Where rule by popular will is at the core of populist movements, fascist movements have focused on the holistic, authoritarian nation-state and the creation of the ‘new man’ (Eatwell, 2017).

#### 1.5.2. Is populism bad?

If populist narratives aim at a shift towards policy that is in everyone’s interest, why is populism even a bad thing? Why do political opponents call one another populist? This is primarily because of the notion that populist movements tend to persuade voters with promises that can’t be delivered (Rodrik, 2018). As mentioned before, populist movements often use a scapegoat such as migrants or the EU to explain the hardship of the people. As these are not truly at the root of their problems, stopping migrants or leaving the EU does not accomplish the required results. Moreover, the people populist movements claim to represent are usually disadvantaged most (Rodrik, 2018). Another reason is the (sometimes dangerous) relationship between populism and democracy. Populism is essentially democratic; it can give voice to the unheard, improve the responsiveness of the political system and increase democratic accountability (Mudde & Kaltwasser, 2017, p 83). However, populism’s notion of majority rule can threaten the existence of minority groups, especially when they are chosen as scapegoats. Moreover, the practice of popular (authoritarian) sovereignty erodes the protection of fundamental rights. We can see this, for example, in Hungary where Viktor Orbán’s Fidesz party has been ruling since 2010. Although the country has experienced unprecedented growth under his presidency, his party also took control of the media, the elections and its opposition (Hopkins, 2020; Beauchamp, 2018). And Hungary is not the only example. In practice, populist movements often are a complete inversion of the ideals and procedures of representative democracy (Mudde & Kaltwasser, 2017, pp. 79 – 81). However, a footnote has to be placed that these arguments don’t apply to all forms of populism, as populism can mean a lot of things. Halmai (2019) makes the distinction between populist movements that are ‘good’ and ‘bad’. The bad populist movements have one or more traits mentioned above. Good populist movements are non-authoritarian grassroots movements against the establishment, such as Spain’s Podemos and Italy’s Five Star Movement.

### 1.5.3. Types of populism

Even though these three core concepts are visible in all sorts of populist movements, there are vastly different ‘flavours’ of populism, all with their own narratives. Many scholars have focused on creating typologies based on the structure of these populist regimes, but fewer works have looked at the narratives of these movements (Peters & Pierre, 2020). However, this research will distinguish populist movements based on their narratives, as is believed people vote on a narrative and not on the governance structure.

The typology that distinguishes populist narratives that are used for this research is that of *The PopuList*, an organisation initiated by The Guardian and backed by the Amsterdam Institute for Social Science Research, the Amsterdam Centre for European Studies, the ECPR Standing Group on Extremism and Democracy and many prominent scholars (Rooduijn et al., 2019). *The PopuList* is a list of more than 200 political parties with at least some populist traits. They categorise all parties as either: non-populist (enough), far-right populist, far left populist or Eurosceptic. This last category is not mutually exclusive, meaning that parties can be both far-right and Eurosceptic, far-left and Eurosceptic or only Eurosceptic. The types of populism are shortly explained hereafter.

#### 1.5.3.1. Left-wing populism

Left-wing populist parties are parties that reject the underlying socio-economic structure of contemporary capitalism and advocate alternative economic and power structures. They see economic inequality as the basis of existing political and social arrangements and call for a major redistribution of resources from existing political elites (March, 2012). Noteworthy examples are Sinistra in Italy and SP in the Netherlands.

#### 1.5.3.2. Right-wing populism

Right-wing populist parties are parties that are nativist and authoritarian. Nativism is an ideology that believes that states should be inhabited exclusively by members of the native group and that non-native elements are fundamentally threatening to the homogenous nation-state. This notion is also portrayed in statements such as “We first”, “Eigen volk eerst”, “Les français d’abord” and “Prima gli italiani”. Authoritarianism is the belief in a strictly ordered society, in which infringements of authority are to be punished severely (Mudde, 2007). Most often these parties use migrants as a scapegoat to blame for all the misery that has fallen on the discontent voters. Noteworthy examples are PVV in the Netherlands, Lega (Nord) and Fratelli d’Italia in Italy.

#### 1.5.3.3. Eurosceptic parties

Eurosceptic parties are parties that express opposition to the process of European integration. This includes both “hard Euroscepticism” and “soft Euroscepticism”. Hard Euroscepticism concerns the outright rejection of all European political and economic integration and the opposition of its own country’s joining or remaining a member of the EU. Soft Euroscepticism accepts the latter, but voices the opposition to European integration (Taggart & Sczcerbiak 2004).

#### 1.5.4. How populism thrives

Now that we know the different flavours of populism, we can dive deeper into how populism is most effective, what influences populism and who is most susceptible to populist narratives. These questions are best answered by the following quote:

*“[...] populism in Western Europe [is] a typical attitude of people who suffer from being overwhelmed and disoriented by societal changes, who have been placed in a weak and vulnerable economic position because of such changes, who feel their voice does not matter in politics, or who face difficulties in finding a positive social identity. These people find in populism [...] a sharp group distinction that allows them to attribute responsibility for their own feelings of uncertainty and uneasiness to factors that lie beyond their control and responsibility so that they can maintain their self-respect [...]” (Spruyt et al, 2016).*

This quote shows what attracts people to populism and therefore also shows what circumstances create a large populist voting share. Pástor and Veronesi (2021) studied the United States and all European Union member states. They found that the support for populist parties is stronger in countries with larger inequality (Pástor and Veronesi, 2021, p. 2862). This corresponds with the quote mentioned above and with the studies mentioned in chapter 1.3. Five factors appear to have the most constant positive relationship with populist voting: long term economic decline, low levels of education, few employment opportunities, GDP per capita and distance to the capital (Dijkstra, Poelman, Rodriguez-Pose, 2020). Against popular belief, ageing is not an issue: older people tend to vote less populist (Rodriguez-Pose, 2019). People who are more in contact with migrants also tend to vote significantly less populist. Of those relevant factors, many have already been touched upon previously. To create a model that is as holistic as possible, the other variables should also be taken into account and briefly discussed.

Unemployment matters when it comes to populism because an increase in unemployment leads to an increase in individuals economic insecurity, which in turn has a direct effect on the trust in current political parties (Algan et al, 2017, p. 316). Moreover, unemployment has a negative relationship with attitude towards immigrants for economic reasons (Algan et al, 2017). By looking at 240 European regions between 2000 and 2017, they were able to prove a statistically significant relationship between unemployment and populism and were even able to prove unemployment influenced the Brexit vote (Algan et al, 2017).

As mentioned before, there is a strong relationship between educational levels and populism. This is partly because people with a higher education level also develop cognitive aspects such as interests in politics, which reduce the tendency to vote populist (Spruyt et al, 2017 p. 342). However, even when taking this mediation into account, there is a significant relationship between education and populism. Interestingly, a higher level of education is associated with a decline in support for far-right political parties but not with a decline in support for far-left political parties (Gidron & Hall, 2020).

Finally, distance to the capital has also been proven to be significantly contributing to populism. It is easy to see why: when one is further away from the capital, that usually houses the seat of government and from which policies are written, it is easier to feel forgotten. However, besides the work of Dijkstra, Poelman and Rodriguez-Pose no other empirical study has tested this relationship.

## 1.6. Conclusion

This theoretical framework began with a short introduction on MNE's. Based on works from Hymer, Vernon and the Uppsala school, Dunning was able to draft the OLI paradigm. This paradigm helps us understand where MNE's will invest and how they organise (Dunning and Lundan, 2008). We then dive deeper into the role of institutions on FDI's. Institutional quality is a strong deterrent for FDI's (Dunning and Lundan, 2008; Zhu et al, 2015). Institutional quality matters in the legislative branch, the executive branch and the judicial branch, but informal institutions are equally important, albeit harder to measure (Comi et al, 2019; Seyoum, 2011).

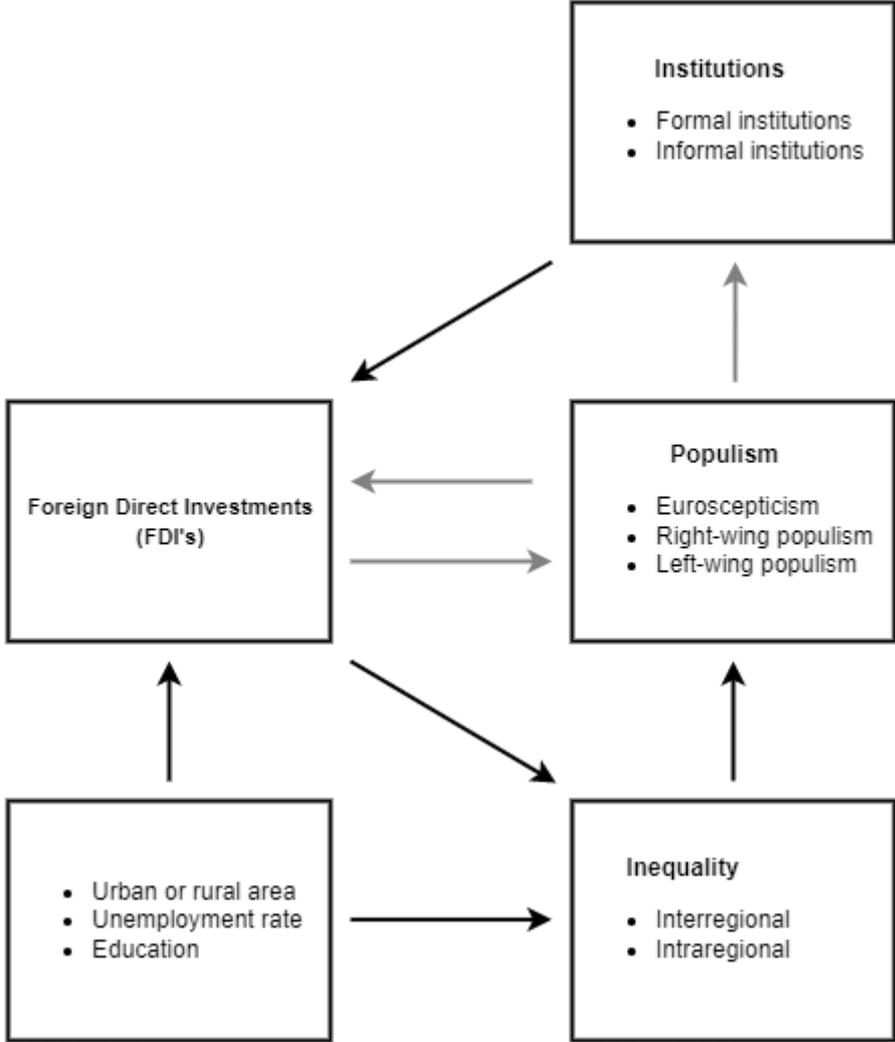
In the next chapter, we explore what appears to be the root cause of our research problem: inequality. Inequality can be linked back to the enforcement of property rights (Glaeser, 2005). Moreover, when the regional average income increases, inequality first rises. This looks at both interregional and intraregional inequality. Although both interregional and intraregional inequality matter for the rise of populism, interregional inequality fits the populism narrative best.

This research then gives a geographical explanation as to why interregional inequality has such an impact on the rise of populism. As the world has become more globalized, rural regions and peripheral urban regions have not been able to remain competitive (Rodriguez-Pose, 2018). As a result, policy-makers have increasingly neglected these areas for the last 40 years. This has led to the creation of places that don't matter: those places that do not receive funding and attention from their national government. As a result (?), this leads to geographies of discontent: the dissatisfaction of individuals who live in these places that don't matter. As these inhabitants feel stuck in a system that no longer serves them, they use the ballot box to voice their discontent (Rodriguez-Pose, 2018; Rodriguez-Pose, 2020).

But what is populism exactly? Populism has been around since the ancient Greek philosophers. In its purest form it is the notion that 'the people' should not be governed by a government that serves 'the elite', but by a government that serves the general will (Mudde & Kaltwasser, 2017). However, current populist movements are often based upon false promises and not in the best interest of 'the people' (Rodrik, 2018). This research then looks at all different populist movements across the political field: the far left, the far-right and Euroscepticism. All with their own narratives.

To sum up, this research has shown the positive relationship between institutional quality and FDI's. The negative relationship between FDI's and inequality and the positive relationship between inequality and populism. This leaves us with the question as to whether we could prove a direct (negative) relationship between FDI's and populism. Considering Dunning's work, a negative relationship between populism and institutions is also not unlikely as MNE's look for favourable policies and political stability (Dunning & Lundan, 2008). However, this should first be examined. Moreover, it is currently unclear whether populism has a direct effect on FDI's, whether it only has an effect with institutions as a mediating variable or whether there is no significant effect. These relationships and suspected relationships have led to the creation of the conceptual model in figure 1.2.

