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„Right Wing Populism and the Impact on COVID-19 Mortality in Austria"

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Abstract

This thesis examines the effect of FPÖ right wing populism on the COVID-19 mortality in Austria. Therefore the connection between corona death numbers and the FPÖ vote share is analysed with an Ordinary Least Square, an Instrumental Variable and a Difference-In-Difference approach. The underlying data is based on the 94 districts of Austria and is processed for either cross-sectional or panel use. In the cross-sectional case the corona mortality is defined as the aggregated COVID-19 death rate per 100,000 inhabitants up to February 2022. To get a first impression a standard Ordinary Least Square estimation is used. In order to get rid of potential endogeneity an Instrumental Variable model is introduced. For further address of the endogeneity problem the data set is adjusted to a panel setting and a Difference-In-Difference model is introduced. Therefore monthly aggregations of the COVID-19 death rate per 100,000 inhabitants from February 2020 to March 2022 are made. In that regard a point estimate of the FPÖ invoke against the corona measures, starting at the end of April 2020, is made. Further, based on epidemiological and pandemic scientific assessments a chain of causality is provided.
All three approaches show a high significant positive effect of the FPÖ vote share on the respective corona death rate. Finally a pro-cyclical stronger increase of the COVID-19 death rate based on the FPÖ vote share is found.

Kurzfassung

Diese Arbeit untersucht inwieweit die politische Positionierung der FPÖ, gegen die getroffenen Corona Maßnahmen der österreichischen Regierung, die COVID-19 Mortalität in Österreich beeinflusst hat. Als Datengrundlage für die vorliegende Masterarbeit dienen das FPÖ Wahlergebnis der Nationalratswahl von 2019 (respektive 2017) sowie die Corona Todesrate. Die verwendeten Daten beziehen sich auf die 94 österreichischen Bezirke und sind je nach Verwendung (Querschnitt oder Panel) angepasst. Mit einem *Ordinary Least Squares* Model wird die Korrelation bestätigt. Damit potentielle Endogenität ausgeschlossen werden kann, wird das Model um eine *Instrumental Variable* erweitert. Zusätzlich wird ein *Difference-In-Difference* Model verwendet um die Auswirkungen der politischen Kehrtwende zu untersuchen. Weiters wird basierend auf epidemiologischer und pandemischer Forschung eine Kausalitätskette hergestellt.
Alle drei Schätzmethoden zeigen einen hoch signifikanten und positiven Effekt des FPÖ Wahlergebnisses auf die Corona Todesraten. Darüber hinaus wird ein pro-zyklisch stärkerer Anstieg der Todesrate basierend auf dem FPÖ Stimmenanteil nachgewiesen.

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1. Introduction

At the end of February 2020 for the first time people were tested positive on COVID-19 in Austria (APA:a, 2020). Only a few weeks later the coronavirus was already spread over the country and large parts of the whole world. As a result the Austrian government, in approval of all opposition parties, implemented the first restrictive laws on 15 March 2020. The main goal was social distancing to protect the health system (APA:b, 2020). Therefore social life was restricted with a lockdown, measures like homeschooling and home office were introduced and leaving one's home was only allowed for essential purpose.

Finally, on 27 April 2020 the opposition party, Austrian Freedom Party (FPÖ) presented their petition "Jetzt reicht‘s! - Allianz gegen den Corona-Wahnsinn“ and officially positioned themselves against the governmental measures and restrictions (APA:c, 2020). By that the FPÖ immediately gathered a significant number of dissatisfied people around them. In the further process of the pandemic the FPÖ remained critical and created a strong movement against the governmental laws and restrictions. Up to March 2022 around 15,000 people died on COVID-19 in Austria.

The aim of this thesis is to analyse, whether the counter movement of the Austrian Freedom Party (FPÖ) drove the COVID-19 death rate in Austria and hence endangered the Austrian society. For this purpose an Instrumental Variable Approach and a Difference-In-Difference Model are applied. District level corona death numbers and the FPÖ vote share of 2019 national council election as characterization of the FPÖ affinity are used for the analysis.

With regard to this the particular research question addressed in this thesis is "How did FPÖ right wing populism affect the COVID-19 mortality in Austria?".

