The Effects of European Union Investment on the Political Urban-Rural Divide in Europe

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Abstract

The growing political urban-rural divide leads to spatial injustice and social fragmentation in Europe. This thesis examines whether European Union investment can mitigate this urban-rural divide. It does so by using data on NUTS2 level for European Union investment and electoral outcomes across nine European countries from the years 1987 to 2022. This study applies regression analysis, lagged investment models, country specific analysis and cross-lagged panel models.

The findings indicate that the effect of European Union on the political urban-rural divide is modest. The lagged investment modes show a non-linear temporal relationship, with marginal effects on the short- and long-term. In the country specific analysis it becomes clear that there are no universal effects noticeable, highlighting the importance the national context and the need for a place-sensitive approach. The cross-lagged panel model showed that past investment does not lead to a reduction in the urban-rural divide. However, it indicated that the urban-rural divide predicts future investment, suggesting reactive governance.

These results call for a more place-sensitive approach and anticipatory policy for reducing the urban-rural divide, as European Union investment alone is not sufficient.

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Introduction

In recent years, the difference in political behavior between urban and rural populations has received increased attention in the United States, Canada, and Europe. Research indicates that this political urban-rural divide has widened in these regions over time (Marcinkiewicz, 2018; Brown & Mettler, 2024; Armstrong et al., 2022; Kenny & Luca, 2021; Huijsmans & Rodden, 2025). A key reason for this growing divide is the marginalization felt in rural communities. This feeling of marginalization arises, because persistent poverty and economic decline leads to feelings of discontent. This discontent often translates into political behavior, with rural voters increasingly supporting populist radical right parties (Rodríguez-Pose, 2018; Patana, 2022; del Horno et al., 2024).

While a political divide between places is a natural part of democracy, it becomes problematic when the divide reflects deeper and structural inequalities. This is the case when some regions continuously face an economic decline, political underrepresentation and social disconnection. In these instances, the urban-rural divide is no longer just a political divide, but also a sign of spatial injustice (Brown & Mettler, 2024; Mettler & Brown, 2022; Cramer, 2016; Rodrígue-Pose, 2018). Additionally, it can lead to social fragmentation by weakening the social cohesion, increase the feelings of exclusion, declining trust in democratic institutions and greater vulnerability to anti-system politics (Mason, 2018; Rodden, 2019; Inglehart & Norris, 2016; Gidron & Hall, 2017).

Therefore, researchers have looked into how to decrease the urban-rural divide. One widely proposed solution to bridging the urban-rural divide is economic investment in the areas that feel left behind. This will enhance the opportunities of the inhabitants and decrease their feeling of being left behind (Arzheimer & Bernemann, 2023; Rodríguez-Pose, 2018). The European Union has two investment funds, which are designed to improve the economic conditions in the left behind regions, the European Regional Development Fund and Cohesion Fund (European Commission, 2025). Throughout the years these funds have invested billions of euro's into European regions. However, the effects of these investments on the urban-rural divide are insufficiently understood.

Thus, this research aims to provide insight into the relationship between economic investment from the European Union and the urban-rural divide in Europe. To do so a database, which showcases the development over time of the urban-rural divide in several countries, from Huijsmans and Rodden (2025) is used. This database is used in combination with European Union investment data, to look into the effects of investment from the European Union on the urban-rural divide (European Commission, 2025). By examining the effectiveness of economic investment in this context, this study seeks to assess whether European Union investments can mitigate the urban-rural divide. Thus, the central research question is:

How has investment from the European Commission influenced the urban-rural divide in European countries and regions since 1987?

Theoretical framework

The goal of this research is to provide insight into the influence of economic investment on the political urban-rural divide in Europe. To understand this influence, it is important to first examine what the urban-rural divide is and why it matters. The urban-rural divide refers to the difference in political behavior between the population in urban and rural areas. Over the past decades, urban populations tended to support more progressive, liberal or cosmopolitan parties. Whereas, in rural areas the political behavior often aligns with more conservative, nationalist or populist parties (Rodden, 2019; Scala & Johnson, 2017; Rodríguez-Pose, 2018).

To understand how economic investment might reduce the urban-rural divide, it is important to examine the underlying social dynamics that sustain and deepen this divide. This theoretical framework will do so by first outlining the origins of the concept of a political urban-rural divide. Then, the influence of structural and individual factors on the urban-rural divide will be outlined. Next, theories of political dealignment and realignment are used to explain how changes in political behavior have influenced the urban-rural divide. Last, economic investment is presented as a potential strategy to reduce the urban-rural divide.

The concept of a political urban-rural divide is not a new one. The origins of the concept can be traced back to the cleavage theory of Lipset and Rokkan (1967). In the cleavage theory Lipset and Rokkan (1967) view the national party system as a reflection of underlying social cleavages. These underlying social cleavages are the cleavage between the central state and peripheral communities, the state and the church, workers and the employer and lastly an urban-rural cleavage (Hooghe & Marks, 2018; Lybeck, 1985; Lipset & Rokkan, 1967). According to the theory the urban rural cleavage reflects the historical tensions between the agrarian rural areas and the industrial urban areas (Knutsen, 2017; Lipset & Rokkan, 1967). Although the specific issues associated with the urban rural cleavage have changed, the foundations for the divide still remain (Taylor et al., 2024).

The focus in the cleavage theory is on that there are fundamental cleavages in society that structure the political party system. It analyses the cleavages that influence political party support over the medium or long time. It focusses on collective identities and groups affiliations, for example with churches and trade unions, and in doing so pay little attention to factors through which individuals are tied into the collectives (Hooghe & Marks, 2018; Bornschier, 2009; Lipset & Rokkan, 1967). However, the social ties that bind individuals to the traditional groups and their collective identities have weakened. For example, due to secularization people go less to church and there is a decline of labor organization. As a result weakening the effect of traditional groups on political behavior (Marks et al., 2020; Van der Brug et al., 2009, Walczak et al., 2012).

This weakening of effect and thus the erosion of the traditional cleavages formulated in the cleavage theory, has led to the conceptualization of the neo-cleavage theory. The idea of the neo-cleavage is that old cleavages lose their capacity to structure the social relations in society, allowing for new cleavages to arise and overlay the old ones (Marks et al., 2020; Marks & Wilson, 2000). According to the theory, processes of alignment and dealignment occur simultaneously, wherein old cleavages lose their explanatory power for the political behavior in society (Zabotkin, 2021; Hooghe & Marks, 2025). As other cleavages have lost relevance, the urban-rural divide has persisted and increased their influence on the political behavior (Taylor et al., 2024; Marks et al., 2017). To understand how this has occurred and how economic investment may influence this divide, it is important to look into the theories of alignment and dealignment.

The theories of alignment and dealignment are clearly conceptualized by Dalton (Dalton, 1984; Dalton, 2018). Political dealignment is first introduced in 1984 by Dalton, it is a process in which increasingly more citizens have less traditional group ties, leading to more individualized political behavior and the decline of the influence of the traditional cleavages on political behavior (Dalton, 1984; Dalton, 2007; Dalton, 2013). This is due to the process of cognitive mobilization. As modernization advances, particularly in countries most advanced by capitalism, rising educational levels and the subsequently advancement of different forms of media have enabled citizens to become more cognitively equipped to establish their own political preferences. Therefore, becoming less dependent on traditional party ties and other social groups to guide their political choices and thus leading to a decline in explanatory power of the traditional cleavages (Dalton, 2007; Dalton, 2013; Borba & Silva, 2020; Zabotkin, 2021).

Political realignment is described by Dalton (2018) as a process in which the structure of political behavior shifts in response to changes in underlying social cleavages (Dalton, 2018). Thus, political dealignment can be seen as the erosion of old cleavages, whereas political realignment is the forming of new cleavages (Dalton, 2018; Borba & Silva, 2020; Inglehart & Rabier, 1986). This idea of political realignment aligns with the neo-cleavage theory, wherein old cleavages lose their explanatory power and new cleavages arise to fill in the vacuum which is left behind. These new cleavages arise around new lines of political conflict (Zabotkin, 2021; Hooghe & Marks, 2025).

One of the most widely recognized emerging cleavages is the cultural cleavage. This cleavage is shaped around the political conflict of identity, values and attitudes toward globalization and change, however it is not clear what constitutes it (Zabotkin, 2021; Marks et al., 2017). As a result, scholars have proposed several concepts to indicate what constitutes this cultural cleavage (Bornschier, 2013; Kriesi et al., 2012). Among these, the GAL-TAN cleavage has gained the most traction over time and is now widely used to represent the cultural cleavage (Zabotkin, 2021; Bakker et al., 2015; Hooghe et al., 2024; Crulli, 2024). The GAL-TAN cleavage was first introduced by Hooghe, Marks and Wilson (2002) and it distinguishes two different value orientations: GAL, which stands for green/alternative/libertarian and TAN, which stands for traditional/authoritarian/nationalist (Hooghe et al., 2002). Attitudes associated with GAL are progressive, cosmopolitan and pluralist. While TAN attitudes are more conservative, protectionist and have more traditional worldviews (Hooghe et al., 2002; Marks et al., 2017; Hooghe et al., 2024).

The GAL-TAN cleavage is not only a functional cleavage, it also is a territorial cleavage in which the urban-rural divide emerges. In urban areas cultural openness, cosmopolitan and green attitudes are more likely to be found, aligning with the GAL attitudes. In contrast, TAN attitudes are more likely to be found in rural areas, where there is a more traditional culture, less ethnic diversity and economic stagnation (Maxwell, 2019; Marks et al., 2021; Crulli, 2024).

There are several reasons for this difference in attitudes. Urban areas tend to have higher population densities, a more diverse economy and are internationally more connected. This attracts people with higher education levels and leads to a more culture divers area. This type of setting leads to the development of attitudes of greater openness to change, progressive social values and multiculturalism. These attitudes are associated with the GAL side of the cultural cleavage (Florida, 2002; Inglehart & Norris, 2016; Marks et al., 2021; Crulli, 2024).

In contrast, rural areas are generally characterized by lower population densities, a greater reliance on manual work and a slower economic growth. Additionally, rural areas often face a demographic decline, experience lower education level. The combination of these factors leads to rural areas often being more culturally homogeneous and having a stronger attachment to tradition. This leads to concerns about social cohesion, national identity and traditional values and these are in turn related to the development of TAN attitudes (Rodríguez-Pose, 2018; Marks et al., 2021; Arzheimer et al., 2024; Arzheimer & Berning, 2019).

This territorial polarization reinforces the urban-rural divide, as political behavior in urban areas tends to gravitate toward green, progressive or cosmopolitan parties, while rural citizens are more likely to support the more nationalist, conservative or populist parties (Kriesi et al., 2008; Hooghe et al., 2002; Hooghe & Marks, 2018). Over time, this territorial polarization contributes to political polarization, fostering feelings of political alienation, perceived inequality and mutual distrust (Cramer, 2016; Rodríguez-Pose, 2018).

To deepen the understanding of how this polarization is sustained and how economic investment might mitigate it, it is essential to further examine the underlying factors that shape political behavior in urban and rural areas. First, attention will be given to the influence of individual factors on political behavior. It will then discuss the influence of structural factors on political behavior. Finally, the potential influence of economic investment on both will be explored. While some individual and structural factors that impact the formation of attitudes regarding the GAL-TAN cleavage have already been mentioned, the following section will provide a more detailed examination on their influence and of other factors on political behavior.

Individual factors shape how people perceive and interpret their environment, but these perceptions do not emerge in a vacuum. They are dependent on the structural factors, as it provides the broader context within which political behavior is formed. Structural factors refer to broader socio-economic and geographic factors that indirectly influence the political behavior in urban and rural places. It does so by influencing the access to resources and opportunities. Political behavior is therefore not solely a product of individual factors, but rather of how these factors are filtered through, and interact with, the contexts provided by the structural factors (Schütze, 2023; Berning, 2016; Cramer, 2016).

As a result, people with similar individual traits may express different political behavior depending on the geographic contexts in which they are situated. For example, a young, highly educated person in a rural area may still support conservative and populist parties if embedded in a context in which economic decline and cultural homogeneity are present. Therefore, place is an important determinant for political behavior (Cramer, 2016; Arzheimer & Bernemann, 2024; Van Gent et al., 2014; Kevický, 2024).

Nevertheless, there are individual factors which make a person more likely to express a certain political behavior, regardless of place. Factors such as age, educational attainment, occupational background, exposure to diversity, place resentment, value orientation and trust in political institutions all influence individual political behavior (Maxwell, 2019; Arzheimer & Bernemann, 2024; Brownstein, 2016; Oesch & Rennwald, 2018; Vlandas & Halikiopoulou, 2019).