Figure 1.2. Conceptual model.



Source: Own work, 2022.

In this conceptual model, we can see the proven relationships, as discussed above, as black arrows. The grey arrows represent the relationships that are plausible but could not be proven based upon previous works. Assuming that all relationships will be proven, we can see a vicious cycle in the conceptual model. As FDI's affect inequality, inequality has an effect on Euroscepticism and Euroscepticism has an effect on FDI's, this could mean that there is a negative feedback loop.

## 2. Research design

When conducting scientific research, it is always important to ask oneself the questions: why, what, how, who, where and when? This helps align the research goals to the results and creates transparent research. The first two questions were answered in the introduction and theoretical framework. The remaining questions will be answered in this chapter. Firstly, in chapter 2.1. we will discuss the methods: the how. Afterwards, in chapter 2.2., we will discuss the units: the who. In chapter 2.3. we will discuss the location: the where. Finally, in chapter 2.4. we will discuss the timeframe: the when. Before we start, it can be helpful to reiterate our research question.

- To what extent can the rise in populism be explained by spatial differences in FDI's?
  - To what extent do FDI's affect inequality?
  - To what extent does inequality affect populism?
  - To what extent do FDI's directly affect populism?
  - To what extent does populism affect FDI's?
  - What other factors explain spatial differences in populism?

### 2.1. Methods

To answer how the abovementioned research question and sub-questions will be answered, we have to think about what data is needed to answer these questions and how this data should be analysed. As this research will look at the relationships between FDI's, populism, inequality and institutions, data is needed for all these variables. We will discuss how this data was collected in chapter 2.5. in more detail, but a quick overview of the data is needed to understand how it should be analysed.

Data on FDI's is available through ESPON and consists of the foreign economic input per region. For data on populism, the regional outcomes of general elections are presented. To determine what share of the region had voted populist, the classification of The Populist is used (Rooduijn et al., 2019). For data on inequality, data is needed on interregional inequality and intraregional inequality. Data on interregional inequality can be made by collecting regional income data from the OECD dataset and comparing it to the national and EU average. Data on intraregional inequality is based upon poverty data from Eurostat. Data on institutional quality is based on the European Quality of Government Index (Charron, Lapuente & Annoni, 2019).

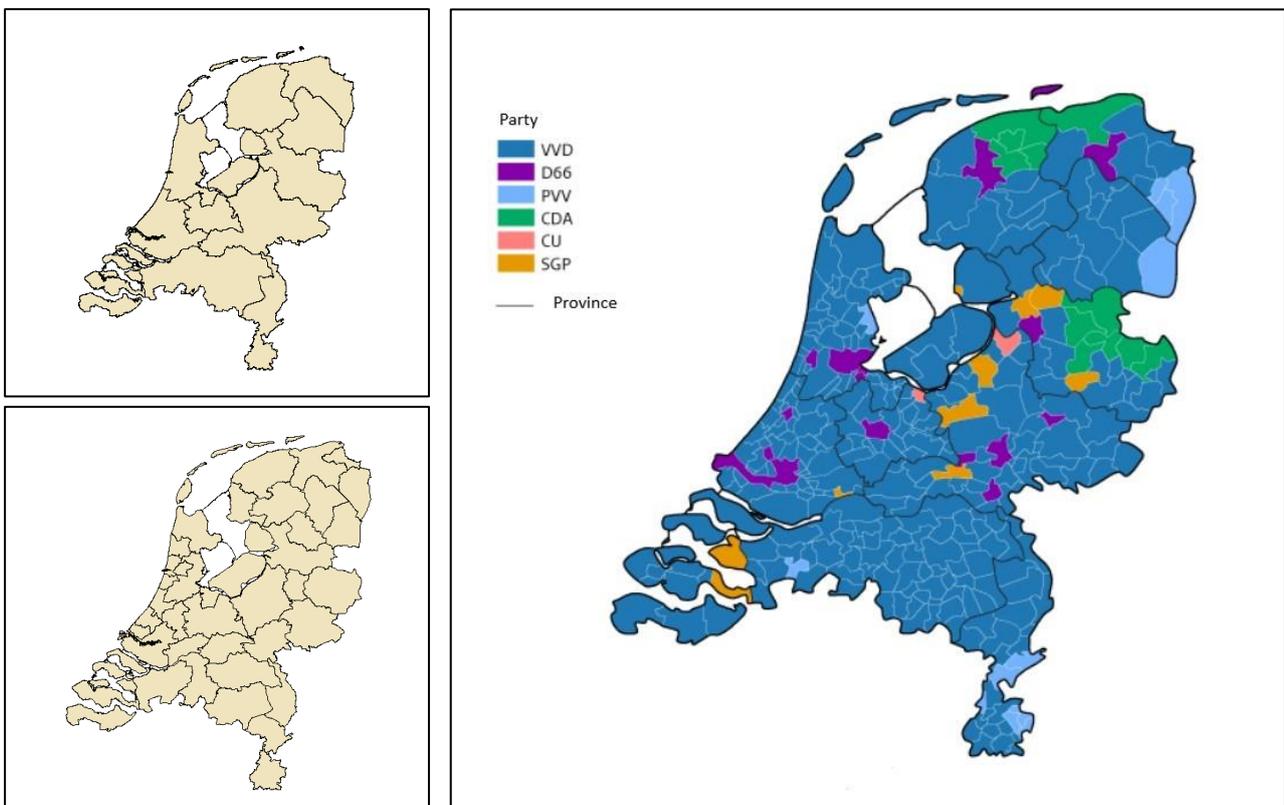
The data will then be analysed by using both SPSS and spatial econometrics in R. SPSS is used to analyse individual relationships. Spatial econometrics is used to study the holistic regression models as a whole. Spatial econometrics originated as a subfield of econometrics that looks at spatial interaction and spatial structure in regression models (Anselin, 2001). Nowadays, it is a field of study that applies to econometrics, economy and geography. By looking at observations over multiple regions and multiple time periods, we can get a clearer view of the relationship between different variables (LeSage & Pace, 2009). To do so, a data file is created consisting of all European NUTS 3 regions with the following variables: FDI's, inequality, populism, informal and formal institutional quality, unemployment and education level. The data file is then loaded into RStudio, where spatial regression models will test the relationship between these variables.

## 2.2. Units and scale

This research is looking at the tendency of people in left-behind places to vote for populist parties. Therefore, the units of this research are the people. However, as we are not interested in the individual, but the geographies of discontent, we will look at the sum of people in a certain economic area. Or more simply: we look at voting behaviour per region.

This data will be viewed on the NUTS 3 level. This is because places that don't matter presumably don't take up entire NUTS 2 regions. This is illustrated in the figures below. In figures 2.1 and 2.2 we see the Netherlands divided in respectively NUTS 2 and NUTS 3 regions. In figure 2.3 we see the results of the 2021 Dutch general election per municipality. By looking at the election results, we can see that the scale level of the NUTS 2 level is too large for this research. This is best illustrated by looking at the east of Groningen. This region has voted for the populist party PVV (Visser, 2021). Coincidentally, the region has also been in economic decline for more than a decade (Rabobank, 2018). Whether there is a relationship between the two variables should be tested, but the area only really becomes visible when looking at NUTS 3 level. At NUTS 2 level the east of Groningen is still part of the entire province of Groningen, which voted for the centre-left party D66 (Kiesraad, 2021). If we would perform a regression analysis on NUTS 2 level, the dependent variable populism would be evened out by the rest of the province. Therefore, this research needs to collect and analyse data on NUTS 3 level.

*Top left: figure 2.1 The Netherlands on NUTS 2 level. Bottom left: figure 2.2 The Netherlands on NUTS 3 level. Right: figure 2.3 Netherlands general election results per municipality.*



Source: Own work, 2022; Visser, 2021.

### 2.3. Location

This paragraph seeks to answer what the geographical scope of this research should be. To answer this question it is important to keep in mind what the aim of the research is. This research builds on the work of Rodriguez-Pose (2018) around places that don't matter. According to the literature FDI's affect interregional inequality in terms of wealth, opportunities and the attention of policymakers (Artelaris, 2021). This has led to a rise in inequality, as the places that don't matter have the power to bite back (Rodriguez-Pose, 2018). This research will elaborate on the matter by looking at the relationships between FDI's, populism, inequality and institutional quality.

As such, it would be fitting to look at many different parts of the world. A study in the US could look at the voting pattern of the 2016 and 2020 elections, both in which Trump participated and was often labelled as a populist. This could potentially generate the strongest relationship between FDI's and populism since the voting outcome is binary. Moreover, studies have already proven the relationship between unemployment and the elections and between population density and the elections (New York Times, 2020). A relationship between FDI's and the elections would also be feasible in this context. However, looking at the US would also mean that only one kind of populism could be examined. Another suitable option would be Europe. As mentioned before, the amount of support for populist movements in Europe has doubled over the last 20 years (Henley, 2020). Since there are many countries, all with their unique political system, all types of populism are visible in the continent, whereas in the United States the two-party system does not offer this wide array. Moreover, as all countries have their domestic policies, all will have their own places that do and places that don't matter. Finally, a more diversified research location would mitigate the risk of statistical noise or falsely assumed relationships. As Trump votes were most prominent in the Mid-West and South-West, one could falsely assume that the access to open water is negatively correlated with voting populist.

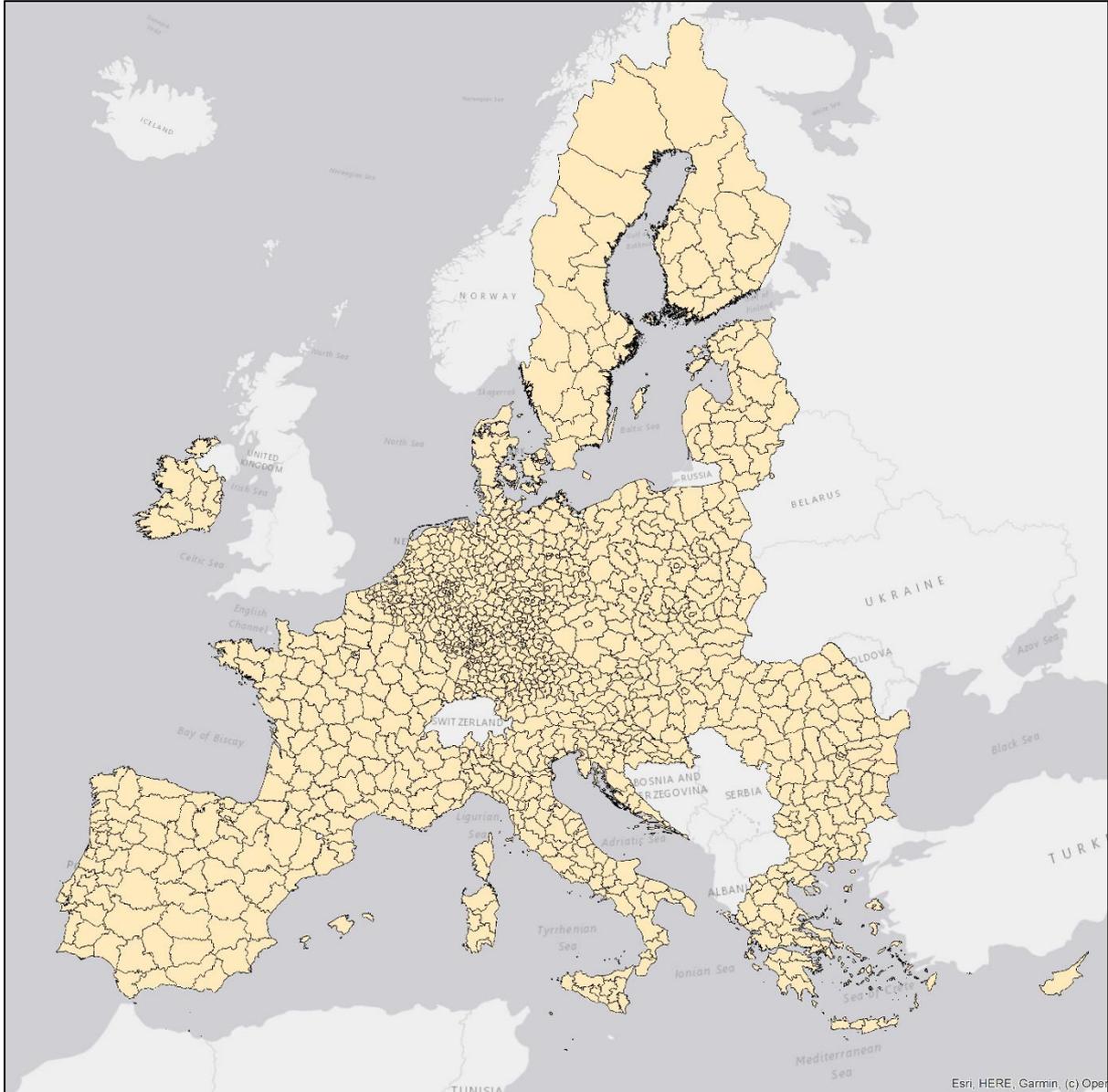
With these considerations taken into account, this research will focus on the European continent. However, the downside of researching the European continent might come from different sources or be collected in a different time period. Luckily many institutions such as Eurostat, OECD and the Constituency-Level Elections Archive (CLEA) have data available that is coherent across the continent. How data from different periods will be compared will be discussed in the next paragraph.