The following paper is structured in five sections. Section 2 illustrates the causality of FPÖ vote share as measure for FPÖ affinity and the concerning problematic. Further the main variables and underling data is explained. Section 3 introduces the econometric baseline model. Section 4 discusses the Instrumental Variable Approach. Section 5 treats the Difference-In-Difference Approach and finally section 6 concludes the findings.

2. Background and Data

2.1. Data Sources

The main data sources used in this paper are from the *Bundesministerium für Digitalisierung*, *Institut für Strategieanalysen GmbH* and *Statistik Austria.*
The data set includes the 94 Austrian districts in which Vienna is treated as one according to a data lack in the COVID-19 death numbers for the separate Viennese districts. Further it represents the time horizon from February 2020 to February 2022 in the Baseline Model and the Instrumental Variable Approach. In the Difference-In-Difference Approach the time horizon is from February 2020 to March 2022. The COVID-19 death numbers of the districts are based on data from *Bundesministerium für Digitalisierung* and can be recalled on *www.data.gv.at.* The election results can be found on *www.wahldatenbank.at* which the *Institut für Strategieanalysen GmbH (ISA)* is in charge of. Further controls and the instrumental variable are provided by the *statistic atlas* and the *statcube* of *Statistik Austria* (*www.statistik.at*).

Table 2.1 shows the summary statistics. It lists the mean, standard deviation, minimal value and maximal value of the later used variables of the three used models.

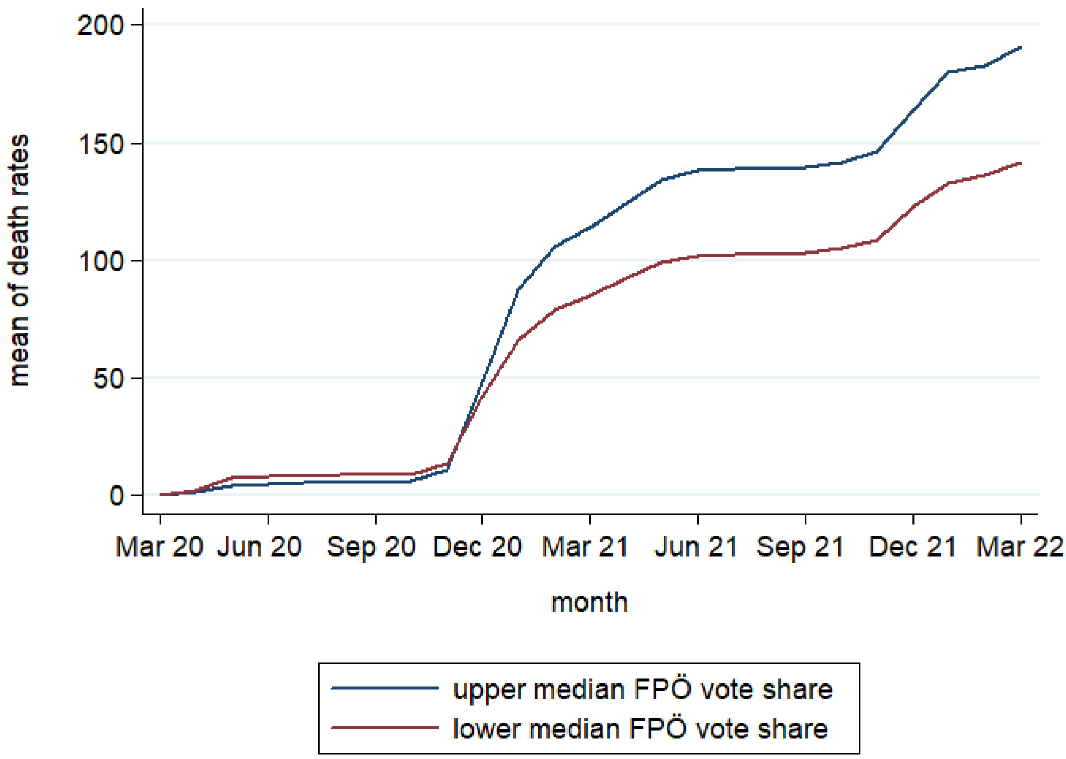
The last listed instrumental variable is a growth rate that includes data of the 1971 immigration stock and citizen stock of the Austrian districts. More detailed explanation follows in section *4. Instrumental Variable Approach*). Since certain districts have been merged in the past 50 years, the historical immigration stocks as well as the citizen stocks hat to be adjusted. The values of the 1971 immigration stock and the 1971 citizen stock for Bruck-Mürzzuschlag are the sum of the 1971 immigration stock respectively citizen stock values of the former districts Bruck an der Mur and Mürzzuschlag (Wikipedia:a, n.d.). In the same manner district Südoststeiermark aggregates the numbers of Feldbach and Radkersburg (Wikipedia:b, n.d.), Hartberg Fürstenfeld aggregates Hartberg and Fürstenfeld (Wikipedia:c, n.d.) and Bezirk Murtal aggregates Judenburg and Knittelfeld (Wikipedia:d, n.d.).
Further Wien-Umgebung was dissolved and the 21 municipalities were assigned to surrounding districts. For simplicity reasons in this paper the historical immigration stock and citizen stock of Wien-Umgebung are divided by 21 and in proportion of the amount of the number of municipalities, that were assigned to a district, added. To district Tulln and district Kronneuburg one part of the share is added. District Bruck an der Leitha got assigned six municipalities and hence six parts of Wien-Umgebung. Bruck an der Leitha gets added the remaining 13 parts of the historical immigration stock and citizen stock (Wikipedia:e, n.d.).

