Emigration and Voting Behaviour in Central and Eastern European EU Member States

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Fabian Aiolfi
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Erstgutachter: Dr. Christian Freudlsperger
Zweitgutachter: Dr. Michele Fenzl

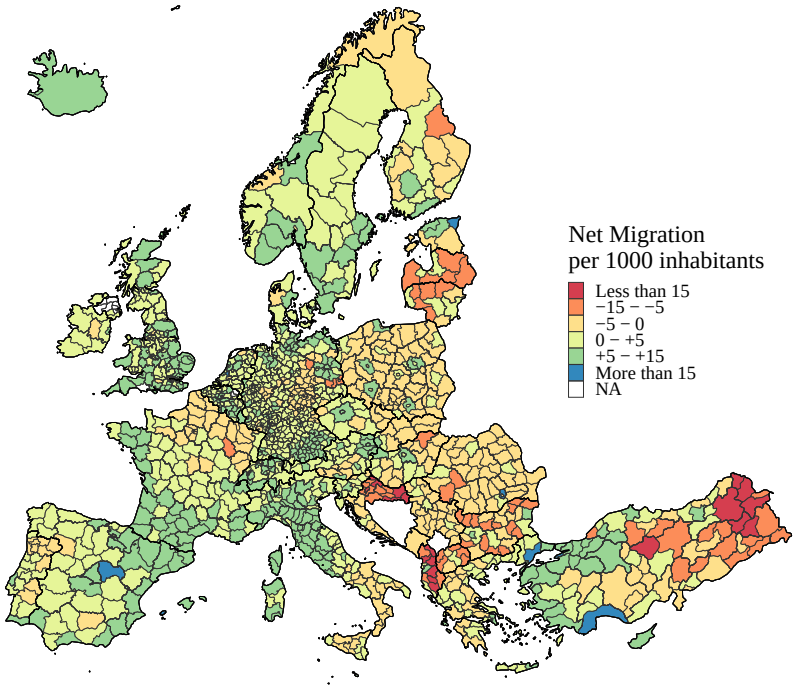
Abstract

This thesis investigates the political consequences of high emigration rates in Central and Eastern European EU countries, where the EU's Freedom of Movement (FoM) accelerates outmigration. Existing research shows that emigration leads to service cuts in affected regions. These cuts decrease service quality, which impacts the electorate's voting behaviour. This thesis aims to identify specific service cuts caused by emigration that subsequently change voting behaviour, specifically incumbent support. The cuts under examination include closures of primary schools, hospitals, and "third places," such as bars and cafés. An association between these service cuts and incumbent support is measured in subnational regions in Poland and Romania between 2005 and 2019. Two-way fixed effects linear regression models aim to assess a relationship between changes in the availability of services per capita and shifts in incumbent support. The results do not show a clear association. However, evidence suggests a correlation between closures of primary schools, induced by emigration, and a decrease in incumbent support within Romania's subnational NUTS3 regions.

Introduction

European Union (EU) member states in Central and Eastern Europe[1] (CEE) have shown high levels of emigration in the past 20 years (Kyriazi et al. 2023, 565; Vorländer 2021, 7). Figure 1 provides a geographic overview of net migration in Europe at subnational level. Accession to the EU has spurred on emigration, facilitated by the EU's policy on Freedom of Movement (FoM). How does emigration affect political behaviour in sending countries? Theory tells us that emigration leads to service cuts, which in turn create grievances amongst the population that remains in sending countries (Dancygier et al. 2022). This population then turns against the incumbent party (Bowler and Lanoue 1992). To better understand the dynamics between emigration and anti-incumbent voting behaviour, it is relevant to examine service cuts in detail.

Figure 1: Average net migration 2000–2021 in subnational regions (NUTS3)



Net migration is calculated by subtracting the crude rate of natural change from the crude rate of population change. This means net migration represents the part of population change that is not caused by births and deaths. A negative net migration indicates more emigration than immigration in a region. These data do not differentiate between internal and external migration. Source: Eurostat variable CNMIGRATRT.

However, before diving into the consequences of service cuts on voting behaviour, it is important to underline why emigration is worth studying. Emigration has a profound effect on sending countries (Thaut 2009) and it is a salient issue amongst the remaining population (Rice-Oxley and Rankin 2019). Furthermore, its effects on CEE EU member states are a blind spot in political science research (Kyriazi et al. 2023).

The United Nations estimated a population decline of 18 million people in Eastern Europe between the early 1990s and 2015, with emigration being the main reason for the decrease

[1] Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia

(Romei 2016). In one concrete example, Lithuania has lost a quarter of its population, with certain regions losing over 50% of residents (Ubarevičienė and van Ham 2017, 58). Intra-EU migration is driven by economic and labour market factors, as people emigrate to look for better job opportunities (Vasilopoulou and Talving 2019, 810).

Emigration impacts sending countries, e.g., through population decline, lack of labour (Roos 2023, 187; Thaut 2009, 220) or a change in the population's ethnic profile (Vorländer 2021, 51). Emigration also affects individuals that are left behind. They feel a sense of loss and develop sentiments of anger, distress and depression (Ivlevs et al. 2019, 135; Marchetti-Mercer 2012, 388).

Does emigration change the voting behaviour of the people left behind? Theory tells us that emigration creates grievances amongst the remaining voters (Dancygier et al. 2022, 2). I follow a definition of grievances provided by Flinders and Hinterleitner (2022, 673), who see them to be negative emotions built around fear or anger. Dancygier et al. (2022) show how these grievances lead to voting for populist and radical right (PRR) parties. I argue that these grievances can also cause a less radical shift in voting behaviour, e.g., an anti-incumbent vote. This argument is underlined by Bowler and Lanoue (1992), who tell us that grieving, dissatisfied voters are prone to casting a ballot against the incumbent (Bowler and Lanoue 1992, 489).

Dancygier et al. (2022) focus solely on Sweden as a case study. I show that the phenomenon of emigration and voting behaviour change can also be applied to CEE EU member states. This is because the typical impacts of emigration, e.g., population decline or labour shortages, are not bound to a specific country.

Dancygier et al. (2022) describe how emigration leads to voting for PRR parties. Regions with high emigration rates are prone to service cuts. These cuts cause grievances amongst the people left behind, who react by voting for PRR parties (Dancygier et al. 2022, 2). However, the authors do not show what exactly causes a change in voting behaviour and suggest that future research should look into which service cuts eventually lead to PRR voting (Dancygier et al. 2022, 35).

Therefore, this thesis poses the following research question: Which emigration-induced service cuts have a negative impact on the sending country's incumbent vote share?

This thesis will examine three types of emigration-induced service cuts that can cause grievances. These cuts are school closures, hospital closures and closures of "third places", i.e., places that foster community building, such as cafés, bars and restaurants. I put forward the idea that these service cuts cause grievances that in turn lead to an anti-incumbent vote.

There is a research gap when it comes to understanding the political repercussions of emigration on sending regions (Kyriazi et al. 2023, 564). This is all the more surprising since, globally speaking, the people who do *not* emigrate outnumber the people who do (Marchetti-Mercer

2012, 378). Therefore, in the specific case of the EU, FoM should be studied not only from the view of a right to enter, but also as a right to exit (Bruzelius 2021, 35) and the consequences this has.

FoM, a foundational aspect of the EU, affects politics in both receiving *and* in sending countries (Kyriazi et al. 2023, 563). Examining the effects of FoM, particularly on voting behaviour, in regions experiencing high emigration levels is crucial in explaining the impact EU accession has on new member states like Croatia and other CEE countries. This analysis will provide insights into the implications of future European integration, e.g., when further Balkan states or Ukraine join the EU.[2]

This thesis is set up as follows. I begin with a literature review, looking into existing findings and theory behind the effects of emigration on voting behaviour. Next, following the approach by Dancygier et al. (2022), I put forward hypotheses that posit an association between emigration-induced service cuts and incumbent support. Based on the theory, I expect service cuts to reduce incumbent support.

I continue by explaining how I operationalise service cuts, emigration and incumbent support based on data provided by Eurostat and the statistical offices of the countries under review, namely Poland and Romania. Based on this, I first examine possible associations between external emigration, incumbent support and service cuts. I work with subnational NUTS[3] level data, as different regions within countries have different levels of emigration and service cuts. This approach allows for more differentiated measurements.

The results from the first step merit further research into the specific case of Romania. Thus in the next step, I build two-way fixed effects linear regression models to uncover an association between incumbent support and service cuts in Romania. The results imply that the hypotheses must be rejected, however there are hints at a possible association between emigration-induced school closures and loss of incumbent support.

The thesis concludes with interpreting the results in the context of European integration, describes the thesis' limits and shows possible avenues of further research.

Literature Review and Theory

The impact of emigration on voting behaviour and electoral outcomes varies by time and location. A variety of studies have explored this phenomenon, ranging from 19th-century Sweden (Karadja and Prawitz 2019, 2) to early 21st-century Mexico (Pfutze 2014, 295).

[2] 2023 State of Union address by EU Commission President Ursula von der Leyen at 1h 5min 41sec (https://www.youtube.com/live/3CodB7iohUI?si=xe06mS4q8qjeJYpi&t=3941, retrieved 6 October 2023)

[3] The NUTS classification (*Nomenclature des unités territoriales statistiques*) is a geographic classification standard established by Eurostat, the EU's statistical office. It is hierarchical system based on three levels of detail, with level NUTS3 being the lowest level, i.e., the level with the smallest geographic regions (https://ec.europa.eu/eurostat/web/nuts/overview, retrieved 23 January 2024)

Emigration can affect electoral outcomes in two ways. First, emigration can change the composition of the electorate. Lim (2023, 39) shows that emigrants from CEE are disproportionately younger, cosmopolitan and politically progressive, resulting in a remaining population that is older and more conservative. As a result, electoral results are more likely to be conservative, too.

Second, emigration can affect the voting behaviour of the people left behind. This effect can be indirect and direct. The *indirect* effect occurs when emigration alters a voter's overall well-being. Family members or neighbours of emigrants have a higher life satisfaction and budget easing through remittances, but suffer from more depression and stress (Ivlevs et al. 2019, 135) and are more prone to anger and distress (Marchetti-Mercer 2012, 388), caused by the departure of people close to them. A voter's overall well-being will, amongst other aspects, influence their perception of parties and candidates and thus their voting behaviour.

There are multiple *direct* effects of emigration on political behaviour. A wide range of literature explains how emigration causes a decrease in political interest. This can be triggered by a decrease in political mobilisation and collective action (Sellars 2019, 1220), a decrease in civic engagement (Bravo 2009; Goodman and Hiskey 2008, 172), opposing voices leaving and thus resulting in a more incumbent supporting electorate (Peters and Miller 2022, 14) or through a loss of political actors (Lim 2023, 44).

Despite this decrease in political interest, some of the remaining electorate still votes. If the number of people casting their ballot decreases, then it becomes all the more important to understand how the remaining voters are affected by emigration and thus how they cast their ballot.

One concrete example why this is important is shown by Barsbai et al. (2017, 36), who reveal a negative effect between emigration and votes for the Communist Party in the Moldovan elections of 2009 and 2010. These elections brought significant political change to the ex-soviet country (Barsbai et al. 2017, 41), because voters cast a ballot against the Communist Party, who had gained electoral power in previous elections. Voters turned against the Communist Party because returning emigrants brought western social norms and political preferences to Moldova (Barsbai et al. 2017, 66). These preferences then diffused amongst the electorate.

A further reason why the effects of emigration on voting behaviour are important is its implications on voting for populist and radical right (PRR) parties (Dancygier et al. 2022, 34; Herold and Otteni 2020, 19; Lim 2023, 56).

Dancygier et al. (2022, 35) uncover a correlation between emigration and the rise of PRR parties. The authors suggest that emigration decreases an area's quality of life, e.g., through cuts in public services. These service cuts create grievances amongst voters. These grievances then affect voting behaviour. Grieving voters turn against incumbents and cast a ballot for PRR parties.

However, there are several reasons why voting for PRR parties can be questioned in the chain of events presented by Dancygier et al. (2022). Grievances caused by emigration do not necessarily have to lead directly to a vote for PRR parties. I argue in favour of a less drastic outcome, namely that emigration-induced grievances alter voting behaviour in general.

Emigration from CEE EU member states is primarily caused by economic factors (Vasilopoulou and Talving 2019, 810). This is relevant because understanding the reason *why* people emigrate helps to explain the impact of emigration on the sending country (Kapur 2014, 488). If one of the impacts caused by *economic* emigration is grievances, then I assume that these grievances will be linked to economic factors and less to, say, personal or family matters, e.g., as described by Ivlevs et al. (2019, 135). Then, if these grievances are of an economic nature, I assume that they are more likely to be voiced in the public realm than grievances stemming from personal issues. This public realm can be the ballot box, and a person voicing their emigration-induced grievances can manifest itself as a change in voting behaviour. Thus I assume that emigration-induced grievances can affect voting behaviour in general, and do not necessarily have to lead directly to supporting a PRR party.

I argue that this general change in voting behaviour manifests itself as a decrease in incumbent support for the following reasons.

First, voters evaluate a government's past performance and their policy outcomes (Key 1966, 35, 58–59, 61). They vote retrospectively and their voting behaviour is influenced by salient issues (Key 1966, 73), such as the described service cuts. These cuts affect citizens' daily lives and cause grievances, giving the incumbent party a poor performance record. Grieving voters that are dissatisfied with the incumbent party will not support them in the next election (Bowler and Lanoue 1992, 489).

Second, Vorländer (2021, 36) shows that far-right parties only profit from emigration in economically weak regions. By only examining votes in favour of PRR parties, I would exclude the effect of emigration on economically stronger regions.

Third, non-extreme parties, e.g., mainstream opposition parties, may also benefit from emigration. There are several possible reasons for this. One, a voter can critique the incumbent government or status quo parties if emigration becomes politicised (Vorländer 2021, 91). Two, voters receive remittances through emigrated family members, which realign their party preferences closer to their personal ideological preferences (Pfutze 2012, 161). This realignment does not necessarily have to lead to voting for an extreme party. Three, voters cannot cast a ballot for an extreme party if there is no such party competing.

In sum, I agree in principle with the causal chain put forward by Dancygier et al. (2022). However, based on the arguments above, I alter its final step from voting for PRR parties to a more general anti-incumbent vote.

Returning to the start of the causal chain described above, it remains unclear which service cuts cause grievances that subsequently change voting behaviour (Dancygier et al. 2022, 35). This presents an opportunity to explore and identify specific service cuts. This thesis aims to identify which emigration-induced service cuts fit into the mechanism described by Dancygier et al. (2022), leading to the following research question: Which emigration-induced service cuts have a negative impact on the sending country's incumbent vote share?

By answering this question, my thesis contributes to literature on emigration and its effects on voting behaviour. Furthermore, this thesis argues that future research should incorporate the causal mechanism proposed by Dancygier et al. (2022) and take the emigration-induced service cuts identified here into account.

Dancygier et al. (2022, 2) state that emigration is linked to service cuts such as schools and business closures. Also, emigration strains the healthcare system. Based on this, I assume that emigration has a negative effect on the number of schools, the number of hospitals and the number of "third places", i.e., local "informal public gathering places" such as cafés, bars and restaurants that foster community building (Oldenburg 1999, 16). Following Dancygier et al. (2022), a decrease in the number of these institutions will cause grievances amongst the remaining population for the following reasons.

Schools contribute towards community feeling (Sageman 2022, 964). Closing a school will reduce a community's cohesion and negatively impact the lives of families with school-aged children. I assume that younger children, i.e., primary school aged children, to be more strongly affected by such a disruption than older children in secondary school or above. This is why I focus on primary schools. Furthermore, primary school children are more likely to be reliant on their parents or guardians when travelling to school. Thus closing a primary school will also impact people close to an affected child, as families must travel further to reach the next school. Children can also be affected by a school closure that is not their own, as children from a closed school must be redistributed amongst existing schools, leading to an increase in children per class.

Because emigrants tend to be younger (Lim 2023, 39), the remaining population is likely to be older (see also Figure 5). Elderly citizens are more reliant on hospitals, thus I argue that a hospital closure can cause distress and grievances amongst the population. Hospital closures in CEE are spurred on by the emigration of medical professionals (Vorländer 2021, 13; Walker 2019).

To underline the importance of school and hospital closures, Dancygier et al. (2022, 32) show how newspapers report on such closings in Swedish regions that experience high levels of emigration. This indicates that there may exist a link between school and hospital closures and grievances.

Schools and hospitals are services predominantly made available by the state. In contrast, third places are provided by the private sector. I make the assumption that the number of third places depends on demand in the population. Third places are institutions frequented by different parts of the population, thus an emigration-induced decrease of the population will lead to a decrease in demand for third places. This decrease in demand can lead to a decrease in supply, thus leading to closures of third places. These closings can erode a communal sense of belonging and push people towards populist parties (Bolet 2021, 1653).

Hypotheses

I assume a decrease in the number of institutions, e.g., less schools, to indicate an increase in service cuts. Thus as a general relation, I expect an increase in service cuts (independent variable) to be associated with a decrease in incumbent support (dependent variable). This leads to the following three hypotheses:

H1: Service cuts to primary schools lead to a decrease in incumbent support.

H2: Service cuts to hospitals lead to a decrease in incumbent support.

H3: Service cuts to third places lead to a decrease in incumbent support.

Case Study Selection

Dancygier et al. (2022) focus on emigration and its effect on voting behaviour in Sweden. Their focus stems from the availability of detailed Swedish data (Dancygier et al. 2022, 34). The authors also show that emigration has a significant positive effect on PRR party support across Europe (Dancygier et al. 2022, 34). This hints at the possibility that the mechanism they put forward can also be applied to other European states. Thus I set out to examine CEE EU member states, as these countries have high emigration rates (Kyriazi et al. 2023, 565; Vorländer 2021, 7), spurred on by the EU's FoM. Emigration in CEE has not been studied in detail (Kyriazi et al. 2023, 566). Here exists an opportunity to measure the political impact of FoM on sending countries. This is an understudied aspect of FoM, as political science research often focuses on the *immigration* that FoM causes and its impact on *receiving* countries (Kyriazi et al. 2023, 563).

Specifically in this thesis, I focus on Poland and Romania. These countries provide accessible data on the above defined service cuts through their respective statistical offices. They are also notable as CEE EU member states, as they have displayed the highest absolute numbers of yearly emigration since 2010.[4] For these reasons and to remain within the scope of this thesis,

[4]Eurostat Variable *migr_emi1ctz*: Total number of long-term emigrants leaving from the reporting country during the reference year (https://ec.europa.eu/eurostat/databrowser/view/tps00177__custom_9431582/default/table?lang=en, retrieved 19 January 2024)

I aim to measure the potential impact of emigration-induced service cuts on incumbent support in both Poland and Romania.

Control Variables

In order to isolate the effect of service cuts on incumbent support, I control for the following variables that may also affect incumbent support. First, I control for general electoral volatility. CEE states show higher levels of electoral volatility than states in Western Europe, Latin America or the United States (Epperly 2011, 831). Incumbent parties suffer the most under this electoral volatility (Bochsler and Hänni 2019, 1).

Second, I control for a region's economic performance. I do this under the assumption that voters punish or reward incumbent parties based on the economic conditions voters find themselves in. Good economic performance leads to incumbent support, bad performance leads to voters punishing the incumbents (Lewis-Beck and Stegmaier 2000, 183). In the specific context of CEE, Powell and Tucker (2014, 139, 143) show that economic downturns, specifically shifts in GDP since the fall of Communism, increase the likelihood of the electorate switching to a new party. This observation aligns with Bertus et al. (2022, 77), who find that in smaller Hungarian settlements, socio-economic dynamics and labour market conditions explain electoral shifts.

Data and Methods

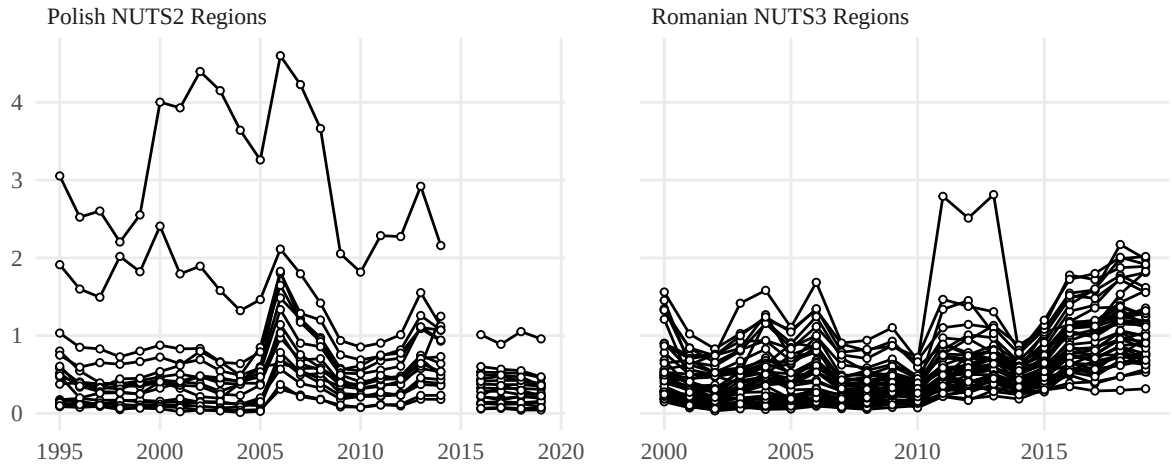
I explicitly differentiate between internal emigration, i.e., emigration within a country, and external emigration, i.e., emigration from one country to another. I do this because I aim to examine the impact of the EU's FoM on voting behaviour in sending countries. Assuming that the EU's FoM facilitates emigration between member states, I focus on external emigration in order to examine the impact of FoM on voting behaviour in sending countries.