So what counts as 'Europe'? Depending on interpretation, many areas count as 'Europe'. The continent of Europe is positioned on the Eurasian plates, west of the Ural mountains. Europe as a construct is millennia-old (Swedberg, 1994). The new idea of Europe is much more recent. After the Second World War many European countries shared the belief that the only way forward was through integration (Hix, 1999). However, the kind of integration depended on the country's wishes and grew organically. As a result, we now have the European Union (EU), the Eurozone, the Schengen Area, the European Economic Area (EEA) and the European Free Trade Association (EFTA), all of which could be considered 'Europe'. As a result, choosing a certain demarcation of Europe will always be contested.

This research will use the smallest demarcation of Europe: the European Union. This is because of practical reasons, but also to prevent statistical noise as non-EU members

experience Euroscepticism for different reasons. Former EU member the United Kingdom is also excluded. Although a study on populism in the UK would be highly interesting, the Brexit referendum itself is not a general election and cannot be incorporated. Including the elections that led up to the Brexit referendum would also cause too much statistical noise as important non-populist parties also promised a Brexit referendum (BBC, 2013). Due to its small size and being excluded from The PopuList, Malta is also excluded from this research. Finally, overseas territories such as French Guyana and La Reunion and Portuguese Madeira are also excluded as they are extreme outliers when it comes to GDP, FDI's, income and inequality data. This creates a total of 1157 NUTS 3 regions in 26 countries. An overview is presented in figure 2.4.

Figure 2.4: all 1157 NUTS 3 regions that make up the research location.



Source: Own work, 2022.

#### 2.4. Timeframe

As mentioned before, populism has been around for two millennia (Kuzminski, 2008). Compared to populism, FDI's are a slightly more new phenomenon. Although there have been multinational companies since the 17<sup>th</sup> century, FDI's became a significant economic influence in the 1980s (Ascani, 2015). Theoretically, a study on the relationship between FDI's and populism could therefore look at a time period of around four decades. However, it is of course more useful to only look at recent times.

Due to limited data availability on FDI's on NUTS 3 scale, this research uses the total accumulated FDI's over a longer time period, namely from 2003 to 2015. As this research is looking at the possible relationship between FDI's and populism, it is interesting to compare the FDI data with the first election results after the time period of the FDI data. Therefore, voting data is used from 2015 up until 2019. An overview of the election years used per country can be found in table 1 in the addendum. This will then enable us to see whether economically stagnating areas are also more populist, even when other variables are taken into account. This has the added benefit of not including general election outcomes since the COVID-19 pandemic. Although not much has yet been proven concerning the effect of the COVID-19 pandemic on voting patterns, it can be hypothesized that more people have voted for populist parties for reasons outside the scope of academia. For data on GDP per NUTS 3 region, the end of the FDI period was used: 2015.

#### 2.5. Operationalization

The operationalization can be seen as the practical part of the research design. The research design started by briefly discussing the first question: the how. Afterwards, the who, the where and the when were discussed. This chapter will dive deeper into the first question by looking at all variables individually and determining how this research should capture them. During this process, it is important to keep in mind how the variable is defined in academia. Based on this definition, the dataset that follows this definition best should be chosen. By doing so, this research can build upon proven methods and learn from previous mistakes. Therefore, this chapter will rely heavily on the theoretical framework. Firstly, this chapter will cover the important variables in our conceptual model. Afterwards, it will briefly touch upon the variables that are also incorporated in our regression model.

##### 2.5.1. FDI's

In this research, we based the definition of FDI's on the work of Barba Navaretti and Venables (2006). This means all cross-border investments made by a foreign company with at least a 10% ownership share should be viewed as FDI's. For this research, the database of ESPON proved to be the most detailed and recent. Another benefit was the fact that ESPON's data covered a longer time period, namely from 2003 to 2015. Using a longer time period will show the overall competitiveness of a region better, and will give a clearer image of which regions are economically falling behind. Another benefit was that the ESPON data was on NUTS 3 level, which no other database could provide. ESPON describes FDI's as follows:

*“FDI takes place when a foreign firm establishes itself [in] a region or expands an existing business (greenfield investments). FDI also takes place when a foreign firm acquires more*

*than 10 per cent of the voting stock in an existing firm or merges with a local firm (M&A deals)."* (Sunesen et al, 2018, p. 5).

This quote highlights how ESPON uses the same definition for FDI's as Barba Naveretti and Venables. Both sources use the 10% point in their definition of investments. For this research, the distinction between greenfield and M&A deals that ESPON makes is not relevant as this was not used in the definition used in the theoretical framework. Therefore, the greenfield and M&A FDI's were joined together. The data was collected on a NUTS 3 scale level. Data was collected for 91% of all regions. The missing 9% is spread over 9 countries.

### 2.5.2. Institutional quality

In the theoretical framework, institutional quality was based on literature from Hall and Jones (1999) and Comi et al (2019). Institutional quality is the sum of institutional and governmental policies that determine the economic environment. This research uses the distinction between formal institutions and informal institutions. For formal institutions impartiality, the lack of corruption and efficiency are key (Globerman & Shapiro, 2002; Comi et al, 2019). For informal institutions the humanly devised constraints that shape (business) interaction are important (North, 1990). This includes trust, social network, culture and attitude towards liberalism (Mondolo, 2019).

To capture formal institutional quality, the European Quality of Government Index [EQI] (Charron, Lapuente & Annoni, 2019) was used. This dataset is based on large citizen surveys that collect the perceived corruption level, perceived impartiality of public services and the perceived level of quality of public services. These pillars are the same as highlighted in the theoretical framework. The difference is that the EQI Index uses perceived institutional quality instead of actual institutional quality. This is not necessarily a bad thing: when it comes to voting, perception matters more than the actual levels of institutional quality. The EQI Index is gathered on a NUTS 2 level. Unfortunately, only 59% of all regions are included. This is because the entirety of Germany, Belgium, Estonia, Latvia and half of Croatia are excluded.

To capture informal institutional quality, the variable 'Business Sophistication' was used from the 2016 Regional Competitiveness Index of the European Commission (European Commission, 2016). This variable measures the degree to which Small and Medium Enterprises (SME's) are involved in innovation cooperation. It was chosen only to use SME's because large firms are almost always involved in innovation cooperation. By doing so, the indicator describes the level of dynamism and vitality of the business environment (European Commission, 2016). Although this variable does not specifically measure informal institutional quality or one of its underlying variables such as trust, business sophistication is still a good way to quantify the level of trust and the social network. This data was collected on a NUTS 3 level. 91% of all regions were included.

### 2.5.3. Inequality

In the theoretical framework, inequality was defined as the *"unfair difference between groups of people in society; when some have more wealth, status or opportunities than others"* (Oxford, 2021). Although this definition is rather broad, scholars such as Glaeser

(2005) and Rietveld (1991) made this more concrete by looking at income and employment respectively. For this research, a distinction was made between inequality within regions (intraregional inequality) and inequality between regions (interregional inequality).

Interregional inequality data was created by collecting regional household income data. This data is available on a NUTS 2 level, where 99% of all regions were included. Data on intraregional inequality was derived from the poverty database of Eurostat. Although there can be inequality without poverty, the poverty database of Eurostat measures how many percent of the regional population has less than 60% of the median regional income after social transfers. Because this is normalized by the median of the own region, this variable still shows inequality. However, it only shows the percentage of the population at the losing end of inequality. For intraregional inequality data was collected on NUTS 2 level. Only 50% of all regions were included, as the whole of Germany, Belgium, France, Croatia, Estonia, Latvia and a part of Finland were not included in the dataset.

#### 2.5.4. Populism

For populism, the theoretical framework is based on the literature of Mudde and Kaltwasser (2017). Although populism is a contested concept, some key features such as 'the people' versus 'the elite' narrative can be found in all parties that are considered populist. For this research, data on populism was created by individually looking at regional election results and filling in how many percent voted far-left populist, far-right populist, Eurosceptic and overall populist for all NUTS 3 regions. The general election results were derived from the Constituency-Level Elections Archive (CLEA) database (Kollman, Hicken, Caramani, Backer & Lublin, 2019). If this database did not include a country or used a different scale level, as was the case in Belgium, Bulgaria, France, Finland and Greece, this research used the internal affairs website of those countries. The work of The PopuList (Rooduijn et al., 2019) was then used to determine which political parties are considered populist. This corresponds with the definition of our theoretical framework because the PopuList bases its definition on the work of Mudde. For 87% of all NUTS 3 regions data could be collected. This is because some countries, most notably Poland and Germany, do not use NUTS 3 to gather their election results data. Where possible, election data from multiple constituencies were added up to create the total of one NUTS 3 area. However, sometimes constituencies were apart in multiple NUTS 3 areas. In these cases, all effected NUTS 3 regions were omitted.

#### 2.5.5. Remaining variables

The previous paragraphs explained how all key variables were captured based on the theoretical framework. However, there are still some variables that were mentioned in the theoretical framework, as they could influence our key variables, but were only mentioned briefly so have no definition. Because these variables will still be taken into account in our regression model, this chapter will briefly discuss how they are collected. This chapter will discuss the following variables: GDP (per capita), unemployment and education.

Data on GDP, unemployment and education was collected using the database of Eurostat. Data was collected for 2015, as this was the last date of the FDI data. Data was collected on a NUTS 3 level, 99% of all areas were included for the first two variables. For education, 98% was included. For education the percentage of people with a high level of completed

education (levels 5 till 8) was collected. The meaning of these levels can be found in table 2.1.

*Table 2.1.: International Standard Classification of Education (ISCED).*

<b>ISCED classification</b>	<b>Level of education</b>
0	Early childhood education ('less than primary' for educational attainment)
1	Primary education
2	Lower secondary education
3	Upper secondary education
4	Post-secondary non-tertiary education
5	Short-cycle tertiary education
6	Bachelor's or equivalent level
7	Master's or equivalent level
8	Doctoral or equivalent level

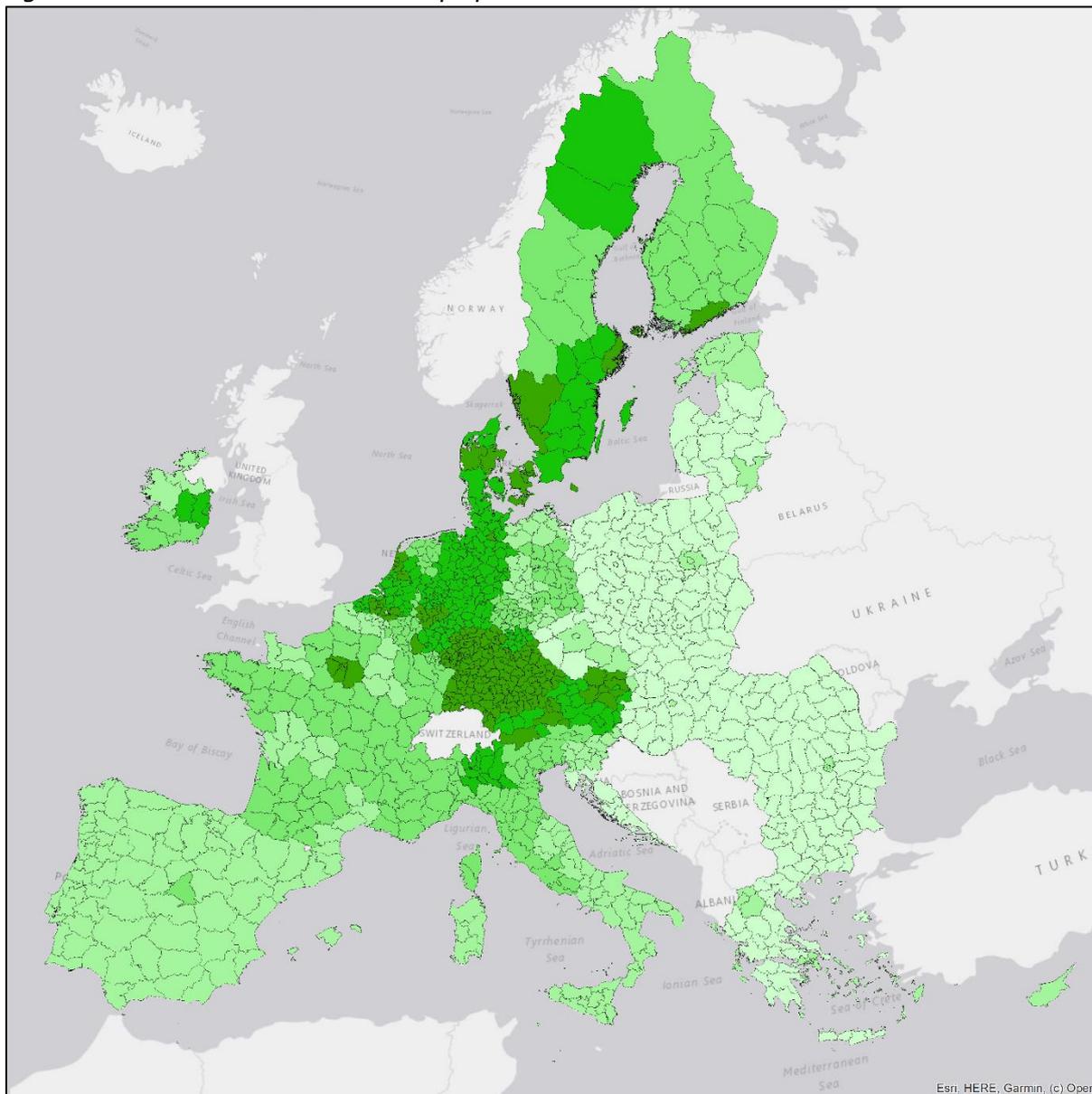
Source: Eurostat, 2020.