Table 2.1.: Summary Statistics

VARIABLES	(1) mean	(2) std. dev.	(3) min	(4) max
inhabitants (Jan 20)	94,692	193,794	1,980	1,911,000
death sum (up to Feb 22)	145.8	295.2	1	2,896
death per month (Feb 20 to Mar 22)	6.109	19.61	0	444
DR baseline and IV	159.5	54.98	39.59	304.1
DR Diff-In-Diff	79.80	139.0	0	1,337
log DR Diff-In-Diff	2.611	2.269	0	7.198
FPÖ vote share 19 election	0.172	0.0315	0.107	0.245
FPÖ vote share 17 election	0.273	0.0413	0.191	0.368
population under 15	0.142	0.0128	0.111	0.163
population 15 to 29	0.164	0.0171	0.129	0.233
population 30 to 44	0.189	0.0131	0.162	0.227
population 45 to 59	0.233	0.0108	0.197	0.258
population 60 to 74	0.169	0.0168	0.131	0.218
population 75 and older	0.103	0.0142	0.0767	0.141
school level1 (ISCED-97 level 2)	0.162	0.0368	0.0950	0.300
school level2 (ISCED-97 level 3)	0.380	0.0596	0.207	0.469
school level3 (ISCED-97 level 4)	0.313	0.0314	0.231	0.381
school level4 (ISCED-97 level 5+6)	0.145	0.0521	0.0848	0.343
unemployment	0.0499	0.0204	0.0184	0.123
out-commuters	0.318	0.0695	0.125	0.407
in-commuters	0.276	0.111	0.124	0.837
initial immigration stock 71 (S)	2,218	6,534	21	61,569
fraction of immigrants 71 (λ)	0.0225	0.0232	0.00296	0.128
immigration entered 71 to 21 (M_{2021})	1,323,000	0	1,323,000	1,323,000
immigration entered 71 to 11 (M_{2011})	704,693	0	704,693	704,693
population 21 (P_{2021})	111,316	257,765	2,158	2,525,000
population 11 (P_{2011})	98,812	210,046	1,987	2,063,000
instrumental variable (IV)	0.680	0.137	0.0402	0.944

2.2. FPÖ, Right Wing Populism and the COVID-19 Pandemic

Figure 2.1.: Motivation



Notes: Figure 2.1. shows the monthly average death rates per 100,000 inhabitants of upper and lower median FPÖ vote share. For this the 94 Austrian districts are split in two. The 47 districts with the highest FPÖ vote share at the 2019 national council election are represented by *upper median FPÖ vote share*. The 47 districts with the lowest FPÖ vote share at the 2019 national council election are represented by *upper median FPÖ vote share*.