Age is seen as an important predictor for political behavior. Younger people tend to support more progressive parties, whereas older people prefer to support more conservative parties. The mainstream-insurgent hypothesis explains this difference, as younger people prefer political parties who are challengers to the traditional party establishment, while older people tend to support traditional or mainstream parties (Watts, 1999; Holland, 2013; Hooghe & Wilkenfeld, 2008). This difference in political behavior between age groups, often aligns with the GAL/TAN cleavage. Where young people tend to exhibit GAL values and older people TAL values (Hooghe & Marks, 2018; Hooghe et al., 2024).

Educational attainment is also of influence on political behavior. A higher education leads to increasement in political participation, democratic attitudes, liberal values and less support for populist parties. There are two reasons for this. First, education enhances cognitive mobilization, therefore increasing individuals political cognitive skills and leading to more political participation and democratic attitudes (Dalton, 2008; Persson, 2015; Berinsky & Lenz, 2011). Second, higher educational institutions are environments of political socialization, where individuals are exposed to diverse perspectives, social situations and values with an emphasis on pluralism and equality. This leads to the creation of liberal values and less support for populist parties (Sunshine Hillygus, 2005; Nie et al., 1996). By contrast, a lower education tends to lead to political disengagement and support for populist parties, as people with lower education are more likely to experience socio-political exclusion (Spruyt et al., 2016; Inglehart & Norris, 2016). These differences in political behavior between educational levels also reflect the GAL/TAN cleavage, with higher education aligning more with GAL attitudes and lower education with TAN attitudes (Hooghe & Marks, 2018; Hooghe et al., 2024).

The occupational background is another way through which political behavior is influenced. As it affects the economic security and the social identity. People with a manual job frequently experience economic insecurity and marginalization, as those jobs are vulnerable to globalization and automation. These conditions align with the TAN attitudes. Therefore, people in those sectors are more inclined to support political parties who promises economic security and national sovereignty, often being populist or radical right parties (Oesch & Rennwald, 2018; Kitschelt & Rehm, 2014; Kriesi et al., 2008; Bornschier, 2010). People with jobs in a knowledge intensive sector or service sector, are generally more economic secure and present in a cosmopolitan environment. This leads to the development of GAL attitudes and as a result more support for progressive and green political parties (Kriesi et al., 2008; Hooghe & Marks, 2018; Bornschier, 2010).

The next individual factor is exposure to diversity, which refers to the extent to which people come into contact with people from different backgrounds in their daily live. Exposure to diversity is partially formed by structural factors, such as urbanism, but it differs greatly between people in the same environment. Therefore, it is best understood as an individual factor. High exposure to diversity results in less prejudice and increases social trust and cohesion. Therefore, a greater exposure to diversity leads to increased tolerance and support for multiculturalism and cosmopolitan values, resulting to more alignment with GAL values (Pettigrew & Tropp, 2006; Enos, 2014; Laurence & Bentley, 2016; Hooghe & De Vroome, 2015). In contrast, limited exposure to diversity leads to lower social trust, reduced social cohesion and negative stereotyping. As a result people experiencing limited exposure are more inclined to support parties with nationalistic, cultural protective and anti-immigration views, making them more receptive for TAN values (Cramer, 2016; Ford, 2011; Putnam, 2007).

Place resentment is the perception of regional exclusion, which is the result of a discrepancy between what the inhabitants of an area perceive that they should receive and what they actually receive. Therefore, it is an individual factor as it reflects the individual experience of the regional inequalities (Munis, 2022; De Lange et al., 2023). High levels of place resentment result in more radical right sentiments among the inhabitants, because these parties often acknowledge the feelings of exclusion and frame themselves as the helpers of the people in the perceived neglected areas (Arzheimer & Bernemann, 2024; Huijsmans, 2023; Cramer, 2016).

Value orientation and trust in political institutions are the final individual factors that influence the political behavior. Both are attitudinal factors and influenced by the other individual factors. Value orientation refers to a person's underlying normative beliefs. These beliefs are shaped by a person's environment and it influences how people interpret political issues and which political party they support. For example, people with a traditional value orientation, are more likely to support parties which emphasizes cultural preservation, aligning with the TAN values (Inglehart & Norris, 2016; Inglehart & Welzel, 2005; Chirumbolo et al., 2016).

Trust in political institutions also aligns with the GAL-TAN cleavage. People with low political institutions trust perceive the mainstream parties as unresponsive or misaligned with their values. Therefore, they are more inclined to support the non-mainstream parties, often being populist or anti-establishment parties. Thus, low trust in political institutions aligns with the TAN values, as anti-mainstream sentiments is part of the values. Conversely, people with a high trust in political institutions are more likely to support mainstream parties, aligning more with the GAL values (Norris, 2011; Hooghe & Marien, 2013; Van der Meer & Zmerli, 2017).

As discussed earlier, individual factors do not emerge in a vacuum, there are dependent on the structural factors. There are several structural factors that influence political behavior, including population density, economic development level, regional connectivity, demographic trends, cultural homogeneity and access to education and public services.

Population density is generally higher in urban areas in comparison to rural areas, ensuring diverse social interactions and exposure to different cultures, which leads to more progressive political behavior. In rural areas the lower population density tends to result in a tight community, which are generally more resistant to cultural changes and consequently causes more conservative political behavior (Scala & Johnson, 2017; Crulli, 2024; Marks et al., 2021).

The economic development level is another structural factor that influences political behavior, as areas with a lower development level often experience more economic insecurities, which influences the political preferences. In rural areas the level of economic development is generally lower than in urban areas, leading to higher unemployment, job insecurity and restricted upward mobility. This difference in level is due to less public investment, innovation and employment growth in comparison to urban areas leading to grievances, as people feel frustrated and neglected. As a result, there is an increasing support for conservative and populist parties, as they often promise to aid these regions (Rodríguez-Pose, 2018; Arzheimer et al., 2024; Arzheimer & Berning, 2019; Maxwell, 2019; Cramer, 2016). The lower economic development level in rural areas is further contributed by the regional connectivity of the areas. Urban areas tend to be better connected to the global economy in comparison to rural areas resulting in increased investments, mobility and cultural exchange. This creates better conditions for the creation of GAL attitudes. In contrast, rural areas often are more isolated, strengthening the circumstances for the creation of TAN attitudes (Hooghe et al., 2024; Hooghe & Marks, 2018).

Demographic trends reveal additional structural differences between urban and rural areas. Urban areas are generally characterized by a growing young and diverse population, while a declining aging population is typical for rural areas. This induces different political behavior in the areas, with the younger urban population generally supporting progressive parties and the older rural population gravitating more toward the traditional parties. This occurs because the demographic trend of a region influences the prevailing political cultures and contextual socialization. Contextual socialization is the way people adapt the dominant political attitudes through interaction with their social environment (Florida, 2002; Rodríguez-Pose, 2018; Inglehart & Norris, 2016; Hooghe & Wilkenfeld, 2008).

This demographic difference often aligns with the cultural homogeneity of regions, as urban areas generally are more ethnically and culturally diverse than rural areas. Therefore, in urban areas environments are created in which exposure to diversity is more likely to happen. As a result, in urban areas there is a higher chance of developing a political culture centered around tolerance, cosmopolitanism and progressive values, supporting the creation of GAL attitudes (Marks & Hooghe, 2018; Maxwell, 2019). Whereas, in rural areas, which are often more cultural homogeneous, there is less chance of intergroup contact. This leads to greater emphasize on traditional norms, local identities and cultural preservation, aligning more with the TAN values (Ford, 2011; Arzheimer & Berning, 2019, Marks et al., 2021).

Finally, access to education and public services is of influence. In urban areas the access to education and public services tends to be higher than in rural areas. In rural areas this limited access can lead to feelings of neglect and place resentment, contributing to more conservative and populist political behavior, as they often promise to aid these areas (Dijkstra et al., 2020; Kriesi et al., 2008).

Given the structural disadvantages faced by many rural areas and their influence on individual factors, targeted economic investment in these areas has emerged as a possible solution to mitigate the growing urban-rural divide (Rodríguez-Pose, 2018; Accordino, 2019). Scholars have emphasized several reasons why this is effective.

First, it has positive effects on the individual factors. It can reduce the feelings of neglect and place resentment felt, as investment in the areas shows the inhabitants that they are seen. Moreover, it can increase the trust in political institutions, because investment can lead to improvement in the areas, making political institutions more perceivable as responsive and trustworthy. As a result the stability of and constructive politic participation improves, reducing the interest in populist or anti-establishment parties (Rodríguez-Pose, 2018; Cramer, 2016; Barca et al., 2012; Dalton, 2018; Hooghe & Marien, 2013; De Lange et al., 2023).

Second, it also has a positive effect on the structural factors of the urban-rural divide. It does so in several ways. With investment in infrastructure regional connectivity can get improved, by reducing the isolation and improving the integration with the global economy. Additionally, investment can improve access to education and public services, possible reducing the feelings of neglect and place resentment. Furthermore, investment can raise the level of economic development, by boosting the economic activity and GDP in the left behind areas, thereby reducing the gap between rural and urban areas. These improvements reduce the structural factors that often lead the population in rural areas to support more nationalist, conservative or populist parties (Dijkstra et al., 2020; Lammarino et al., 2019; Rodríguez-Pose, 2018; Becker et al., 2017).

Third, by targeted economic investment in rural areas, the solution is place-sensitive. Therefore, the specific needs, strengths and identities of the area can be taken into account (Barca et al., 2012; Rodríguez-Pose, 2018; Dijkstra et al., 2020). However, the effectiveness of targeted economic investment depends on the visibility, communication and community involvement. As economic investment that is poorly communicated can be perceived as imposed and investment that is not clearly visible may not result in the intended mitigation of the urban-rural divide (Mendez et al., 2019; Mendez et al., 2019b).

Methodology

Research design

In this study a quantitative, cross-national, research design is used to examine the influence of economic investment on the urban-rural divide across European countries. The analysis is conducted at the NUTS2 level, combining electoral and regional investment data across several decades , to answer the central research question:

How has investment from the European Commission influenced the urban-rural divide in European countries and regions since 1987?

To investigate this influence a panel dataset is build consisting of the NUTS2 regions in nine countries: Denmark, Germany, Italy, Sweden, Spain, the Netherlands, United Kingdom, France and Austria. The time span covers the years from 1987 till 2022. Each observation in the dataset represent a region-year combination, an urban-rural divide score and the investment total. With this dataset a regression analysis, lagged-investment effect analysis, country specific analysis and a cross-lagged panel are performed.

There are several reasons for why this research design is suitable for this research question. First, it captures variations across space and time, ensuring that with a quantitative approach regional and temporal influences can be accounted for. Second, the cross-national aspect of the research enables generalizing the findings beyond individual country contexts, enabling that broader patterns can be recognized. Third, by using NUTS2 level data and a standardized metric for the urban-rural divide ensures comparability and consistency of the data across countries and regions. Fourth, by accounting for the lagged investments effects, the delayed effects for the investments get taken into account. Fifth, by performing country specific analysis it is possible to check if effects are universal. Last, cross-lagged panel analysis allows for exploring the temporal and directional relationships between investment and the urban-rural divide, therefore insights into whether investment precedes changes in the urban-rural divide or the other way around, are obtained (Allen, 2017; Selig & Little, 2012).

Data sources

For this analysis several data sources are employed. All of the datasets are harmonized at the NUTS2 level to enable consistent analysis. The data sources that are used in this study, are:

- URED dataset (Huijsmans & Rodden, 2024).

The URED (Urban-Rural electoral divide) dataset is created by Huijsmans and Rodden (2024). This dataset consists of national election results at the lowest available geographic level, often electoral districts, in fifteen countries, party-level vote shares, party identifiers and population density all over roughly five decades. This dataset is the foundation for calculating the urban-rural divide measure that is used in this research.

- European Commision Fund payment data (European Commission, 2025).

Data on investment of the European Commission on regions is obtained via the European Commsion's open data portal. This data consist of the investments amounts from the European Regional Development Fund and Cohesion Fund at the NUTS2 level from the years 1987 till 2022 (European Commission, 2025). This research therefore focuses on these years, as those are the years through which there is an overlap in data between the URED dataset and the data on the investment of the European Commission. This is also the reason for only including the countries Denmark, Germany, Italy, Sweden, Spain, the Netherlands, United Kingdom, France and Austria in the analysis, as those are the countries for which there is data available in both datasets.

- NUTS2 region mapping data (Eurostat, 2024).

Since the data in the URED dataset is at the lowest available geographic level and the European Commission fund data on NUTS2 level, additional region-matching datasets were required to allow for a merge. For this purpose, region-matching files were constructed using a Eurostat dataset that links Local Administrative Units (LAUs) to their corresponding NUTS2 region (Eurostat, 2024). To improve match accuracy, further matching procedures were conducted using national statistical databases and official geographic references.