### 3. Data

#### 3.1. Descriptive statistics

When looking at the variables individually, we can see some commonalities. Most notably, the ‘Banana corridor’ appears for GDP per capita, household income and soft institutional quality. This corridor, also known as the European backbone, is the area covering the Benelux, the German Ruhr area and south Germany, Austria and the north of Italy, which is often seen as the productive core of Europe (Capoani, 2021). This is illustrated in figure 3.1. where income household income is plotted. The greener areas represent the higher percentile income groups where Luxembourg leads with €36.600. The paler regions represent areas with a lower household income, where Vidin in Bulgaria leads with €2.400.

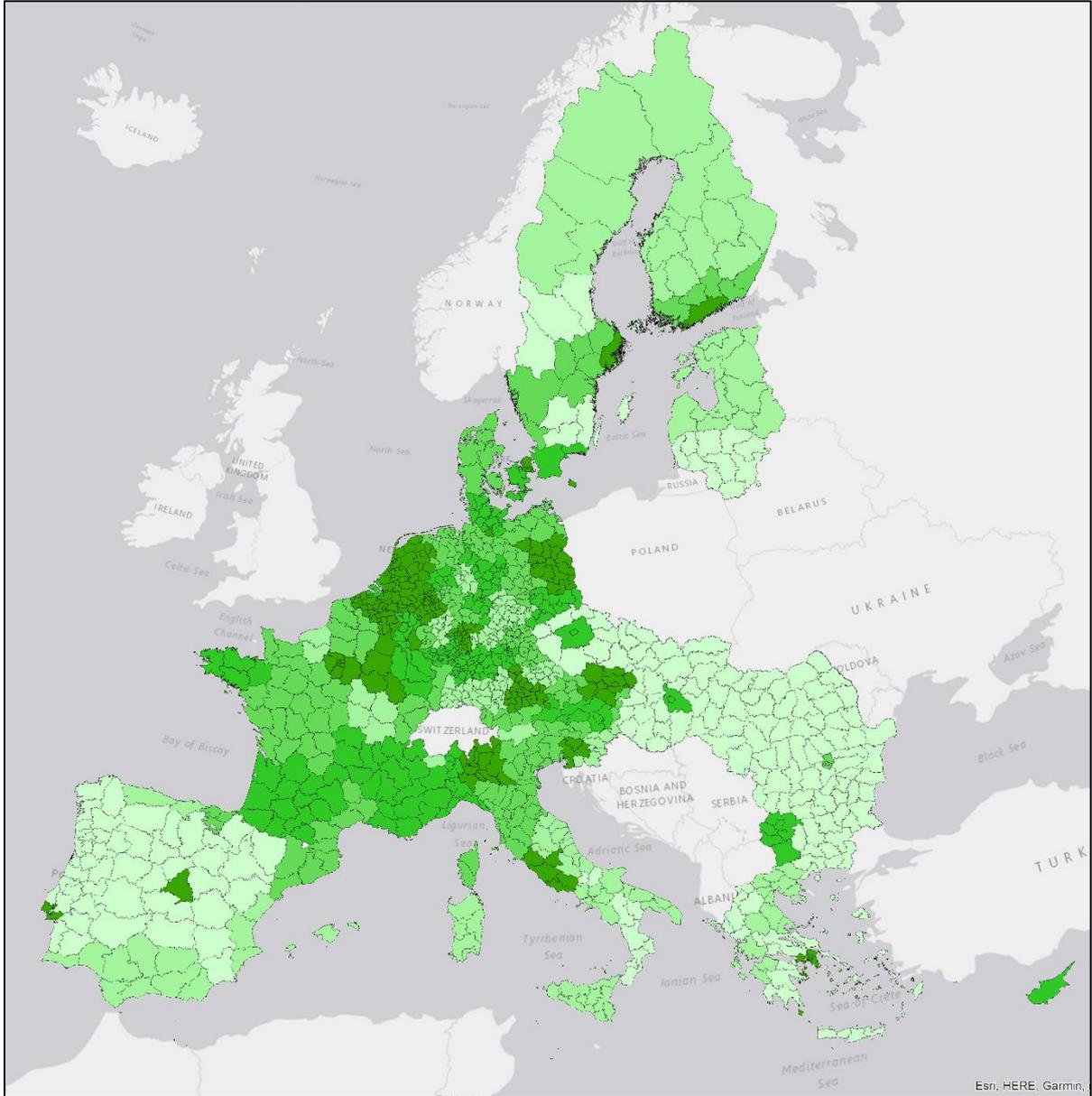
Figure 3.1: Household income in Europe per NUTS 3 scale level.



Source: Own work, 2022.

Furthermore, an interesting pattern can be found when looking at informal institutional quality, which is illustrated in figure 3.2. Green areas represent a high overall score, meaning SME's in that area have more innovation cooperation. Red areas represent a low score. Although Poland is missing, the same patterns as in the previous figure can be spotted. Once again, the best scoring region is Luxembourg. Five Romanian regions have an equal score which is the lowest overall. The most noteworthy difference is that capital regions outside the 'Banana corridor' are closer behind than in the previous figure. Especially rural areas in the south and east of Europe underperform.

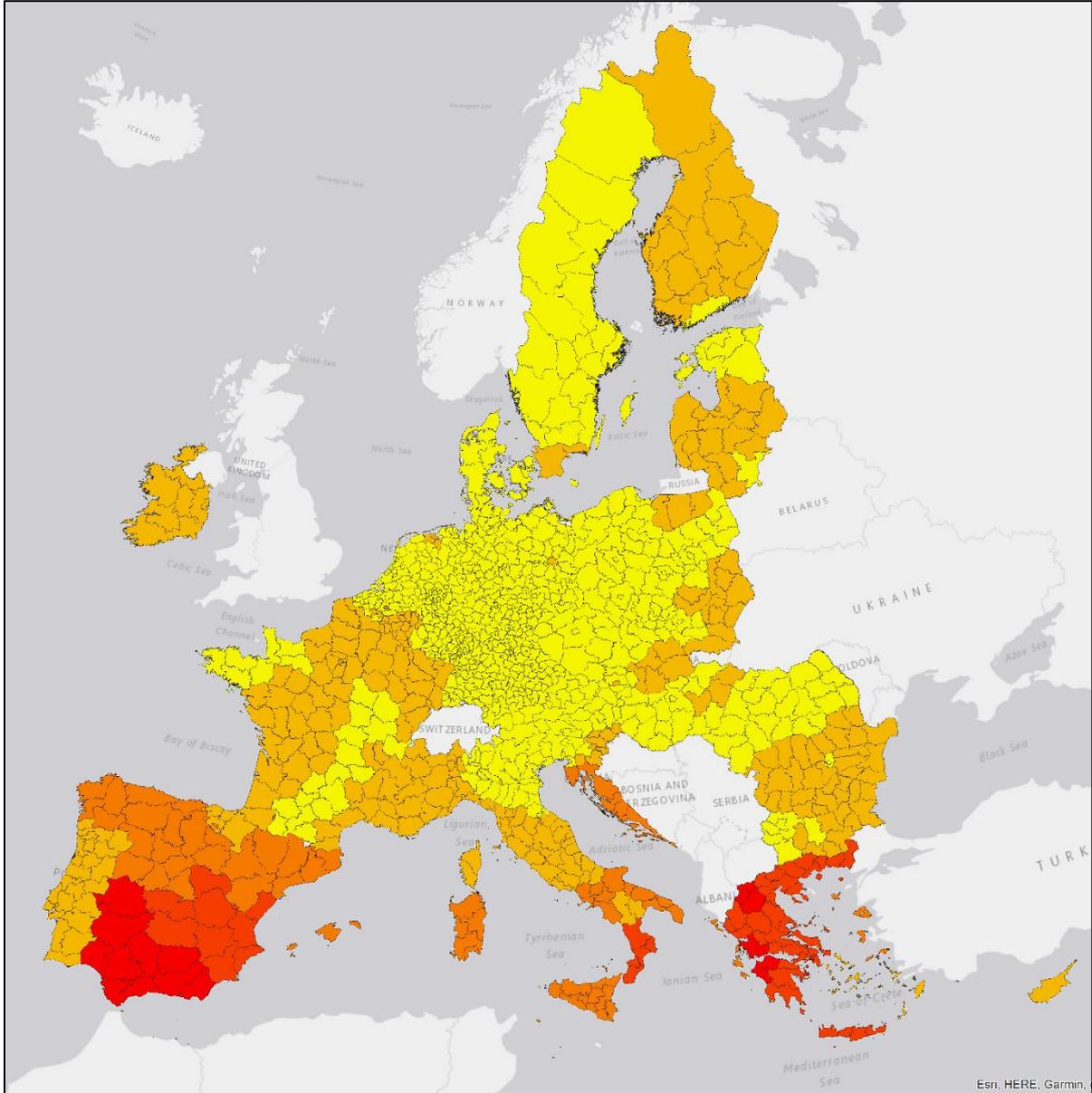
Figure 3.2: Informal institutional quality in Europe per NUTS 3 scale level.



Source: Own work, 2022.

Finally, another interesting pattern was found when plotting the unemployment levels in Europe. Figure 3.3. shows the percentage of unemployment per NUTS 3, where red areas have more unemployment and yellow areas have the lowest levels of unemployment. Here, we can vaguely see an inverted 'Banana'. The lowest unemployment levels are found in the south of Germany, where 2.5% of the working population is unemployed. On the other end of the spectrum, the southern part of Italy, half of Spain, and the whole of Greece have very high unemployment levels. The highest unemployment level is found on the African continent, where the Spanish enclave of Melilla has a 34% level unemployment level. The highest level on the European continent is found on the other side of the Strait of Gibraltar with Almeria which has a 32% unemployment level.

Figure 3.3.: Unemployment levels in Europe per NUTS 3 scale level.



Source: Own work, 2022.

### 3.2. Data limitations

As mentioned before, not all variables were available for all NUTS 3 regions. The most important variable where this occurred is our response variable: voting behaviour. Some countries, such as Germany, do not use NUTS 3 regions to collect voting data. In some cases, the data for the NUTS 3 regions could still be derived by manually adding two or more constituencies. However, this was only the case when these constituencies together exactly formed the NUTS 3 region. When this could not be done, the data was omitted from our database. This decision was made because missing data would be better than overlapping and incorrect data. The extent of the missing constituencies can be found in addendum table 1. These difficulties appeared in 7 of the 26 selected countries. In all but one country, more than two-thirds of all NUTS 3 regions were still correctly collected. In Poland, only 55% of the regions could be filled in. The same data limitation issue was also prevalent for data on institutional quality where Germany, Belgium, Estonia and Latvia are all completely missing in the dataset. For the data on GDP and FDI's a smaller number of NUTS 3 regions were missing. A precise overview of the missing data can be found in table 3.1.