Overall noteworthy is the paper by Mellacher (2022). Using a Difference-In-Difference model Mellacher (2022) finds divergence in the health risk beliefs of COVID-19 between FPÖ voters and the others. Further the author analyses the correlation between the FPÖ vote share and COVID-19 death and infection numbers. As he only finds correlation between the vote share and the death numbers, he introduces a heterogeneous mixing epidemiological model to study a testing bias.
Inspired by this figure 2.1. illustrates the monthly average death rates of upper and lower median FPÖ vote share districts of 2019 national council election. From November 2020 on the difference between the two means starts to diverge. By this time the mean death rate of the upper median FPÖ vote share districts begins to grow much stronger and remains on an approximately 25 to 30 percent higher level than of the lower ones.

To figure out whether this illustration is based on a causal connection the following three concerns need to be clarified.

1. Do the measures and restrictions that were implemented by the Austrian government have an impact on the pandemic situation and subsequently on the death rate of the COVID-19 virus?
2. Is there a link between the FPÖ downplay of the pandemic situation and higher risk taking behavior of their voters?
3. Can the FPÖ vote share results of the 2019 council election reflect the FPÖ affinity in the Austrian districts during the first years of the corona pandemic?

Depending on the pandemic course the social life in Austria from March 2020 to March 2022 was mostly restricted by different governmental measures to fight the COVID-19 dissemination. Especially in winter times when the virus began to spread faster and the health system was almost working to capacity social distancing, obligatory masks in public, regular testing, contact tracing and vaccination were used to steer the pandemic situation. Although the FPÖ sow doubt on the impact of these measures, recent studies indicate the efficiency of them.
Greenstone & Nigam (2020) provides evidence for the effectiveness of social distancing. The authors projected 1.7 million less death in conjunction with corona by moderate social distancing in the United States from late March 2020 to 1 October 2020. Further Ainslie et al. (2020) conclude that "the eventual decorrelation between transmission and movement is likely a key feature of successful COVID-19 exit strategies".
Regarding obligatory masks Howard et al. (2021) review that for high compliance the usage of masks in public slows down virus spread and recommend the implementation of mask use requirements by governments. Further the authors state that "in conjunction with widespread testing, contact tracing, quarantining of anyone that may be infected, hand washing, and physical distancing, face masks are a valuable tool to reduce community transmission".
Concerning the efficacy of vaccinations early studies by Dashtbali & Mirzaie (2021) find that the total number of infections at epidemic peaks decreased with higher vaccine coverage in divers countries like Egypt and Germany and hence help to steer the pandemic. Finally Waize et al. (2021) state that the German vaccination campaign impede 38.300 COVID-19 deaths in between January and July 2021.
Summing up there is a sufficient scientific evidence for the effectiveness of the main measures that were implemented to contain the pandemic and reduce corona death rates.

Although various studies proved the positive impact of the governmental measures against COVID-19, the FPÖ attitude concerning the COVID-19 measures remained negative from the turning point in late April 2020 on. During the first half of 2021 when Austrian social life was mostly shut down and also the economy had to face big limitations the FPÖ directly invoked to join demonstrations against corona measures (APA:a, 2021). Further FPÖ politicians officially disregarded the measures themselves (APA:b, 2021), invoked to refuse testing (APA:e, 2020) and doubted the effectiveness of COVID-19 vaccines (APA:c, 2021).

The rollover of the FPÖ policies and attitude towards the governmental measures is provided by Paul et al. (2021). The authors find that the lowest willingness for a fast vaccination between Austrian electorates is among FPÖ voters. Only 31 percent of the people who voted for the FPÖ in the 2019 elections stated to get vaccinated as soon as possible. This goes in line with Kennedy (2019) who find high significant evidence for the relation between populist parties vote share and a negative percipience regarding importance and effectiveness of vaccines.
Further literature concerning the behavior of populist parties and their voters find partisan differences in behavior and beliefs. More precisely using GPS data it was found that in Republican areas social distancing was less practiced. This is confirmed by self reported survey studies which in addition reveal a lower risk assessment of the severity of COVID-19 by Republicans (Allcott et al., 2020). In accordance to that Gollwitzer et al. (2020) find that counties which were in favour of Trump in the the 2016 presidential election elaborated 14 percent less physical distancing which subsequently resulted in higher infection and fatality corona rates.

Finally there remains the question, whether the FPÖ vote share of the 2019 council election coincides with the part of the Austrian population which pursued the FPÖ counter movement during the first years of the corona pandemic. Therefore findings from Grewenig et al. (2020) are used. The authors provide evidence for the reverse effect of exogenous policy preferences. This means that not only parties orientate their platforms on voters preference, but also voters preferences concerning a political topic depend on the positioning of their preferred party.