Furthermore, I will measure external emigration and the effects of service cuts on the lowest subnational NUTS level that data are available for. Emigration rates vary across NUTS regions in Poland and Romania (see Figure 2). Taking these regional differences into account will help develop accurate and robust models when examining the association between service cuts and incumbent support.

Available Data

I begin by describing which data would be best to test my hypotheses. Ideal emigration data would be longitudinal, beginning several years before a country's accession and would continue up to and include the year 2019. Emigration rates for the year 2020 and later should be disregarded, as the COVID-19 pandemic interferes with the mobility of EU citizens (Ramji-Nogales and Goldner Lang 2020, 596), decreasing external emigration rates (Cristian et al. 2022, 17).

Figure 2: Yearly external emigration per 1000 inhabitants in a NUTS region



Sources: Statistics Poland, Romanian National Institute of Statistics

Furthermore, the data would ideally be available for the lowest subnational region, i.e., NUTS3, and would explicitly differentiate between internal and external emigration. Finally, the data would be provided in the form of a rate per 1000 population, in order to make the data comparable across different NUTS3 regions.

In order to measure incumbent support, election results would ideally be available for each party in a NUTS3 region and for elections in the same time period that emigration data are available for. Furthermore, the data would explicitly state if a party is in government, supports government or is in opposition. This makes it possible to differentiate between pro- and anti-incumbent support within a region.

In an ideal setting, longitudinal data on the number of schools, hospitals and third places would be retrievable for every NUTS region under examination. This would allow to measure potential service cuts in a single region.

However, the available data are not as extensive as preferred (see Table 1). E.g., only NUTS2 level data is available for Poland across all variables. Also, electoral data for Poland and Romania only include one election prior to their respective EU accession. This means that party vote changes can only be calculated for post-accession elections.

When constructing comparable models, data availability is limited by the dataset with the shortest historical reach. In this case, the primary constraint is the Polish electoral data and data on third places in Poland, both of which start in the year 2005. Therefore, to ensure comparability in my analysis, I am confined to using data from 2005 onwards. This limitation is necessary because only from this year do I have access to parallel data sets, allowing for an accurate comparison.

Table 1: Overview of available data

	Poland	Romania
NUTS Level	2 (17 regions)	3 (42 regions)
Election Results	2001, 2005, 2007, 2011, 2015, 2019 (1)	2004, 2008, 2012, 2016 (1)
Emigration Data	1995 – 2019 (2015 missing) (2)	2000 – 2019 (3)
Entire Population	1995 – 2019 (2)	2000 – 2019 (3)
Primary School Aged Population	1998 – 2019 (4)	1995 – 2019 (3)
Primary Schools	1998 – 2019 (2)	1990 – 2019 (3)
Hospitals	2003 – 2019 (2)	1990 – 2019 (3)
Third Places	2005 – 2019 (2)	2002 – 2019 (3)
GDP per Capita	2000 – 2019 (4)	2000 – 2019 (4)
Unemployment	Not Retrieved	1991 – 2019 (3)

Sources: (1) Schraff et al. 2023; (2) Statistics Poland; (3) Romanian National Institute of Statistics; (4) Eurostat

The European NUTS-level election dataset (Schraff et al. 2023) provides subnational, NUTS-level election results and specifies the years in which national parliamentary elections were held. I remove EU parliament elections from the data, leaving only national parliament election results. I also remove votes cast from abroad, parties with less than one percent of the national vote share[5] and elections before the year 1994 and after 2020. I calculate a party's vote share by dividing the number of received votes by the total number of votes cast in a region, then multiply this by 100 to receive a party's regional vote share in percent. Then I calculate a party's regional vote change between two consecutive elections.

The V-Party Dataset (Staffan I. Lindberg et al. 2022) provides information on which parties are in or support the government.[6] I manually add further elections and parties to the data[7] in order to match the existing observations to the emigration data time span. This manual extension results in a more complete picture of anti-incumbent voting. Manually added data on whether a party is incumbent or in opposition is based on the party's documented electoral history on their respective Wikipedia page.[8] I only manually add missing values of parties with a vote share equal to or larger than 4% or a vote change between elections equal to or larger than 1%. I do this in order to keep the scope of this thesis manageable. I categorise parties that show government support leading up to an election as incumbent, even if they are outside of government. I do this because the V-Party Dataset defines incumbents the same way and I make the assumption that a voter who wants to cast a ballot *against* incumbents will vote against *any* party that supports or sympathises with incumbent parties.

Using unique party IDs, I combine the European NUTS-level election dataset with the V-Party Dataset. This combined dataset shows the regional vote change of incumbent parties. A random

[5] These parties are classified as "Other" (Schraff et al. 2023, 571)

[6] Variable *v2pagovsup*: "Does this party support the government formed immediately after this election?" I categorise the responses "Yes, as senior partner", "Yes, as junior partner" and "Yes, but the party is not officially represented in government" as being an incumbent party (Lindberg et al. 2022, 24)

[7] See https://github.com/fabianaiolfi/MA_Thesis/blob/main/scripts/01_anti_incumbent_vote/02_1_manual_adjustment.R for details

[8] E.g., https://en.wikipedia.org/wiki/Greater_Romania_Party#Electoral_history (retrieved 15 January 2024)

sample from this dataset is displayed in Table 2 in order to provide an impression of the data structure.

Data to calculate service cuts at regional levels are provided by national statistical offices. The Polish government agency Statistics Poland[9] provides data on the number of primary schools at NUTS2 level[10] and the size of the primary school population[11] and entire population[12] in a NUTS2 region. Statistics Poland also provides NUTS2 level data on the number of hospitals[13] as well as the number of third places.[14]

The Romanian government agency National Institute of Statistics[15] hosts NUTS3-level data on the number of primary and lower-secondary schools,[16] the size of the population enrolled in these schools[17] and the size of the entire population in a NUTS3 region.[18] Furthermore, Romania's National Institute of Statistics also counts the number of hospitals[19] and third places.[20]

All raw data collected from Statistics Poland and Romania's National Institute of Statistics are displayed as figures in the Appendix. As Figure 17 in the Appendix shows, there is a large drop in the number of Romanian schools in the early 2000s. I suspect that along with school closures, the Romanian National Institute of Statistics changed the way they counted single school entities.[21] To counter this problem, I use the number of classrooms in primary

[9] https://bdl.stat.gov.pl/bdl/start, retrieved 20 November 2023

[10] Variable *P1781*: Primary schools for children, youth, and adults, by governing authority (https://bdl.stat.gov.pl/bdl/metadane/cechy/1781, retrieved 20 November 2023)

[11] Variable *P1341*: Population by singular age and sex (https://bdl.stat.gov.pl/bdl/metadane/cechy/1341, retrieved 20 November 2023)

[12] Variable *P2425*: The population density and indicators (https://bdl.stat.gov.pl/bdl/metadane/cechy/2425, retrieved 17 November 2023)

[13] Variable *P2452*: General hospitals (https://bdl.stat.gov.pl/bdl/metadane/cechy/2452, retrieved 24 November 2023)

[14] Variable *P2505*: Number of catering estabilishments [sic] (https://bdl.stat.gov.pl/bdl/metadane/cechy/2505, retrieved 27 November 2023)

[15] https://insse.ro/cms/en, retrieved 15 January 2024

[16] Variable *SCL101A*: Education units, by categories of units, ownerships, macroregions, development regions and counties (http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table, retrieved 15 December 2023)

[17] Variable *SCL103E*: Enrolled population, by level of education, urban/ rural area, macroregions, development regions and counties (http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table, retrieved 15 December 2023)

[18] Variable *POP107A*: Legally Resident Population at January 1st (http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table, retrieved 13 November 2023)

[19] Variable *SCL101A*: Sanitary units, by category of units, ownerships, macroregions, development regions and counties (http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table, retrieved 18 December 2023)

[20] Variable *INT101U*: Active local units, by activity of national economy at level of CANE Rev.2 classes, size classes of number of employees, macroregions, development regions and counties (http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table, retrieved 15 December 2023)

[21] The Romanian National Institute of Statistics define an "education unit" as an entity under a "single management system" (Source: http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table, retrieved 29 January 2024). This obscure definition could indicate that the number of school buildings can change depending on how schools are managed within a region.

Table 2: Random sample of rows from the combined European NUTS-Level Election Dataset and the V-Party Dataset

Election Year (E1)	Country	Region Name	NUTS ID	Party ID	Vote Share %	Vote Change	Incumbent at E0?
2005	Poland	Opolskie	PL52	727	10.167	–0.334	FALSE
2005	Poland	Wielkopolskie	PL41	57	12.295	–31.464	TRUE
2007	Poland	Podkarpackie	PL82	602	11.625	+1.986	FALSE
2008	Romania	Neamt	RO214	1105	0.090	–0.107	TRUE
2011	Poland	Zachodniopomorskie	PL42	57	10.604	–3.401	FALSE
2011	Poland	Opolskie	PL52	57	7.296	–2.682	FALSE
2011	Poland	Lubelskie	PL81	731	11.356	+10.353	FALSE
2012	Romania	Tulcea	RO225	1305	0.739	–3.476	FALSE
2019	Poland	Pomorskie	PL63	602	6.897	+3.847	FALSE
2019	Poland	Dolnoslaskie	PL51	602	6.772	+3.718	FALSE

Full party names can be accessed at partyfacts.herokuapp.com/data/partycodes/Party ID/

and lower-secondary schools[22] as a proxy for the number of school buildings. Figure 18 in the Appendix displays the number of classrooms, whereby a decrease is visible across most regions, but no sudden drop as seen with the number of school buildings. Thus I assume the number of classrooms to be an adequate proxy for the number of Romanian school buildings.

Data on external emigration are provided by Statistics Poland and the Romanian National Institute of Statistics. I define external emigration as the sum of people moving abroad from a NUTS region in a single year. I pick this absolute value because it carries more validity when it comes to measuring the impact of emigration than, e.g., net migration, a popular metric when measuring migration. Net migration has the disadvantage of including *immigration* in its calculation, thus not explicitly indicating the number of people emigrating from a region.

Statistics Poland provides their data in the form of comma separated value (.csv) files, while the Romanian National Institute of Statistics offer their data as Microsoft Excel (.xls) files. I extract the data from all retrieved files using the R programming language. Data from all sources described above are then combined based on all the source's common use of NUTS region names.

Operationalisation

Dependent Variable: Incumbent Vote Share Change In my analysis, the dependent variable is the change in incumbent vote share. To operationalise this, I pick two consecutive national parliamentary elections, referred to as E_0 and E_1. Following the data provided by Staffan I. Lindberg et al. (2022) and manual adjustments (see p. 11), I label each party as either incumbent or non-incumbent at E_0. Next, I calculate the change in the party's vote share between E_0 and E_1. A positive value indicates an increase in support, a negative value signifies a loss in vote share and thus less support.

[22] Variable *SCL105C*: Classrooms (school cabinets/amphiteaters [sic]), by level of education, macroregions, development regions and counties (http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table, retrieved 8 January 2024)

Independent Variable: Service Cuts I operationalise service cuts based on the assumption that a person's experience of a service is influenced by the number of people per institution, e.g., per school or hospital. When one institution closes down, more people use the remaining institutions, whereby an individual's experience of the services provided by the remaining institutions deteriorates. This is due to factors such as diminished individual attention, overstretched personnel and longer waiting times.

In short, a service cut, such as the closure of a hospital, results in an increased number of people who use the remaining institutions. This leads to a perceived decrease in service quality. By calculating the ratio of people per institution in a region, I aim to capture the perceived quality of a service. This offers a more nuanced understanding than merely counting the number of institutions in a region. Also, by using this ratio I can account for change in population size, e.g., population decline in regions affected by emigration. Measuring service cuts this way aims to capture the deterioration of service quality and its impact on the development of grievances, which finally lead to a change of voting behaviour.

Service cuts are operationalised by examining the average change of people per institution between two elections. For service cuts to primary schools, this only includes the primary school aged population in a NUTS region. For service cuts to hospitals and third places, this covers a region's entire population, as all inhabitants in a region are potential users of hospitals and third places.

Service cut operationalisation can be best understood with an example, as displayed in Table 3. The number of primary-aged children per school in a specific NUTS region in a given year equals the ratio. This ratio varies annually and is recorded in the "Yearly Change in Children per School" column. To calculate the average change between two elections, I average the yearly change values starting from the year of the last election and ending one year before the next election. In Table 3, the Average Change value of 43.426 equals the average Yearly Change over the years 2004 through 2007.

By operationalising service cuts in this manner, I aim at capturing the electorate's retrospective vote, as voters judge the incumbent parties on past performances (see p. 6). When casting a ballot, I assume that they take into account the development of service quality since the last election. Service cuts lead to a decrease in service quality, which in turn can lead to a decrease in incumbent support.

As described in the Theory section on p. 7, the three service cuts under examination are school and hospital closures, as well as shutting down third places. I operationalise these service cuts as the average changing ratio of primary school aged children per primary school, the average changing ratio of people per hospital and the average changing ratio of people per third place, all within the same NUTS region.

Table 3: Operationalising service cuts to primary schools in Bihor County, Romania (NUTS3 ID: RO111)

Year	Number of Schools	Primary School Aged Population	Children per School	Yearly Change in Children per School	Average Change in Children per School at E1
2004	217	56 147	258.742	–15.635	+35.914
2005	215	53 844	250.437	–8.305	
2006	114	52 889	463.939	+213.501	
2007	114	51 081	448.079	–15.86	
2008	111	51 066	460.054	+11.975	+43.426

Romanian national parliamentary elections took place in 2004 and in 2008. Source: Romanian National Institute of Statistics

Table 4: Operationalising emigration rate in Bihor County, Romania (NUTS3 ID: RO111)

Year	Number of Emigrants	Population Size	Yearly Emigration Rate	Emigration Rate at E1
2004	521	629 155	0.83	2.48
2005	297	627 257	0.47	
2006	335	626 219	0.53	
2007	178	625 647	0.28	
2008	181	625 611	0.29	2.12

Romanian national parliamentary elections took place in 2004 and in 2008. Source: Romanian National Institute of Statistics

Control Variables

In order to isolate the effect of service cuts on incumbent support, I control for external emigration, electoral volatility and economic performance within a NUTS region.

Emigration Rate When operationalising emigration rate, I base my approach on Dancygier et al. (2022). I only take the number of departures from a NUTS region into account, in order to isolate the effect of emigration from other demographic factors that may influence the association between population decline and incumbent support (Dancygier et al. 2022, 5). Also, I only take *external* emigration into account, i.e., migration abroad, and discard internal emigration between subnational regions.

I operationalise emigration rate as the sum of emigrants in a NUTS region (Dancygier et al. 2022, 17), divided by the average population in the same NUTS region between two consecutive national parliamentary elections. I then multiply this value by 1000 in order to retrieve the value per 1000 inhabitants. Table 4 displays this operationalisation with an example.

This operationalisation aims at capturing a region's entire population outflow and thus the impact of emigration on its remaining inhabitants. I use the sum of all emigrants from a region between two elections to capture the extent of emigration that a voter may perceive. Averaging the population is a means to find a middle value between two elections. Finally, I divide by the population and multiply by 1000 in order to calculate a region's rate, thus allowing for comparisons between regions.

Electoral Volatility I operationalise electoral volatility by calculating the Pedersen Index (Pedersen 1979) in each NUTS region for every election that data are available for. The Pedersen Index provides a value between 0 and 100 representing the electoral volatility from one election to the next. A value of 0 means there is no change in party vote share between elections. A value of 100 means the opposite, that all parties from the previous election lose all vote share in the next election and are replaced with new parties. Using data from Schraff et al. (2023), I calculate the Pedersen Index using the politicsR package (Silva et al. 2023) in the R programming language. Table 5 shows the electoral volatility between the 2008 and 2012 national parliamentary elections in an exemplary Romanian NUTS3 region.

In the context of calculating the Pedersen Index, it is important to point out how Schraff et al. (2023) define parties. Each party receives a unique ID based on Döring and Regel (2019). However, defining a party as a single entity over time has its caveats (Döring and Regel 2019, 101). E.g., how should two merging parties, party dissolutions or a party renaming be dealt with? Within the scope of this thesis, I deem the most sensible option to follow the party coding provided by Schraff et al. (2023), who code parties in the following manner. Two separate parties have their own unique IDs, P_1 and P_2, at election E_0. If these two parties then merge to compete together in the next election E_1, this will result in a third, new party ID, P_3. This new ID is completely detached from the previous two IDs, thus no connection can be made between the IDs P_1, P_2 and P_3. A consequence of this approach is that all three IDs exist for both elections, E_0 and E_1. However, P_1 and P_2 have a vote share of zero percent in E_1. This is because P_1 and P_2 did not compete in E_1, as they competed together as P_3.

A real life example can be observed in Table 5. In Bihor County, Romania, the National Liberal Party (Party ID: 481) reached 23.835% of the vote in the 2008 election, the Alliance PSD+PC (Party ID: 6153) got 17.724% of the vote. In 2011, these two parties merged to form the Social Liberal Union[23] (Party ID: 5941) and competed under this name in the 2012 election. Due to this merger, the National Liberal Party and the Alliance PSD+PC both display an election result of zero percent in the 2012 election. On the other hand, the Social Liberal Union has zero percent vote share in the 2008 election and 49.254% vote share in the 2012 election.

Treating party mergers this way works if voters consider a new alliance of existing parties to be a novel party. This is however a very charitable assumption and most likely will not hold. In sum, this setup will result in a Pedersen Index that is too high, as parties that merge do not truly lose their entire electoral share from one election to the next. Developing a method to more precisely capture party landscape changes over time would be called for, but this is not feasible within the scope of this thesis. Thus I continue using the unique party IDs provided by Schraff et al. (2023).

[23] Source: https://en.wikipedia.org/wiki/National_Liberal_Party_(Romania)#Transition_from_USL_to_ACL_and_third_governing_experiences_(2010%E2%80%932020), retrieved 27 January 2024

Table 5: Calculating electoral volatility using the Pedersen Index in Bihor County, Romania (NUTS3 ID: RO111)

Party ID	Vote Share 2008 (E0) in %	Vote Share 2012 (E1) in %	Absolute Difference between E0 and E1
1105	24.250	18.978	5.271
481	23.835	0.000	23.835
660	21.148	0.000	21.148
6153	17.724	0.000	17.724
1305	4.204	1.259	2.945
296	2.281	0.000	2.281
(Party ID missing)	1.914	2.208	0.294
(Party ID missing)	1.148	1.087	0.061
5940	0.000	12.004	12.004
2474	0.000	9.128	9.128
(Party ID missing)	0.000	3.056	3.056
5941	0.000	49.254	49.254

The Pedersen Index equals the sum of the absolute vote share differences divided by 2 (Pedersen 1979). The sum of the absolute differences in Bihor County is 147, thus the Pedersen Index equals 73.5 for the year 2012. Party IDs for parties with very low vote shares are missing (Schraff et al. 2023, 572). Full party names can be accessed at partyfacts.herokuapp.com/data/partycodes/Party ID/. Source: Schraff et al. 2023

Economic Performance I operationalise a region's economic performance using two variables. The first variable is a region's yearly gross domestic product (GDP) at current market prices in Euros per inhabitant. These data are provided by Eurostat.[24] I use the GDP per capita as a general indicator for a region's economy under the assumption that this value captures the overall economic performance in a way that is comparable across different subnational regions.

The second variable I use to operationalise a region's economic performance is its unemployment rate, provided by the Romanian Statistical Agency.[25] The unemployment rate is a common indicator to judge the incumbent party's economic performance by, widely recognised and easily understood by voters.

In sum, both economic performance variables aim at capturing the overall economic mood that the electorate perceives and judges incumbent parties by when casting their vote.

Preliminary Analysis

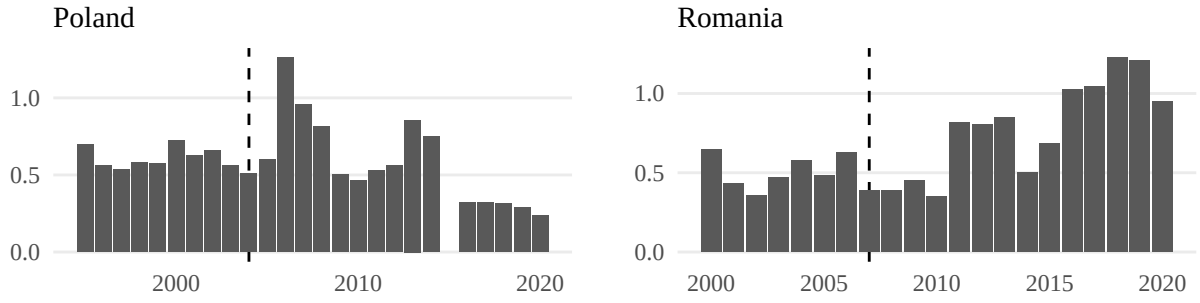
The hypotheses put forward by this thesis are based on three assumptions. One, does a country's accession to the EU affect external emigration? Two, does external emigration affect service cuts? And finally three, does external emigration affect incumbent vote share? In order to correctly test the hypotheses, these assumptions must be true for Poland and Romania.