*Table 3.1: Overview of missing data per variable.*

<b>Variable</b>	<b>Total missing regions</b>	<b>Percentage covered</b>
Elections	145	87%
EQI Index	475	59%
Soft Institutional Quality	102	91%
GDP	12	99%
FDI's	103	91%
Interregional Inequality	14	99%
Intraregional inequality	581	50%
Unemployment	16	99%
Education	21	98%

Source: Own work, 2022.

### 3.3. Representativity

As for some variables, a large number of cases are excluded, we should check if they are still representative for the entire research population. This is firstly done by checking the most important assumptions. Afterwards, some statistical outputs will be presented.

Firstly, we need a sample size large enough to be representative for the entire research population. As our research population consists of 1157 NUTS 3 regions, we need a sample size of at least 289 to be representative within the 95% confidence level. This minimum requirement is met on all occasions.

Secondly, it is important that the cases that are excluded were excluded by chance and not because of any underlying phenomena. Later, this will be checked by looking at the statistics, but let us first look at the reason why cases could be excluded. The only reason cases are excluded is the fact that the boundaries of the variable's database differ from the own dataset. This happened for several reasons. First of all, this happened when a country redrew their boundaries over time to better fit its population's distribution equally. Another reason why areas do not match is when the variable measures on a different scale level. In most cases, this issue was fixed by manually adding areas, but sometimes the lower scale level boundaries did not match with the NUTS 3 level boundaries. A final reason why areas were excluded is the fact that some variables did not collect data from all countries. For the first two reasons, we can say that these occur randomly and therefore do not affect the representativeness of the research sample. For the last reason, we should be extra attentive when looking at the statistics.

To check whether variables with a lower coverage are still representative, we look at interregional inequality. This is an important explanatory variable and has the lowest coverage of all variables. The other variable with similar lower coverage: the European Quality of Government Index is a Likert-score, where the European average is unknown. As such, we can't perform the same representativity test. In our database, poverty has an average of 17,68%. According to the European Commission, the average poverty rate in the European Union in 2016 was 17,3% (European Commission, 2020). A one-sample t-test was performed to analyse if poverty in our dataset differed from the mean published by the European Commission. This test has proven that the average poverty level in our dataset does not differ significantly from the average as reported by the European Commission,  $t(575) = 1,19$ ,  $p = 0,235$ ,  $d = 0,05$ , 95% CI [-0,25, 1,02]. The statistical outcome is also found in figure 1 of the addendum. As the other two variables with a lower coverage

## 4. Results

This chapter will answer the main research question and the sub-questions based on the statistical tests done in SPSS and R. It will do so by first answering all sub-questions. After which, these answers will be combined to answer the main question. In this chapter only the statistical outcomes will be discussed. The explanation of these relationships, especially when they differ from the theoretical framework, will be discussed in chapter 5. Relevant significant statistical outcomes are attached in the addendum. As this chapter will follow the order of the sub-questions and main question, these questions are repeated for clarity.

- To what extent can the rise in populism be explained by spatial differences in FDI's?
  - To what extent do FDI's affect inequality?
  - To what extent does inequality affect populism?
  - To what extent do FDI's directly affect populism?
  - To what extent does populism affect FDI's?
  - What other factors explain spatial differences in populism?

### 4.1. Results sub-question 1

To answer the first sub-question *"To what extent do FDI's affect inequality?"*, the relationship between FDI's and interregional and intraregional inequality was tested. Interregional inequality was measured through household income. To test this, a simple regression test was executed. This analysis, which is added in figure 2 in the addendum, showed that FDI's have a significant effect on household income. The relationship is positive, meaning that more FDI's results in a higher income. The relationship is weak,  $b = 188,12$ ,  $t(1042) = 3,38$ ,  $p \leq 0,01$ , Adjusted  $R^2 = 0,01$ . This means that 11% of all variation in household income could be explained by FDI's. When FDI's increase, so does interregional inequality.

Intraregional inequality was measured through poverty, since this variable showed how the lowest income groups of every country related to the country's average. To test this, a simple regression test was executed. This analysis, which is added in figure 3 in the addendum, showed that FDI's has a weak significant positive effect on poverty,  $b = 98761$ ,  $t(531) = -2,76$ ,  $p \leq 0,05$ , Adjusted  $R^2 = 0,01$ . This means that 12% of all variation in household income could be explained by FDI's. When FDI's increase, so does intraregional inequality.

### 4.2. Results sub-question 2

To answer the second sub-question *"To what extent does inequality affect populism?"*, the relationship between income and populism was tested. Several tests were necessary as both interregional- and intraregional inequality served as response variables. Moreover, there were four explanatory variables: populist voting, Eurosceptic voting, far-right voting and far-left voting.

The first relationship that was tested was between the variable household income (representing interregional inequality) and the total of populist votes. To test this, a simple regression test was executed. This analysis, which is added in figure 4 in the addendum, showed that household income has a weak significant negative effect on populism,  $b = -9133,53$ ,  $t(996) = -7,24$ ,  $p \leq 0,05$ , Adjusted  $R^2 = 0,05$ . This means that 4,9% of all variation in populism could be explained by household income. When household income increases, the share of populist votes decreases.

The second relationship that was tested was between the variable poverty (representing intraregional inequality) and the total of populist votes. To test this, a simple regression test was executed. No significance could be found.

The third and fourth relationships that were tested were between the variables income and poverty (respectively representing both interregional- and intraregional inequality) and Eurosceptic voting. On both occasions a linear regression test was executed. Both did not prove to be significant.

Next, the relationship between household income (representing interregional inequality) and the votes on far-right parties was analysed. To test this, a simple regression test was executed. This analysis, which is added in figure 5 in the addendum, showed that household income has a weak but significant positive effect on far-right voting,  $b = 6403,16$ ,  $t(992) = 3,151$ ,  $p \leq 0,05$ , Adjusted  $R^2 = 0,009$ . When household income increases, voting far-right also increases.

Afterwards, the relationship between poverty (representing intraregional inequality) and the votes on far-right parties was analysed. To test this, a simple regression test was executed. This analysis, which is added in figure 6 in the addendum, showed that poverty has a weak significant negative effect on far-right voting,  $b = -17,6$ ,  $t(516) = -8,56$ ,  $p \leq 0,05$ , Adjusted  $R^2 = 0,123$ . This means that 12,3% of all variance of far-right voting can be explained by intraregional inequality. When intraregional inequality rises, voting for far-right parties declines.

The second to last relationship that was tested was between household income (representing interregional inequality) and the votes on far-left parties. To test this, a simple regression test was executed. This analysis, which is added in figure 7 in the addendum, showed that household income has a weak significant negative effect on far-left voting,  $b = -19598,02$ ,  $t(991) = -9,89$ ,  $p \leq 0,05$ , Adjusted  $R^2 = 0,09$ . This means that 8,9% of all variance of far-left voting can be explained by interregional inequality. When household income increases, voting far-left decreases.

Finally, the relationship between poverty (representing intraregional inequality) and the votes on far-left parties was analysed. To test this, a simple regression test was executed. This analysis, which is added in figure 8 in the addendum, showed that poverty has a weak significant positive effect on far-left voting,  $b = 14,10$ ,  $t(515) = 6,90$ ,  $p \leq 0,05$ , Adjusted  $R^2 = 0,08$ . This means that 8,3% of all variance of far-left voting can be explained by intraregional inequality. When intraregional inequality rises, so does voting far-left.

#### *4.3 Results sub-question 3*

To answer sub-question 3 *“To what extent do FDI’s directly affect populism?”*, analysis was done in both SPSS and R. Firstly, four relationships were tested in SPSS. In all four tests, the explanatory variable was FDI’s. The response variables were: the total share of populist votes, share of Eurosceptic votes, share of far-right votes and the share of far-left votes. In all cases a linear regression was used, none of which was significant. However, it could be hypothesized that there are too many mediating variables which create statistical noise. Therefore, a multiple regression analysis was executed in R, which allowed for all other variables to be filtered out. However, even FDI’s did not appear to be a significant explanatory variable for any of the response variables.

#### 4.4. Results sub-question 4

To answer sub-question 4 *“To what extent does populism affect FDI’s?”*, four different linear regression analyses were done. In all cases, the response variable was the amount of FDI’s received. Four different explanatory variables were used: the total share of populist votes, share of Eurosceptic votes, share of far-right votes and the share of far-left votes. None of the linear regressions turned out to be significant.

#### 4.5. Results sub-question 5

To answer the final sub-question *“What other factors explain spatial differences in populism?”*, a spatial regression model was made in R. By doing so, many different variables could be taken into account, so false relationships due to confounding variables can be filtered out. To answer this question, four different spatial regression models were built for the total share of populist votes, for the share of Eurosceptic votes, for the share of far-right votes and for the share of far-left votes.

For the total share of populist votes the variables household income, soft institutional quality, unemployment and poverty were found to be significant. This can also be found in the attached figure 9 in the addendum. Household income was already proven to be significant in sub-question 2, it was again proven with a 95% confidence interval to have a negative effect on populist voting. Soft institutional quality had a positive effect on populism, meaning that populism decreases when soft institutional quality decreases. This was proven with a 99% confidence interval. Moreover, the share of unemployed people was also proven significant with a 99% confidence interval. The effect was positive, meaning that the share of people voting populist rises as the unemployment increases. Finally, poverty (which represents intraregional inequality) was also proven to have a significant effect on the share of populist votes. The negative effect was proven with a 99% confidence interval, meaning that an increase in poverty leads to a decrease in populist votes. The spatial regression model, which can be found in figure 8 of the addendum, could account for 57,4% of all variance,  $R^2 = 0,57$ .

For the total share of Eurosceptic voting, six variables were found to be significant. Firstly, household income was once proven to be significant. Although it could not be proven when using linear regression, the multiple regression analysis could prove a negative relationship with a 90% confidence interval. This means Eurosceptic voting went down if household income increases. Moreover, soft institutional quality was once again proven to have a significant positive effect, this time with a 90% confidence interval. This means that the share of people voting Eurosceptic rises when soft institutional quality increases. As with the previous regression model, the share of unemployment again proved to be significant, the effect was positive and proven with a 99% confidence interval, meaning that Eurosceptic voting increases when unemployment rises. The share of people that have completed a high level of education also proved to be significant. The effect was negative, meaning that more highly educated citizens leads to fewer Eurosceptic voters. The effect was proven with the 90% confidence interval. Finally, poverty again proved to be significant with a 99% confidence interval. The effect was negative, meaning that when poverty increases, voting Eurosceptic went down. The spatial regression model, which can be found in figure 10 of the addendum, accounted for 43% of all variance,  $R^2 = 0,43$ .

The third spatial model was that of far-right voting. The model can be found in figure 11 in the addendum. Many different variables proved to be significant. The institutional quality index, the share of people having a high education level and poverty had a negative

relationship, meaning that an increase in the response variable would lead to a decrease in far-right voting. Only corruption and household had a positive relationship, meaning that an increase in populism leads to an increase in far-right voting. All variables proved to be significant with a 95% confidence interval, except for poverty, which was significant with a 99% confidence interval and household income, which was significant with a 90% confidence interval. The regression model could account for 31,5% of all variance,  $R^2 = 0,32$ .

The final regression model was for far-left voting behaviour. This model could be found in figure 12 of the addendum. Household income, the ratio between FDI and GDP, soft institutional quality and the institutional quality index had a negative relationship, meaning that an increase in the response variable would lead to a decrease in far-left voting. Corruption, impartiality, quality of government, unemployment, share of high education level, and poverty were positively related, meaning that an increase in the response variable would lead to an increase in far-left voting. All variables were significant with a 95% confidence interval except for soft institutional quality which was significant with a 90% confidence interval and household income, the ratio between FDI and GDP, unemployment, education and poverty which were significant with a 99% confidence interval. The model accounted for 43,5% of all variance,  $R^2 = 0,44$ .

#### *4.6. Results main question*

To answer the main question *“To what extent can the rise in populism be explained by spatial differences in FDI’s?”* we simply have to reiterate our findings from sub-question 1, 2 and 3 and complement this with our findings from the regression models in sub-question 5.

As was predicted in by theory, there is a relationship between FDI’s and inequality. When FDI’s increase household income increases as well. This means that FDI’s have an effect on interregional inequality. Furthermore, FDI’s also significantly effect poverty, thus intraregional inequality.

On its turn, inequality also effects populism. In sub-question 2, the majority of test turned out to be significant. Interregional inequality had a significant effect on far-right voting, far-left voting and overall populist voting. It did not have a significant relationship with Eurosceptic voting. Intraregional inequality had a significant effect on both far-right voting and far-left voting.

Although FDI’s have a significant effect on inequality and inequality had some significant effects on populism, no noteworthy direct effect between FDI’s and populism could be established. When performing multiple (spatial) regression analysis in R, only the ratio of FDI’s and GDP turned out to be weakly significant for voting far-left. Possible clarifications for all these findings will be discussed in the next chapter.