As a result, a minimum match rate of 85 percent was achieved for each country. Figure 1 displays the observations per country and which percentage of these observations achieved matching. As can be noted, full matching coverage is not obtained in every country. The is due to the dissolution or merging of places throughout time, therefore they are no longer part of the LAU dataset. Although this has been attempted to rectify with the use of national databases, the availability and quality of historical records vary across the countries. As a result, the final dataset contains 1.614 region-year observations.

Figure 1

Match rate and observations per country.

Country	Observations	Match Rate (%)
Denmark	23,350	100.0
Sweden	25,125	100.0
United Kingdom	36,289	100.0
Netherlands	113,803	98.7
Germany	676,329	97.9
France	4,734,493	94.9
Italy	1,246,161	94.1
Spain	973,861	93.3
Austria	274,036	86.6

Operationalization of concepts

To examine the relationship between economic investment and the urban-rural divide, several concepts are used. These concepts are:

- Urban and rural classification.

Urban and rural places were classified using a population density measure, in the same way as proposed in the methodology by Huijsmans and Rodden (2024). For each country and year the observations were ranked by population density. Observations in the upper forty percent were classified as urban, while observations in the bottom forty percent were classified as rural. The urban and rural classification is done this relative way, to ensure that there is accounted for intra-country variation and it stays consistent over time (Huijsmans & Rodden, 2024).

- Urban-rural divide

The urban-rural divide is calculated in the same way as in the research of Huijsmans and Rodden (2024), with the exception that they calculated it on national level and in this research the divide is calculated on NUTS2 level. To calculate the urban-rural divide the difference in vote shares between urban and rural areas are used. Based on these shares, the urban-rural divide for each political party is calculated. *D* is the urban-rural divide per party, *U* is the parties urban vote share, *R* their rural vote share. *p* is the party, *i* the election and *j* the NUTS2 region (Huijsmans & Rodden, 2024).

$$D_{pij} = \left(\frac{U_{pij}}{U_{pij} + R_{pij}} - 0.5 \right) \times 2$$

Afterwards the urban-rural divide per election in each NUTS2 region is calculated as the weighted total of the absolute party level measure. Where *K* is the number of parties partaking in the election and *V* is the regional vote share of a party. This leads to a urban-rural divide score between zero and 1, with higher values indicating a greater urban-rural divide (Huismans & Rodden, 2024).

$$D_{ij} = \sum_{2}^{K} abs\left(D_{pij}\right) \times V_{pij}$$

- Economic investment.

Economic investment is operationalized using investment data from the European Commission at the NUTS2 level. Investment data from the European Regional Development Fund and Cohesion Fund are used, as both of these funds have as goal to improve the economic situation in left behind regions (European Commission, z.d.) For each election the total amount of funding each region received between elections was aggregated, as the urban-rural divide data is per election and the investment data per year, thus ensuring that no investment data is lost. To take into account that effects on the political response from economic investment are not immediate, lagged variables of economic investment were created (Rodríguez-Pose & Garcilazo, 2018; Duch & Stevenson, 2008). Cumulative investment variables were created, using a 1-, 3-, 5- and 7-election lagged investment. This allows to take into account the delayed effects of the investments.

In the investment data there was a strong right-skewness as some regions received small amounts and others received hundreds of millions. To address this problem and to reflect diminishing marginal effects, as the first millions of investment have greater impact than the later millions, a natural logarithmic transformation is applied, as this is done frequently in economic practice to bypass these problems (Wooldridge, 2010; Gujarati & Porter, 2009). In the logarithmic transformation a +1 is added to prevent undefined values for the zero investment observations (Cameron & Trivedi, 2005).

$$\log(1 + \text{Investment}_{rj})$$

Analytical strategy

There are several steps undertaken to examine the relationship between economic investment and the urban-rural divide and how this relationship may differ between different polarization levels.

First, the computation of the urban-rural divide on the NUTS2 level was done using the calculations outlined in the operationalization of concepts, resulting in a dataset with an absolute value for the urban-rural divide. Second, investment data and lagged investments were integrated with each region-year combination in the dataset. In each election year, the total investment of the years between elections were combined and added to the corresponding NUTS2 region and the lagged investments variable was added.

Third, linear regression models were performed with the urban-rural divide as the dependent variable. The model can be expressed as:

$$URD_{rjt} = \beta_0 + \beta_1 \cdot \log(1 + I_{rjt}) + Y_j + C_c + e_{rjt}$$

Where *URD* is the urban-rural divide, *r* the region, *j* the year and *t* the country. *I* is the investment, Y_j the year fixed effects, C_c the country fixed effects and e_{rjt} the error term. The year and country fixed effects are added to ensure that the results account for over-time and within-country variation.

Diagnostic checks were performed to ensure that the underlying assumptions for linear regression were met. This included tests for linearity and distribution of residuals and the output can be found in appendix 1. No major breaches were observed, ensuring the validity of the linear regression model.

Fourth, lagged investment effects models were performed using 1-, 3-, 5- and 7-election lagged models to account for the delayed effects of investment. Afterwards, country specific analysis were done, to determine if the relationship between investment and the urban-rural divide is universal across the nine countries. Last, a cross-lagged panel model was performed to explore the temporal and directional relationship between investment and the urban-rural divide.

Ethical considerations

For this research solely publicly available datasets will be utilized, therefore no human participants are involved in the research. However, several ethical considerations remain regarding data integrity, interpretation and transparency.

For the data integrity, it is important to keep the limitations and potential biases in the datasets in mind and any manipulation of the data that could lead to misunderstandings should be avoided. This is important to remember, because of the economic and political dimensions of this research. Therefore, the findings of this research could be used by policymakers to support their beliefs, so it is crucial to carefully formulate the conclusions to avoid misunderstandings (Zook et al., 2017; Boyd & Crawford, 2012; Boswell, 2009).

Second, transparency is necessary to ensure that these things do not occur. This will be achieved by clear documentation of the data used, the steps in the processing of the data and the statistical methods, ensuring that the research is replicable and verifiable (Committee on Science, 2009; Zook et al., 2017).

Considering these ethical considerations, this research will be conducted as ethically, transparent and responsible as possible.

Results

This chapter presents the findings of this study. First, a descriptive overview of the evolution of the urban-rural divide across the NUTS2 region in the nine countries will be presented. Afterwards the results of the linear regression model will be presented, which examined the relationship between economic investment, level of polarization and the urban-rural divide.

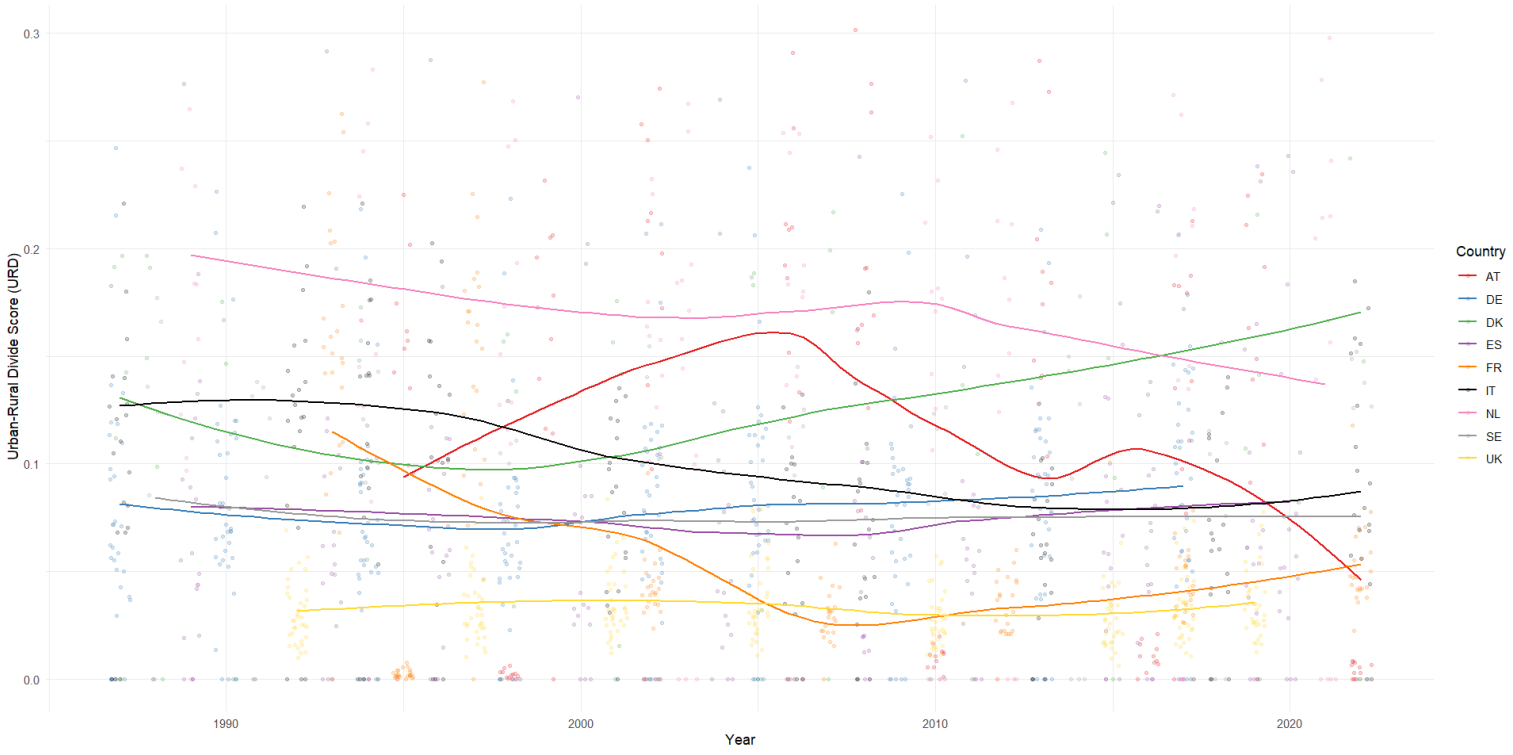
Descriptive overview

Figure 1 provides a descriptive overview for the evolution of the urban-rural divide over time in the NUTS2 regions in the nine countries. Each point represents a region-year combination and the smoothed trend lines are added for each country to allow for easier comparison. The majority of the observations have a maximum y-value of 0.3. For visual clarity the 21 observations that exceeded this value have been removed from figure 1. However, none of the observations are dropped for the calculation of the smoothed trend lines.

Figure 1 shows the cross-national differences. the Netherlands almost consistently exhibit the highest urban-rural divide on average in their NUTS2 regions, although a gradual decline can be noticed over time. In the NUTS2 regions in Denmark a noticeable incline in the urban-rural divide can be noticed since 1997. In Austria an initial growing urban-rural divide trend can be acknowledged, followed by an decline since 2006. In Italy and France a declining trend can be noticed, with a modest incline in the last few years. In contrast, in the other countries, Sweden, Spain, Germany and the United Kingdom, the average trendline remain relatively flat, suggesting limited changes in the urban-rural divide. These descriptive patterns provide useful context for the more detailed analysis in the country specific analysis later in this chapter.

Figure 1

Urban-rural divide score by NUTS2 region over time, with smoothed trend lines.



Regression analysis

Table 2 shows the results of the linear regression model assesing the relationship between economic investment and the urban-rural divide. In the model, the log-transformed investment is the main predictor, with the region and year fixed effects.

Table 2

Results of linear regression model predicting the urban-rural divide.

Variable	**ß (SE)**
Log_{1+}(Investment)	0.001 (0.001)
Constant	0.139*** (0.017)
R^2	0.803
Marginal R^2	0.0004

Note. ***p < 0.01, **p <0.05, *P < 0.1. Region and year fixed effects are included but not shown, see appendix 1 for all fixed effects.

In the model, investment has a small positive effect on the urban-rural divide, but it is not significant (*ß* = 0.001, p >0.1). This suggest that investment alone does not have a clear effect on the urban-rural divide. The coefficient for the investment appears minimal (*ß* = 0.001), but it is important to note that it concerns a log transformed value. Therefore, over time a substantial increase in investment in a region can leads to a meaningful effect on the urban-rural divide. The full model, including the region and year fixed effects explains 80.3% of the variance (R^2 = 0.803). However, when examining solely the investment effects the explained variance is 0.04% (Marginal R^2 = 0.0004).