[24] https://ec.europa.eu/eurostat/databrowser/view/nama_10r_3gdp__custom_9030433/default/table?lang=en (retrieved 16 December 2023)

[25] Variable *SOM103A*: Unemployment rate by gender, macroregions, development regions and counties (http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table, retrieved 19 January 2024)

Does EU Accession Affect Emigration? Gaining EU membership grants member states access to FoM, facilitating migration between member states. Does emigration from CEE EU member states increase after accession? I examine this question in two steps. In the first step, I plot external emigration from Poland and Romania over time. If the assumption that access to FoM leads to an increase in emigration holds, we should observe higher emigration rates after a country's accession. Figure 3 displays each country's emigration rate over time, with the vertical dashed line marking the year of accession to the EU. In both Poland and Romania we can observe a constant emigration rate until joining the EU. Once a country joins, emigration rates increase. However, the increase is lagged by two years in Poland and four years in Romania. The two countries also display different developments of emigration after this initial increase. Poland's emigration rate decreases constantly after a peak is reached in 2006, with another small increase around 2013 and 2014. Romania displays a constant increase in emigration after 2010. These two varying developments hint at other factors influencing emigration rates alongside access to FoM.

Figure 3: External emigration over time



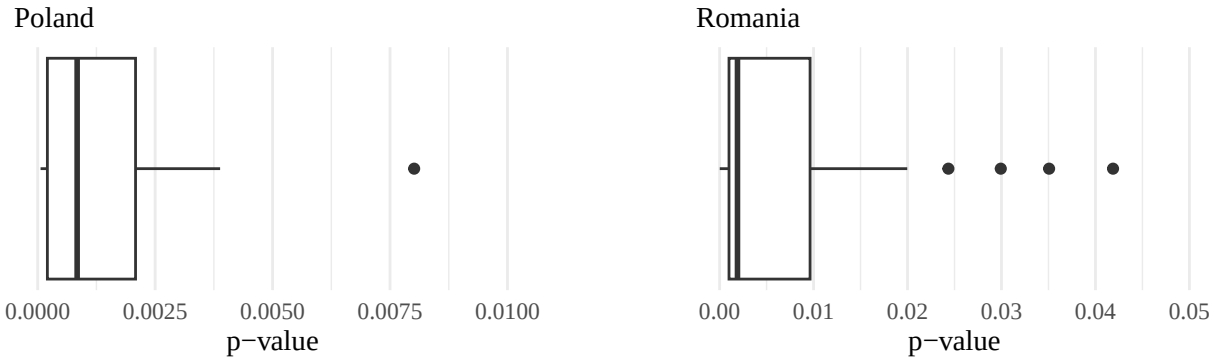
Dashed line: Year of EU accession. Sources: Statistics Poland, Romanian National Institute of Statistics

In a second step, I perform a Chow-Test (Chow 1960) for each NUTS region in Poland and Romania to examine if EU accession creates a break in the rate of emigration over time. A country's year of accession is set as the break point. The Chow-Test returns a p-value, with which I can determine if the development of the emigration rate over time displays a significant difference before and after accession. In this specific case, I receive a p-value for every NUTS region in Poland and Romania.

In Poland, 15 of the 17 NUTS2 regions, or around 88%, return p-values with conventional statistical significance ($p < 0.05$), while in Romania 38 of the 42 NUTS3 regions, about 90%, do. Figure 4 displays the distribution of the returned p-values in a box plot. The plots show that almost all regions in Poland and Romania display a significant break in emigration rate around EU accession.

Based on the visual interpretation of the bar plots and results from the Chow Test, I assume an association to exist between a country's accession to the EU and a change in emigration rate. I assume this association to be positive, whereby accession increases emigration. This is

Figure 4: Distribution of Chow Test p-values



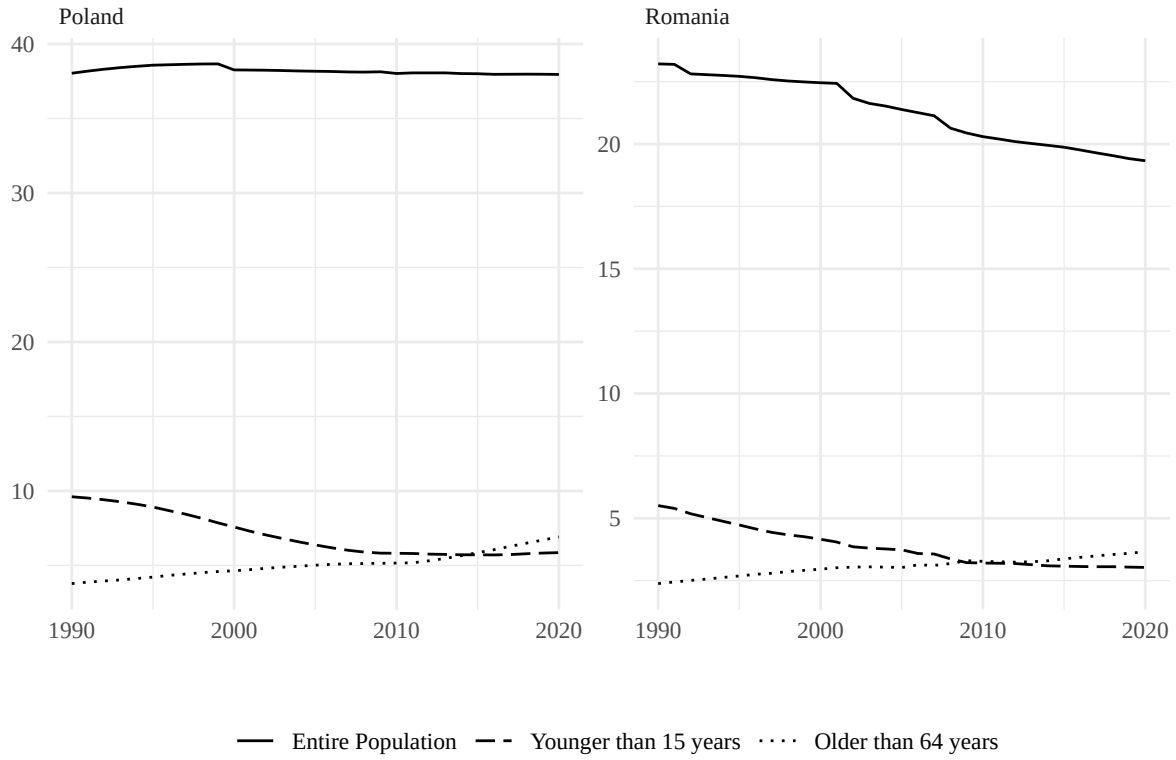
likely due to a country's access to FoM through EU membership. However, as the diverging emigration rates between Poland and Romania after joining the EU show, accession is not the only factor that influences external emigration.

Does Emigration Cause Service Cuts? I examine a possible association between external emigration and service cuts in Poland and Romania. Guiding this preliminary examination of a possible association is Figure 5. It displays the development of different population groups between the years 1990 and 2020 in Poland and Romania. The plot differentiates between the number of primary school aged children, the number of seniors and the entire population. We can observe that in Poland, the entire population size remains constant, while in Romania the overall population decreases over time. In both countries the number of children under 15 years decreases and the number of citizens aged 65 and older increases. The decrease in children hints at a possible effect on school closures, however the direction of causality remains unclear at this point. I.e., do less children cause school closings or do school closings cause families with children to move away? The increase in the number of seniors implies that health care institutions, such as hospitals, become more important, as senior citizens are more reliant on these types of institutions than non-senior citizens.

In order to measure an association between emigration and service cuts, I operationalise service cuts as the yearly change in the number of three types of institutions in a NUTS region, specifically primary schools, hospitals and third places. I look at the *real* number of institutions, as I want to examine an association between emigration and service cuts. A negative change, i.e., a decrease in the number of institutions, indicates service cuts. This yearly change is thus the model's dependent variable. I use the lagged emigration rate (see p. 15 for emigration rate operationalisation) as the model's independent variable, applying three different lags (one, three and five years) as robustness checks. I lag the emigration rate because I assume its impact on closures is not immediate, instead taking one or more years to take effect.

I set up a two-way fixed effect linear regression model (Huntington-Klein 2021, 395), as this can model data that varies across both regions and time. The Polish models use NUTS2 and

Figure 5: Population development 1990–2020 in millions



Sources: Statistics Poland, Romanian National Institute of Statistics, Eurostat

Romanian models use NUTS3 regions as well as years as fixed effects. Modelling three institutions separately and applying three different emigration lags results in nine models for each country under examination (see Table 6 for Poland and Table 7 for Romania).

For Poland (Table 6), we can observe negative coefficients in almost all models. This indicates that a higher emigration rate is associated with a decrease in the number of institutions, apart from the number of schools when emigration is lagged by one year. Statistically significant results are only observable when modelling lagged emigration on the change in number of third places. Here we see that shorter lag periods display stronger effects. This may be due to the immediate effect of emigration on third places, as a lack of customers can lead a bar or café to rapidly close down.

Table 7 displays results for Romania. Results are mixed, with some (borderline) statistically significant coefficients. When observing the change in the number of schools, we see negative coefficients throughout all three models, indicating higher emigration is associated with a decrease in the number of schools. The five year lag shows borderline statistical significance ($p = 0.132$). Looking at the change in number of hospitals, there is again borderline statistical significance when applying emigration lagged by five years ($p = 0.238$). However, this relatively high p-value and the positive effect of emigration lagged by three years on the number of hospitals indicate that these models are not sufficiently robust. When modelling changes in

Table 6: Dependent variable: Yearly change in number of institutions in Poland

	Schools			Hospitals			Third Places		
Emigration (1 year lag)	7.870			−0.039			−78.657*		
	(4.813)			(0.676)			(27.040)		
Emigration (3 year lag)		−4.104			−0.370			−78.876**	
		(11.691)			(0.323)			(24.782)	
Emigration (5 year lag)			−1.458			−0.444			−44.430+
			(4.138)			(0.703)			(21.057)
Num.Obs.	402	402	371	238	239	238	271	271	271
R2	0.373	0.373	0.732	0.250	0.247	0.244	0.217	0.219	0.188
R2 Adj.	0.303	0.303	0.702	0.141	0.138	0.134	0.111	0.114	0.079
R2 Within	0.001	0.000	0.001	0.000	0.001	0.001	0.047	0.056	0.017
R2 Within Adj.	−0.002	−0.003	−0.002	−0.005	−0.004	−0.004	0.043	0.052	0.013

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Fixed Effects: NUTS regions and years. Standard errors are grouped by NUTS2 region and are shown in parentheses.
Source: Statistics Poland

Table 7: Dependent variable: Yearly change in number of institutions in Romania

	Schools			Hospitals			Third Places		
Emigration (1 year lag)	−7.621*			−0.657**			6.067		
	(3.334)			(0.202)			(8.958)		
Emigration (3 year lag)		−1.614			0.101			2.004	
		(4.352)			(0.350)			(10.474)	
Emigration (5 year lag)			−2.502			−1.552			−9.105
			(1.627)			(1.296)			(14.061)
Num.Obs.	882	840	756	882	840	756	833	793	711
R2	0.403	0.401	0.281	0.151	0.149	0.178	0.245	0.203	0.200
R2 Adj.	0.357	0.354	0.220	0.087	0.082	0.108	0.185	0.138	0.129
R2 Within	0.003	0.000	0.001	0.009	0.000	0.036	0.001	0.000	0.002
R2 Within Adj.	0.002	−0.001	0.000	0.008	−0.001	0.034	−0.001	−0.001	0.000

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Fixed Effects: NUTS regions and years. Standard errors are grouped by NUTS3 region and are shown in parentheses.
Source: Romanian National Institute of Statistics

the number of third places, we cannot observe a statistically significant association between the dependent and independent variables.

As discussed on p. 12, data on the number of schools in Romania has its drawbacks. This is why I model the number of primary classrooms in Romania as a proxy for the number of schools. Table 8 displays these results. Both coefficients for emigration lagged by one and five years display strong and statistically significant effects, indicating higher emigration rates are associated with a decrease in the number of classrooms.

In sum, there is no general, overarching support for emigration causing service cuts in Poland and Romania. However, specific results hint at an association between emigration and service cuts and thus merit further investigation.

Does Emigration Affect Incumbent Vote Share? I examine if there is an association between emigration rates and incumbent support. Following the theory, emigration causes

Table 8: Dependent variable: Yearly change in number of classrooms in Romania

	Classrooms		
Emigration (1 year lag)	−27.393**		
	(8.576)		
Emigration (3 year lag)		−2.078	
		(8.288)	
Emigration (5 year lag)			−31.673+
			(18.742)
Num.Obs.	882	840	756
R2	0.169	0.151	0.166
R2 Adj.	0.106	0.085	0.095
R2 Within	0.006	0.000	0.006
R2 Within Adj.	0.005	−0.001	0.005

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Fixed Effects: NUTS regions and years. Standard errors are grouped by NUTS3 region and are shown in parentheses. Source: Romanian National Institute of Statistics

Table 9: Dependent variable: Change in incumbent vote share

	Poland	Romania
Emigration since last election	0.033	−6.497***
	(0.152)	(1.613)
Num.Obs.	187	168
R2	0.502	0.790
R2 Adj.	0.439	0.718
R2 Within	0.000	0.136
R2 Within Adj.	−0.006	0.129

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Fixed Effects: NUTS regions and years. Standard errors are grouped by NUTS region and are shown in parentheses. Sources: Staffan I. Lindberg et al. 2022, Schraff et al. 2023, Statistics Poland, Romanian National Institute of Statistics

grievances, which in turn can decrease incumbent support. Thus I expect that higher emigration to be associated with a decrease in incumbent vote share.

As with the previous preliminary analysis, I create a two-way fixed effect linear regression model, using NUTS regions and years as fixed effects. For the model's dependent variable I use the incumbent vote change between national parliamentary elections (see p. 13 for incumbent vote change operationalisation). The model uses the total emigration rate from a region between two elections as the independent variable (see p. 15 for emigration rate operationalisation). I model Poland and Romania separately. Results for both models are displayed in Table 9.

There is no statistically significant association between external emigration and incumbent voting in Poland. Also, the coefficient is positive, which indicates that an increase in emigration is associated with an increase in incumbent vote share. On the other hand, the Romanian model displays a result that aligns with the theoretical expectations. In Romania, higher emigration rates between elections are associated with a relatively strong decrease in incumbent vote share. An increase of one emigrant per thousand inhabitants in a NUTS3 region is associated with a decrease of incumbent vote share of around 6.5%. The coefficient displays statistical significance

at conventional levels. Furthermore, the Romanian model displays relatively high R^2 values, indicating that the model explains a large part of the dependent variable's overall variance.

The preliminary results show that the three assumptions hold for Romania, but do not hold for Poland. Thus I proceed by testing the hypotheses on Romania and discard the case of Poland from this point onwards, as external emigration displays no effect on Polish incumbent support.

Model Specification

In the preliminary analysis, I establish a negative correlation between emigration and the change in incumbent vote share in Romania. Building upon this finding, I develop two model specifications to test the hypotheses that service cuts decrease incumbent support. Using two specifications instead of a single specification has the advantage of providing a more comprehensive and robust exploration of a possible association between service cuts and incumbent support.

The aim of Model Specification A is to analyse the isolated effect of service cuts on incumbent vote share. Thus service cuts form the independent variable. To isolate the effect of service cuts on incumbent vote share, I control for emigration, as emigration rates vary across NUTS3 regions within Romania and, as previously established, influence incumbent vote share. To further isolate the effect of service cuts on incumbent vote share, I add electoral volatility, GDP per capita and the unemployment rate as further control variables.

I set up a two-way fixed effects linear regression model, using NUTS3 regions and years as fixed effects. The variables service cuts and emigration rate capture changes over time in an attempt to establish a clear causal direction of their effect on incumbent vote support.

This leads to the Model Specification A:

$$
\begin{aligned}
Incumbent\ Vote\ Share\ Change_{n,y} = \beta_n + \beta_y \\
&+ \beta_1 Service\ Cuts_{n,y} \\
&+ \beta_2 External\ Emigration\ Rate_{n,y} \\
&+ \beta_3 Electoral\ Volatility_{n,y} \\
&+ \beta_4 GDP_{n,y} \\
&+ \beta_5 Unemployment_{n,y} \\
&+ \varepsilon
\end{aligned}
$$

The subscript n symbolises a Romanian NUTS3 region and subscript y indicates an election year. ε denotes the error term.

In a next step, I examine if the impact of service cuts on incumbent vote share is *conditioned by emigration*. E.g., if the emigration rate increases, does this influence the impact of service cuts on incumbent support? And if so, by how much? The causal chain of events presented by Dancygier et al. (2022, 35) imply that a region with a high emigration rate will experience more service cuts than a region with less emigration. Higher emigration rates lead to more grievances amongst a region's inhabitants, leading to a stronger decrease in incumbent support.

Thus Model Specification B aims to examine two aspects. First, it determines whether a statistically significant interaction exists between service cuts and emigration. Second, it assesses how different emigration levels modify the effect of service cuts on incumbent support. By analysing the interaction between the two variables, the model can reveal if emigration increases or decreases the effects of service cuts on incumbent support, thus further testing the hypotheses.

Model Specification B builds upon Model Specification A by adding an interaction term between the emigration rate and service cuts:

$$
\begin{aligned}
Incumbent\ Vote\ Share\ Change_{n,y} = \beta_n + \beta_y \\
&+ \beta_1 Service\ Cuts_{n,y} \\
&+ \beta_2 External\ Emigration\ Rate_{n,y} \\
&+ \beta_3 (Service\ Cuts_{n,y} \times Emigration\ Rate_{n,y}) \\
&+ \beta_4 Electoral\ Volatility_{n,y} \\
&+ \beta_5 GDP_{n,y} \\
&+ \beta_6 Unemployment_{n,y} \\
&+ \varepsilon
\end{aligned}
$$

In both model specifications, each service cut, i.e. school closings, hospital closings and third places closings, are modelled separately.

Results

Table 10 displays the results of Model Specification A. This models the average change of number of people per institution separately on incumbent support, while controlling for external emigration, electoral volatility, GDP per capita and unemployment and applying NUTS3 regions and years as fixed effects. Models 1 through 4 contain each service cut separately, while Models 5 and 6 combine all service cuts together. Model 5 uses the number of schools and Model 6 applies the classroom proxy to operationalise service cuts to schools. Model 0 does not include any service cuts and is included in Table 10 as a reference model.

Table 10: Results of Model Specification A; Dependent variable: Change in incumbent vote share

	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Avg. Children per School		−0.093				−0.098	
		(0.056)				(0.069)	
Avg. Children per Classroom			−2.289				−2.483
			(2.611)				(2.544)
Avg. People per Hospital				0.000		0.000	0.000
				(0.000)		(0.000)	(0.000)
Avg. People per Third Place					0.017	0.012	0.017
					(0.011)	(0.011)	(0.011)
Control Variables							
Emigration since last election	−5.500***	−5.161**	−5.282***	−5.586***	−5.405**	−5.802**	−5.316**
	(1.447)	(1.478)	(1.482)	(1.470)	(1.852)	(1.811)	(1.944)
Volatility	1.069	0.699	1.228	1.001	1.044	0.751	1.213
	(0.730)	(0.761)	(0.792)	(0.631)	(0.680)	(0.687)	(0.737)
GDP per capita	0.003*	0.003*	0.003*	0.002*	0.004*	0.003*	0.004*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Unemployment	−3.499**	−3.692***	−3.446**	−3.452**	−3.683***	−3.689***	−3.581**
	(1.029)	(1.034)	(1.054)	(1.004)	(0.984)	(0.985)	(1.022)
Num.Obs.	168	168	168	168	165	165	165
R2	0.825	0.829	0.826	0.826	0.843	0.846	0.844
R2 Adj.	0.758	0.762	0.758	0.758	0.779	0.781	0.778
R2 Within	0.278	0.295	0.282	0.284	0.311	0.327	0.318
R2 Within Adj.	0.254	0.266	0.252	0.254	0.282	0.286	0.276

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Fixed Effects: NUTS regions and years. Standard errors are grouped by NUTS3 region and are shown in parentheses.