## 5. Discussion

In the previous chapter, all sub-questions and the main-question were answered by analysing the extended database in both SPSS and R. Some relationships that were proven to be significant were already expected based on the theoretical framework. However, some expected significant relationships were not found. This chapter will try to explain why these relationships could not be discovered in our research. Moreover, some significant relationships are found that are contra intuitive and sometimes even contradict the theoretical framework. These relationships will also be discussed and further research will be added to clarify these discrepancies.

### 5.1. Conclusion

The first relevant finding was that when FDI's increase both interregional and intraregional inequality rise. This was predicted by our theoretical framework as it was highlighted that FDI's do not distribute evenly and therefore grant more capital to certain areas thus increasing interregional inequality (Zhu et al, 2015). Moreover, not everyone benefits from FDI's equally, as shareholders gain more than normal employees. As such, FDI's also increase intraregional inequality (Artelaris, 2021).

Next, this research has conducted many different tests in both SPSS and R, using both interregional and intraregional inequality as explanatory variables and populist, Eurosceptic, far-right and far-left as response variables. It is good to note that all different tests across SPSS and R generated the same results.

First of all, interregional inequality has a significant negative effect on populist voting. This may seem illogical at first, but interregional inequality is captured by household income. Therefore, it was proven that when interregional inequality rises and a region is on the 'winning end' of this increase, populist voting decreases. As such, when a region is on the 'losing side' of increasing interregional inequality, populist voting increases. These findings have been at the centre of our research as Rodriguez-Pose (2018) pointed out that places that don't matter take revenge by using the ballot box. This counts for both populist voting in general as for voting Eurosceptic and far-left. What is more interesting, is that voting far-right is positively correlated with interregional inequality. A possible explanation could be that the far-right spectrum of the political field is too diverse to be captured by conventional theories regarding populist movements. Populism is normally attractive to the 'common folk', but recently most western European countries have developed a far-right populist movement that focuses primarily on anti-immigration instead of the elite versus the people narrative (Rydgren, 2010; Hayes & Dudek, 2020). As a result, far-right populist parties such as the German AfD, the Dutch FvD and Austria's FPÖ are pulling votes from all income and education levels (Hayes & Dudek, 2020). The German AfD has even been nicknamed "the party of professors" (Konstantinis, 2021).

When looking at intraregional inequality instead of interregional inequality, there are also different types of relations for different kind of populist movements. Both the Euroscepticism and far-left voting are positively related with intraregional inequality. This makes sense, as being at the losing end of intraregional inequality is an important source for political discontent and therefore for populist voting (Lenzi & Perucca, 2021). The total populist vote and the far-right vote, however, are negatively correlated with intraregional inequality. A possible explanation could be the same as for the relationship with interregional inequality: the far-right spectrum currently has many very different narratives.

This in turn also influences the relationship between intraregional inequality and populism as a whole.

As mentioned in the conclusion in last chapter, overall there is no direct relationship between FDI's and populism. The only significant relationship between the two variables that could be detected was that of the relationship between the ratio between FDI's and GDP and far-left voting. The explanatory variable was created when dividing FDI's received by the regions GDP. When this variable is high, that means the region received many FDI's in relation to the size of its economy. Or in other words, FDI's represent a larger part of their economy. In those cases, FDI's did prove weakly negatively significant for far-left voting. So we could say that in FDI dependent regions, voting far-left is weakly tempered. As such, the negative feedback loop that was hypothesized where fewer FDI's result in a more populist regional government, which will attract fewer FDI's, could not be found.

Finally, some other variables proved to have a significant effect on populism. This research found a significant positive relationship between soft institutional quality and both populism as a whole and Euroscepticism. This means that when the business sophistication, captured by innovation cooperation, improves, people vote more populist and Eurosceptic. At first, this is highly counterintuitive. Populism is seen as a phenomenon that thrives best in regions with a underdeveloped business climate (Rodriguez-Pose, 2018). As a result of this climate and the few opportunities, people resort to populism as a counter vote (Mudde & Kaltwasser, 2017). Although further research is highly recommended, two possible explanations can be found. The first one is that an increase in populism can have a positive effect on FDI's (Röth, Afonso & Spies, 2018). Although this relationship could not be found in this research, and was actually contradicted in the theoretical framework, a study that only looked at western Europe and looked on country level, found that there is positive effect. This is because of the fact that populism often goes hand in hand with deregulation and privatization. This then attracts FDI's because MNE's tend to favour markets that protect their rights over employee rights (Gross & Ryan, 2008). These FDI's in turn then lead to more innovation cooperation. The second line of reasoning is that an increase in populism leads to a decrease in public funding for innovation (Borins, 2018). This was especially the case after the election of Trump in the US, but was also proven to be significant in Europe. When public innovation decreases, innovation by SME's increases and therefore innovation cooperation increases. As mentioned before, to fully understand these dynamics further investigation is required to both understand the causality and relationship between the two variables.

Another variable that proved to significantly effect populism was unemployment, which was significant in all regression models except for voting far-right. Why it was not significant for far-right voting is hard to say. Theoretically, unemployment was especially for the far-right seen as a trigger to vote. However, this finding is not unique, as other studies were also unable to discover a relationship between unemployment and voting far-right (Rydgren, 2002; Sipma & Lubbers, 2020). A meta-analysis on the relationship provided the insight that the relationship could only be found in western and eastern Europe (Sipma & Lubbers, 2020). This anomaly could not be found for far-left populism (Ramiro & Gomez, 2017). This could explain why unemployment was only not significant for far-right voting.

The share of highly educated people was significant in all models except for the model for populism as a whole. The reason for this is that a high share of highly educated was negatively correlated for Euroscepticism and far-right voting, but positively correlated

for far-left voting. In other words, highly educated people tended to increase the likelihood of a high far-left vote turnout and decreased the likelihood of a high far-right and Eurosceptic vote turnout. This matches our theory as Gidron and Hall (2020) already pointed out that a higher level of education decreased the likelihood to vote far-right but not far-left.

Finally, all pillars of the EQI Index and the EQI Index itself were significant for the far-right and the far-left regression models. The EQI Index was negatively correlated, which means a higher overall EQI score results in fewer populist votes. This outcome matches the theory, as high levels of corruption, low levels of impartiality and poor quality of services were all previously proven to increase dissatisfaction and distrust in the political regime, thus increasing the likelihood to countervote (Hanley, & Sikk, 2016).

### *5.2. Reflection*

After finalizing a research, it is always important to critically reflect. By reflecting, we remain aware of the limitations of the research, and as a result, know its limitations and validity.

The first limitation has been mentioned before: the data limitation. Although the research sample size easily exceeded the requirements needed to generalize results with a 95% confidence interval to the total population and variables with a low coverage could be generalized to all countries, the aim of this research was to create a completely comprehensive database, which has not been accomplished for all variables.

Another limitation is the fact that the entire European Union was put in the same model. Although this has some benefits, such as creating an understanding of which processes exceed country borders, it also has the downside that significant processes in one country are cancelled out by opposite processes in other countries, leaving no significance in the model. For instance: in country A unemployment might lead to a feeling of economic uncertainty which leads to a lack of trust in the political system which increases populism, in country B unemployment might lead to an increase in voluntary work which leads to a stronger social network which leads to a decrease in populism. Both processes might be significant and both are relevant, but because there is a different process going on in both countries, the significant effects are not visible in the analysis. Moreover, the same process could also differ across the political spectrum, where processes on the left-wing and the right-wing might cancel each other out. Although all regression models were able to explain a decent amount of the occurring variance, the models might have been stronger when only looking at either western, eastern or southern Europe. However, when one of the current models was able to prove a certain variable was significant, this was proven with much certainty. This can also be observed when looking at the statistical outcomes: even when a variable only explained a small percentage of the variance, confidence intervals were always high.

### *5.3. Recommendations*

Besides reflecting on the limitations of a research, it is also important to note which valuable insights can be taken from the research. These insight can be new paths of research to pursue. After all, almost all literary works were not possible without the previous breakthrough. Secondly, it is also important to note what valuable lessons can be taken from the research and in what way the research can contribute to society.

### 5.3.1. Recommendations for further research

This research has tried to create a holistic model of many different geographical, political, demographical and economic variables. As a result, a dataset of 1157 NUTS 3 regions was formed with more than 20 variables. However, more variables can always be added. During the search for data, many other interesting datasets were found that were not included in the model but are still worth further exploring. The first variable is internet usage. This could be in the form of a share of the population that uses the internet, or the average hours spend on the internet. This would be interesting because it could show what effect internet, and in particular social media, has on populism. It is often hypothesized social media increases the probability to radicalise and that the structure of social media's algorithms enforces so-called "Echo chambers" where users are not corrected on this behaviour (Boulianne, Koc-Michalska & Bimber, 2020).

Moreover, it could also be interesting to replace FDI data with data on economic resilience. It could be argued that economic resilience is a strong way to capture economic competitiveness as it generally favours diversified and knowledge-intensive economies (Simmie & Martin, 2010).

Another research could perhaps look at the relationship between Euroscepticism and EU or national funding. It is logical to think that funding will help mitigate the feeling of being left behind. As such, it could be hypothesized that there is a negative relationship between EU funding and Euroscepticism. If true, such a research could quantify how much funding is needed to prevent a region from voting populist.

Furthermore, this research chose to not look at the UK. This is because this research looked at the general elections. The general elections in the UK leading up to the Brexit referendum were too complicated to be in line with general populist theory. The Brexit referendum itself was a binary voting (either remain or leave) so also did not fit in the classification between far-left, far-right and/or Eurosceptic. However, it would be highly interesting to use the variables of this research to explain the Brexit referendum results.

Moreover, this research did not make a distinction between Greenfield FDI's or Merger and Acquisitions as this distinction was not used in the theoretical framework. However, it could be hypothesized that a Greenfield FDI would create a stronger influence in the region and would therefore maybe also create a stronger sense of European unity and mitigate Euroscepticism.

Finally, an anomaly in the statistical outcome was found when looking at the relationship between populism and soft institutional quality, which was captured by innovation cooperation. The theory suggested that soft institutional quality would decrease populism. The data however, showed a positive relationship. Although causality is not certain, it was then hypothesized that this could be because populist regimes relieve protectionist legislation, which generates FDI's and on its turn cooperation or that populist regimes decrease public spending on innovation, which would require SME's to innovate themselves. Which theory, if any, is true, would need to be looked at further.

### 5.3.2. Policy recommendations

Next to the recommendations for further research, it is also highly important to see what this research can contribute to society. This is best done by taking the most important findings and apply them to policies. As the central problem of this research has been trying to find explanations for the rise in populism, the following policy recommendations to reduce populism have been created.

The first takeaway would be to address the unequal distribution of FDI's, since this leads to a more unequal society, which in turn can fuel populism. To find solutions to better distribute FDI's, we only have to look at the OLI paradigm. One way to do this, for instance, is to invest in (online) infrastructure in the periphery of the country, so that transport costs would decrease and work efficiency or connectivity could increase. Another possible solution would be to decentralize government, which creates more knowledge hubs within the country. This has proven to be an effective solution to create more interregional equal growth patterns (McCann, 2020). However, Treisman (2002) found some evidence that this reduces the quality of government. Another more direct measure to increase equality would be a more progressive income tax.

Furthermore, the share of highly educated people seemed to be an important and significant variable in explaining populism. To reduce the share of populist votes, a government could decide to university tuition-free and to hand out scholarships so that more people can afford to study. Another measure could be to reduce unemployment and corruption within regions, as these were a significant contribution to the rise in populism. However, finding solutions to these problems would require a separate thesis.

## 6. Summary

Over the previous 50 years, economic geographers have observed some key changes in the world. As globalisation has shaped our world, we now look at it from a more regional perspective. We pay much attention to the regions that have succeeded, such as Silicon Valley, but we also look at the regions that have fallen behind. We now often view the future of peripheral regions in the first world as less hopeful than central regions in the third world (Rodriguez-Pose, 2018). As many revitalisation projects have failed to make peripheral regions catch up, policymakers believe it is the best strategy to put all eggs in one basket and only focus on the biggest cities in the country. As a result, underperforming cities and peripheral regions are left out of the development scope. These underrepresented regions are 'the places that don't matter' (Rodriguez-Pose, 2018). Populist parties are often popular in these areas because they make the unrepresented feel heard (Rodriguez-Pose, 2020). As a result, the support for populist parties has doubled in Europe over the last 20 years (Henley, 2020).