Lagged investment effects models

To inspect whether the effects of investment on the urban-rural divide manifest over time, lagged investment models were estimated using lagged investment variables of 1-, 3-, 5- and 7-election intervals. The results are presented in table 3. In the model with a 1-election lag, there is a moderate positive and significant effect of investment on the urban-rural divide (*ß* = 0.001, p <0.1). A similar pattern is observable in the 7-election lag model, where the effect of the lagged investment is positive and marginally significant (*ß* = 0.001, p <0.1).

In contrast to the 1- and 7-election lagged models, there are no statistically significant effects in the lagged investment effect for the 3- and 5-election lagged models. Indicating that medium term effects are less pronounced and may exert less consistent influence on the urban-rural divide. These results indicate that the temporal effect of investment on the urban-rural divide may be nonlinear, with both the short- and longer-election lagged models showing pronounced effects. However, due to the smaller sample size in the 7-eleciton lagged model (N = 403), caution should be warranted with the interpretation of the results.

As observable in table 3 the models explain a large proportion of the variance when the region and year fixed effects are included (R^2 ranging from 0.856 to 0.880). In contrast, when these effects are not included, the explained variances drops to near zero in all of the models (Marginal R^2 <0.0008), indicating that investment only meaningfully explains variances when combined with the regions and year fixed effects.

Table 3

Results of lagged investment models by election lag.

Variable	**1-Election ß (SE)**	**3-Election ß (SE)**	**5-Election ß (SE)**	**7-Election ß (SE)**
Lagged Investment	0.001* (0.0004)	0.001 (0.0004)	0.0005 (0.001)	0.001* (0.001)
Constant	0.085*** (0.021)	0.070*** (0.021)	0.041* (0.024)	0.003 (0.030)
R^2	0.860	0.860	0.856	0.880
Marginal R^2	0.0000004	0.0004	0.0003	0.0008
Observations	1,438	1,087	743	403

Note. ***p < 0.01, **p <0.05, *P < 0.1. Region and year fixed effects are included but not shown, see appendix 2 for all fixed effects.

Country specific analysis

To assess whether the relationship between investment and the urban-rural divide is universal across the nine countries or varies per country, separate models were performed for each of the nine countries. The results of this analysis are presented in table 4.

Despite there being not many significant effects, a few interesting patterns emerge. In Austria investment is negative and marginally significant in the baseline model (β = -0.0088, P <0.1), indicating that investment might contribute to a diminishing urban-rural divide. Contrary, Sweden shows a positive and marginally significant effect in the baseline model (β = 0.0078, P <0.1) and a highly significant positive effect in the 1-election lagged model (β = 0.0125, P < 0.01), suggesting that investment might lead to a growing urban-rural divide. Like Sweden, this pattern is also observable in Spain, where there is also a positive effect in the baseline model (β = 0.0018, P <0.05).

In contrast, for the other countries, Denmark, France, Italy, the Netherlands and the United Kingdom, there were no significant effects noticed. These mixed results indicate that the relationship between investment and the urban-rural divide is not universal, but that the national context is of importance in determining the effectiveness.

It is important to note that the number of observations varies per country and model. It varies between 328 observations and 45 observations. Therefore, this should be taken into account when interpreting the strength and significance of the model, especially in the countries with fewer observations.

Table 4

Country specific effects of investment and interaction on the urban-rural divide across elections.

Country	Investment ß	1-Election Investment ß	3-Election Investment ß
AT	-0.0088*	-0.0005	0.0042
DE	0.0003	-0.00001	0.0001
DK	0.0223	-0.0327	-0.0511
ES	0.0018**	0.0012	-0.0003
FR	-0.0065	-0.0025	0.0007
IT	0.0003	0.0018	-0.0035
NL	0.0016	0.0001	-0.0028
SE	0.0078*	0.0125***	-0.0024
UK	0.0002	0.0004	-0.0003

Note. ***p < 0.01, **p <0.05, *P < 0.1. Observations and R^2 per country and model are available in appendix 3.

Cross-lagged panel model

To examine the temporal relationship between investment and the urban-rural divide, a cross-lagged panel model was estimated using an 1-election lag structure. The results are presented in table 5. The results shows that past investment does not significantly predict future changes in the urban-rural divide (*ß* = 0.0003, P >0.1), suggesting that there is no clear short-term effect of investment on the urban-rural divide. In contrast, the effect of the past urban-rural divide on the future urban-rural divide score indicate a strong stability over time (*ß* = 0.75, P <0.01). Furthermore, the effect of the past urban-rural divide on the future investment is marginally significant (*ß* = 2.03, P <0.1), suggesting that regions with a higher urban-rural divide are likely to receive slightly more investment in the future. As with the urban-rural divide, investment also shows a strong stability over time (*ß* = 0.78, P <0.01). Indicating that past investment is a great predictor for future investment.

In table 6 the correlations among the residuals are presented. The residuals suggest a marginally significant effect of investment on the urban-rural divide (*ß* = 0.01, P <0.1). This effect is not observable in the previous time points (*ß* = -0.02, P >0.1).

Table 5

Results from the cross-lagged panel model.

Dependent Variable	**Predictor**	**Coefficient (ß)**	**SE**
Urban-Rural Divide	Lagged Investment	0.0003	0.00022
	Lagged URD	0.7500***	0.040
Investment	Lagged URD	2.0300*	1.170
	Lagged Investment	0.7800***	0.020

Note. ***p < 0.01, **p <0.05, *P < 0.1. Full output from the model is available in appendix 4.

Table 6

Residuals correlations from the cross-lagged panel model.

Variable 1	***Variable 2***	***Coefficient (r)***	***SE***
URD (t)	*Investment (t)*	*0.0100**	*0.0055*
Lagged Investment (t–1)	*Lagged URD (t–1)*	*-0.0200*	*0.0200*

Note. ***p < 0.01, **p <0.05, *P < 0.1.

Discussion and Conclusion

In this study the goal was to examine the effects of economic investment on the urban-rural divide and what the influence of the level of polarization is on this relationship. By combining data on the NUTS2 level of election results and European Union investment numbers for nine European countries, the findings offer important insights on the effectiveness of European Union investments in the mitigation of the urban-rural divide in the nine countries.

The findings indicate that the effect of the European Union investment on the urban-rural divide is modest and context-dependent. In the baseline model, investment had no significant effect on the urban-rural divide. This aligns with other research, where investment was viewed as not solely sufficient for mitigating the urban-rural divide in areas (Iammarino et al., 2019; Barca et al., 2012).

The lagged investment effects models illustrate nonlinear temporal effects. There were marginally positive effects visible on the short- and long-term, but not in the medium-term. Suggesting that the effect of the European Union investment might not be consistent, but rather fluctuate and disappear over time. This nonlinear and delayed effect of European union investment was also found in prior studies. The effect might be due to the shifting local circumstances, institutional memory and the investment visibility (Becker et al., 2010; Gagliardi & Percoco, 2017; Rodríguez-Pose & Garcilazo, 2018). These temporal effects also align with the realignment theory, as the erosion and realignment of cleavages are developed over multiple election periods (Dalton et al., 2017; Franklin et al., 2024; Inglehart & Rabier, 1986).

The country specific analysis demonstrated that these effects are not uniform across the nine countries, but that it differs per country. This reinforces the importance of the national context in the relationship between investment and the urban-rural divide and it highlights the importance of moving on from the one-size-fits-all approach common in European Union investment policy to a place-sensitive approach (Becker et al., 2017; Arzheimer & Bernemann, 2024; Barca et al., 2012; Rodríguez-Pose, 2018)

The cross-lagged panel model showed that past investments does not significantly predict changes in the urban-rural divide on the short-term. Additionally, the model revealed a strong stability in the urban-rural divide, aligning with the idea of entrenched cleavages, wherein political cleavages are viewed as becoming more persistent, institutionalized and resistant to short-term measures. Therefore, highlighting the importance of continuous investments strategies, instead of episodic (Marks et al., 2020; Dalton, 2008, Rodríguez-Pose & Garcilazo, 2018). Interestingly, regions with a high urban-rural divide tend to receive more investment in the following years. This suggests a form of reactive governance, where policymakers invest in regions already experiencing a visible urban-rural divide (Dijkstra et al., 2020; Duch & Stevenson, 2008). This is concerning, because if investment arrives after the urban-rural divide is high, its ability to reverse the feelings of neglect and place resentment felt by the residents may be limited (Rodríguez-Pose & Garcilazo, 2018; Cramer, 2016). Therefore, more anticipation might be needed in the investment policies, as that can prevent grievances to form or to increase.

These findings have theoretical consequences for how the urban-rural divide is viewed. As past investment does not result in a reduction in the urban-rural divide, the urban-rural divide is stable over time and past urban-rural divide predicts future investment. This indicates that the divide is structural, rather than a reaction to economic deprivation. This supports with the neo-cleavage theory, as it argues that political divides are influenced by long-term economic, cultural and institutional trends, rather than short-term interventions. Thus, short-term investment might not be capable of mitigating the divide, as it appears that the urban-rural divide is reproduced through feelings of neglect, marginalization and an entrenched identity (Rodden, 2019; Franklin et al., 2024; Inglehart & Rabier, 1986; Rodríguez-Pose, 2018). Resulting in that the urban-rural divide is not just a spatial difference in political preference, but a persistent political conflict. Therefore, investment may not be sufficient in mitigating the divide, but a fundamentally different approach of integrating regions into national and European economy and politics is needed (Rodden, 2019; Barca et al., 2012).

These findings have important consequences for policy design. First, it suggest that the effectiveness of European Union investment on reducing the urban-rural divide relies not solely on the total amount invested. Where, when and the context in which the investment is done, are all relevant aspects. Therefore, this calls for more place-sensitive European Union investment policy, so investments are undertaken with a better understanding of the local issues, governance capabilities and political context.

Second, the findings regarding the reactive governance, highlights the need for more anticipatory European Union investment policy. Instead of waiting for a strong urban-rural divide to form and then investing in the regions to dampen the feelings of neglect and place resentment, policymakers should seek out early indicators of structural disadvantage and political disengagement to implement proactive interventions.

Despite these findings for policy design, several limitations of this study, and corresponding future research directions, should be acknowledged. First, in this analysis electoral districts were matched to NUTS2 regions. Although effort is made to match each electoral district to their corresponding NUTS2 region using Eurostat and national databases, part of the observations could not be matched and there might be some minor inconsistencies due to historical boundary changes. Therefore, future research could benefit from using datasets with better data resolution. Second, determining urban and rural areas is done with an exact cut-off. Therefore the measure could be sensitive to the choice of the exact cut-off (Huijsmans & Rodden, 2024). Additionally, the urban-rural divide measure does not take into account the differences between extremer urban and rural areas and areas closer to the average. Huijsmans and Rodden (2024) have tested what the effect on the urban-rural divide would be if this was accounted for and saw no substantial difference (Huijsmans & Rodden, 2024). However, additional research could be conducted to determine the effect of alternative operationalizations to create a more extensive view.

Third, this study solely focuses on investment from the European Commission. This is only a part of the economic investment in regions, therefore the results do not account for all the economic investment that has happened in the regions. Future research into the relationship between investment and the urban-rural divide could benefit from integrating additional investment data, like national and regional government investment data. This would allow for a more complete insight into the effects of investment on the urban-rural divide. Additionally, in this research investment is used as a single metric. However, not every type of investment has the same influence. Future research should therefore analyze what the effect of different types of investments are, for example investments in infrastructure and education. This would help the identification of which interventions are more successful in reducing the urban-rural divide (Mendez et al., 2019; Barca et al., 2012; Gagliardi & Percoco, 2017; Becker et al., 2010).

Fourth, while fixed effects were put in place to account for difference in over-time and within-country variation, differences remain in the political system and the regional governance across the different countries. Furthermore, the model includes year and country fixed effects, but it does not control for other regional factors that might be of influence on the urban-rural divide, like unemployment, GDP per capita and educational levels. As a result there is a possible omitted variable bias. These differences and omitted variable bias may influences the effect of investment on the urban-rural divide in ways not accounted for in the model. Therefore, the extent to which the findings can be generalized outside the data sample is limited. This can be bettered by incorporating regional-level control variables to reduce omitted variable bias and to better highlight the effects of European Union investment. Variables about the economic performance, demographic composition and institutional capacity can help achieve this, as shown in previous research (Fetzer, 2019; Becker et al., 2010; Inglehart & Norris, 2016; Rodríguez-Pose & Garcilazo, 2018).

Fifth, in this research the investment data is aggregated at the NUTS2 level, this creates the assumption that the investment is distributed equally across the NUTS2 region. As a result uniform exposure to the investment is assumed, while in reality some places in the region get more exposure to investment than others. Therefore, observed effects might be weakened or political responses of places might be ignored. Future research should be conducted to examine the variation in effect of investment within regions, by exploring more granular data and local responses to investment (Charron et al., 2014, Dijkstra et al., 2020).