The service cuts by themselves (Models 1 through 4) show mixed results. Service cuts to schools (school buildings or classrooms) display negative coefficients, meaning that an increase of children per school or classroom is associated with a decrease in incumbent support. While the coefficient for Model 2 is not statistically significant, the average number of children per school (Model 1) displays borderline statistical significance ($p = 0.103$). This coefficient means that for a given Romanian NUTS3 region, in a year where the average rate of children per school is one child higher than it typically is for that region, we expect the incumbent vote share to decrease. Specifically, it decreases by 0.093 percentage points more than is typical for that region. This holds while controlling for external emigration, electoral volatility, GDP per capita and unemployment in the region. In other words, if a school grows by eleven children between two national parliamentary elections, then this is associated with an incumbent vote share decrease of around 1 percentage point, while controlling for the above mentioned variables.

The change in number of hospitals has no effect (Model 3), and the change in number of third places shows a positive effect (Model 4). This indicates that an increase in the number of third places is associated with an increase in incumbent vote share. However, these results are not statistically significant at conventional levels.

By combining the different service cuts in Models 5 and 6, we can examine what the unique contributions are of each service cut on incumbent vote change. However, the results from Models 5 and 6 are very similar to the results from Models 1 through 4. Again, only school service cuts show negative associations, but these results are not statistically significant and their coefficient strengths change marginally. However, this stability can be interpreted positively.

These unchanged coefficients indicate that the effect of each service cut on incumbent vote share change is relatively independent of each other. In other words, the different service cuts capture distinct aspects of the variance of incumbent vote share change without overlapping with each other. Thus, I interpret the coefficient stability between Model 1 through 4 and Models 5 and 6 to show that the model specification is robust.

I move on to report the control variable coefficient results. I acknowledge that control variables are not the primary interest, however they can contribute to evidence of effects on incumbent support (Hünermund and Louw 2023, 4). I begin by discussing the coefficient of the control variable emigration and then its varying coefficient strength in the different models. Across all models, we can observe that an increase in emigration is associated with a decrease in incumbent vote share. This fulfils the theoretical expectation and fits into the causal mechanism of emigration causing grievances, which in turn decrease incumbent support.

Depending on which service cut is applied, the emigration coefficient varies in strength. This hints at omitted variable bias in Model 0, the reference model. We observe the biggest change in strength when school service cuts are added, using the children per school operationalisation (Model 1). Here the emigration coefficient increases by 0.339, from -5.5 to -5.161. This indicates that Model 0 was underspecified and suffered from omitted variables bias, overstating the effect of emigration on incumbent support. This is then corrected when school service cuts are added to the model. Same goes for Models 2, 4 and 6, as these models also see a decrease in coefficient size, however to a smaller extent compared to Model 1.

Two of the three further control variables display coefficients that align with the theoretical assumptions and are statistically significant across all models. Both economic control variables, GDP per capita and unemployment, show coefficients that align with the theoretical expectation. An increase in per capita GDP is associated with an increase in incumbent support, which can be interpreted that incumbent parties are rewarded for a good state of the economy. On the other hand, we see that an increase in unemployment is associated with a decrease in incumbent support. This suggests that voters punish incumbent parties for poor economic performance. Electoral volatility shows a positive coefficient throughout all models, indicating an increase in volatility is associated with an increase in incumbent support. This is unexpected, as we would assume high levels of volatility to be associated with a decrease in incumbent support, as incumbent parties would be voted out of office and replaced with new parties.

One difference between the service cuts-combining models (Models 5 and 6) and the other models (Models 1 through 4) are the increased Adjusted Within R-Squared values. We can interpret this value as the variation in incumbent vote share change within Romanian NUTS3 regions over time that is captured by the models. E.g., Model 5 displays the highest Adjusted Within R-Squared, with 28.6% of the variation being explained by the model. This indicates that combining all service cuts as independent variables makes the models fit the data better

Table 11: Results of Model Specification B; Dependent variable: Change in incumbent vote share

	Model 0	Model 1	Model 2	Model 3	Model 4
Avg. Children per School × Emigration since last election		−0.058			
		(0.036)			
Avg. Children per Classroom × Emigration since last election			1.124		
			(0.920)		
Avg. People per Hospital × Emigration since last election				−0.001	
				(0.000)	
Avg. People per Third Place × Emigration since last election					0.005
					(0.009)
Control Variables					
Emigration since last election	−5.500***	−3.229	−5.441**	−6.182***	−4.821*
	(1.447)	(2.114)	(1.548)	(1.509)	(2.310)
Volatility	1.069	0.879	1.410+	1.310+	1.074
	(0.730)	(0.748)	(0.807)	(0.676)	(0.675)
GDP per capita	0.003*	0.004**	0.003*	0.003*	0.003+
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Unemployment	−3.499**	−3.403**	−3.231**	−3.250**	−3.767***
	(1.029)	(1.089)	(1.120)	(1.031)	(0.994)
Num.Obs.	168	168	168	168	165
R2	0.825	0.832	0.827	0.828	0.843
R2 Adj.	0.758	0.764	0.758	0.759	0.778
R2 Within	0.278	0.308	0.288	0.292	0.313
R2 Within Adj.	0.254	0.273	0.252	0.256	0.278

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Fixed Effects: NUTS regions and years. Standard errors are grouped by NUTS3 region and are shown in parentheses.

than applying the service cuts separately. This increase in within groups explanatory power hints at the possibility that all these different service cuts contribute to influencing incumbent support.

Table 11 displays the results of Model Specification B, which models the interaction between average change of number of people per institution on incumbent support, while controlling for external emigration, electoral volatility, GDP per capita and unemployment and applying NUTS3 regions and year fixed effects. The results from these models tell us how a service cut and the change in incumbent vote share are associated, given a specific emigration rate. The models in Table 11 also include coefficients for service cuts on their own, in order to measure the direct effect of service cuts on incumbent vote share change. However, these coefficients have been hidden in Table 11 in order to focus on the interaction terms. Furthermore, the interpretation of the service cut coefficients by themselves are not meaningful. Table 12 in the appendix includes all variable coefficients. Model 0 does not include any service cuts and is included in Table 11 as a reference model.

Similar to the results shown in Table 10, service cuts display mixed results when interacting with emigration. When modelling service cuts conditioned on emigration separately on incumbent vote share change, only school service cuts (Model 1, operationalised using school buildings) displays a coefficient that aligns with the theoretical expectations, i.e., a negative coefficient, and is borderline statistically significant ($p = 0.112$). This result shows that the effect of service cuts on incumbent support changes when the external emigration rate differs. The only other coefficient result to meet the theoretical expectations are the hospital service cuts when

interacted with emigration (Model 3). However, this coefficient is not statistically significant at conventional levels ($p = 0.200$) and the association is small in magnitude (-0.001).

I continue by interpreting Model 1's negative interaction coefficient. The base effect of school service cuts on incumbent vote share change, without taking emigration into account, equals 0.045.[26] This means that in a year where the average rate of children per school is one child higher that it typically is for that region, incumbent vote share change *increases* by 0.045 percentage points more than is typical for that region, holding all other variables constant. The interaction term modifies this effect based on the emigration rate. For each one-unit increase in emigration, the effect of school service cuts on incumbent vote share change *decreases* by 0.058 percentage points. In order to calculate the total effect of a one child per school increase when emigration also increases by one person per 1000, I sum the base effect of service cuts and the interaction effect: $0.045 + -0.058 = -0.013$. This means that when emigration is added as an interaction term, the effect of school service cuts on incumbent vote share change shifts from a positive effect of 0.045 percentage points to a negative effect of -0.013 percentage points. In short, in Romanian NUTS3 regions where the emigration rate increases by one unit, an increase in children per school is associated with a *decrease* in incumbent vote share.

When we look at the interaction term between the school service cuts operationalised with children per classroom together with emigration (Model 2), we see, despite Model 2's positive coefficient in Table 11, a similar result. The base effect of average children per classroom is -4.753.[27] The interaction term equals 1.124. I calculate the sum of the base effect and interaction term: $-4.753 + 1.124 = -3.629$. Thus when emigration is added as an interaction term, the effect of school service cuts increases slightly but still stays below zero, indicating a negative effect on incumbent support. However, this interaction is not statistically significant, thus these results should be interpreted with caution.

In sum, the negative effect of school service cuts on the change in incumbent vote share becomes more pronounced as emigration increases. In Romanian NUTS3 regions with higher emigration rates, the impact of school closures on reducing incumbent vote share is stronger. However, given the borderline statistical significance, the results require careful interpretation.

Models 2, 3 and 4 do not display statistically significant interaction effects. Furthermore, the effects are either very small in magnitude (Model 3) or display a positive coefficient (Models 2 and 4) and thus do not align with the theoretical expectation.

As in Table 10, we can observe that higher emigration rates are associated with a decrease in incumbent vote share. This aligns with the theory.

When comparing coefficient strengths of the emigration control variable, we see that Model 1 displays a large drop in strength compared to the reference Model 0. The coefficient increases

[26] See Table 12 in the Appendix
[27] See Table 12 in the Appendix

by 2.271, from -5.5 to -3.229. As in Model 1 in Table 10, this again indicates that Model 0 in Table 11 suffers from omitted variable bias and that adding the interaction between school service cuts and emigration corrects this. A similar coefficient increase can be observed in Models 2 and 4, however to a lesser extent than Model 1.

When observing the other control variables in all models in Table 11, we see similar coefficients as in Table 10. Two of the three further control variables display coefficients that align with the theoretical assumptions and are statistically significant across all models. The one control variable that does not align with the theoretical expectation is again electoral volatility, as it shows positive coefficients across all models. This indicates that an increase in volatility is associated with an increase in incumbent vote share change, an unexpected result.

Because electoral volatility displays unexpected results as a control variable across all models and in both model specifications, this may point towards an error in its operationalisation or in the underlying data. This issue is discussed in the Conclusion.

As with the models in Table 10, we can observe some variation in the Adjusted Within R-Squared value across the different models. Their values are roughly at the same levels as the models in Table 10, indicating that both the models with and without interaction terms capture a similar amount of variation in incumbent vote share change within Romanian NUTS3 regions over time.

Based on the outcomes of Model Specifications A and B, I evaluate the hypotheses to determine if they should be rejected or not rejected.

It is evident that in the case of Romania all three hypotheses put forward must be rejected. I draw this conclusion from the fact that none of the model outcomes demonstrate statistical significance below the conventional threshold of $p = 0.1$. However, two results do exhibit borderline significance. The service cuts to primary schools in Model Specification A (Model 1 in Table 10) and in Model Specification B (Model 1 in Table 11).

This hints at a potential association between emigration-induced school closures and a decrease in incumbent support, both as an isolated effect (Model Specification A) and as a conditioning effect (Model Specification B). But in order to confirm the validity and robustness of this finding and thus to be able to not reject Hypothesis 1, more observations are needed. Also, when further examining the effect of school closures on incumbent support, the sudden drop in the number of Romanian primary schools at the beginning of the 2000s[28] should be specifically examined, as this drop increases the number of children per school, thus directly affecting the model's independent variable.

When looking at results around hospital closures, we can observe no effect on incumbent support. There are several possible explanations for this, first and foremost the possibility that

[28] See Figure 17 in the Appendix

voters do not blame hospital closures on incumbent parties. This may be due to hospitals being more strongly associated with local authorities than with national incumbent government parties.

Furthermore, when looking at the ratio of people per hospital,[29] we cannot distinguish a general trend across NUTS regions. E.g., RO212 sees a two-fold increase in the number of people per hospital between 2000 and 2019, while RO411 sees this ratio cut in half in the same time period. The variation between regions differs too, such as RO112 displaying very little and RO322 a lot of variation. This lack of a clear pattern in the data can also contribute to no discernible effect appearing in the final results.

Finally, I look at the closures of third places being positively associated with incumbent vote share change in Romania across all results. This positive association may stem from the general increase of people per third place in a majority of Romanian NUTS3 regions.[30] The model results may indicate that closing down bars and cafés is received differently by the electorate than school or hospital closures. An increase in people per third place may not impede service quality to the same extent as, e.g., an increase in people per hospital. There may even be an opposite effect, whereby a higher number of people per third place results in a stronger feeling of community, thus benefiting incumbents. However, this is speculative and merits more examination.

These results indicate that incumbent support is a complex matter, influenced by a variety of further factors that the models in this thesis do not take into account. In sum, the lack of a clear statistical significance in the current results underscore the necessity for further investigation and data collection. This would help to build models that can clearly fail to reject the hypotheses put forward.

Conclusion

This thesis sets out to identify emigration-induced service cuts that decrease incumbent support in Poland and Romania. I build upon findings by Dancygier et al. (2022) who identify a causal chain between emigration and support for populist and radical right (PRR) parties in Sweden. The authors put forward the idea that emigration causes service cuts, which in turn cause grievances amongst the electorate. This then leads to an increase in PRR support. As possible future research, the authors suggest identifying specific service cuts that fit into their causal chain.

I apply this causal chain on subnational NUTS regions in Poland and Romania. Both states experienced an increase in external emigration after joining the European Union and gaining access to the EU's Freedom of Movement (FoM). Examining Poland and Romania in this context enables to uncover a potential impact FoM has on *sending* countries. This is important

[29] See Figure 23 in the Appendix
[30] See Figure 24 in the Appendix

because the effects of emigration on Central and Eastern European (CEE) EU member states is a blind spot in political science research.

While Dancygier et al. (2022) focus on PRR support, I argue for a more general approach. I examine instead the change of incumbent support associated with service cuts. I identify three service cuts that have the potential to decrease incumbent support. These are primary school closures, hospital closures and the closure of third places, i.e., bars and cafés. I measure service cuts as the average change of people per institution between two national parliamentary elections. E.g, the yearly change in number of children per primary school averaged between two elections. I argue that service cuts lead to an increase of people per institution, which impedes service quality, creating grievances and thus contributing to a decrease in incumbent support.

Using data provided by the European NUTS-level election dataset (Schraff et al. 2023), the V-Party Dataset (Staffan I. Lindberg et al. 2022), Eurostat and the statistical offices of Poland and Romania, I first examine possible associations between external emigration, incumbent support and service cuts. Results from these preliminary explorations merit further investigation in the case of Romania. In a next step, I build two-way fixed effects linear regression models to uncover an association between incumbent support and service cuts in Romania. The overall results are mixed, and the hypotheses that put forward an association between service cuts and incumbent support are rejected. However, results from the models hint at a possible association between emigration-induced school closures and a decrease in incumbent support. Further research is needed in order to verify this finding.

This thesis shows that Romania's access to FoM is associated with higher emigration, which in turn is associated with a change in voting behaviour. This highlights that migration within the EU, one its fundamental freedoms (Ramji-Nogales and Goldner Lang 2020, 599), has an impact on receiving *and* on sending countries, such as Romania. The impact on sending countries influences who is in power and thus shapes politics on a national and supranational level.

We can observe that higher levels of external emigration are associated with a decrease in incumbent support. Incumbent parties in a candidate EU member state should take this into account when going forward with their membership application. Government parties are well advised to prepare for an FoM-induced outflux in order to dampen its impact and minimise the potential emigration-induced decrease on incumbent support. This can be achieved by implementing policies that incentivise returns, e.g., by giving tax breaks to citizens who return home after having studied or gathered work experience abroad.

Focusing on schools, and assuming an association between their closures and external emigration, a reduction in schools can detrimentally affect the education system. A decrease in school numbers could have serious long-term effects, potentially resulting in a generation receiving a substandard education due to FoM-induced emigration. This educational shortfall can impact

job prospects, fuelling grievances that contribute to Euroscepticism later on. Therefore, it is in the EU's own interest to address anti-EU sentiments, which ironically arise from a key EU principle, FoM. This issue could be mitigated through EU-level policies aimed at investing in the education system in regions affected by emigration. Providing for a certain educational standard will have a positive impact on future job prospects for the inhabitants of such regions. Furthermore, educational investments should prevent school service cuts, thus eliminating the risk of citizens developing grievances in this context.

This thesis contains several limitations that can be addressed in future research. First and foremost is the fact that many factors can influence incumbent support aside from the service cuts identified here. Causality is never this simple and there may be a mediating factor in the causal mechanisms, which can be further explored in future research.

Second, this thesis strongly simplifies the flow of emigration. King and Skeldon (2010, 1623) shows that external emigration can occur in multiple steps, e.g. first internally from rural to urban areas, then from urban areas to another country. Internal emigration is not taken into account in this thesis, potentially skewing emigration rates. Focusing on external emigration was a conscious design decision in order to measure the impact of FoM, however there is an argument to be made that the effect on the people left behind is no different between internal and external emigration. They are, in both cases, being left behind.

Third, in the preliminary analyses, Poland and Romania displayed large differences across all results. This could be an indication that the examined effects of emigration on incumbent support and service cuts may be specific to a country. This would mean that no broad, pan-CEE EU member state generalisation is possible or perhaps even sensible, due to cultural and historical differences. Future research could attempt to identify country specific service cuts.

Fourth, this thesis does not consider *who* is leaving. I do not take into account an emigrant's level of income (Dancygier et al. 2022, 11) or education. Regions that see emigration of high income individuals will experience higher losses of tax revenues than regions with low income emigrants. Taxes pay for services provided by the state, thus a loss of a state's income will impact which services are cut, influencing incumbent support.

Fifth, the models do not contain data on grievances in a region. This would make the model more complete when following the approach by Dancygier et al. (2022). However, NUTS-level longitudinal data on grievances in CEE EU member states are not readily available and must be either gathered in surveys or replaced with a proxy variable.

Sixth, the interaction coefficient results in Table 11 may lack statistical power due to noise that occurs when using interactions (Gelman 2018). In order to counter this problem, more observations are needed, e.g., data covering a longer time period. When collecting further observations, it could be of interest to obtain more electoral data too, as the data provided by

Schraff et al. (2023) only cover one election prior to EU accession. Pre-accession electoral data would provide the opportunity to compare the effect of emigration on incumbent support *before* the introduction of FoM, yielding further insights.

Finally, as mentioned on p. 29, volatility may have been operationalised incorrectly. All results show a positive coefficient, indicating that higher levels of volatility are associated with higher levels of incumbent support. This is an unexpected result and may be due to the simplified method of how party changes are dealt with when calculating the Pedersen Index (see p. 16). Future research could implement a more nuanced approach when handling party changes or when controlling for electoral volatility.

Based on the findings presented here, there are several avenues of future research. E.g., does incumbent party orientation play a role in the context of emigration-induced service cuts? I assume that party orientation has an influence on how much and which services are cut back, thus having different impacts on the electorate. Also, does party orientation have an effect on emigration? E.g., do more people emigrate if PRR parties are in power?

Another potential future avenue is examining the long term effect of emigration-induced school closures on the electorate. This can help understand how far reaching the impact of FoM is in a sending country. However, these panel data probably do not exist yet, but could be of interest once school aged children from the 2010s become of voting age in the 2020s.

Finally, further effects of emigration on sending countries beyond service cuts should be examined. Does emigration impact democratic institutions, social cohesion or other factors? Answering these questions can help obtain a bigger picture of the extent of FoM on sending countries.

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Appendix

Reproducibility

All scripts used to prepare data and build models are available on Github: https://github.com/fabianaiolfi/MA_Thesis

Data files are available for download here: https://www.dropbox.com/scl/fi/xc8fuhn17vfjf6h29hltu/ma_thesis_data.zip?rlkey=07u5yjvbe8hecztn68ml1ep12&dl=0

Use of Artificial Intelligence

OpenAI's ChatGPT 4[31] was used in a supporting manner to edit texts and develop R scripts. Prompts can be made available upon request: fabian.aiolfi@stud.unilu.ch

[31] https://openai.com/chatgpt, retrieved 6 February 2024

Table 12: All coefficient results of Model Specification B; Dependent Variable: Change in incumbent vote share

	Model 0	Model 1	Model 2	Model 3	Model 4
Avg. Children per School		0.046			
		(0.097)			
Avg. Children per School × Emigration since last election		−0.058			
		(0.036)			
Avg. Children per Classroom			−4.753		
			(3.374)		
Avg. Children per Classroom × Emigration since last election			1.124		
			(0.920)		
Avg. People per Hospital				0.001	
				(0.001)	
Avg. People per Hospital × Emigration since last election				−0.001	
				(0.000)	
Avg. People per Third Place					0.010
					(0.012)
Avg. People per Third Place × Emigration since last election					0.005
					(0.009)
Control Variables					
Emigration since last election	−5.500***	−3.229	−5.441**	−6.182***	−4.821*
	(1.447)	(2.114)	(1.548)	(1.509)	(2.310)
Volatility	1.069	0.879	1.410+	1.310+	1.074
	(0.730)	(0.748)	(0.807)	(0.676)	(0.675)
GDP per capita	0.003*	0.004**	0.003*	0.003*	0.003+
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Unemployment	−3.499**	−3.403**	−3.231**	−3.250**	−3.767***
	(1.029)	(1.089)	(1.120)	(1.031)	(0.994)
Num.Obs.	168	168	168	168	165
R2	0.825	0.832	0.827	0.828	0.843
R2 Adj.	0.758	0.764	0.758	0.759	0.778
R2 Within	0.278	0.308	0.288	0.292	0.313
R2 Within Adj.	0.254	0.273	0.252	0.256	0.278
AIC	1221.6	1218.5	1223.3	1222.3	1187.6
BIC	1368.4	1371.6	1376.4	1375.4	1339.8
RMSE	6.94	6.79	6.89	6.87	6.57
Std.Errors	by: nuts2016	by: nuts2016	by: nuts2016	by: nuts2016	by: nuts2016
FE: nuts2016	X	X	X	X	X
FE: year	X	X	X	X	X

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Fixed Effects: NUTS regions and years. Standard errors are grouped by NUTS3 region and are shown in parentheses.