This research aimed to understand whether or not inequality is causing the rising populist support. Moreover, it tries to understand what role FDI's play. To realise this, the following research question and sub-questions were asked:

- To what extent can the rise in populism be explained by spatial differences in FDI's?
  - To what extent do FDI's affect inequality?
  - To what extent does inequality affect populism?
  - To what extent do FDI's directly affect populism?
  - To what extent does populism affect FDI's?
  - What other factors explain spatial differences in populism?

Through a literary study, we've established that Dunning's (2008) OLI paradigm can help us understand MNE's FDI location choices. Ownership-, location- and internalization advantages all play a role in determining if and where to invest. Important variables that play a role are: formal and informal institutional quality, human capital, infrastructure, stability and culture. In its turn, FDI's can affect inequality and inequality can affect populism.

To test whether FDI's also have a direct effect on populism, this research proposed to conduct spatial regression analysis in R. The research consisted of the entire European Union, without former member the United Kingdom and without overseas territories on a NUTS 3 scale level. FDI data was collected over a longer time period, namely 2003 till 2015. All other variables were captured from 2015 till 2019 at the latest to see the effects of FDI's. To create the dataset, many different sources were used such as ESPON, Eurostat, the EQI Index and the OECD database. Finally, to obtain voting data, the CLEA dataset as well as many different internal affairs datasets were used.

The dataset consisted of 1157 regions and more than 20 variables. Although for some variables not all regions were included, most variables still proved to be representative for the total research population as the data was randomly collected and the sample size allowed us to generalize with a 95% confidence interval. For some variables however, it should be noted that the findings can't be generalized to certain counties.

After analysing the dataset, we found that FDI's increase both interregional- as intraregional inequality. On its turn, these types of inequalities mostly significantly affected the four different types of populism, although some relationships were positively related and others were negatively related. As a result, no direct relationship between FDI's and populism could be established. Furthermore, there was no negative feedback loop detected between FDI's and populism. Some noteworthy relationships with populism that were found were the positive relationship with unemployment and voting populist, Eurosceptic and far-left and the positive relationship with high education levels and voting far-right, but negative relationship with voting far-left.

These findings can then be used as further prove that policy needs to address inequality in order to reduce populism. Further research could build on these findings by adding different types of FDI's or economic resilience to this database or by zooming in to one specific country.

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## Addendum

Table 1: Election years used per country

Country	Election year	Notes
Austria	2017	* 83.33%
Belgium	2019	
Bulgaria	2017	
Croatia	2016	
Republic of Cyprus	2017	
Czech Republic	2017	
Denmark	2015	
Estonia	2019	
Finland	2019	*68.43%
France	2017	*98.96%
Germany	2017	*74.20%
Greece	2019	*89.36%
Hungary	2018	
Ireland	2016	
Italy	2018	
Latvia	2018	
Lithuania	2016	
Luxembourg	2018	
The Netherlands	2017	
Poland	2015	*54.79%
Portugal	2019	
Romania	2016	
Slovakia	2016	
Slovenia	2018	
Spain	2015	*88.14% Although the 2015 election results were too close to form a coalition and elections were held again in 2016, it was decided to use the 2015 elections and not the re-election as people may have voted differently in the 2016 elections to prevent a second stalemate.
Sweden	2018	

\* Some NUTS 3 regions could not be filled in because of discrepancies between NUTS 3 and constituencies. The percentage shows the total coverage of NUTS 3 regions in that country.

Figure 1. One sample T-test for poverty rate

<b>One-Sample Statistics</b>					
	N	Mean	Std. Deviation	Std. Error Mean	
Poverty	576	17.68	7.761	.323	

<b>One-Sample Test</b>							
Test Value = 17.3							
	t	df	Significance		Mean Difference	95% Confidence Interval of the Difference	
			One-Sided p	Two-Sided p		Lower	Upper
Poverty	1.188	575	.118	.235	.384	-.25	1.02

<b>One-Sample Effect Sizes</b>					
	Standardizer <sup>a</sup>	Point Estimate	95% Confidence Interval		
			Lower	Upper	
Poverty	Cohen's d	7.761	.049	-.032	.131
	Hedges' correction	7.771	.049	-.032	.131

a. The denominator used in estimating the effect sizes.  
 Cohen's d uses the sample standard deviation.  
 Hedges' correction uses the sample standard deviation, plus a correction factor.

Source: Own work, 2022.

Figure 2. Statistical outcome of linear regression between FDI's and Household income.

Variables Entered/Removed <sup>a</sup>			
Model	Variables Entered	Variables Removed	Method
1	HHIncTotal <sup>b</sup>	.	Enter

a. Dependent Variable: FDI0315  
b. All requested variables entered.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.104 <sup>a</sup>	.011	.010	15683160.037

a. Predictors: (Constant), HHIncTotal

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.811E+15	1	2.811E+15	11.427	<.001 <sup>b</sup>
	Residual	2.563E+17	1042	2.460E+14		
	Total	2.591E+17	1043			

a. Dependent Variable: FDI0315  
b. Predictors: (Constant), HHIncTotal

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	105740.172	1176498.912		.090	.928
	HHIncTotal	188.124	55.652	.104	3.380	<.001

a. Dependent Variable: FDI0315

Source: Own work, 2022.

Figure 3. Statistical outcome of linear regression between FDI's and poverty.

**Variables Entered/Removed<sup>a</sup>**

Model	Variables Entered	Variables Removed	Method
1	Poverty <sup>b</sup>	.	Enter

a. Dependent Variable: FDI0315

b. All requested variables entered.

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.119 <sup>a</sup>	.014	.012	17657921.300

a. Predictors: (Constant), Poverty

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.381E+15	1	2.381E+15	7.636	.006 <sup>b</sup>
	Residual	1.656E+17	531	3.118E+14		
	Total	1.679E+17	532			

a. Dependent Variable: FDI0315

b. Predictors: (Constant), Poverty

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
		B	Std. Error			
1	(Constant)	9607029.599	1924196.396		4.993	<.001
	Poverty	-272918.261	98761.049	-.119	-2.763	.006

a. Dependent Variable: FDI0315

Source: Own work, 2022.

Figure 4. Statistical outcome of linear regression between household income and populism.

**Variables Entered/Removed<sup>a</sup>**

Model	Variables Entered	Variables Removed	Method
1	PERPO <sup>b</sup>	.	Enter

a. Dependent Variable: HHIncTotal  
b. All requested variables entered.

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.223 <sup>a</sup>	.050	.049	8185.703

a. Predictors: (Constant), PERPO  
b. Dependent Variable: HHIncTotal

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3507316353.6	1	3507316353.6	52.344	<.001 <sup>b</sup>
	Residual	66737707424	996	67005730.345		
	Total	70245023778	997			

a. Dependent Variable: HHIncTotal  
b. Predictors: (Constant), PERPO

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	21768.735	471.782		46.141	<.001
	PERPO	-9133.535	1262.430	-.223	-7.235	<.001

a. Dependent Variable: HHIncTotal

Source: Own work, 2022.

Figure 5. Statistical outcome of linear regression between household income and far-right voting.

**Variables Entered/Removed<sup>a</sup>**

Model	Variables Entered	Variables Removed	Method
1	PERRIGHT <sup>b</sup>		Enter

a. Dependent Variable: HHIncTotal

b. All requested variables entered.

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.100 <sup>a</sup>	.010	.009	8363.373

a. Predictors: (Constant), PERRIGHT

b. Dependent Variable: HHIncTotal

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	694403147.39	1	694403147.39	9.928	.002 <sup>b</sup>
	Residual	69386443543	992	69946011.636		
	Total	70080846690	993			

a. Dependent Variable: HHIncTotal

b. Predictors: (Constant), PERRIGHT

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	17951.483	399.063		44.984	<.001
	PERRIGHT	6403.161	2032.217	.100	3.151	.002

a. Dependent Variable: HHIncTotal

Source: Own work, 2022.

Figure 6. Statistical outcome of linear regression between poverty and far-right voting.

**Variables Entered/Removed<sup>a</sup>**

Model	Variables Entered	Variables Removed	Method
1	PERRIGHT <sup>b</sup>		Enter

a. Dependent Variable: Poverty

b. All requested variables entered.

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.353 <sup>a</sup>	.124	.123	7.43961

a. Predictors: (Constant), PERRIGHT

b. Dependent Variable: Poverty

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4055.063	1	4055.063	73.265	<.001 <sup>b</sup>
	Residual	28559.447	516	55.348		
	Total	32614.510	517			

a. Dependent Variable: Poverty

b. Predictors: (Constant), PERRIGHT

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	20.718	.437		47.364	<.001
	PERRIGHT	-17.591	2.055	-.353	-8.560	<.001

a. Dependent Variable: Poverty

Source: Own work, 2022.

Figure 7. Statistical outcome of linear regression between household income and far-left voting.

**Variables Entered/Removed<sup>a</sup>**

Model	Variables Entered	Variables Removed	Method
1	PERLEFT <sup>b</sup>	.	Enter

a. Dependent Variable: HHIncTotal

b. All requested variables entered.

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.300 <sup>a</sup>	.090	.089	8028.170

a. Predictors: (Constant), PERLEFT

b. Dependent Variable: HHIncTotal

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6305477371.9	1	6305477371.9	97.833	<.001 <sup>b</sup>
	Residual	63871452376	991	64451516.021		
	Total	70176929748	992			

a. Dependent Variable: HHIncTotal

b. Predictors: (Constant), PERLEFT

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
		B	Std. Error			
1	(Constant)	21069.169	336.123		62.683	.000
	PERLEFT	-19598.015	1981.389	-.300	-9.891	<.001

a. Dependent Variable: HHIncTotal

Source: Own work, 2022.

Figure 8. Statistical outcome of linear regression between poverty and far-left voting.

**Variables Entered/Removed<sup>a</sup>**

Model	Variables Entered	Variables Removed	Method
1	PERLEFT <sup>b</sup>	.	Enter

a. Dependent Variable: Poverty

b. All requested variables entered.

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.291 <sup>a</sup>	.085	.083	7.62102

a. Predictors: (Constant), PERLEFT

b. Dependent Variable: Poverty

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2767.310	1	2767.310	47.647	<.001 <sup>b</sup>
	Residual	29911.150	515	58.080		
	Total	32678.461	516			

a. Dependent Variable: Poverty

b. Predictors: (Constant), PERLEFT

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.489	.416		39.613	<.001
	PERLEFT	14.100	2.043	.291	6.903	<.001

a. Dependent Variable: Poverty

Figure 9. Spatial regression model for the share of total populist votes.

	<i>Dependent variable</i>
<i>Household income</i>	-0,452*** (0,201)
<i>Soft Institutional Quality</i>	0,077*** (0,022)
<i>Percentage unemployment</i>	1,465*** (0,215)
<i>Poverty</i>	-1,054*** (0,194)
<i>Constant</i>	7,498 (14,848)
<i>Observations</i>	426
<i>R<sup>2</sup></i>	0,597
<i>Adjusted R<sup>2</sup></i>	0,574
<i>Residual Std. Error</i>	0,160 (df = 402)
<i>F statistic</i>	25,916*** (df = 23; 402)
<i>Note</i>	*P<0,1; **p<0,05; ***p<0,01

Source: Own work, 2022.

Figure 10. Spatial regression model for the share of Eurosceptic votes.

	<i>Dependent variable</i>
<i>Household income</i>	-0,454*** (0,201)
<i>Soft Institutional Quality</i>	0,038* (0,022)
<i>Percentage unemployment</i>	1,088*** (0,215)
<i>Share of highly educated</i>	-24,819* (14,862)
<i>Poverty</i>	-0,869*** (0,195)
<i>Constant</i>	24,265 (14,870)
<i>Observations</i>	426
<i>R<sup>2</sup></i>	0,461
<i>Adjusted R<sup>2</sup></i>	0,430
<i>Residual Std. Error</i>	0,160 (df = 402)
<i>F statistic</i>	14,926*** (df = 23; 402)
<i>Note</i>	*P<0,1; **p<0,05; ***p<0,01

Source: Own work, 2022.

Figure 11. Spatial regression model for the share of far-right votes.

	<i>Dependent variable</i>
<i>Household income</i>	0,024* (0,015)
<i>Quality of government Index</i>	-4,862** (2,307)
<i>Corruption</i>	1,661** (0,791)
<i>Impartiality</i>	1,636** (0,798)
<i>Quality of institutions</i>	1,705** (0,797)
<i>Share of highly educated</i>	-31,031** (13,170)
<i>Poverty</i>	-1,077*** (0,172)
<i>Constant</i>	31,190 (13,177)
<i>Observations</i>	426
<i>R<sup>2</sup></i>	0,352
<i>Adjusted R<sup>2</sup></i>	0,315
<i>Residual Std. Error</i>	0,142 (df = 402)
<i>F statistic</i>	9,513*** (df = 23; 402)
<i>Note</i>	*P<0,1; **p<0,05; ***p<0,01

Source: Own work, 2022.