Six, this study was performed on the NUTS2 level, while this allowed for investing the relationship between the urban-rural divide and European Union investment, political behavior is fundamentally influenced by how individuals perceive their environment. Therefore, future research should be conducted to explore the relationship between individual attitudes, such as place resentment, feelings of neglect and political trust, and economic investment. This would enable a more nuanced understanding of how investment impacts political behavior across different types of attitudes and therefore can lead to better place-based approaches (Cramer, 2016; Huijsmans, 2023, Arzheimer & Bernemann, 2024). Seventh, this research is conducted using nine European countries. Future research with additional countries is needed to determine if the patterns observed in this study are also present in other European countries.

Last, the findings of this study suggest that the European Union investment in the regions is reactive governance, where investment is more likely to occur as reaction to a high urban-rural divide rather than preventing it. However, this study does not provide insight into how this reactive governance can be avoided. Further research is needed to discover which early indicators of structural disadvantage and political disengagement in a region are present, so the European Union eventually can shift to proactive interventions (Duch & Stevenson, 2008; Dijkstra et al., 2020).

Taken together, this research has shown that European Union investment alone is not sufficient to mitigate the urban-rural divide. The effects of investment are shaped by timing and the national and regional context. By highlighting this lack of universal effects and presence of contradictory effects, this research calls attention to the need for sustained and place-sensitive investment strategies. However, these investments strategies solely will not be sufficient, policymakers need deeper understanding of how the urban-rural divide emerges, so proactive interventions can be implemented. As such, this research adds to the understanding of the effects of investments on the urban-rural divide and contributes to designing more effective European Union investments strategies.

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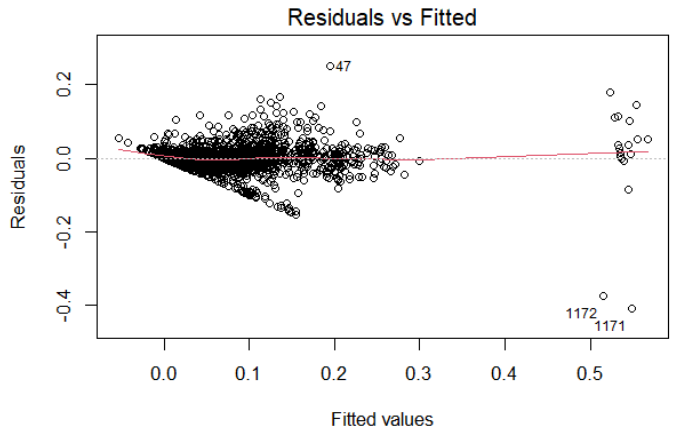
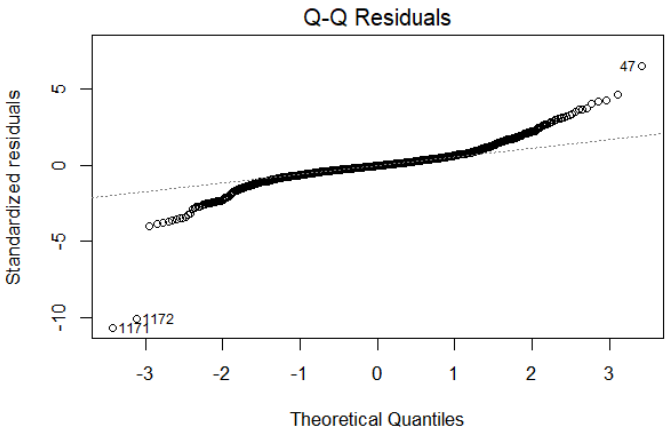
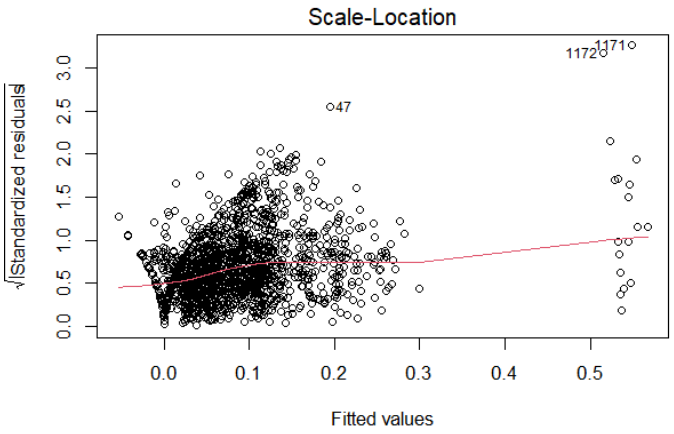
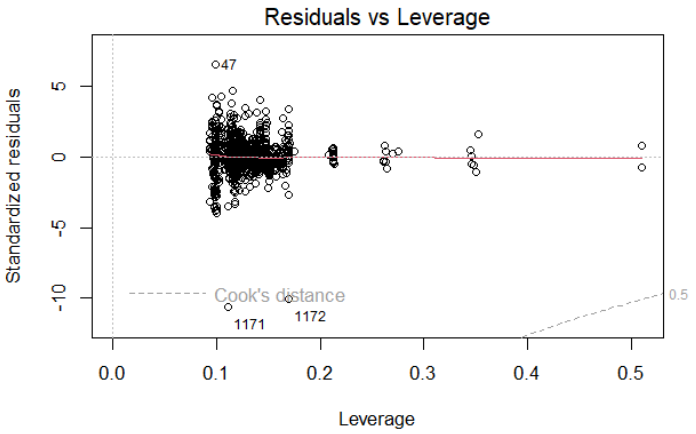
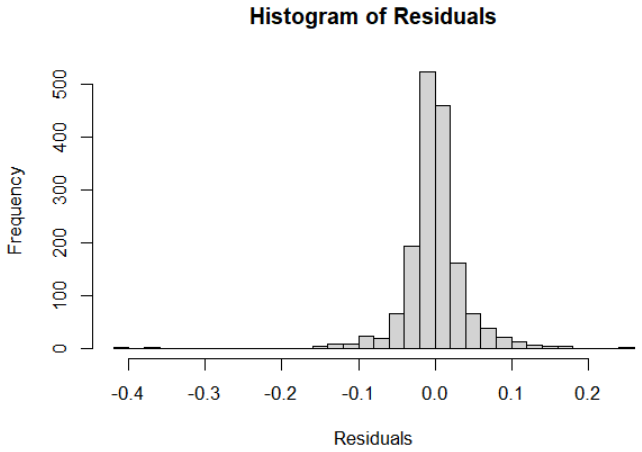
Appendix 1 – output diagnostic checks

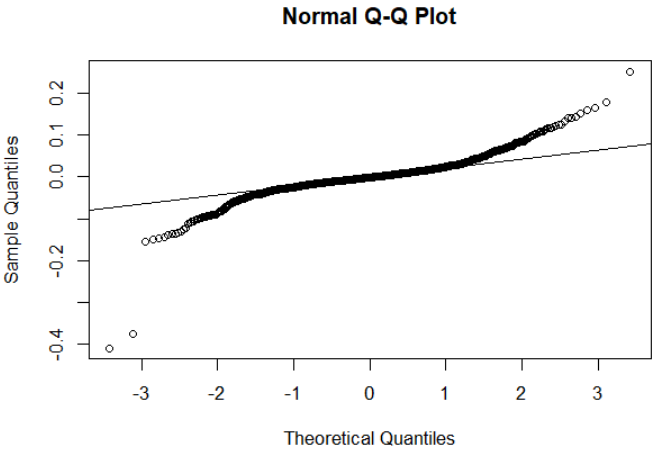












Appendix 2 – Full linear regression output

Regression Results

	Dependent variable:
	urd_region
log1p(cum_investment)	0.001***
	(0.0005)
factor(nuts2_code)AT11	-0.036**
	(0.016)
factor(nuts2_code)AT12	-0.030*
	(0.016)
factor(nuts2_code)AT2	0.033**
	(0.014)
factor(nuts2_code)AT21	-0.074***
	(0.016)
factor(nuts2_code)AT22	-0.023
	(0.016)
factor(nuts2_code)AT3	0.025*
	(0.014)
factor(nuts2_code)AT31	-0.015
	(0.016)
factor(nuts2_code)AT32	-0.048***
	(0.016)
factor(nuts2_code)AT33	-0.025
	(0.016)
factor(nuts2_code)AT34	-0.036**
	(0.016)
factor(nuts2_code)DE11	-0.046***
	(0.017)
factor(nuts2_code)DE12	-0.061***
	(0.017)
factor(nuts2_code)DE13	-0.063***
	(0.017)
factor(nuts2_code)DE14	-0.064***
	(0.017)
factor(nuts2_code)DE21	-0.006
	(0.018)
factor(nuts2_code)DE22	-0.065***
	(0.018)
factor(nuts2_code)DE23	-0.053***
	(0.018)

factor(nuts2_code)DE24	-0.059***
	(0.018)
factor(nuts2_code)DE25	-0.059***
	(0.018)
factor(nuts2_code)DE26	-0.055***
	(0.018)
factor(nuts2_code)DE27	-0.059***
	(0.018)
factor(nuts2_code)DE30	-0.110***
	(0.019)
factor(nuts2_code)DE40	-0.069***
	(0.018)
factor(nuts2_code)DE50	-0.107***
	(0.018)
factor(nuts2_code)DE71	-0.050***
	(0.017)
factor(nuts2_code)DE72	-0.061***
	(0.017)
factor(nuts2_code)DE73	-0.060***
	(0.017)
factor(nuts2_code)DE80	-0.063***
	(0.018)
factor(nuts2_code)DE91	-0.059***
	(0.018)
factor(nuts2_code)DE92	-0.060***
	(0.017)
factor(nuts2_code)DE93	-0.055***
	(0.017)
factor(nuts2_code)DE94	-0.107***
	(0.018)
factor(nuts2_code)DEA1	-0.076***
	(0.018)
factor(nuts2_code)DEA2	-0.051***
	(0.018)
factor(nuts2_code)DEA3	0.054***
	(0.018)
factor(nuts2_code)DEA4	-0.058***
	(0.018)
factor(nuts2_code)DEA5	0.030*
	(0.018)
factor(nuts2_code)DEB1	-0.076***
	(0.018)

factor(nuts2_code)DEB2	-0.105***
	(0.017)
factor(nuts2_code)DEB3	-0.056***
	(0.018)
factor(nuts2_code)DEC0	-0.052***
	(0.018)
factor(nuts2_code)DED2	-0.054***
	(0.018)
factor(nuts2_code)DED4	-0.069***
	(0.018)
factor(nuts2_code)DED5	-0.045**
	(0.018)
factor(nuts2_code)DEE0	-0.099***
	(0.018)
factor(nuts2_code)DEF0	-0.052***
	(0.018)
factor(nuts2_code)DEG0	-0.050***
	(0.018)
factor(nuts2_code)DK01	0.052***
	(0.017)
factor(nuts2_code)DK02	-0.028*
	(0.017)
factor(nuts2_code)DK03	0.006
	(0.017)
factor(nuts2_code)DK04	0.014
	(0.017)
factor(nuts2_code)DK05	-0.108***
	(0.016)
factor(nuts2_code)ES11	-0.058***
	(0.018)
factor(nuts2_code)ES12	-0.089***
	(0.018)
factor(nuts2_code)ES13	-0.089***
	(0.017)
factor(nuts2_code)ES21	0.078***
	(0.018)
factor(nuts2_code)ES22	-0.087***
	(0.017)
factor(nuts2_code)ES23	-0.085***
	(0.017)
factor(nuts2_code)ES24	-0.065***
	(0.017)

factor(nuts2_code)ES30	-0.090***
	(0.017)
factor(nuts2_code)ES41	-0.082***
	(0.017)
factor(nuts2_code)ES42	-0.074***
	(0.018)
factor(nuts2_code)ES43	-0.121***
	(0.017)
factor(nuts2_code)ES51	0.024
	(0.017)
factor(nuts2_code)ES52	-0.086***
	(0.017)
factor(nuts2_code)ES53	-0.088***
	(0.017)
factor(nuts2_code)ES61	-0.085***
	(0.018)
factor(nuts2_code)ES62	-0.075***
	(0.017)
factor(nuts2_code)ES63	-0.118***
	(0.017)
factor(nuts2_code)ES64	-0.118***
	(0.017)
factor(nuts2_code)ES70	-0.083***
	(0.017)
factor(nuts2_code)FR10	-0.069***
	(0.018)
factor(nuts2_code)FRB0	-0.065***
	(0.016)
factor(nuts2_code)FRC1	-0.062***
	(0.016)
factor(nuts2_code)FRC2	-0.068***
	(0.016)
factor(nuts2_code)FRD1	-0.079***
	(0.016)
factor(nuts2_code)FRD2	-0.089***
	(0.016)
factor(nuts2_code)FRE1	-0.060***
	(0.016)
factor(nuts2_code)FRE2	-0.053***
	(0.016)
factor(nuts2_code)FRF1	-0.079***
	(0.016)