Following this chain of causality the FPÖ vote share of the 2019 council election serves as the numerical implementation of civil disobedience, based on the FPÖ policy towards the first years of the corona pandemic. It illustrates the attitude of the FPÖ regarding the governmental COVID-19 measures and the corona virus per se. For the purpose of robustness, all further calculations are also performed with the FPÖ vote share of the 2017 national council election as measurement for the FPÖ affinity, and listed in *Appendix B*.

3. Baseline Model

In this section the effect of the FPÖ vote share on the COVID-19 death rate of a district is estimated with a standard ordinary least squares (OLS) model that is described by equation (3.1).

$$DR_i = \alpha + \beta FPOE19_i + X_i'\gamma + \epsilon_i \tag{3.1}$$

The dependent variable *DR* denotes the death rate and is defined as the aggregated COVID-19 death number per 100,000 inhabitants up to February 2022 in district *i*. α is the constant and β describes the to be estimated coefficient. The main regressor of interest is the FPÖ vote share of the 2019 council election which is represented by *FPOE19*. *X'* is a vector of control variables like age distribution, education level, unemployment and commuters (in and out) as listed in table 2.1. γ represents the coefficients of the corresponding controls. The FPÖ vote share and all controls are decimal numbers from 0 to 1. ϵ denotes the error term.

$$DR_i = \alpha + \beta FPOE19_i + X_i'\gamma + \delta_s + \epsilon_i \tag{3.2}$$

Equation (3.2) takes state fixed effects δ into account. The index s assigns the nine Austrian states. The usage of state fixed effects controls for the effects of independent corona policy measures in the states. Although there have been several solo efforts or deviations by the states, the main COVID-19 policy measures were set on national level. In line with the overall aggregation of the death numbers the usage of state fixed effects in the Baseline Model setting is questionable and not preferred.

3.1. Results Baseline Model

Table 3.1 provides the estimation results of the OLS baseline model. The very basic OLS regression (1) shows an increase of the COVID-19 death rate of 926.8 based on an increase of the FPÖ vote share from 0 to 100 percent. Introducing state fixed effect (2) reduces the effect to 595.9. By adding age distribution variables as controls to the basic OLS (3) the effect counts for 880.1. The combination of the controls and state fixed effects (4) indicates an increase of the death rate by 631.5.

The other previous mentioned controls are not significant and hence removed from the model. Further the impact of the NEOS party, who intermittently were also critical about certain governmental measures is checked. The estimations showed a negative insignificant effect and hence this research is not further elaborated.
At this point the Breusch-Pagan Test is applied. It indicates homoscedasticity which means that the OLS estimator provides unbiased estimates.

Although all variations of the baseline OLS model show similar high significant impacts of the FPÖ vote share on the COVID-19 death rate, potential endogeneity can not be excluded. Hence it can't be ensured that the *FPÖ19* and the error term are uncorrelated and so the OLS estimation is inconsistent. In order to address this problem in the following an instrumental variable is introduced.

Table 3.1.: Baseline Model Estimation Results

	(1)	(2)	(3)	(4)
VARIABLES	OLS	OLS with FE	OLS with controls	OLS with controls and FE
FPÖ vote share	926.8***	595.9***	880.1***	631.5***
	(154.0)	(175.7)	(159.8)	(173.6)
pop under 15			1,738**	2,595***
			(766.6)	(862.4)
pop 16 to 29			2,119***	2,174***
			(574.3)	(602.7)
pop 60 to 74			2,244***	2,408***
			(846.0)	(871.6)
pop 75 and older			1,316**	1,479**
			(620.1)	(661.7)
Constant	0.120	56.82*	-1,101***	-1,233***
	(26.92)	(30.62)	(317.3)	(338.1)
Observations	94	93	94	93
R-squared	0.282	0.453	0.414	0.557

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: This table reports the estimation results of variations of the baseline OLS model based on equation (3.1) and (3.2).