Raw Data: CEE

This is an overview of the available external emigration data at NUTS3 level (Poland: NUTS2; Slovenia: NUTS1). Please note that the y-axis varies by country, the x-axis however is the same for all countries. This makes a comparison of available data across different countries easier. Of the eleven CEE EU member states, only ten are displayed as Czechia does not provide data solely on external emigration. Each grey line represents a NUTS region. The black line, which applies smoothing to enhance readability, displays the overall trend over all available years and regions within a country. Sources: See Table 13.

Figure 6: Emigration per 1000 inhabitants at NUTS3 (Poland: NUTS2; Slovenia: NUTS1) level in CEE EU member states

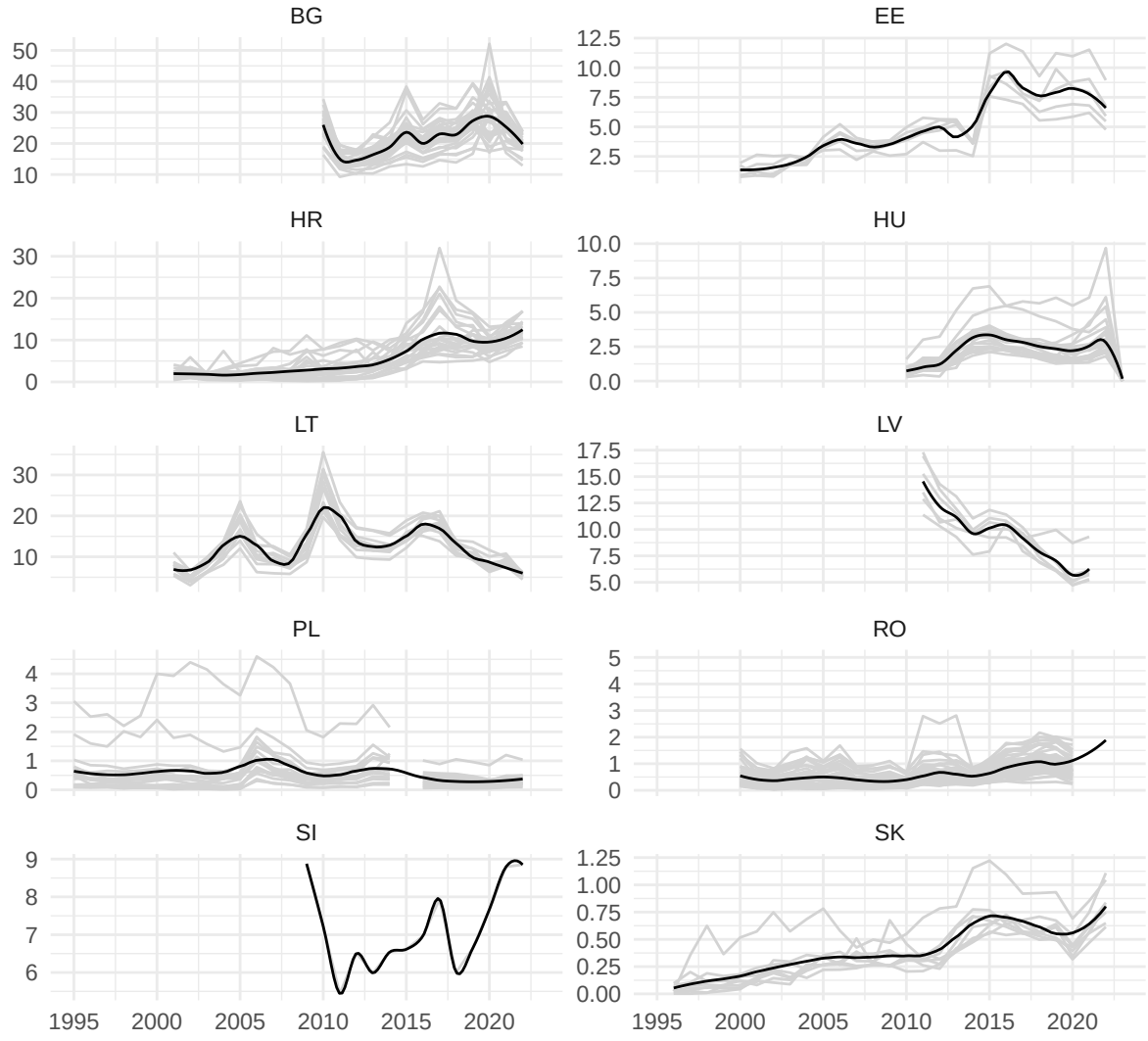


Table 13: Sources of Emigration and Population Data

	Emigration Data	Retrieved	Population Data	Retrieved
Bulgaria	https://www.nsi.bg/en/content/3060/migration-population-districts-municipalities-and-sex	2 Nov 2023	https://www.nsi.bg/en/content/2975/population-districts-municipalities-place-residence-and-sex	2 Nov 2023
Estonia	https://andmed.stat.ee/en/stat/Lepetatud_tabelid__Rahvastik.Arhiiv__Rahvastikus%C3%BCndmused.%20Arhiiv/RVR01	7 Nov 2023	https://andmed.stat.ee/en/stat/Lepetatud_tabelid__Rahvastik.Arhiiv__Rahvastikun%C3%A4itajad%20ja%20koosseis.%20Arhiiv/RV022/table/tableViewLayout2	7 Nov 2023
Croatia	https://podaci.dzs.hr/media/ueajlqe5/stanovnistvo-pregled-po-zupanijama.xlsx	3 Nov 2023	https://podaci.dzs.hr/media/ueajlqe5/stanovnistvo-pregled-po-zupanijama.xlsx	3 Nov 2023
Hungary	https://statinfo.ksh.hu/Statinfo/haViewer.jsp	7 Nov 2023	https://www.ksh.hu/stadat_files/nep/en/nep0034.html	16 Nov 2023
Lithuania	https://osp.stat.gov.lt/statistiniu-rodikliu-analize	9 Nov 2023	https://osp.stat.gov.lt/statistiniu-rodikliu-analize	9 Nov 2023
Latvia	https://data.stat.gov.lv/pxweb/en/OSP_PUB/START__POP__IB__IBE/IBE080/table/tableViewLayout1/	9 Nov 2023	https://data.stat.gov.lv/pxweb/en/OSP_PUB/START__POP__IR__IRS/IRS030/table/tableViewLayout1/	9 Nov 2023
Poland	https://bdl.stat.gov.pl/bdl/dane/podgrup/tablica	17 Nov 2023	https://bdl.stat.gov.pl/bdl/dane/podgrup/tablica	17 Nov 2023
Romania	http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table	13 Nov 2023	http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table	13 Nov 2023
Slovenia	https://pxweb.stat.si/SiStatData/pxweb/en/Data/Data/05N1042S.px/table/tableViewLayout2/	10 Nov 2023	https://pxweb.stat.si/SiStatData/pxweb/en/Data/Data/05E1016S.px/table/tableViewLayout2/	10 Nov 2023
Slovakia	https://datacube.statistics.sk/#!/view/en/vbd_dem/om7021rr/v_om7021rr_00_00_00_en	10 Nov 2023	https://datacube.statistics.sk/#!/view/en/vbd_dem/om7011rr/v_om7011rr_00_00_00_en	10 Nov 2023

Raw Data: Poland

Plots are ordered by average annual growth rate, with the highest at the top left and decreasing to the bottom right.

Figure 7: Population in millions in Poland at NUTS2 level (Source: Statistics Poland)

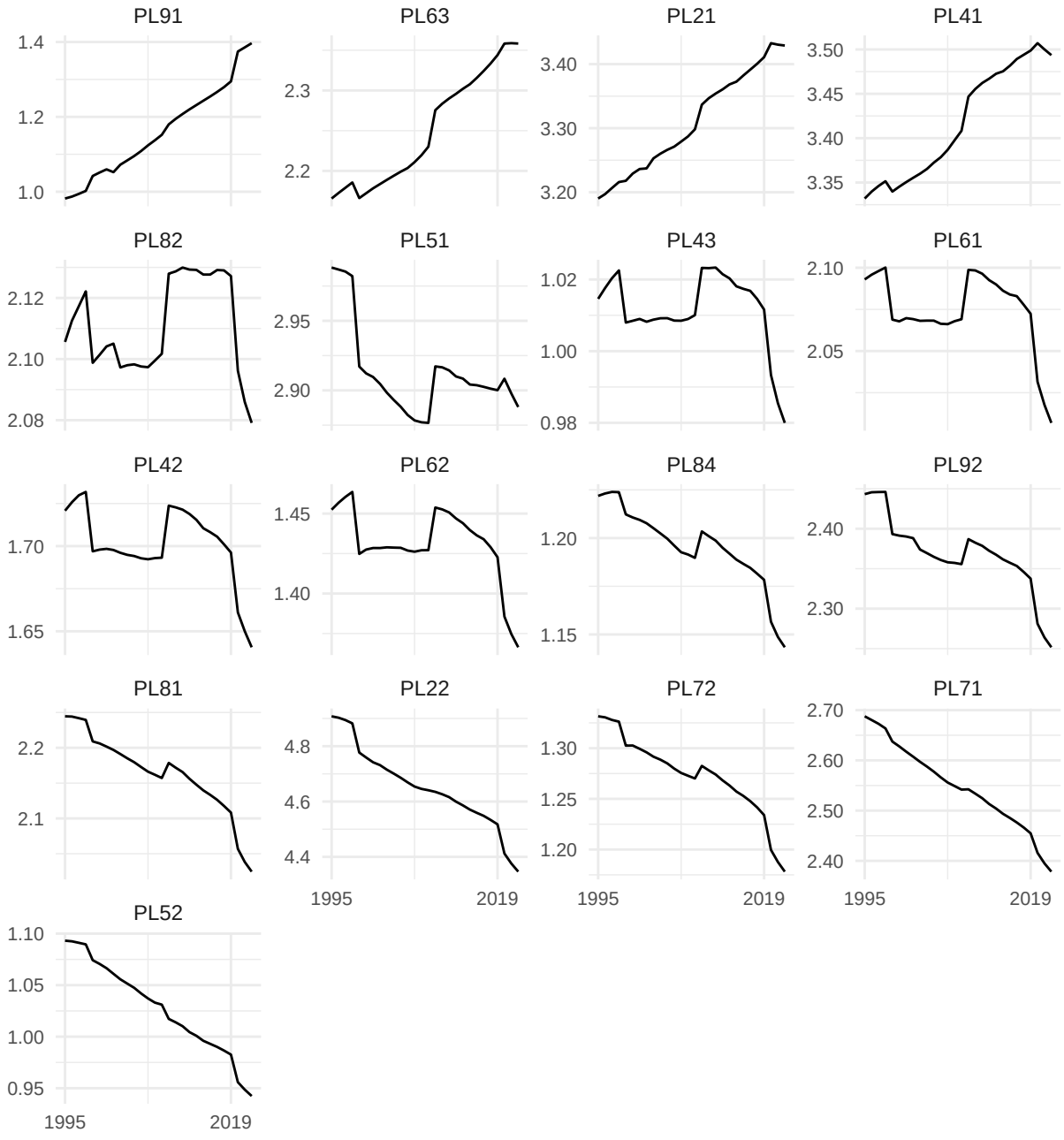


Figure 8: Primary school age population in 1000s in Poland at NUTS2 level (Source: Eurostat)

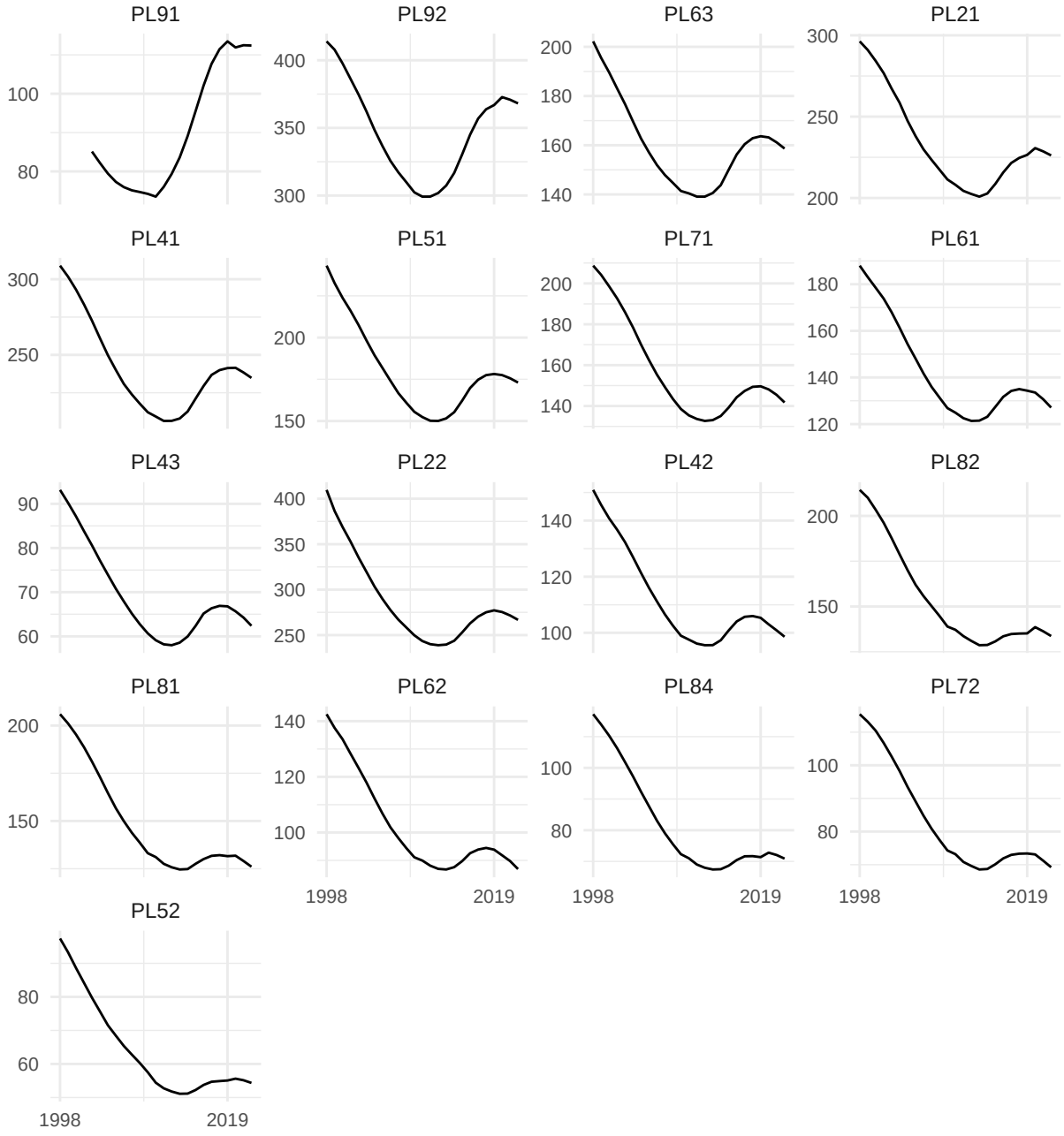


Figure 9: Number of primary schools in Poland at NUTS2 level (Source: Statistics Poland)

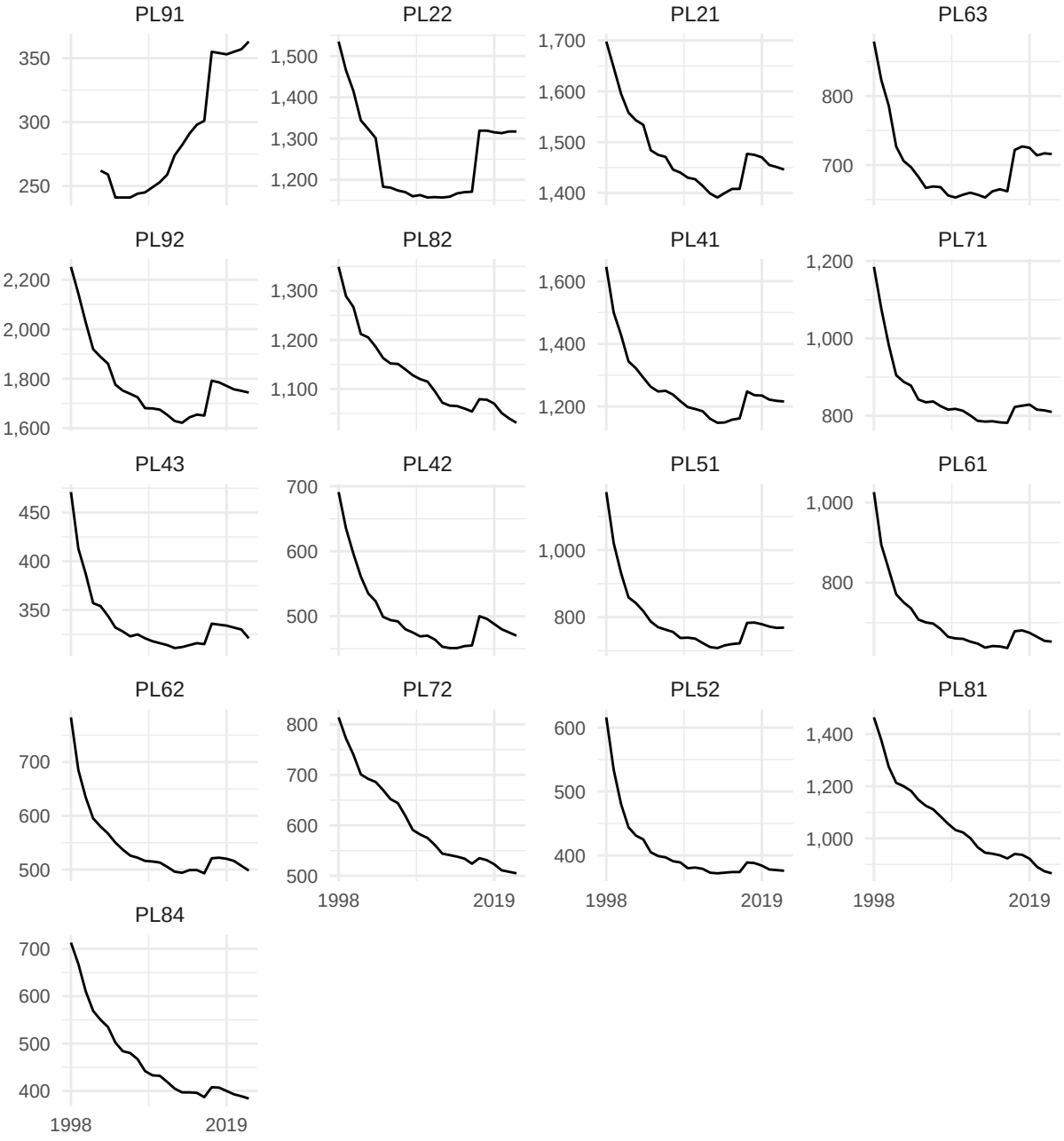


Figure 10: Number of hospitals in Poland at NUTS2 level (Source: Statistics Poland)