factor(nuts2_code)FRF2	-0.061***
	(0.016)
factor(nuts2_code)FRF3	-0.066***
	(0.016)
factor(nuts2_code)FRG0	-0.056***
	(0.016)
factor(nuts2_code)FRH0	-0.053***
	(0.016)
factor(nuts2_code)FRI1	-0.080***
	(0.016)
factor(nuts2_code)FRI2	-0.052***
	(0.016)
factor(nuts2_code)FRI3	-0.071***
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	(0.016)
factor(nuts2_code)FRJ2	-0.042***
	(0.016)
factor(nuts2_code)FRK1	-0.054***
	(0.016)
factor(nuts2_code)FRK2	-0.052***
	(0.016)
factor(nuts2_code)FRL0	-0.042***
	(0.016)
factor(nuts2_code)FRM0	-0.058***
	(0.016)
factor(nuts2_code)FRY1	-0.101***
	(0.022)
factor(nuts2_code)FRY2	-0.079***
	(0.020)
factor(nuts2_code)ITC1	-0.010
	(0.017)
factor(nuts2_code)ITC2	0.025
	(0.028)
factor(nuts2_code)ITC3	-0.051***
	(0.017)
factor(nuts2_code)ITC4	-0.046***
	(0.017)
factor(nuts2_code)ITF1	-0.052***
	(0.017)
factor(nuts2_code)ITF2	-0.043**
	(0.017)

factor(nuts2_code)ITF3	-0.032*
	(0.018)
factor(nuts2_code)ITF4	-0.052***
	(0.018)
factor(nuts2_code)ITF5	-0.112***
	(0.017)
factor(nuts2_code)ITF6	-0.044**
	(0.018)
factor(nuts2_code)ITG1	-0.036**
	(0.018)
factor(nuts2_code)ITG2	-0.047***
	(0.018)
factor(nuts2_code)ITH1	0.363***
	(0.018)
factor(nuts2_code)ITH2	-0.103***
	(0.017)
factor(nuts2_code)ITH3	-0.051***
	(0.017)
factor(nuts2_code)ITH4	-0.033*
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factor(nuts2_code)ITH5	-0.058***
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factor(nuts2_code)ITI1	-0.060***
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factor(nuts2_code)ITI2	-0.102***
	(0.017)
factor(nuts2_code)ITI3	-0.063***
	(0.017)
factor(nuts2_code)ITI4	-0.050***
	(0.017)
factor(nuts2_code)NL11	0.041**
	(0.017)
factor(nuts2_code)NL12	-0.103***
	(0.017)
factor(nuts2_code)NL13	-0.090***
	(0.017)
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	(0.017)
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	(0.017)
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	(0.015)
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factor(nuts2_code)SE33	-0.101***
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factor(nuts2_code)UKC2	-0.125***
	(0.018)
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	(0.018)
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	(0.018)

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	(0.018)
factor(nuts2_code)UKD7	-0.109***
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factor(nuts2_code)UKE1	-0.122***
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	(0.018)
factor(nuts2_code)UKE3	-0.118***
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factor(nuts2_code)UKE4	-0.110***
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factor(nuts2_code)UKF2	-0.114***
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	(0.022)
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	(0.018)
factor(nuts2_code)UKG3	-0.123***
	(0.018)
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	(0.018)
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	(0.018)
factor(nuts2_code)UKJ3	-0.104***
	(0.018)
factor(nuts2_code)UKJ4	-0.135***
	(0.018)
factor(nuts2_code)UKK1	-0.123***
	(0.018)

factor(nuts2_code)UKK2	-0.097***
	(0.018)
factor(nuts2_code)UKK4	-0.131***
	(0.018)
factor(nuts2_code)UKL1	-0.113***
	(0.018)
factor(nuts2_code)UKL2	-0.096***
	(0.018)
factor(nuts2_code)UKM2	-0.125***
	(0.018)
factor(nuts2_code)UKM3	-0.106***
	(0.020)
factor(nuts2_code)UKM5	-0.111***
	(0.018)
factor(nuts2_code)UKM6	-0.096***
	(0.018)
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	(0.016)
factor(nuts2_code)UKM8	-0.079***
	(0.016)
factor(nuts2_code)UKN0	-0.126***
	(0.018)
factor(year)1988	-0.005
	(0.011)
factor(year)1989	0.011
	(0.008)
factor(year)1990	-0.010
	(0.008)
factor(year)1991	-0.009
	(0.014)
factor(year)1992	-0.009
	(0.010)
factor(year)1993	0.014
	(0.012)
factor(year)1994	-0.015
	(0.010)
factor(year)1995	-0.030**
	(0.012)
factor(year)1996	-0.014
	(0.011)
factor(year)1997	0.002
	(0.011)

factor(year)1998	-0.035***
	(0.011)
factor(year)1999	0.007
	(0.014)
factor(year)2000	-0.013
	(0.014)
factor(year)2001	-0.019*
	(0.011)
factor(year)2002	-0.024**
	(0.011)
factor(year)2003	-0.020
	(0.014)
factor(year)2004	-0.014
	(0.014)
factor(year)2005	-0.020*
	(0.011)
factor(year)2006	-0.016
	(0.012)
factor(year)2007	-0.026**
	(0.012)
factor(year)2008	-0.013
	(0.012)
factor(year)2009	-0.027**
	(0.012)
factor(year)2010	-0.029**
	(0.012)
factor(year)2011	-0.008
	(0.013)
factor(year)2012	-0.030**
	(0.012)
factor(year)2013	-0.018
	(0.011)
factor(year)2014	-0.016
	(0.017)
factor(year)2015	-0.009
	(0.012)
factor(year)2016	-0.041***
	(0.012)
factor(year)2017	-0.025**
	(0.011)
factor(year)2018	-0.028**
	(0.013)

factor(year)2019	-0.005
	(0.011)
factor(year)2020	-0.004
	(0.013)
factor(year)2021	-0.052***
	(0.014)
factor(year)2022	-0.038***
	(0.011)
Constant	0.105***
	(0.014)
Observations	1,614
R^2	0.863

*p<0.1; **p<0.05; ***p<0.01

Appendix 3 – Full lagged investment model output

	Dependent variable:			
	urd_region			
	1-Year	3-Year	5-Year	7-Year
	(1)	(2)	(3)	(4)
lag_log_inv_1y	0.001*			
	(0.0004)			
lag_log_inv_3y		0.001		
		(0.0004)		
lag_log_inv_5y			0.0005	
			(0.001)	
lag_log_inv_7y				0.001*
				(0.001)
nuts2_codeAT11	-0.029*	-0.032*	-0.017	-0.004
	(0.017)	(0.018)	(0.021)	(0.028)
nuts2_codeAT12	-0.022	-0.029	-0.020	-0.015
	(0.017)	(0.018)	(0.021)	(0.028)
nuts2_codeAT2	0.043***	0.056***	0.071***	0.086***
	(0.015)	(0.016)	(0.020)	(0.025)
nuts2_codeAT21	-0.062***	-0.058***	-0.013	0.009
	(0.017)	(0.018)	(0.021)	(0.028)
nuts2_codeAT22	-0.015	-0.016	-0.008	-0.005
	(0.017)	(0.018)	(0.021)	(0.027)
nuts2_codeAT3	0.026*	0.031*	0.025	0.019
	(0.015)	(0.016)	(0.020)	(0.025)
nuts2_codeAT31	-0.008	-0.011	-0.006	0.001
	(0.017)	(0.018)	(0.021)	(0.027)
nuts2_codeAT32	-0.040**	-0.042**	-0.012	0.007
	(0.016)	(0.018)	(0.021)	(0.027)
nuts2_codeAT33	-0.017	-0.018	-0.004	0.006
	(0.016)	(0.018)	(0.021)	(0.027)
nuts2_codeAT34	-0.029*	-0.035*	-0.032	-0.028
	(0.016)	(0.018)	(0.021)	(0.027)
nuts2_codeDE11	-0.036**	-0.040**	-0.012	0.017
	(0.018)	(0.019)	(0.024)	(0.033)
nuts2_codeDE12	-0.047***	-0.052***	-0.026	0.022
	(0.018)	(0.019)	(0.024)	(0.033)
nuts2_codeDE13	-0.053***	-0.063***	-0.053**	-0.075**
	(0.018)	(0.019)	(0.025)	(0.034)
nuts2_codeDE14	-0.057***	-0.068***	-0.057**	-0.081**

	(0.018)	(0.019)	(0.025)	(0.034)
nuts2_codeDE21	0.002	-0.010	-0.001	-0.017
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDE22	-0.053***	-0.060***	-0.047*	-0.072**
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDE23	-0.044**	-0.056***	-0.044*	-0.037
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDE24	-0.050***	-0.064***	-0.067***	-0.069**
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDE25	-0.048***	-0.056***	-0.053**	-0.059*
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDE26	-0.047***	-0.054***	-0.052**	-0.063*
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDE27	-0.050***	-0.060***	-0.049**	-0.061*
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDE30	-0.098***	-0.105***	-0.077***	-0.067
	(0.019)	(0.021)	(0.028)	(0.045)
nuts2_codeDE40	-0.054***	-0.048**	-0.023	0.025
	(0.018)	(0.020)	(0.025)	(0.033)
nuts2_codeDE50	-0.097***	-0.103***	-0.077***	-0.056
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDE71	-0.039**	-0.046**	-0.024	0.003
	(0.018)	(0.019)	(0.024)	(0.033)
nuts2_codeDE72	-0.055***	-0.060***	-0.041*	-0.043
	(0.018)	(0.019)	(0.025)	(0.034)
nuts2_codeDE73	-0.050***	-0.060***	-0.024	-0.001
	(0.018)	(0.019)	(0.024)	(0.033)
nuts2_codeDE80	-0.054***	-0.066***	-0.051**	-0.100***
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDE91	-0.052***	-0.064***	-0.039	-0.058*
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDE92	-0.050***	-0.060***	-0.055**	-0.083**
	(0.018)	(0.019)	(0.025)	(0.034)
nuts2_codeDE93	-0.043**	-0.054***	-0.038	-0.044
	(0.018)	(0.019)	(0.025)	(0.034)
nuts2_codeDE94	-0.096***	-0.102***	-0.077***	-0.054
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDEA1	-0.069***	-0.084***	-0.072***	-0.079**
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDEA2	-0.042**	-0.054***	-0.047*	-0.094***
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDEA3	0.062***	0.050**	0.059**	0.034

	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDEA4	-0.046**	-0.053***	-0.040	-0.054
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDEA5	0.039**	0.026	0.034	0.012
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDEB1	-0.065***	-0.069***	-0.039	-0.009
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDEB2	-0.095***	-0.101***	-0.076***	-0.052
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDEB3	-0.046**	-0.058***	-0.037	-0.013
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDEC0	-0.044**	-0.058***	-0.057**	-0.084**
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDED2	-0.042**	-0.056***	-0.048*	-0.034
	(0.019)	(0.021)	(0.027)	(0.044)
nuts2_codeDED4	-0.056***	-0.068***	-0.057**	-0.077**
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDED5	-0.035*	-0.041**	-0.020	-0.005
	(0.019)	(0.021)	(0.027)	(0.044)
nuts2_codeDEE0	-0.097***	-0.103***	-0.075***	-0.044
	(0.019)	(0.021)	(0.027)	(0.043)
nuts2_codeDEF0	-0.041**	-0.047**	-0.020	0.004
	(0.018)	(0.020)	(0.025)	(0.034)
nuts2_codeDEG0	-0.039**	-0.048**	-0.015	0.015
	(0.019)	(0.021)	(0.027)	(0.043)
nuts2_codeDK01	0.065***	0.070***	0.100***	0.121***
	(0.017)	(0.018)	(0.022)	(0.029)
nuts2_codeDK02	-0.018	-0.023	0.016	0.074**
	(0.017)	(0.018)	(0.021)	(0.029)
nuts2_codeDK03	0.017	0.011	0.031	0.046
	(0.017)	(0.018)	(0.022)	(0.029)
nuts2_codeDK04	0.026	0.022	0.045**	0.055*
	(0.017)	(0.018)	(0.022)	(0.029)
nuts2_codeDK05	-0.096***	-0.098***	-0.069***	-0.035
	(0.017)	(0.018)	(0.021)	(0.029)
nuts2_codeES11	-0.039**	-0.035*	-0.022	-0.007
	(0.018)	(0.019)	(0.022)	(0.030)
nuts2_codeES12	-0.069***	-0.072***	-0.050**	-0.040
	(0.018)	(0.019)	(0.022)	(0.030)
nuts2_codeES13	-0.070***	-0.073***	-0.047**	-0.016
	(0.017)	(0.019)	(0.022)	(0.029)
nuts2_codeES21	0.096***	0.079***	0.079***	0.077**