4. Instrumental Variable Approach

4.1. Instrumental Variable Strategy and Empirical Implementation

The usage of an Instrumental Variable Approach is to get rid of the previously mentioned endogeneity problem, and identify the real causal effect of the FPÖ vote share on the COVID-19 death rate. Therefore the main aim is to find a variable that correlates with the FPÖ vote share but does not with the error term that potentially includes unobserved drivers of the death rate. For this purpose an adapted version of the instrumental variable, that was used by Halla et al. (2017) is employed. In the original version the IV provides evidence for the increase of the FPÖ vote share based on immigration inflow. The link between the IV introduced in equation (4.1) and the FPÖ vote share is given by their correlation of 0.316. This connection will be further discussed with the interpretation of the first-stage regression in *chapter 4.2*. Also from an non-empirical point of view, the increase of right wing vote share on account of immigration can be argued. Halla et al. (2017) mention negative voters welfare regarding labor market competition or neighborhood quality.
Further, a relationship between the chosen IV and the unobserved drivers in the error term has to be ruled out. Although, this can never be fully verified, it is very unlikely that the IV, which is defined as a growth rate that predicts the change of immigration in a district proportional to Austria between 2011 and 2021 based on the 1971 initial immigration stock, is correlated to the unobserved.

$$IV_{i,2021,2011} = \frac{\frac{S_i + M_{i,2021} * \lambda_i}{P_{i,2021}} + \frac{S_i + M_{i,2011} * \lambda_i}{P_{i,2011}}}{\frac{S_i + M_{i,2011} * \lambda_i}{P_{i,2011}}} \tag{4.1}$$

Equation (4.1) shows the instrumental variable, that is employed in the further analysis. It refers to the initial immigration stock in 1971 denoted by S. i is the index for the 94 Austrian districts. M is the number of immigrants that entered Austria between 1971 and 2011 respectively 2021. λ represents the fraction of immigrants in the districts in 1971 and P is the population in 2011 respectively 2021.
Because of a lack of data access, the two following restrictions compared to the IV of Halla et al. (2017) have to be taken. First, the initial immigration share S, the immigration inflow M and the fraction of immigrants λ are additionally subdivided in source countries of immigration. Second, in the original form the IV was based on community level data, whereas here it is on district level.

The first-stage regression of the 2-stage least squares (2SLS) is

$$FPOE19_i = \alpha + \beta IV_i + X_i'\gamma + \epsilon_i \tag{4.2}$$

where IV denotes the instrumental variable. The definition of the other variables is the same as explained in *chapter 3*. The control vector *X'* is just added, because it is part of the 2SLS. It is not considered in the separate estimation of the first-stage regression.

$$DR_i = \alpha + \beta F\widehat{POE}19_i + X_i'\gamma + \epsilon_i \tag{4.3}$$

Equation (4.3) describes the second-stage regression. $F\widehat{POE}19$ is the predicted effect of the IV from the the first-stage regression. The other variables are again defined as before.

Once more, for a matter of completeness, both equations are additionally estimated with state fixed effects although their usage is questionable and not preferred.

4.2. Results Instrumental Variable Approach

Table 4.1.: First-Stage Regression

VARIABLES	(1) OLS	(2) OLS with FE
IV	0.0730***	0.0478*
	(0.0228)	(0.0242)
Constant	0.122***	0.140***
	(0.0158)	(0.0169)
Observations	94	93
R-squared	0.100	0.374

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: This table reports the estimation results of the first-stage regression based on equation (4.2).

Table 4.1. shows the results of the first-stage regression explained in equation (4.2). The regression result (1) of 0.07 is positive and high significant. This indicates, that the previous introduced IV is a legit instrument for the FPÖ vote share. However, the R^2 of 0.1 is low, which can be an indication for a potential weak instrument choice. This issue is discussed in detail later in this section.
The estimation with fixed effects shows a positive significant effect of 0.05 under the 10 percent level. The R^2 increases to 0.37 and the t-statistic drops to 1.97. Hence, on overall

the explanatory power of the first-stage regression doesn't increase.