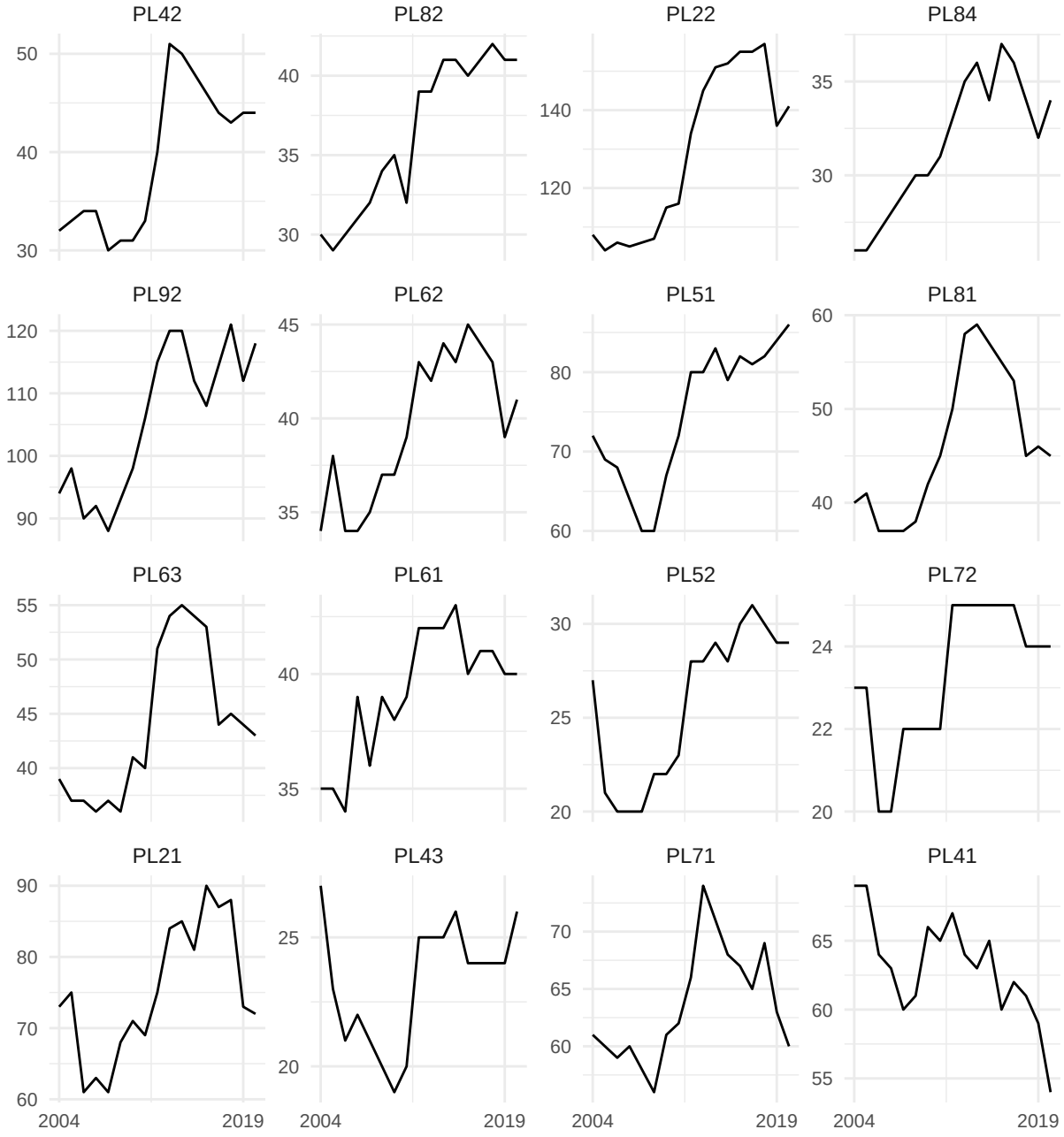


Figure 11: Number of third places in Poland at NUTS2 level (Source: Statistics Poland)

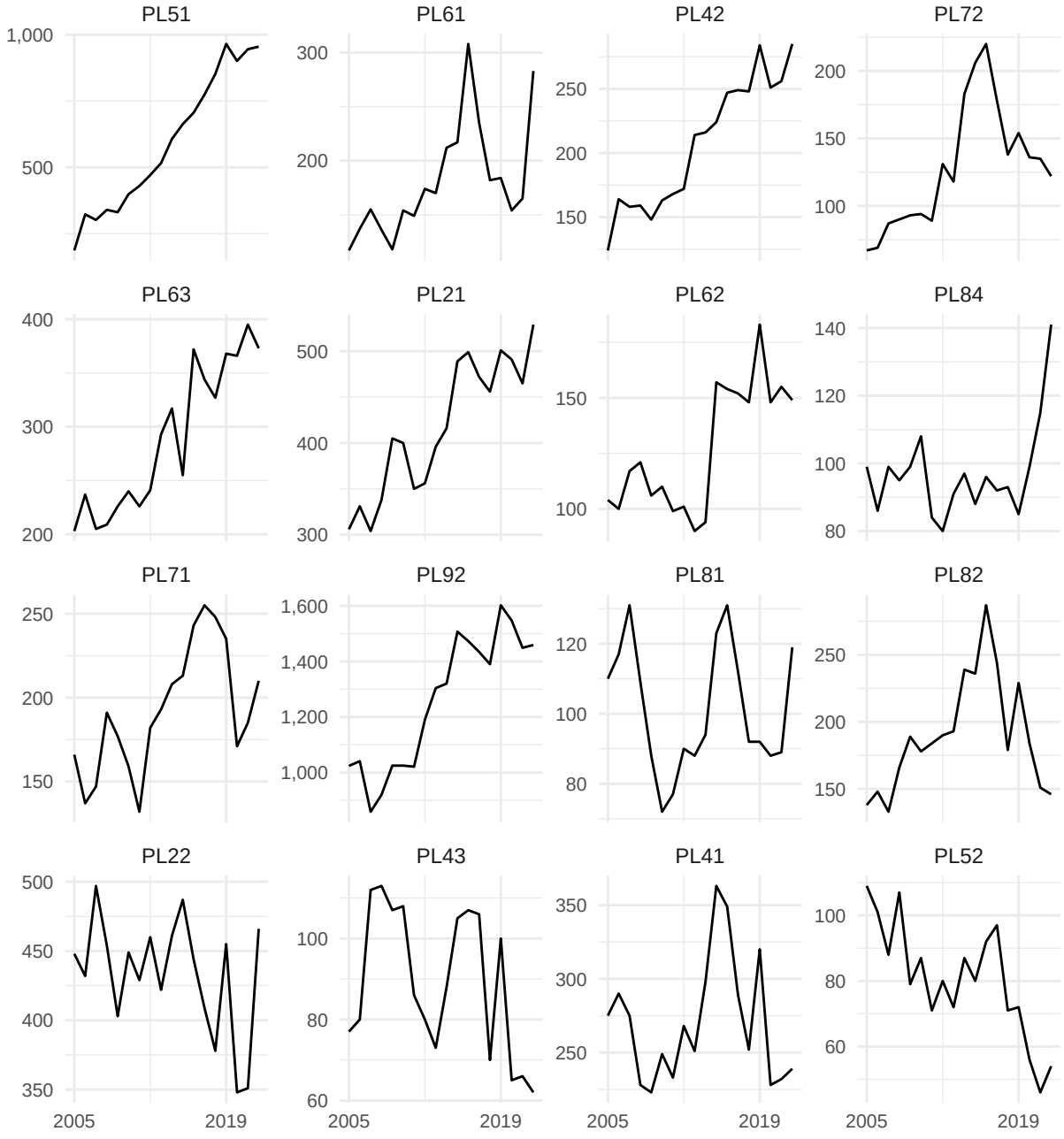


Figure 12: Number of primary school children per school in Poland at NUTS2 level (Sources: Statistics Poland, Eurostat)

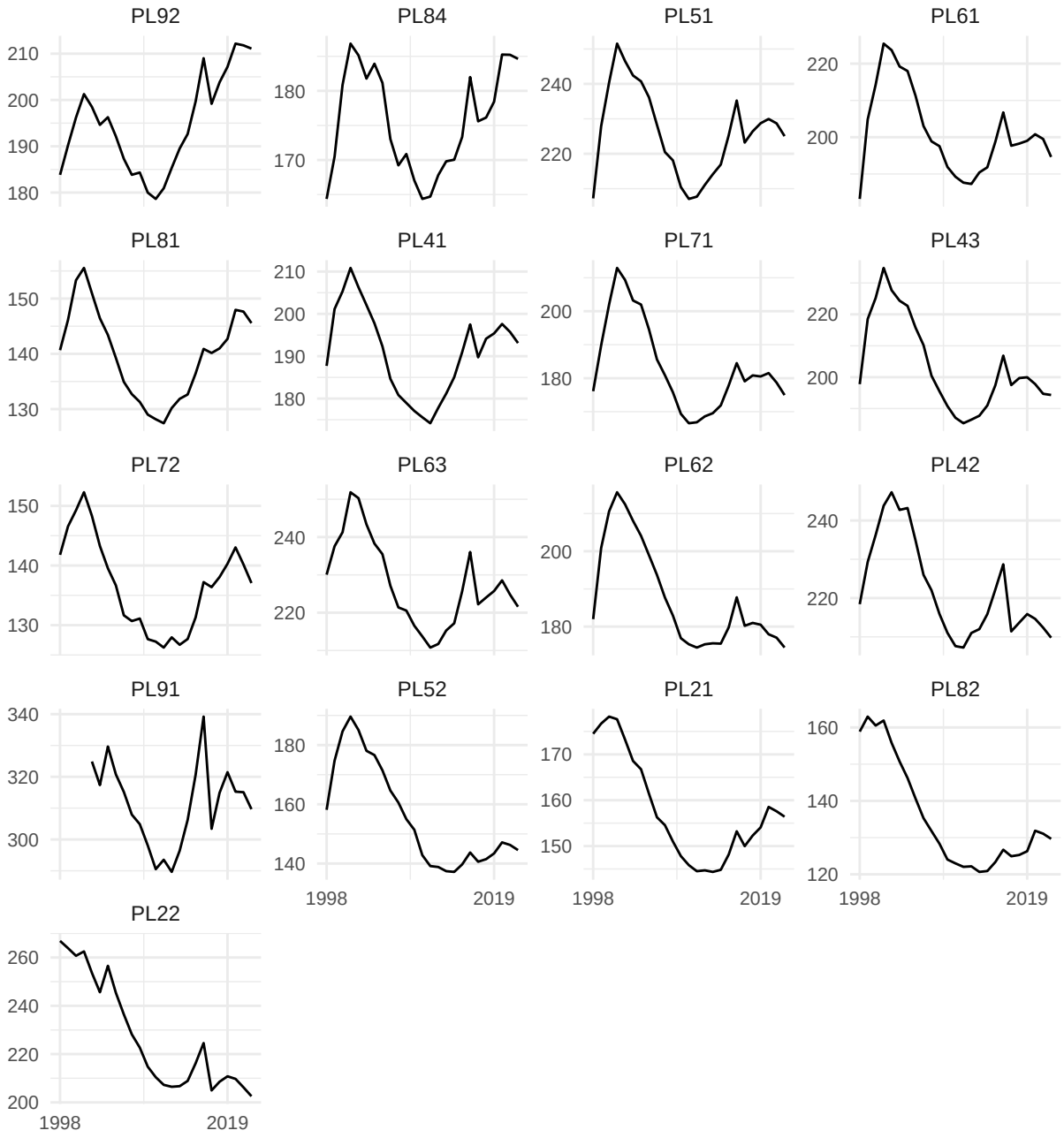


Figure 13: Number of people per hospital in Poland at NUTS2 level (Source: Statistics Poland)

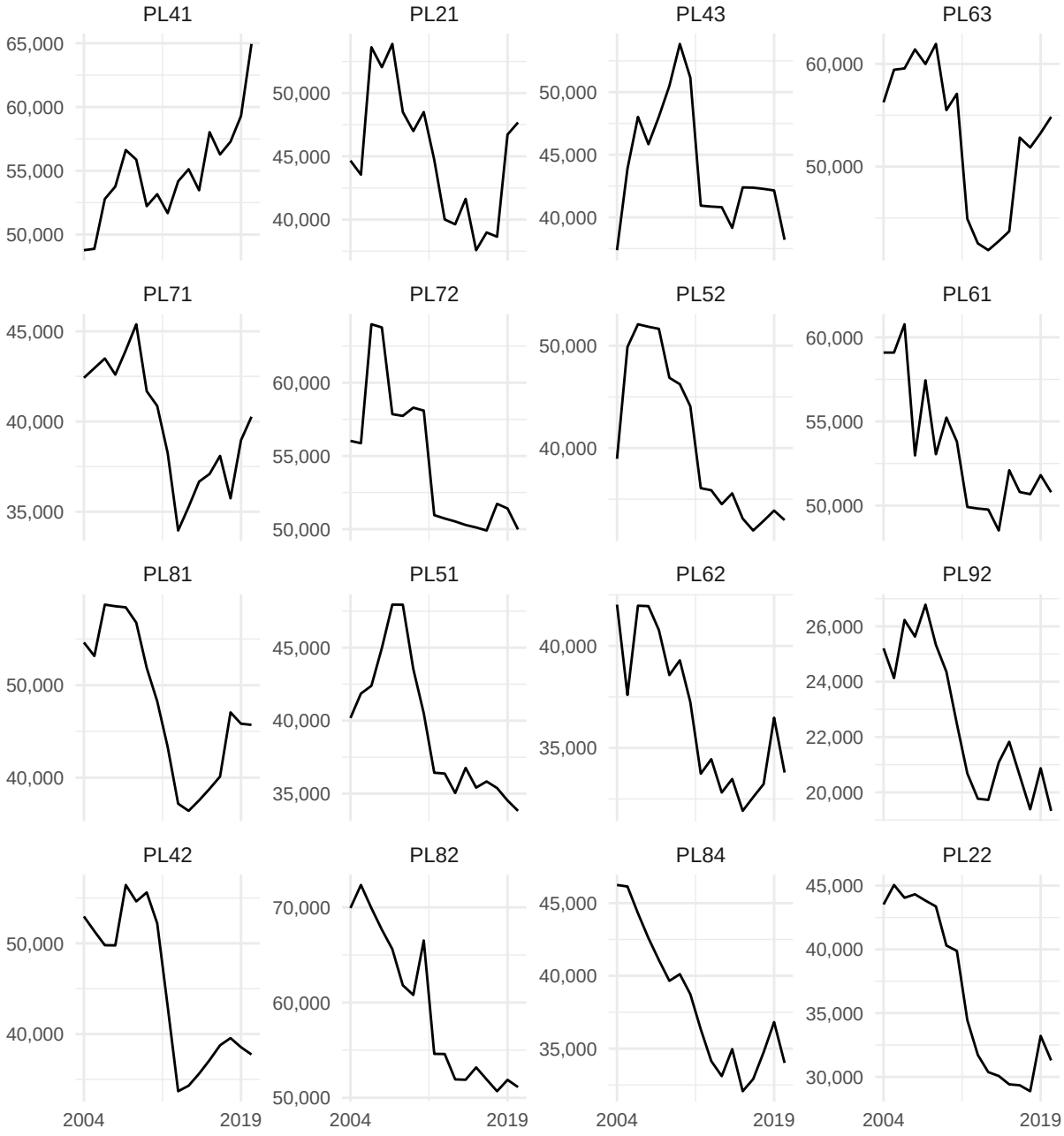
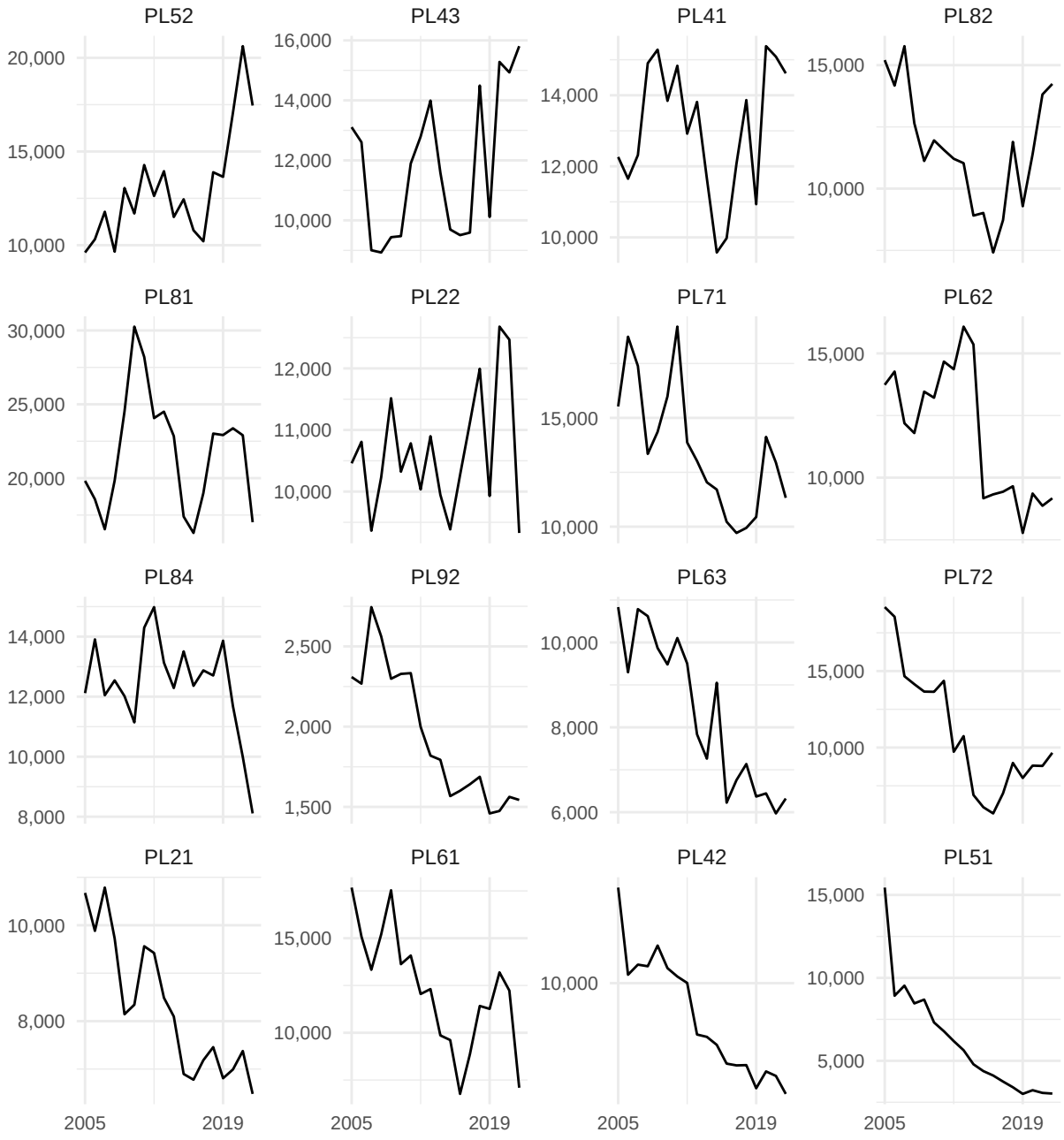


Figure 14: Number of people per third place in Poland at NUTS2 level (Source: Statistics Poland)



Raw Data: Romania

Plots are ordered by average annual growth rate, with the highest at the top left and decreasing to the bottom right.

Figure 15: Population in millions in Romania at NUTS3 level (Source: Romanian National Institute of Statistics)

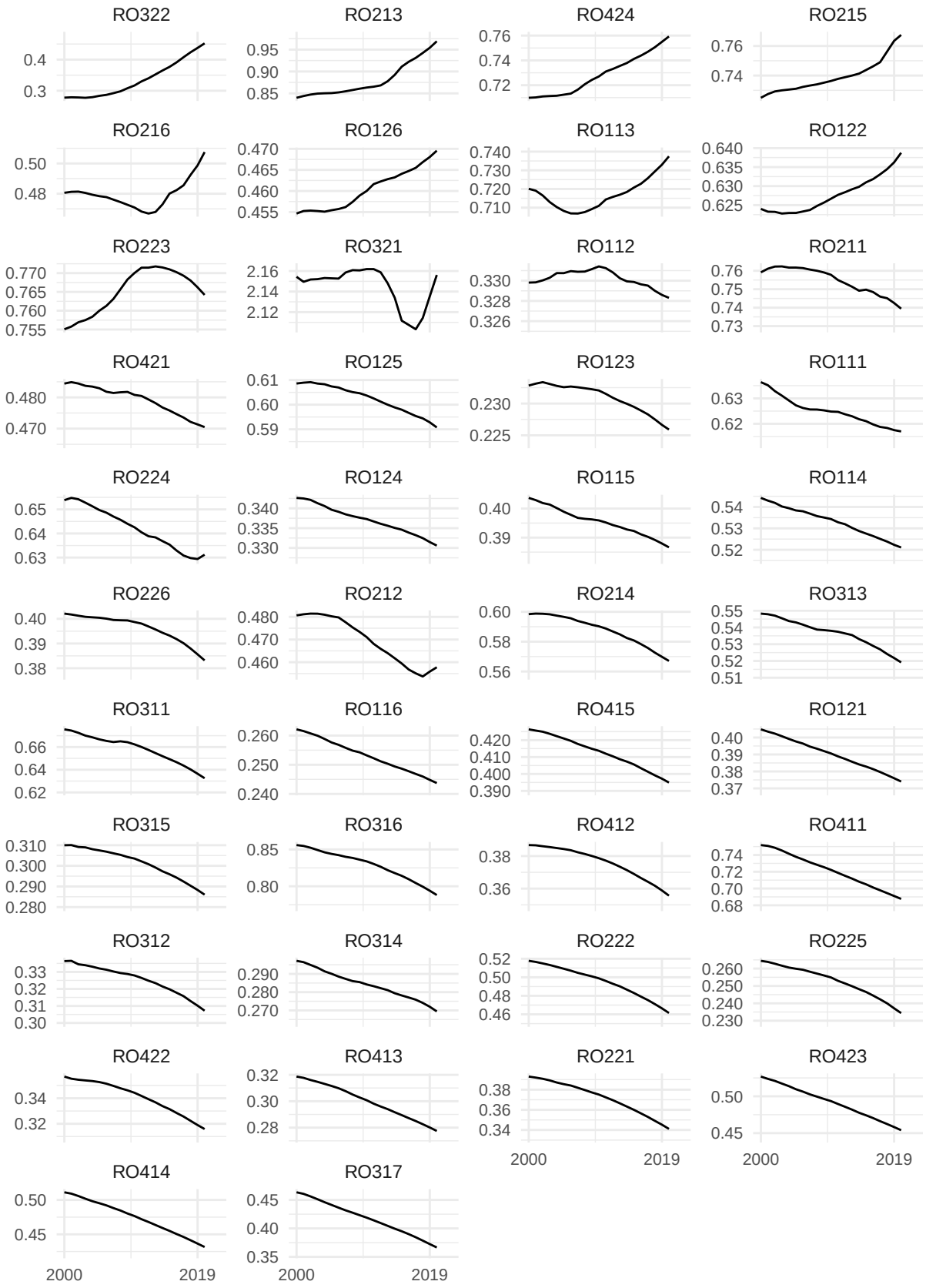


Figure 16: Primary school age population in 1000s in Romania at NUTS3 level (Source: Romanian National Institute of Statistics)