	(0.018)	(0.019)	(0.023)	(0.030)
nuts2_codeES22	-0.071***	-0.083***	-0.071***	-0.047
	(0.017)	(0.019)	(0.022)	(0.029)
nuts2_codeES23	-0.069***	-0.065***	-0.043**	-0.035
	(0.017)	(0.019)	(0.022)	(0.029)
nuts2_codeES24	-0.046***	-0.047**	-0.028	-0.004
	(0.018)	(0.019)	(0.022)	(0.030)
nuts2_codeES30	-0.068***	-0.069***	-0.050**	-0.041
	(0.018)	(0.019)	(0.022)	(0.029)
nuts2_codeES41	-0.062***	-0.068***	-0.046**	-0.034
	(0.018)	(0.019)	(0.022)	(0.030)
nuts2_codeES42	-0.054***	-0.062***	-0.041*	-0.023
	(0.018)	(0.019)	(0.023)	(0.031)
nuts2_codeES43	-0.101***	-0.102***	-0.075***	-0.048
	(0.018)	(0.019)	(0.022)	(0.030)
nuts2_codeES51	0.046***	0.043**	0.053**	0.076**
	(0.018)	(0.019)	(0.022)	(0.030)
nuts2_codeES52	-0.063***	-0.067***	-0.036	-0.005
	(0.018)	(0.019)	(0.022)	(0.030)
nuts2_codeES53	-0.068***	-0.077***	-0.064***	-0.059**
	(0.017)	(0.019)	(0.022)	(0.029)
nuts2_codeES61	-0.070***	-0.082***	-0.073***	-0.061*
	(0.018)	(0.020)	(0.023)	(0.031)
nuts2_codeES62	-0.052***	-0.051***	-0.022	0.003
	(0.018)	(0.019)	(0.022)	(0.030)
nuts2_codeES63	-0.099***	-0.100***	-0.074***	-0.045
	(0.017)	(0.019)	(0.022)	(0.029)
nuts2_codeES64	-0.098***	-0.100***	-0.074***	-0.044
	(0.017)	(0.019)	(0.022)	(0.029)
nuts2_codeES70	-0.062***	-0.070***	-0.082***	-0.072**
	(0.018)	(0.019)	(0.022)	(0.030)
nuts2_codeFR10	-0.071***	-0.097***	-0.102***	-0.080*
	(0.019)	(0.021)	(0.027)	(0.044)
nuts2_codeFRB0	-0.057***	-0.073***	-0.052**	-0.097**
	(0.017)	(0.020)	(0.026)	(0.044)
nuts2_codeFRC1	-0.059***	-0.068***	-0.049*	0.031
	(0.017)	(0.020)	(0.026)	(0.043)
nuts2_codeFRC2	-0.067***	-0.093***	-0.083***	-0.070
	(0.017)	(0.020)	(0.026)	(0.044)
nuts2_codeFRD1	-0.078***	-0.103***	-0.097***	-0.092**
	(0.017)	(0.020)	(0.026)	(0.044)
nuts2_codeFRD2	-0.077***	-0.085***	-0.068***	-0.080*

	(0.017)	(0.020)	(0.026)	(0.044)
nuts2_codeFRE1	-0.057***	-0.079***	-0.051**	-0.097**
	(0.017)	(0.019)	(0.026)	(0.044)
nuts2_codeFRE2	-0.050***	-0.071***	-0.059**	-0.021
	(0.017)	(0.020)	(0.026)	(0.044)
nuts2_codeFRF1	-0.077***	-0.099***	-0.078***	-0.062
	(0.017)	(0.020)	(0.026)	(0.044)
nuts2_codeFRF2	-0.056***	-0.076***	-0.069***	-0.091**
	(0.017)	(0.019)	(0.026)	(0.044)
nuts2_codeFRF3	-0.063***	-0.079***	-0.046*	-0.083*
	(0.017)	(0.019)	(0.026)	(0.044)
nuts2_codeFRG0	-0.065***	-0.097***	-0.079***	-0.069
	(0.017)	(0.020)	(0.026)	(0.044)
nuts2_codeFRH0	-0.044***	-0.062***	-0.033	0.029
	(0.017)	(0.020)	(0.026)	(0.043)
nuts2_codeFRI1	-0.074***	-0.087***	-0.058**	-0.097**
	(0.017)	(0.019)	(0.026)	(0.044)
nuts2_codeFRI2	-0.048***	-0.072***	-0.056**	0.016
	(0.017)	(0.020)	(0.026)	(0.043)
nuts2_codeFRI3	-0.063***	-0.064***	-0.033	0.034
	(0.017)	(0.020)	(0.026)	(0.043)
nuts2_codeFRJ1	-0.058***	-0.081***	-0.056**	-0.092**
	(0.017)	(0.019)	(0.026)	(0.044)
nuts2_codeFRJ2	-0.053***	-0.082***	-0.050*	-0.073
	(0.017)	(0.019)	(0.026)	(0.044)
nuts2_codeFRK1	-0.054***	-0.063***	-0.045*	0.035
	(0.017)	(0.020)	(0.026)	(0.043)
nuts2_codeFRK2	-0.048***	-0.059***	-0.028	0.031
	(0.017)	(0.020)	(0.026)	(0.043)
nuts2_codeFRL0	-0.044***	-0.081***	-0.076***	-0.095**
	(0.017)	(0.019)	(0.026)	(0.044)
nuts2_codeFRM0	-0.063***	-0.070***	-0.052**	-0.089**
	(0.017)	(0.019)	(0.026)	(0.044)
nuts2_codeFRY1	-0.086***			
	(0.027)			
nuts2_codeFRY2	-0.078***	-0.088**		
	(0.023)	(0.037)		
nuts2_codeITC1	-0.002	-0.022	-0.012	-0.011
	(0.018)	(0.019)	(0.024)	(0.030)
nuts2_codeITC2	0.016			
	(0.038)			
nuts2_codeITC3	-0.040**	-0.043**	-0.016	0.011

	(0.018)	(0.019)	(0.023)	(0.030)
nuts2_codeITC4	-0.034*	-0.037*	-0.013	0.012
	(0.018)	(0.019)	(0.023)	(0.030)
nuts2_codeITF1	-0.040**	-0.046**	-0.014	0.018
	(0.018)	(0.019)	(0.024)	(0.030)
nuts2_codeITF2	-0.035**	-0.056***	-0.036	0.010
	(0.018)	(0.019)	(0.024)	(0.030)
nuts2_codeITF3	-0.023	-0.032*	-0.010	0.020
	(0.018)	(0.019)	(0.024)	(0.030)
nuts2_codeITF4	-0.044**	-0.052***	-0.017	0.025
	(0.018)	(0.020)	(0.024)	(0.030)
nuts2_codeITF5	-0.101***	-0.105***	-0.073***	-0.037
	(0.018)	(0.019)	(0.024)	(0.030)
nuts2_codeITF6	-0.036**	-0.052***	-0.026	0.032
	(0.018)	(0.019)	(0.024)	(0.030)
nuts2_codeITG1	-0.025	-0.044**	-0.015	0.016
	(0.018)	(0.019)	(0.024)	(0.031)
nuts2_codeITG2	-0.036**	-0.041**	-0.0002	0.033
	(0.018)	(0.019)	(0.024)	(0.030)
nuts2_codeITH1	0.369***	0.351***	0.376***	0.365***
	(0.019)	(0.021)	(0.027)	(0.044)
nuts2_codeITH2	-0.092***	-0.095***	-0.072***	-0.034
	(0.018)	(0.019)	(0.023)	(0.030)
nuts2_codeITH3	-0.041**	-0.047**	-0.042*	-0.024
	(0.018)	(0.019)	(0.024)	(0.030)
nuts2_codeITH4	-0.023	-0.035*	-0.028	-0.009
	(0.018)	(0.019)	(0.023)	(0.030)
nuts2_codeITH5	-0.049***	-0.060***	-0.033	0.0002
	(0.018)	(0.019)	(0.023)	(0.030)
nuts2_codeITI1	-0.051***	-0.060***	-0.024	0.026
	(0.018)	(0.019)	(0.024)	(0.030)
nuts2_codeITI2	-0.090***	-0.092***	-0.064***	-0.020
	(0.018)	(0.019)	(0.023)	(0.030)
nuts2_codeITI3	-0.051***	-0.059***	-0.031	0.010
	(0.018)	(0.019)	(0.023)	(0.030)
nuts2_codeITI4	-0.037**	-0.047**	-0.038	-0.017
	(0.018)	(0.019)	(0.024)	(0.030)
nuts2_codeNL11	0.053***	0.050***	0.083***	0.083**
	(0.017)	(0.019)	(0.024)	(0.032)
nuts2_codeNL12	-0.091***	-0.102***	-0.066***	-0.075**
	(0.017)	(0.019)	(0.024)	(0.033)
nuts2_codeNL13	-0.081***	-0.102***	-0.065***	-0.074**

	(0.017)	(0.019)	(0.023)	(0.033)
nuts2_codeNL21	0.056***	0.025	0.054**	0.022
	(0.017)	(0.019)	(0.024)	(0.033)
nuts2_codeNL22	0.106***	0.093***	0.119***	0.091***
	(0.017)	(0.019)	(0.024)	(0.033)
nuts2_codeNL23	0.394***	0.336***	0.318***	0.186***
	(0.017)	(0.019)	(0.024)	(0.033)
nuts2_codeNL31	-0.008	-0.034*	-0.015	-0.075**
	(0.017)	(0.019)	(0.025)	(0.036)
nuts2_codeNL32	0.045***	0.032*	0.049**	0.024
	(0.017)	(0.019)	(0.024)	(0.033)
nuts2_codeNL33	0.019	0.002	0.029	-0.037
	(0.017)	(0.019)	(0.024)	(0.033)
nuts2_codeNL34	-0.090***	-0.101***	-0.065***	-0.073**
	(0.017)	(0.019)	(0.023)	(0.033)
nuts2_codeNL35	0.044***	0.032*	0.056**	0.008
	(0.016)	(0.018)	(0.023)	(0.032)
nuts2_codeNL36	0.082***	0.065***	0.075***	0.020
	(0.016)	(0.018)	(0.023)	(0.032)
nuts2_codeNL41	0.039**	0.027	0.057**	0.036
	(0.017)	(0.019)	(0.023)	(0.032)
nuts2_codeNL42	0.047***	0.035*	0.071***	0.072**
	(0.017)	(0.019)	(0.024)	(0.033)
nuts2_codeSE11	-0.021	-0.032*	-0.011	-0.011
	(0.017)	(0.018)	(0.023)	(0.032)
nuts2_codeSE12	-0.021	-0.027	0.007	0.069**
	(0.017)	(0.018)	(0.023)	(0.030)
nuts2_codeSE21	-0.092***	-0.099***	-0.065***	-0.011
	(0.017)	(0.018)	(0.023)	(0.030)
nuts2_codeSE22	-0.028*	-0.044**	-0.020	-0.014
	(0.017)	(0.018)	(0.023)	(0.032)
nuts2_codeSE23	-0.014	-0.017	0.004	0.018
	(0.017)	(0.018)	(0.023)	(0.032)
nuts2_codeSE31	-0.036**	-0.045**	-0.017	-0.024
	(0.017)	(0.018)	(0.023)	(0.032)
nuts2_codeSE32	-0.092***	-0.099***	-0.065***	-0.011
	(0.017)	(0.018)	(0.023)	(0.030)
nuts2_codeSE33	-0.092***	-0.099***	-0.065***	-0.011
	(0.017)	(0.018)	(0.023)	(0.030)
nuts2_codeUKC1	-0.088***	-0.087***	-0.063**	-0.049
	(0.019)	(0.021)	(0.027)	(0.045)
nuts2_codeUKC2	-0.114***	-0.122***	-0.120***	-0.127***