Table 4.2.: 2-Stage Least Squares Estimation Results

VARIABLES	(1) IV	(2) IV with FE	(3) IV with controls	(4) IV with controls and FE
FPÖ vote share	1,783***	2,721**	356.9	1,167
	(557.4)	(1,307)	(1,709)	(774.7)
pop under 15			1,982*	2,510***
			(1,117)	(850.0)
pop 16 to 29			2,233***	2,137***
			(695.1)	(590.4)
pop 60 to 74			3,065	1,800
			(2,807)	(1,209)
pop 75 and older			990.8	1,966**
			(1,234)	(943.2)
Constant	-147.2	-335.3	-1,169***	-1,259***
	(96.00)	(227.6)	(394.2)	(327.0)
Observations	94	94	94	94
R-squared	0.041		0.343	0.504

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: This table reports the estimation results of variations of the instrumental variable model based on equation (4.3).

The main results of the 2-stage least squares estimations are presented by table 4.2. Column (1) shows an high significant 1,783 increase of the COVID-19 death rate per 100.000 inhabitants, caused by an 0 to 1 increase of the FPÖ vote share. The introduction of state fixed effects (2) increases the effect size further to 2,721. A change of the FPÖ vote share, by one standard deviation (0.03), leads to a change of the death rate of 53.49, respectively 81.63.
To figure out the magnitude of the effects, they are set in relation to the standard deviation of the death rate (54.97). Following this rationale, the magnitude of the 2-stage least squares estimation, without fixed effects, is 0.97 and with fixed effects 1.48.[1] Thereof results a change of the death rate by 0.97 standard deviation respectively 1.48 standard deviation caused by a change of one standard deviation of the vote share.

Column (3) and (4) represents the estimation results of the 2-stage least squares estimation with controls. By introducing the same control variables that were used in the baseline model, the estimation results of the 2-stage least squares estimation with as well as without state fixed effects gets insignificant. Hence, the control variables are disregarded.

[1] $\frac{1,783 * std.dev.FPvoteshere}{std.dev.deathrate} = \frac{1,783 * 0.03}{54.97} = 0.97$

$\frac{2,721 * std.dev.FPvoteshere}{std.dev.deathrate} = \frac{2,721 * 0.03}{54.97} = 1.48$

For further verification the Wu-Hauman test for endogeneity is applied. The null-hypothesis can be rejected under the 10 percent level, which indicates that the *FPÖ19* variable is endogenous. Hence, the standard OLS estimation provides inconsistent results, whereas the IV estimates are consistent.
The F-statistic of the FPÖ vote share variable *FPÖ19* reports a value, that is just above the threshold of 10. This rejects the assumption of a weak instrument choice.

Summing up, the Instrumental Variable Approach provides a causal connect between the FPÖ vote share and higher COVID-19 death rates in the Austrian districts. In the next chapter a Difference-In-Difference Model is used to investigate further evidence.

5. Difference in Difference Approach

Another possibility to tackle potential unobserved effects that influence the estimates is to use a Difference-In-Difference model. The panel data setting allows to estimate the average effect of the FPÖ invoke against the corona measures at the end of April 2020. Further monthly estimates are used to analyse the cyclical behaviour and growth rate of the death rate based on the FPÖ vote share. To motivate this, an Event Study is introduced.