Figure 12. Spatial regression model for the share of far-left votes.

	<i>Dependent variable</i>
<i>Household income</i>	-0,744*** (0,159)
<i>Soft Institutional Quality</i>	-0,029* (0,018)
<i>Quality of government Index</i>	-4,100** (2,054)
<i>Corruption</i>	1,336* (0,704)
<i>Impartiality</i>	1,517** (0,710)
<i>Quality of institutions</i>	1,447** (0,710)
<i>Unemployment</i>	0,996*** (0,170)
<i>Share of highly educated</i>	34,040*** (11,724)
<i>Poverty</i>	0,670*** (0,154)
<i>Ratio FDI to GDP</i>	-0,005*** (0,002)
<i>Constant</i>	-35,066*** (11,730)
<i>Observations</i>	426
<i>R<sup>2</sup></i>	0,465
<i>Adjusted R<sup>2</sup></i>	0,435
<i>Residual Std. Error</i>	0,127 (df = 402)
<i>F statistic</i>	15,207*** (df = 23; 402)
<i>Note</i>	*P<0,1; **p<0,05; ***p<0,01

Source: Own work, 2022.

Figure 13. R script for the spatial regression analysis.

```
# 1) Installing packages, downloading data and cleaning data

install.packages("stargazer")
install.packages("spdep")
install.packages("maptools")
install.packages("RColorBrewer")
install.packages("classInt")
install.packages("corrplot")
install.packages("GISTools")
install.packages("spatstat")
install.packages("tidyverse")
install.packages("dplyr")
install.packages("rgdal")
install.packages("sf")
install.packages("dplyr")
install.packages("tmap")
install.packages("spdep")
install.packages("spatialreg")
library(stargazer)
library(spdep)
library(maptools)
library(RColorBrewer)
library(classInt)
library(corrplot)
library(GISTools)
library(spatstat)
library(tidyverse)
library(dplyr)
library(rgdal)
library(sf)
library(dplyr)
library(tmap)
library(spdep)
library(spatialreg)

# read in shapefile
eushp <- rgdal::readOGR("NUTS_RG_01M_2016_3035.shp")
head(eushp)

# read in csv
mydata <- read.csv("ALLDATAempty.csv",stringsAsFactors = FALSE)
head(mydata)

# duplicate data
mydata1 <- mydata
head(mydata)

# deal with missing data
mydata[mydata == 999999] <- NA # replace with NAs
head(mydata)

# How many NA's?
mydata$HumanCapital999999ex <- NULL
sum(is.na(mydata)) # 4256
```

```

# remove all NAs from data set
mydata <- na.omit(mydata)
head(mydata)

### 2) Merge my dataset with a shapefile of the EU using rgdal (there is a common attribute to merge them)

# Merge the csv file with the shp file, by merging them using by="LEVL_CODE", we remove all countries that
are not in both data sets.
eushp@data <- merge(x=eushp@data, y=mydata, by.x="NUTS_ID", by.y="CODE", all.y=TRUE)
unique(eushp$CNTR_CODE) # 27 unique countries in total before merge
data <- merge(x=eushp, y=mydata, by.x="NUTS_ID", by.y="CODE", all.x=FALSE)

# check for countries
unique(data$CNTR_CODE)

# write the merge data to a shapefile
st_as_sf(data) %>%
write_sf("merged_data.shp")
data_final <- rgdal::readOGR("merged_data.shp")

### 3) Make centroids, using the shapefile data

# check all variables in the merged shapefile
names(data)
hist(data$PERPO, main=NULL)
hist(data$PEREUR, main = NULL)
hist(data$PERLEFT, main=NULL)
hist(data$PERRIGHT, main=NULL)

# check for outliers
boxplot(data$PERPO, horizontal = TRUE)
boxplot(data$PEREUR, horizontal = TRUE)
boxplot(data$PERRIGHT, horizontal = TRUE)
boxplot(data$PERLEFT, horizontal = TRUE)

# create polygons from shapefile
data_poly <- poly2nb(data, queen=TRUE)
data_poly[1]

# create centroids
centroids <- coordinates(data)

# plotting the first 9 attributes
png("data_final.png",width = 1200, height = 1200)
plot(data,border="gray")
plot(data_poly,centroids,add=TRUE)
title("Merged data incl. centroids", cex.main= 2)

# Shapefile where NA values have been eliminated
# populist
tm_shape(data) + tm_fill(col="PERPO", style="quantile", n=8, palette="Spectral") +
  tm_legend(outside=TRUE)

# eurocentric
tm_shape(data) + tm_fill(col="PEREUR", style="quantile", n=8, palette="Reds") +
  tm_legend(outside=TRUE)

```

```

# leftwing
tm_shape(data) + tm_fill(col="PERLEFT", style="quantile", n=8, palette="Greens") +
  tm_legend(outside=TRUE)

# rightwing
tm_shape(data) + tm_fill(col="PERRIGHT", style="quantile", n=8, palette="Blues") +
  tm_legend(outside=TRUE)

### 4) Run 4 basic regression models.
# Explain voting populist, voting Eurosceptic, voting left wing and voting right wing through all other variables.

# First we restructure the .csv file by removing all columns that are not needed for the regression model.
str(mydata)

data_lm <- mydata

data_lm$CCODE <- NULL
data_lm$COUNTRY <- NULL
data_lm$CODE <- NULL
data_lm$NAME <- NULL
data_lm$URBRUL <- NULL
data_lm$METRO <- NULL
data_lm$HumanCapitalI999999ex <- NULL

# remove all NA values from data set
data_lm <- na.omit(data_lm)
str(data_lm)

### Voting populist
# create new data frame
data_pop <- data_lm

# remove the other voting variables
data_pop$PEREUR <- NULL
data_pop$PERRIGHT <- NULL
data_pop$PERLEFT <- NULL

# rename voting populist to something clearer
data_pop <- data_pop %>%
  rename(PERPO = Voting_populist)

m1 <- lm(PERPO ~., data = data_pop)
summary(m1)

### Voting Eurosceptic
# create new data frame
data_euroskep <- data_lm

# remove the other voting variables
data_euroskep$PERPO <- NULL
data_euroskep$PERRIGHT <- NULL
data_euroskep$PERLEFT <- NULL

# rename voting populist to something clearer
data_euroskep <- data_euroskep %>%
  rename(PEREUR = Voting_euroskeptic)

```

```

m2 <- lm(PEREUR ~., data = data_euroskep)
summary(m2)

### Voting left wing
# create new data frame
data_left <- data_lm

# remove the other voting variables
data_left$PERPO <- NULL
data_left$PERRIGHT <- NULL
data_left$PEREUR <- NULL

# rename voting populist to something clearer
data_left <- data_left %>%
  rename(Voting_leftwing = PERLEFT)

m3 <- lm(Voting_leftwing ~., data = data_left)
summary(m3)

### Voting right wing
# create new data frame
data_right <- data_lm

# remove the other voting variables
data_right$PERPO <- NULL
data_right$PERLEFT <- NULL
data_right$PEREUR <- NULL

# rename voting populist to something clearer
data_right <- data_right %>%
  rename(Voting_rightwing = PERRIGHT)

m4 <- lm(Voting_rightwing ~., data = data_right)
summary(m4)

# output all 4 as tables
stargazer(m1, type="html", out="Voting Populist.html")
stargazer(m2, type="html", out="Voting Eurosceptic.html")
stargazer(m3, type="html", out="Voting Left Wing.html")
stargazer(m4, type="html", out="Voting Right Wing.html")

### 5) Create Moran's I
# Distance Based Weight Matrix
lw <- nb2listw(data_poly, style = "W", zero.policy = TRUE)
lw$weights[1]
is.symmetric.nb(lw$neighbours)

# create spatially lagged for all political votings
lag_perpo <- lag.listw(lw, data$PERPO)
head(lag_perpo)

lag_pereur <- lag.listw(lw, data$PEREUR)
head(lag_pereur)

lag_left <- lag.listw(lw, data$PERLEFT)
head(lag_left)

```

```

lag_right <- lag.listw(lw, data$PERRIGHT)
head(lag_right)

# Plot the data and Moran I coefficient
# PERPO
plot(lag_perpo ~ data$PERPO, pch=20, asp=1, las=1)

PERPO <- lm(lag_perpo ~ data$PERPO)
coef(PERPO)[2] # highly spatially correlated 0.897 # I get 0.12

# PEREUR
plot(lag_per eur ~ data$PEREUR, pch=20, asp=1, las=1)

PEREUR <- lm(lag_per eur ~ data$PEREUR)
coef(PEREUR)[2] # highly spatially correlated 0.84 # I get 0,03

# PERLEFT
plot(lag_left ~ data$PERLEFT, pch=20, asp=1, las=1)

PERLEFT <- lm(lag_left ~ data$PERPO)
coef(PERLEFT)[2] # negative spatially correlated -0.30 # I get -0.11

# PERRIGHT
plot(lag_right ~ data$PERRIGHT, pch=20, asp=1, las=1)

PERRIGHT <- lm(lag_right ~ data$PERRIGHT)
coef(PERRIGHT)[2] # highly spatially correlated 0.838 # I get 0.1

# create Moran I statistics
moran.test(data$PERPO,lw, zero.policy=TRUE)
moran.test(data$PEREUR,lw, zero.policy=TRUE)
moran.test(data$PERLEFT,lw,zero.policy=TRUE)
moran.test(data$PERRIGHT,lw,zero.policy=TRUE)

# plot
moran.plot(data$PERPO,lw, zero.policy = TRUE)
moran.plot(data$PEREUR,lw, zero.policy = TRUE)
moran.plot(data$PERLEFT,lw, zero.policy = TRUE)
moran.plot(data$PEREUR,lw, zero.policy = TRUE)

### 6) Add spatially lagged variable
lag_poverty <- lag.listw(lw, data$Poverty)
head(lag_poverty)
lag_unemployed <- lag.listw(lw, data$PERCUNEMPL)
head(lag_unemployed)

### 7) Add spatially lagged variable to regression model, create spatial model and run LM test
# For this we only choose the significant variables from the first regression model.
# Further we create a spatial error model and run a LM test for the lagged regression model

# Voting populist:
summary(m1)
data_pop <- data_pop[1:424,]
m1_lag <- lm(PERPO ~ SOFTINQUAL+
            EQIINDEX +
            CORR +
            IMPART +

```

```

    PERCUNEMPL +
    Poverty +
    lag_poverty+
    lag_unemployed,
    data = data_pop)
summary(m1_lag)

# spatial error model
errmod1 <- spautolm(m1_lag,listw=lw)
summary(errmod1, Nagelkerle=TRUE)

# Run LM test
summary(lm.LMtests(m1_lag,lw,zero.policy=TRUE,test="all"))

# Voting euroskeptic:
summary(m2)
data_euroskep <- data_euroskep[1:424,]
m2_lag <- lm(Voting_euroskeptic ~ HHincToRegion +
    PERCUNEMPL +
    Poverty +
    lag_poverty+
    lag_unemployed,
    data = data_euroskep)
summary(m2_lag)

# Spatial error model
errmod2 <- spautolm(m2_lag,listw=lw)
summary(errmod2, Nagelkerle=TRUE)

# Run LM test
summary(lm.LMtests(m2_lag,lw,zero.policy=TRUE,test="all"))

# Voting left wing:
summary(m3)
data_left <- data_left[1:424,]
m3_lag <- lm(Voting_leftwing ~ HHincToRegion +
    FDIGDP+
    EQIINDEX +
    SOFTINQUAL +
    LowEdu +
    MidEdu +
    INCOMETOTAL +
    INCOMECOMPAREDCOUNT +
    PERCUNEMPL +
    Poverty +
    lag_poverty+
    lag_unemployed,
    data = data_left)
summary(m3_lag)

# spatial error model
errmod3 <- spautolm(m3_lag,listw=lw)
summary(errmod3, Nagelkerle=TRUE)

# Run LM test
summary(lm.LMtests(m3_lag,lw,zero.policy=TRUE,test="all"))

```

```
# Vote right wing
summary(m4)
data_right <- data_right[1:424,]
m4_lag <- lm(Voting_rightwing ~
  LowEdu +
  PERCUNEMPL +
  Poverty +
  lag_poverty+
  lag_unemployed,
  data = data_right)
summary(m4_lag)

# spatial error model
errmod4 <- spautolm(m4_lag,listw=lw)
###
summary(errmod4, Nagelkerle=TRUE)

# Run LM test
summary(lm.LMtests(m4_lag,lw,zero.policy=TRUE,test="all"))
```