	(0.019)	(0.021)	(0.027)	(0.045)
nuts2_codeUKD1	-0.116***	-0.122***	-0.114***	-0.114**
	(0.018)	(0.021)	(0.027)	(0.045)
nuts2_codeUKD3	-0.087***			
	(0.028)			
nuts2_codeUKD4	-0.106***	-0.122***	-0.129***	-0.134***
	(0.018)	(0.021)	(0.027)	(0.045)
nuts2_codeUKD6	-0.083***	-0.083***	-0.060**	-0.043
	(0.018)	(0.020)	(0.026)	(0.044)
nuts2_codeUKD7	-0.100***	-0.108***	-0.100***	-0.097**
	(0.019)	(0.021)	(0.027)	(0.045)
nuts2_codeUKE1	-0.116***	-0.128***	-0.120***	-0.118***
	(0.019)	(0.021)	(0.027)	(0.045)
nuts2_codeUKE2	-0.092***	-0.096***	-0.062**	-0.044
	(0.018)	(0.021)	(0.027)	(0.045)
nuts2_codeUKE3	-0.110***	-0.125***	-0.132***	-0.134***
	(0.019)	(0.021)	(0.027)	(0.045)
nuts2_codeUKE4	-0.102***	-0.107***	-0.119***	-0.112**
	(0.019)	(0.021)	(0.027)	(0.045)
nuts2_codeUKF1	-0.087***	-0.084***	-0.059**	-0.041
	(0.019)	(0.021)	(0.027)	(0.045)
nuts2_codeUKF2	-0.107***	-0.123***	-0.132***	-0.139***
	(0.018)	(0.021)	(0.027)	(0.045)
nuts2_codeUKF3	-0.100***	-0.088**		
	(0.024)	(0.037)		
nuts2_codeUKG2	-0.098***	-0.086***	-0.053**	-0.038
	(0.018)	(0.021)	(0.027)	(0.045)
nuts2_codeUKG3	-0.113***	-0.118***	-0.117***	-0.115**
	(0.019)	(0.021)	(0.027)	(0.045)
nuts2_codeUKH1	-0.100***	-0.099***	-0.105***	-0.137***
	(0.018)	(0.020)	(0.026)	(0.044)
nuts2_codeUKH2	-0.095***	-0.091***	-0.056**	-0.033
	(0.018)	(0.020)	(0.026)	(0.044)
nuts2_codeUKH3	-0.100***	-0.089***	-0.056**	-0.041
	(0.018)	(0.020)	(0.026)	(0.044)
nuts2_codeUKI5	-0.070***	-0.074***	-0.059**	-0.024
	(0.017)	(0.020)	(0.026)	(0.043)
nuts2_codeUKI6	-0.072***	-0.074***	-0.054**	-0.016
	(0.017)	(0.020)	(0.026)	(0.043)
nuts2_codeUKJ1	-0.120***	-0.120***	-0.126***	-0.129***
	(0.018)	(0.020)	(0.026)	(0.044)
nuts2_codeUKJ2	-0.101***	-0.101***	-0.082***	-0.135***

	(0.018)	(0.020)	(0.026)	(0.044)
nuts2_codeUKJ3	-0.095***	-0.079***	-0.055**	-0.036
	(0.018)	(0.020)	(0.026)	(0.044)
nuts2_codeUKJ4	-0.125***	-0.133***	-0.130***	-0.135***
	(0.018)	(0.021)	(0.026)	(0.044)
nuts2_codeUKK1	-0.109***	-0.101***	-0.079***	-0.137***
	(0.018)	(0.021)	(0.026)	(0.045)
nuts2_codeUKK2	-0.086***	-0.078***	-0.053**	-0.034
	(0.018)	(0.021)	(0.027)	(0.045)
nuts2_codeUKK4	-0.120***	-0.128***	-0.127***	-0.131***
	(0.019)	(0.021)	(0.027)	(0.045)
nuts2_codeUKL1	-0.097***	-0.082***	-0.055**	-0.040
	(0.019)	(0.021)	(0.027)	(0.045)
nuts2_codeUKL2	-0.085***	-0.088***	-0.057**	-0.038
	(0.019)	(0.021)	(0.027)	(0.045)
nuts2_codeUKM2	-0.111***	-0.107***	-0.124***	-0.126***
	(0.019)	(0.021)	(0.027)	(0.045)
nuts2_codeUKM3	-0.091***	-0.108***		
	(0.022)	(0.028)		
nuts2_codeUKM5	-0.098***	-0.098***	-0.094***	
	(0.019)	(0.022)	(0.030)	
nuts2_codeUKM6	-0.084***	-0.091***	-0.080***	-0.092**
	(0.019)	(0.021)	(0.027)	(0.044)
nuts2_codeUKM7	-0.077***	-0.080***	-0.052**	-0.015
	(0.017)	(0.019)	(0.026)	(0.043)
nuts2_codeUKM8	-0.077***	-0.079***	-0.062**	-0.028
	(0.017)	(0.020)	(0.026)	(0.043)
nuts2_codeUKN0	-0.113***	-0.110***	-0.105***	-0.128***
	(0.019)	(0.021)	(0.027)	(0.045)
year1990	0.009			
	(0.017)			
year1991	0.006			
	(0.021)			
year1992	0.019			
	(0.018)			
year1993	0.007			
	(0.019)			
year1994	0.007			
	(0.017)			
year1995	-0.022			
	(0.020)			
year1996	0.0004	0.035*		

	(0.019)	(0.019)		
year1997	0.023			
	(0.018)			
year1998	-0.014	0.026		
	(0.018)	(0.017)		
year1999	0.027			
	(0.021)			
year2000	-0.003	0.026		
	(0.020)	(0.019)		
year2001	-0.001	0.019		
	(0.018)	(0.019)		
year2002	-0.003	0.029*		
	(0.018)	(0.017)		
year2003	-0.001	0.033		
	(0.021)	(0.021)		
year2004	-0.003	0.015		
	(0.020)	(0.020)		
year2005	-0.001	0.019	0.036*	
	(0.018)	(0.018)	(0.019)	
year2006	0.005	0.031*	0.031	
	(0.019)	(0.018)	(0.020)	
year2007	-0.006	0.025	0.012	
	(0.019)	(0.019)	(0.024)	
year2008	0.003	0.024	0.033*	
	(0.019)	(0.019)	(0.020)	
year2009	-0.007	0.015	0.028	
	(0.019)	(0.019)	(0.020)	
year2010	-0.010	0.011	0.006	
	(0.019)	(0.019)	(0.020)	
year2011	0.003	0.021	0.028	0.024
	(0.019)	(0.019)	(0.021)	(0.025)
year2012	-0.010	0.025	0.028	0.084***
	(0.019)	(0.019)	(0.021)	(0.028)
year2013	0.002	0.024	0.030	0.040*
	(0.019)	(0.019)	(0.020)	(0.023)
year2014	0.006	0.028	0.034	0.016
	(0.023)	(0.023)	(0.024)	(0.032)
year2015	0.006	0.022	0.031	0.026
	(0.019)	(0.019)	(0.020)	(0.022)
year2016	-0.028	-0.012	-0.001	0.002
	(0.019)	(0.019)	(0.021)	(0.026)
year2017	-0.005	0.018	0.024	0.041

	(0.018)	(0.018)	(0.020)	(0.026)
year2018	-0.008	0.015	0.017	0.002
	(0.020)	(0.020)	(0.021)	(0.029)
year2019	0.012	0.027	0.035*	0.037
	(0.018)	(0.019)	(0.020)	(0.025)
year2020	0.005	0.022	0.029	0.024
	(0.020)	(0.020)	(0.023)	(0.028)
year2021	-0.033	-0.0001	-0.001	0.041
	(0.021)	(0.021)	(0.023)	(0.030)
year2022	-0.017	0.009	0.012	0.003
	(0.019)	(0.018)	(0.020)	(0.027)
Constant	0.085***	0.070***	0.041*	0.003
	(0.021)	(0.021)	(0.024)	(0.030)
Observations	1,438	1,087	743	403
R^2	0.860	0.860	0.856	0.880
Adjusted R^2	0.836	0.828	0.807	0.780
Residual Std. Error	0.034 (df = 1226)	0.035 (df = 886)	0.037 (df = 552)	0.039 (df = 219)
F Statistic	35.668*** (df = 211; 1226)	27.195*** (df = 200; 886)	17.296*** (df = 190; 552)	8.796*** (df = 183; 219)
Note:	*p<0.1; **p<0.05; ***p<0.01			

Appendix 4 – R^2 per model and country

Country	model	R^2	N
AT	Main	0.8951234	132
AT	Lag 1	0.9002269	121
AT	Lag 3	0.8966125	99
DE	Main	0.9417031	328
DE	Lag 1	0.9538546	291
DE	Lag 3	0.9551382	217
DK	Main	0.9165607	60
DK	Lag 1	0.9173347	55
DK	Lag 3	0.9272760	45
ES	Main	0.9229298	209
ES	Lag 1	0.9223208	190
ES	Lag 3	0.9298704	152
FR	Main	0.8418688	183
FR	Lag 1	0.8247939	159
FR	Lag 3	0.7464183	111
IT	Main	0.9630683	200
IT	Lag 1	0.9598963	179
IT	Lag 3	0.9638102	138
NL	Main	0.8816820	139
NL	Lag 1	0.8794431	125
NL	Lag 3	0.8746873	97
SE	Main	0.9749397	80
SE	Lag 1	0.9816004	72
SE	Lag 3	0.9828672	56
UK	Main	0.8855586	283
UK	Lag 1	0.8873259	246
UK	Lag 3	0.8930847	172

Appendix 5 – Full cross-lagged panel model

```
  Estimator                                      ML
  Optimization method                        NLMINB
  Number of model parameters                     14

  Number of observations                       1438
  Number of missing patterns                      1

Model Test User Model:
                                              Standard      Scaled
  Test Statistic                                 0.000       0.000
  Degrees of freedom                                 0           0

Model Test Baseline Model:

  Test statistic                              3207.154    1522.922
  Degrees of freedom                                 6           6
  P-value                                        0.000       0.000
  Scaling correction factor                                  2.106

User Model versus Baseline Model:

  Comparative Fit Index (CFI)                    1.000       1.000
  Tucker-Lewis Index (TLI)                       1.000       1.000

  Robust Comparative Fit Index (CFI)                         1.000
  Robust Tucker-Lewis Index (TLI)                            1.000

Loglikelihood and Information Criteria:

  Loglikelihood user model (H0)              -5386.102   -5386.102
  Loglikelihood unrestricted model (H1)      -5386.102   -5386.102

  Akaike (AIC)                               10800.204   10800.204
  Bayesian (BIC)                             10873.999   10873.999
  Sample-size adjusted Bayesian (SABIC)      10829.525   10829.525

Root Mean Square Error of Approximation:

  RMSEA                                          0.000          NA
  90 Percent confidence interval - lower         0.000          NA
  90 Percent confidence interval - upper         0.000          NA
  P-value H_0: RMSEA <= 0.050                       NA          NA
  P-value H_0: RMSEA >= 0.080                       NA          NA

  Robust RMSEA                                               0.000
  90 Percent confidence interval - lower                     0.000
  90 Percent confidence interval - upper                     0.000
  P-value H_0: Robust RMSEA <= 0.050                            NA
  P-value H_0: Robust RMSEA >= 0.080                            NA
```

Standardized Root Mean Square Residual:

SRMR	0.000	0.000

Parameter Estimates:

Standard errors	Sandwich
Information bread	Observed
Observed information based on	Hessian

Standardized Regression Paths

Outcome	Predictor	Coefficient (ß)	SE	z	p	Std. Beta
URD (t)	Lagged Investment (a)	0.000	0.000	1.281	.200	0.027
URD (t)	Lagged URD (b)	0.754	0.037	20.222	<.001***	0.769
Investment (t)	Lagged URD (c)	2.025	1.174	1.724	.085†	0.024
Investment (t)	Lagged Investment (d)	0.776	0.020	38.183	<.001***	0.859

Residual Correlations

Variable 1	Variable 2	r	SE	z	p	Std. r
URD (t)	Investment (t)	0.011	0.006	1.948	.051	0.052
Lagged Investment (t–1)	Lagged URD (t–1)	-0.025	0.018	-1.335	.182	-0.035

Intercepts

Variable	Estimate	SE	z	p	Std. Estimate
URD (t)	0.014	0.004	3.181	.001**	0.168
Investment (t)	4.308	0.387	11.123	<.001***	0.585
Lagged Investment (t–1)	13.808	0.215	64.307	<.001***	1.696
Lagged URD (t–1)	0.085	0.002	37.201	<.001***	0.981

Residual Variances

Variable	Estimate	SE	z	p	Std. Var
URD (t)	0.003	0.000	12.499	<.001***	0.410
Investment (t)	14.259	1.042	13.680	<.001***	0.263
Lagged Investment	66.298	1.930	34.344	<.001***	1.000
Lagged URD	0.008	0.001	10.199	<.001***	1.000