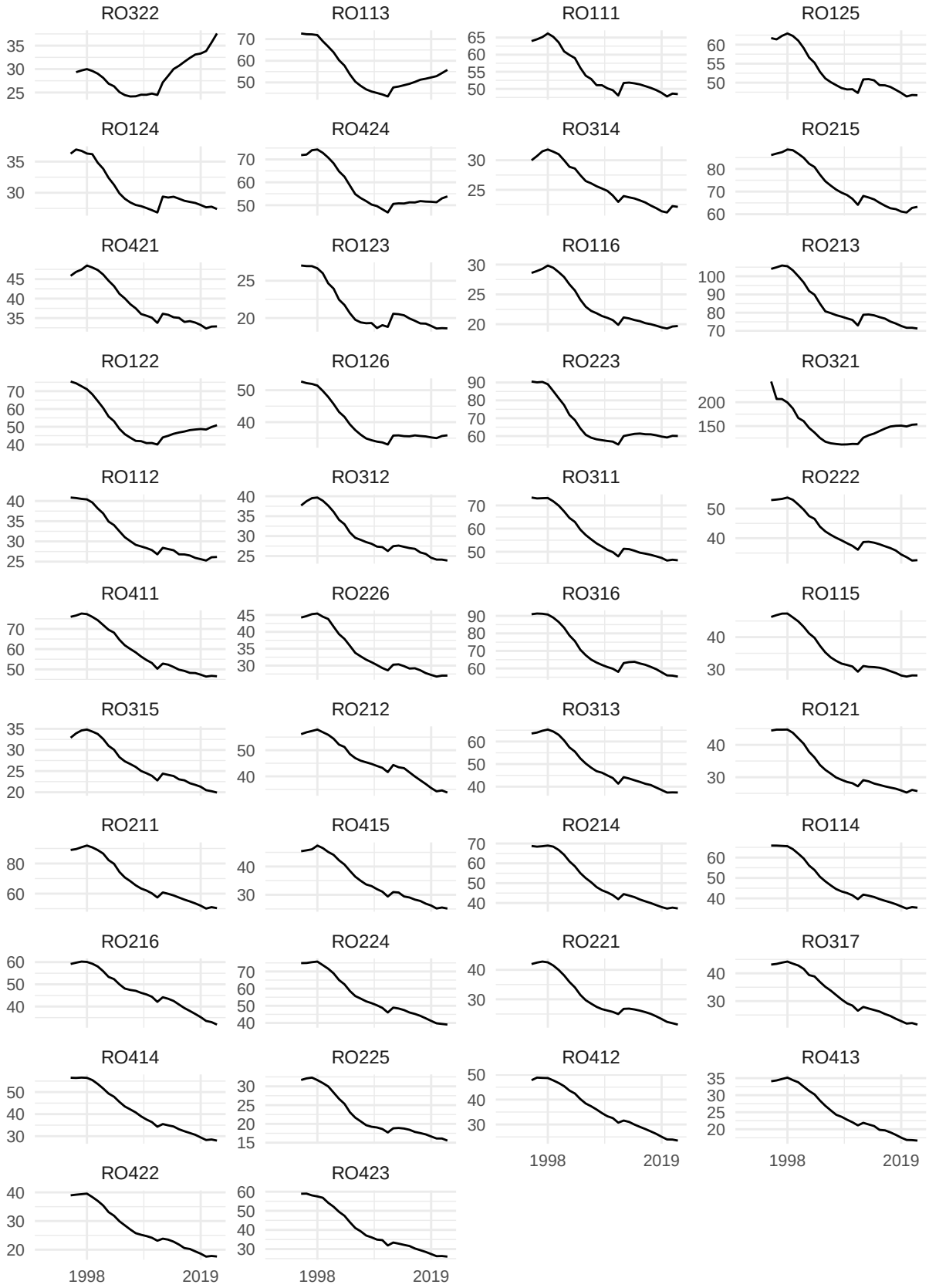


Figure 17: Number of primary schools in Romania at NUTS3 level (Source: Romanian National Institute of Statistics)

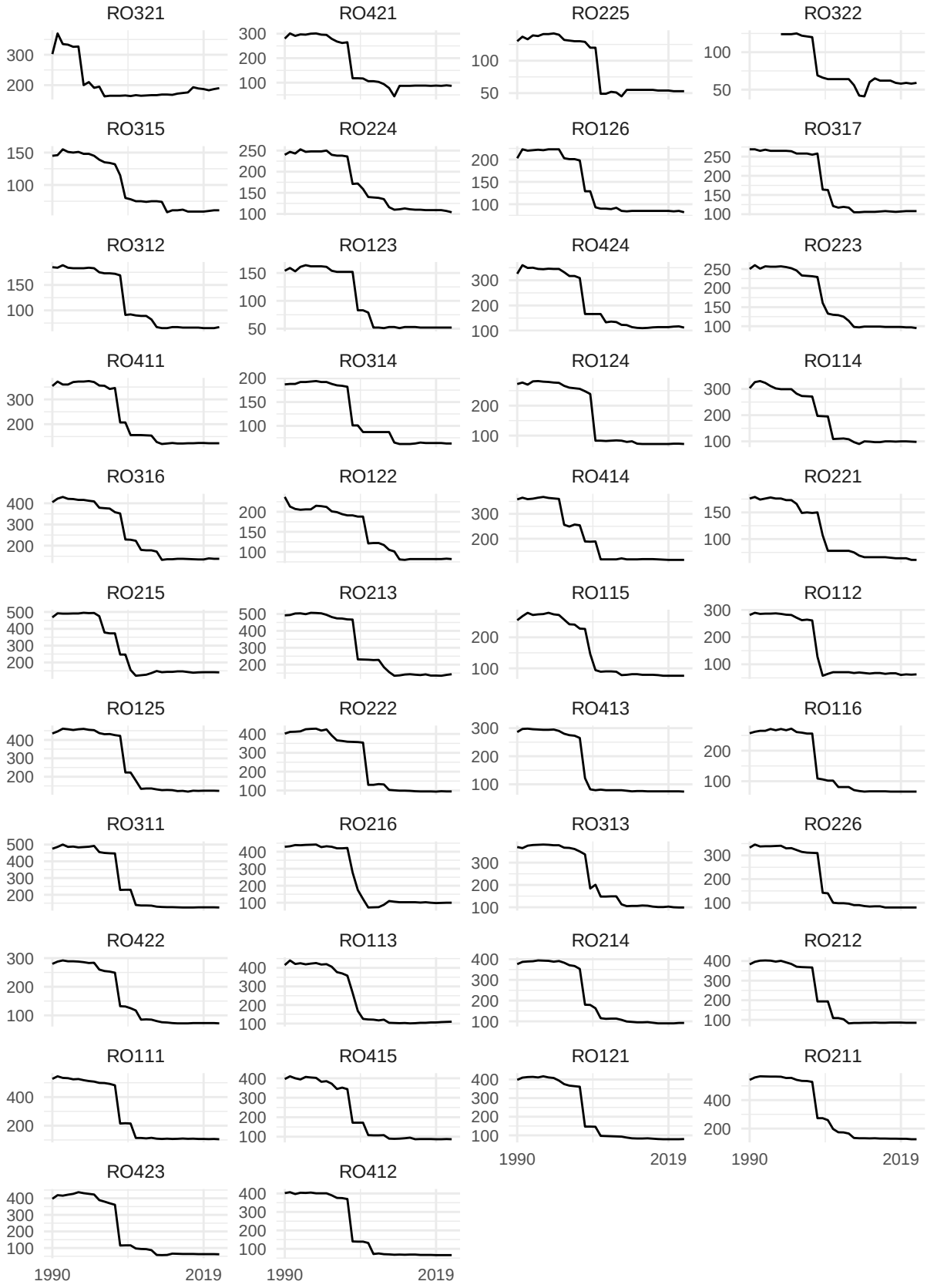


Figure 18: Number of classrooms in primary schools in Romania at NUTS3 level (Source: Romanian National Institute of Statistics)

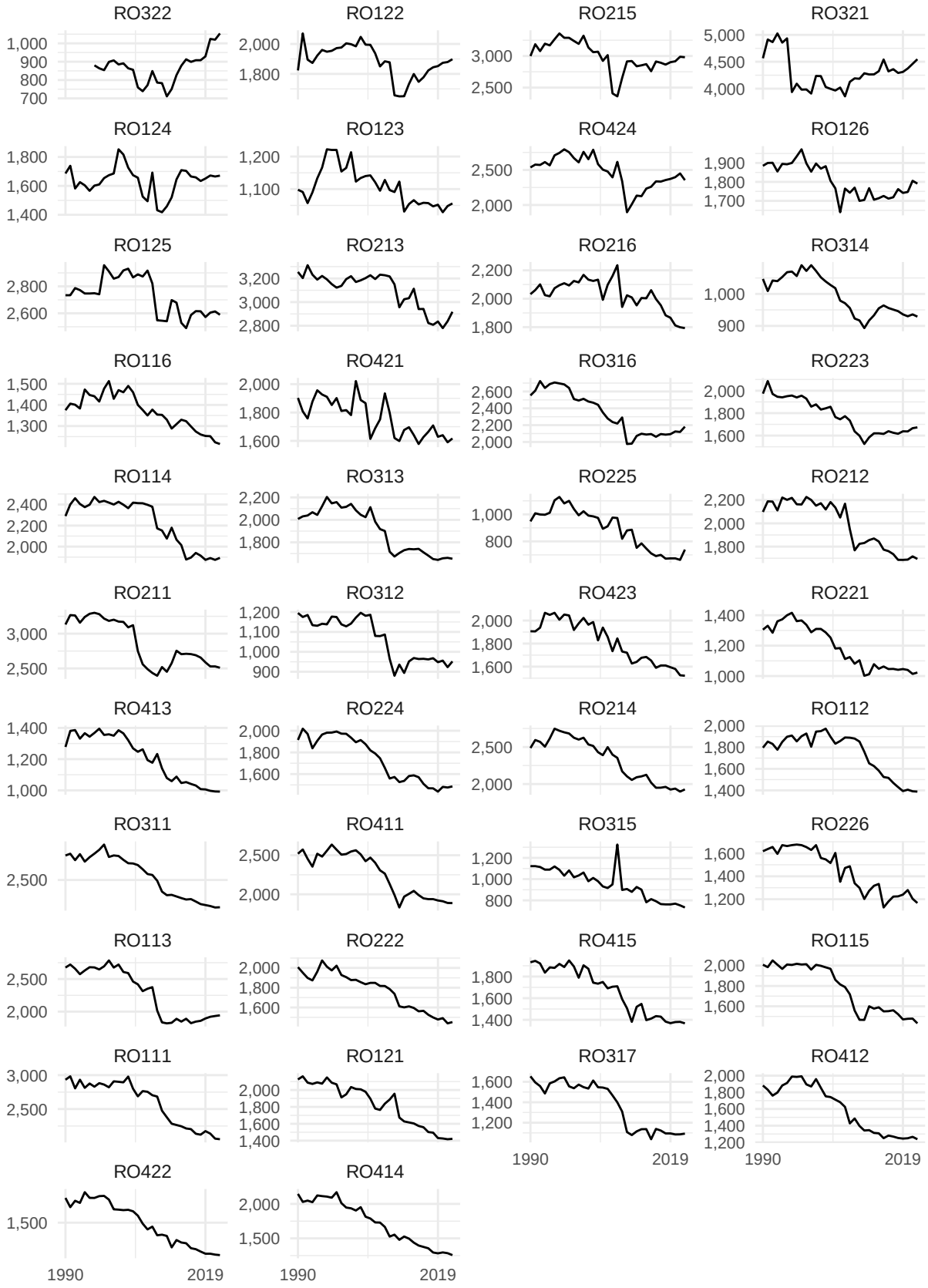


Figure 19: Number of hospitals in Romania at NUTS3 level (Source: Romanian National Institute of Statistics)

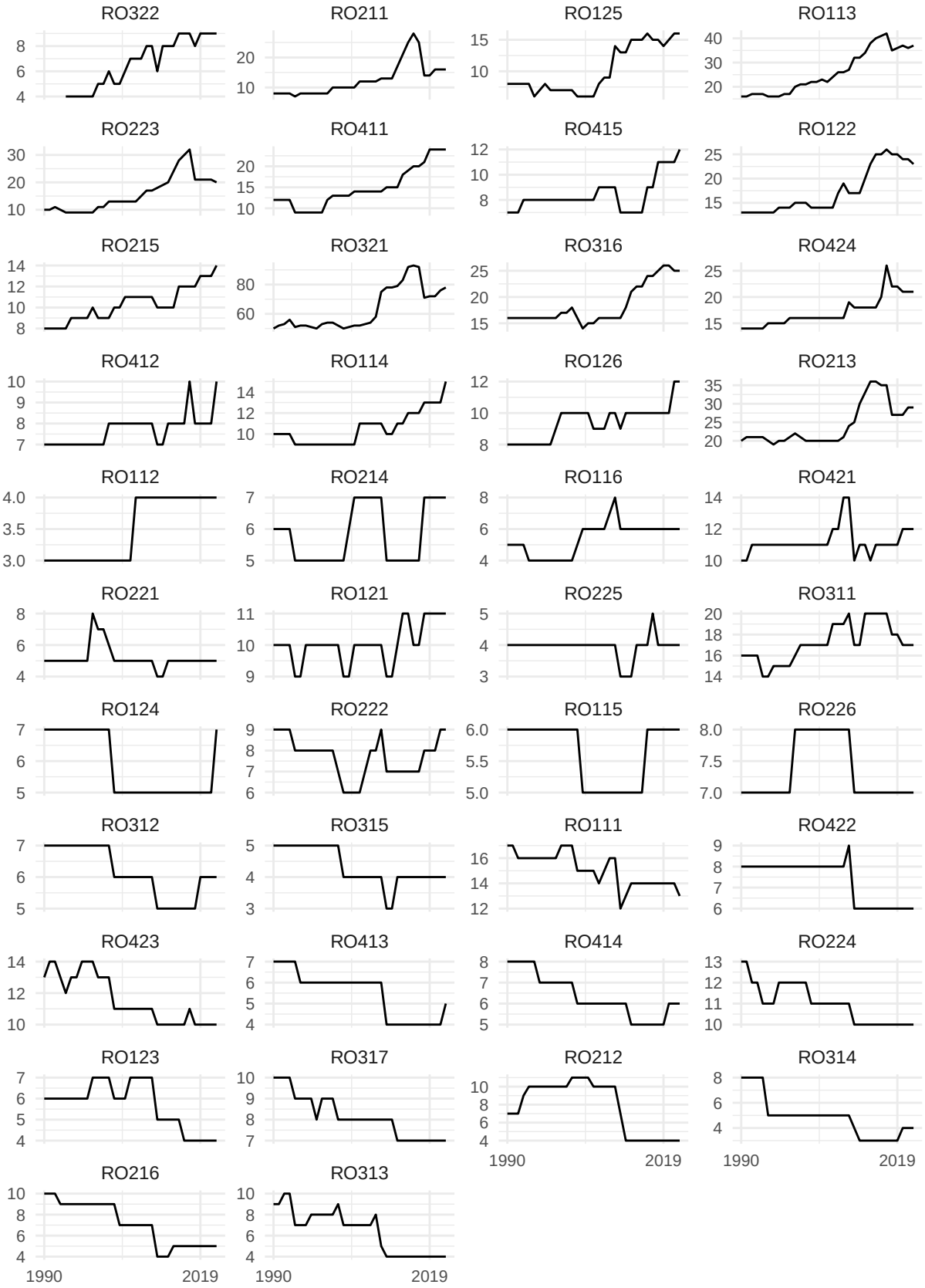


Figure 20: Number of third places in Romania at NUTS3 level (Source: Romanian National Institute of Statistics)

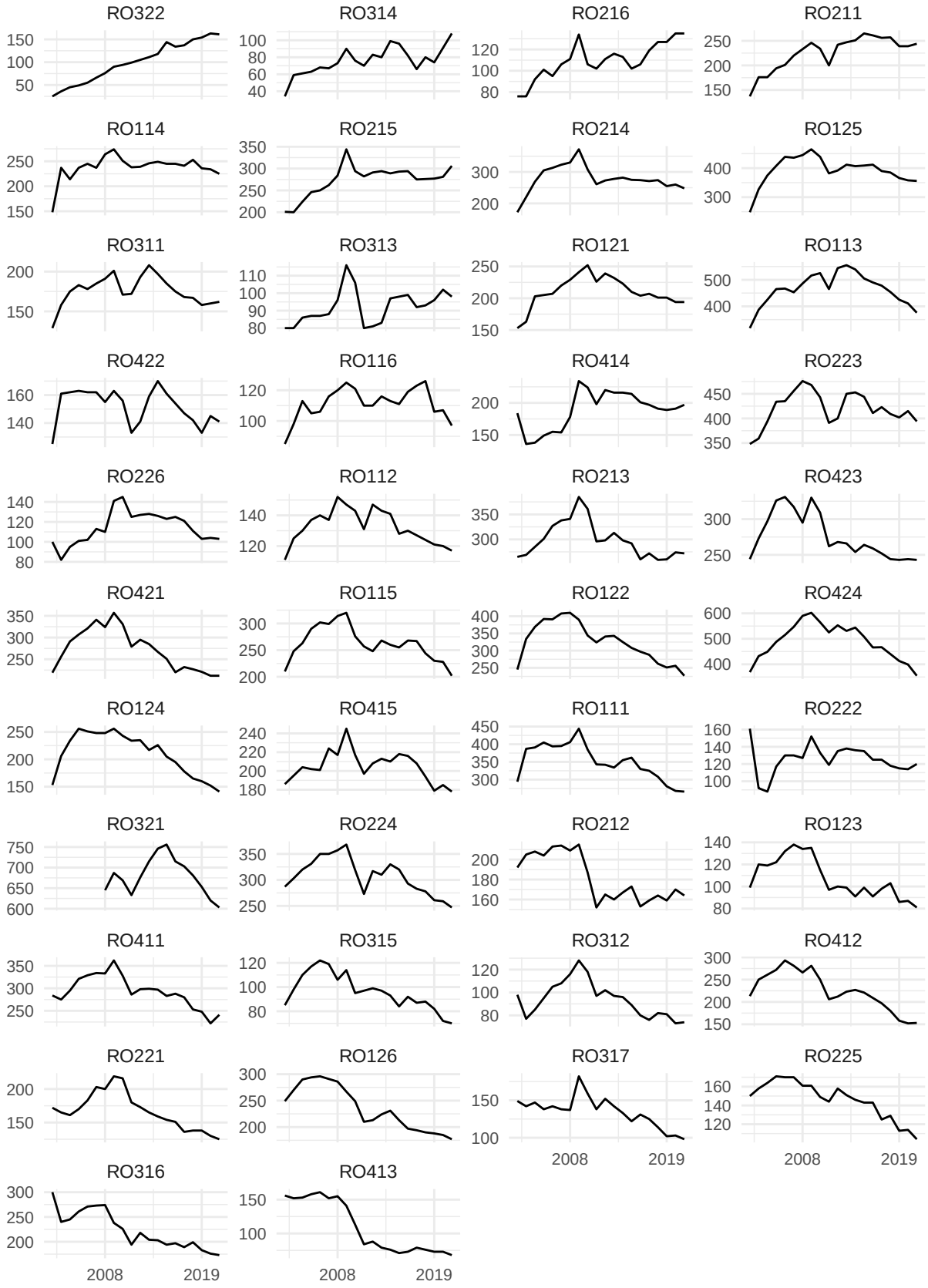


Figure 21: Number of primary school children per school in Romania at NUTS3 level (Source: Romanian National Institute of Statistics)

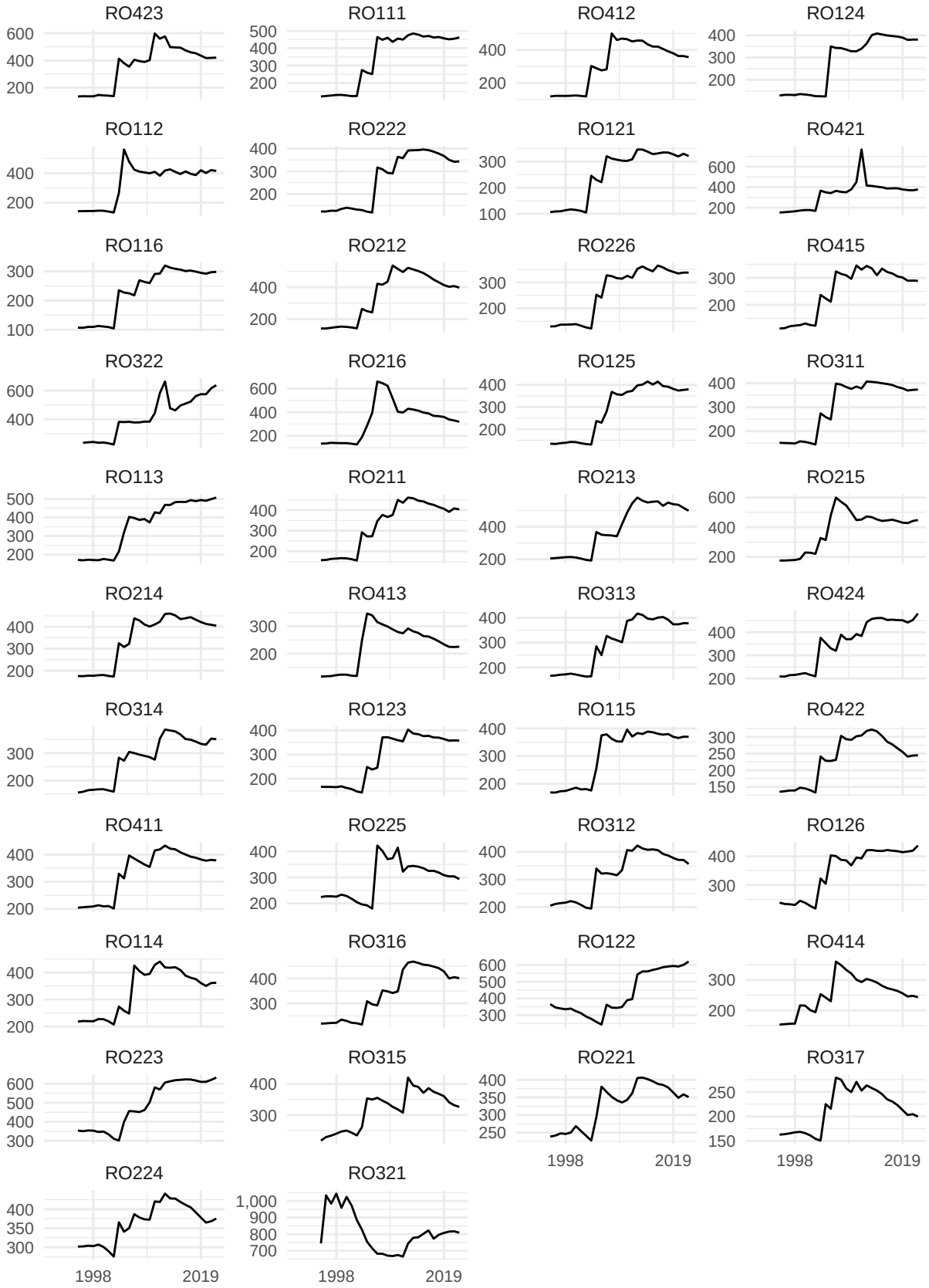


Figure 22: Number of primary school children per classroom in Romania at NUTS3 level (Source: Romanian National Institute of Statistics)

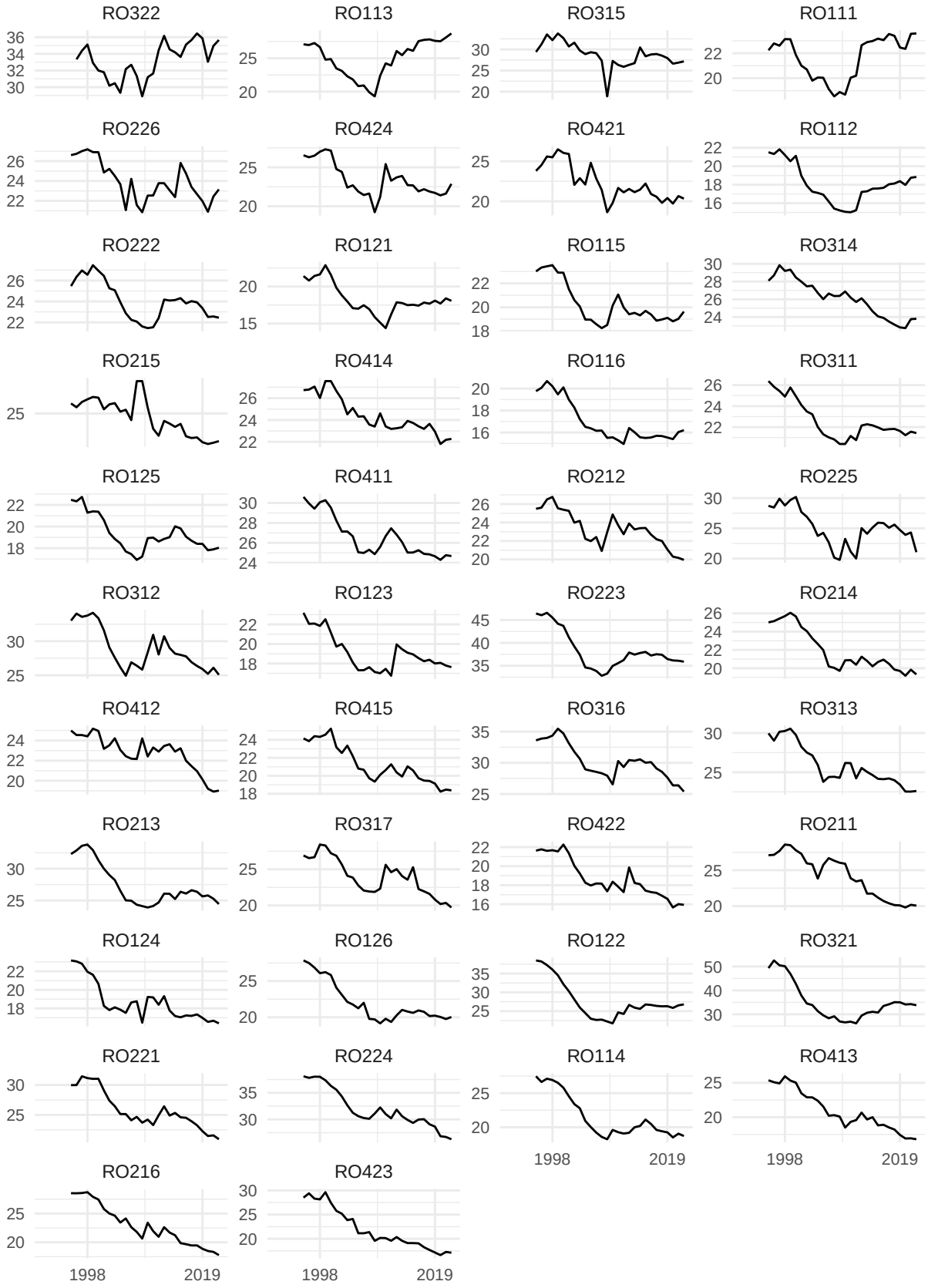


Figure 23: Number of people per hospital in Romania at NUTS3 level (Source: Romanian National Institute of Statistics)

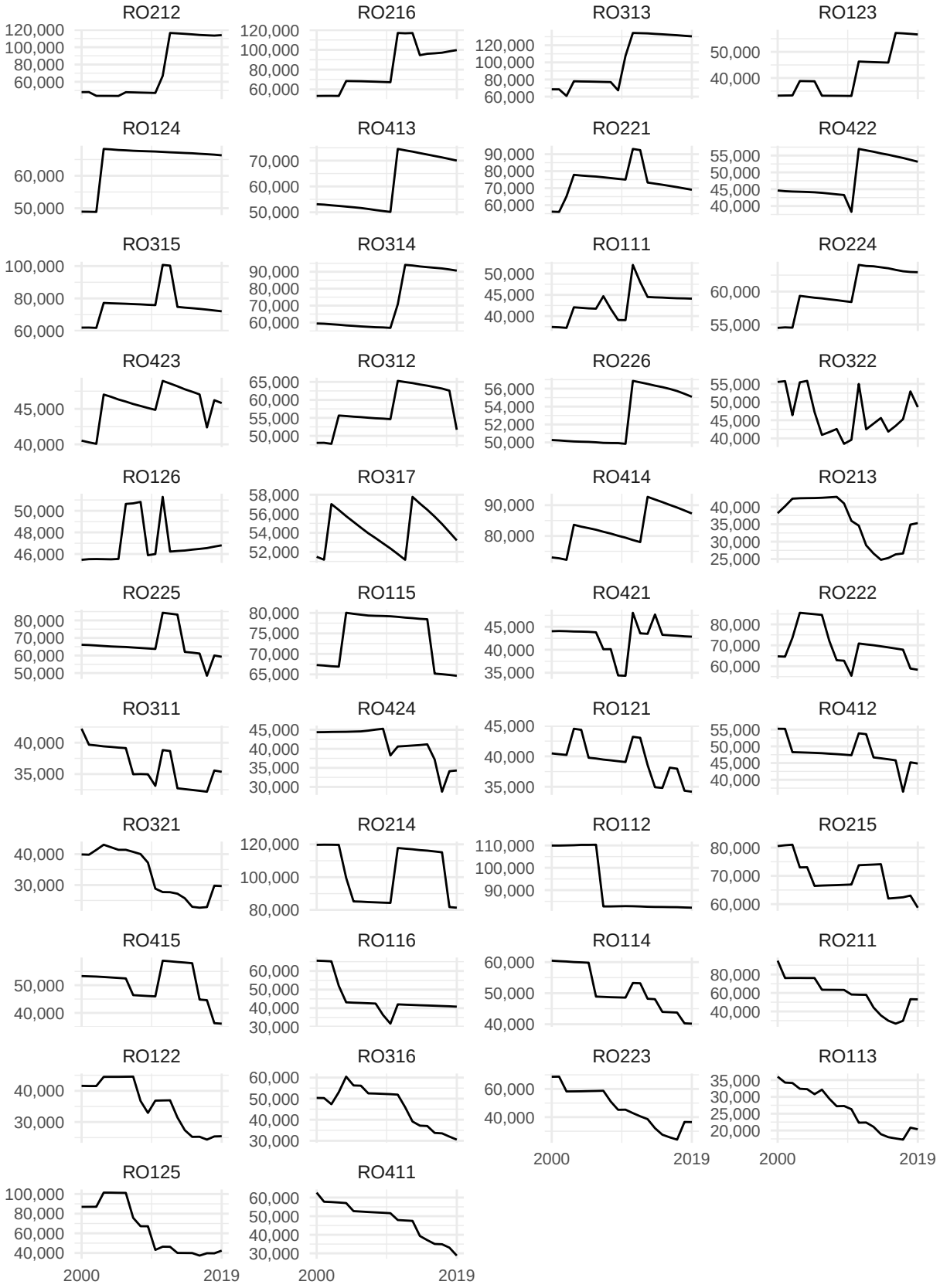


Figure 24: Number of people per third place in Romania at NUTS3 level (Source: Romanian National Institute of Statistics)

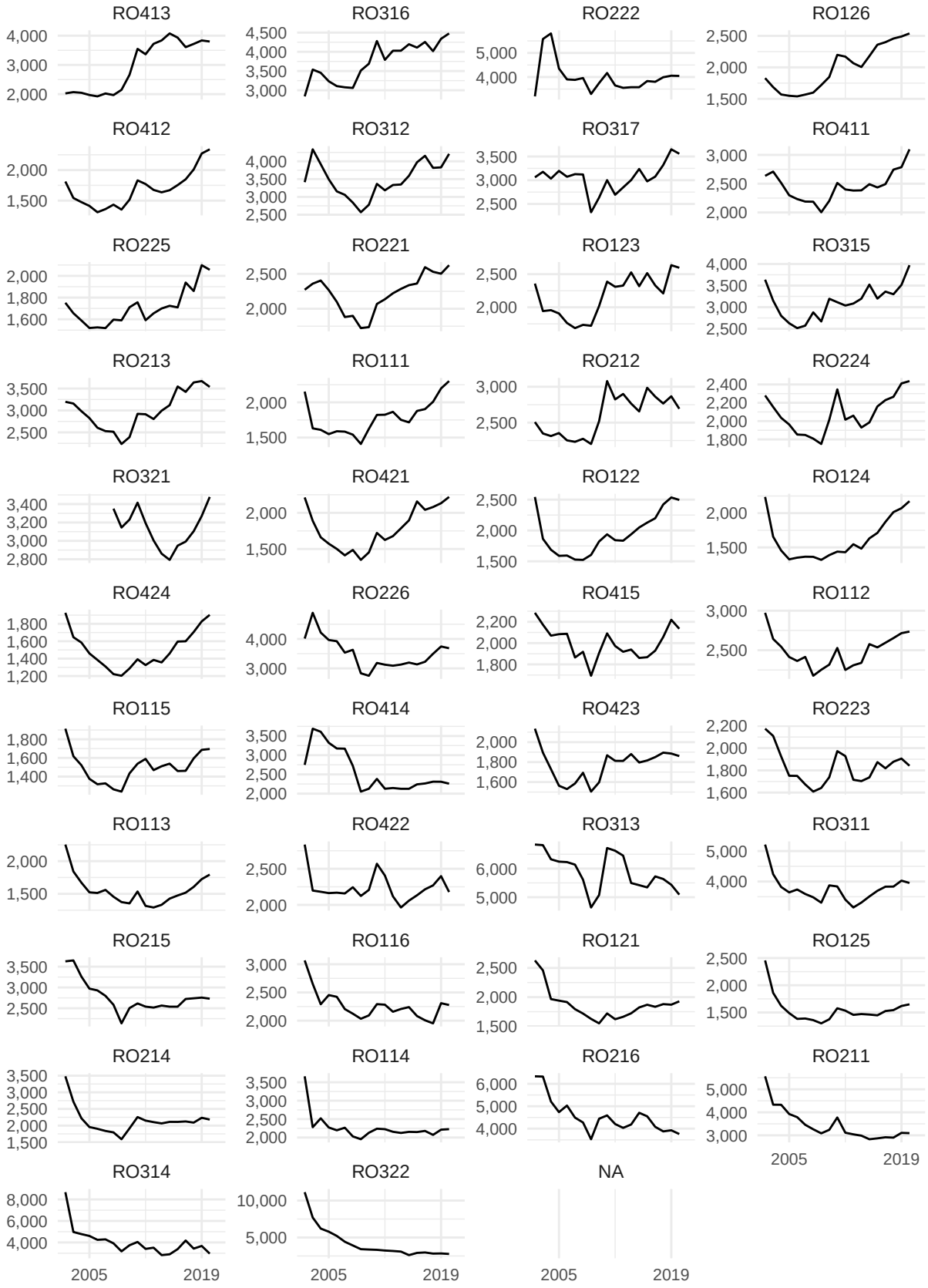


Figure 25: Electoral volatility in Romania at NUTS3 level (Source: Schraff et al. 2023)

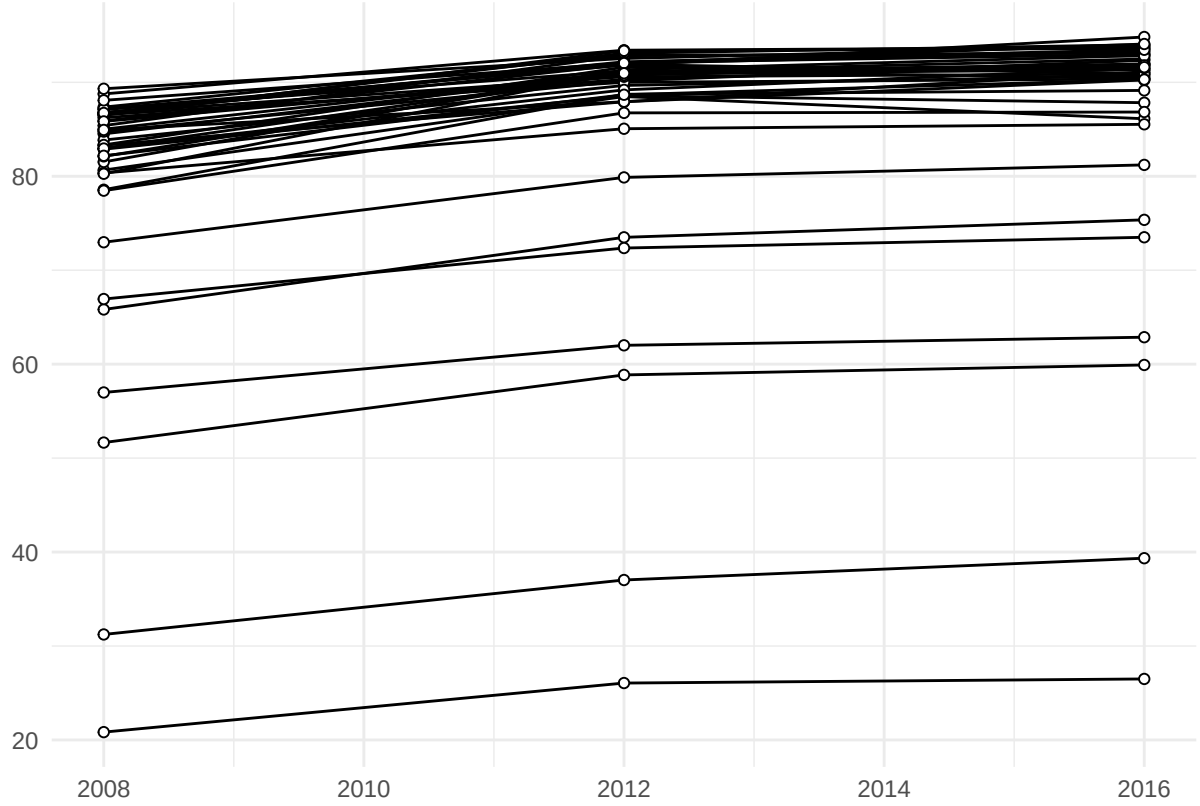


Figure 26: GDP per capita at current market prices in Romania at NUTS3 level (Source: Eurostat)

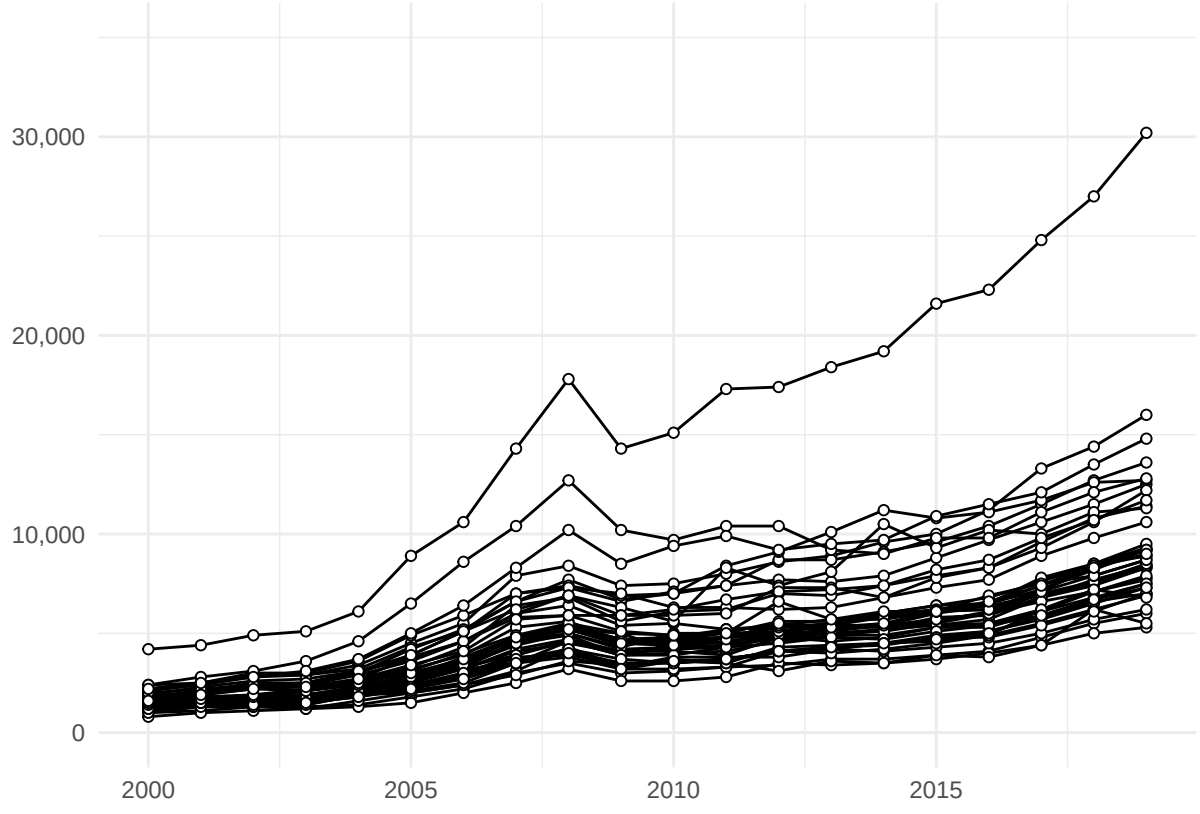


Figure 27: Unemployment rate in Romania at NUTS3 level (Source: Romanian National Institute of Statistics)