Figure 5.1.: Event Study

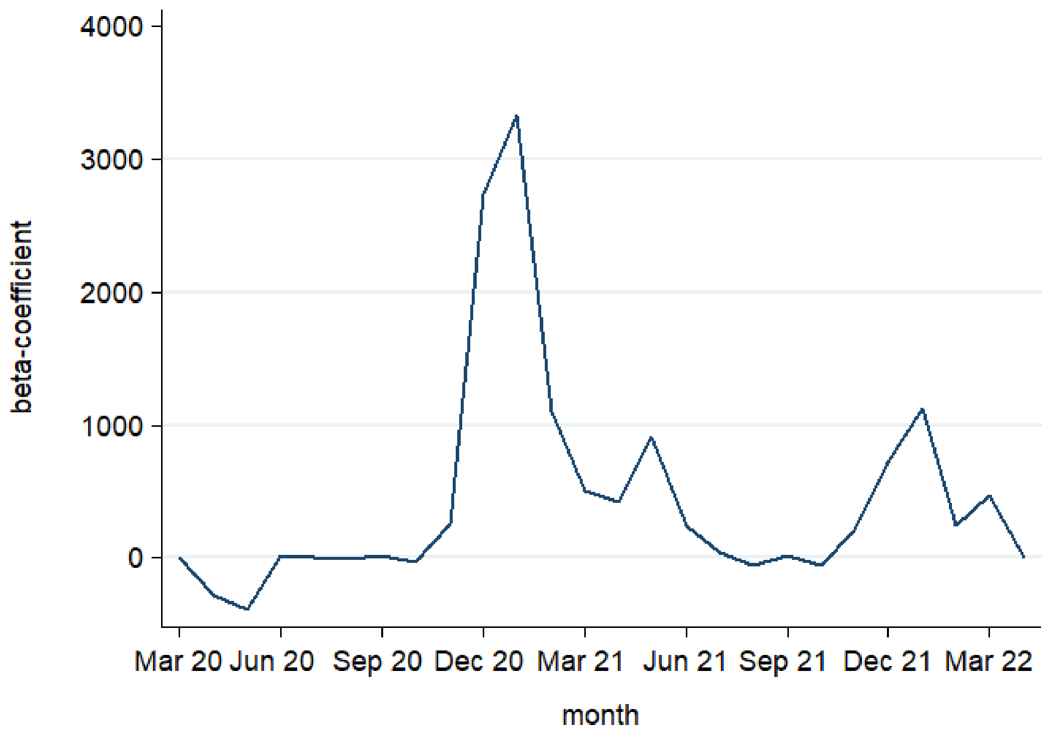


Figure 5.1 provides monthly estimates of standard regression equation:

$$DR_i = \alpha + \beta FPOE19_i + \epsilon_i \tag{5.1}$$

where DR denotes the annualized (multiplied by 12) monthly aggregated death rate per 100,000 inhabitants from February 2020 to February 2022[1].i index the 94 Austrian districts and α is the constant. β describes the plotted coefficients in Figure 5.1. *FPOE19* is the FPÖ vote share of the 2019 council election. ϵ denotes the error term.

The Event Study indicates a strong pro-cyclical increase of the COVID-19 death rate based on the FPÖ vote share. In the summer months, when the overall death rates were low there was almost no noticeable impact. Whenever the pandemic situation became more critical the Event Study shows peaks in the effect size of 3,339 in December 2020 and 1,128 in December 2021. This calculations provide no causal estimates, but are used to arouse suspicion and motivate the following approaches based on a Difference-In-Difference model.

5.1. Empirical Implementation of the Difference in Difference Estimation

The presentation of the petition "Jetzt reicht‘s! - Allianz gegen den Corona-Wahnsinn“ (APA:c, 2020) on 27 April 2020 is seen as the official start of the FPÖ invoke against the COVID-19 measures. In the following the average effects of this political u-turn are estimated. The applied model therefore is:

$$DR_{i,t} = \alpha + \beta(D_t * FPOE19_i) + \delta_i + \tau_t + \epsilon_{i,t} \tag{5.2}$$

where i index the district at time t. DR denotes the annualized (multiplied by 12) monthly aggregated death rate per 100.000 inhabitants from February 2020 to February 2022 [1]. α is the constant and β the to be estimated coefficient. D is a dummy that is 0 from February 2020 to June 2020 and 1 afterwards [2]. *FPOE19* stands for the FPÖ vote share of the 2019 council election. The interaction between the dummy variable and the vote share represents the FPÖ policy change. ϵ is the error term. δ and τ denote district and time fixed effects. Although Hausman test favours random effects, district and time fixed effects are taken into account [3]. On monthly district data, fixed effects seem the most reliable to cover individual politic measures in the course of the pandemic. Monthly data for potential control variables, as mentioned before, where not available and hence not introduced to the model.

To verify the pro-cyclical behaviour of the death rate based on the FPÖ vote share equation (5.2) is revised as follows:

[1] p.e. March 2021 aggregates the death numbers of February 2021 from 1 February to 28 February.

[2] Although the official start of the FPÖ invoke is set on 27 April 2020 the dummy variable remains 0 up to June 2020. The reason therefore is that June 2020 represents the aggregation of the May 2020 death numbers. Even if an immediate impact of the invoke is assumed, the typical course of a COVID-19 disease from infection to death, makes the invoke as a reason for a death in May 2020 implausible

[3] Breusch-Pagan also supports random effects over no effects

$$DR_{i,t} = \alpha + \sum_{s=1}^{25} \beta_s (FPOE19_i * month_s) + \delta_i + \tau_t + \epsilon_{i,t} \tag{5.3}$$

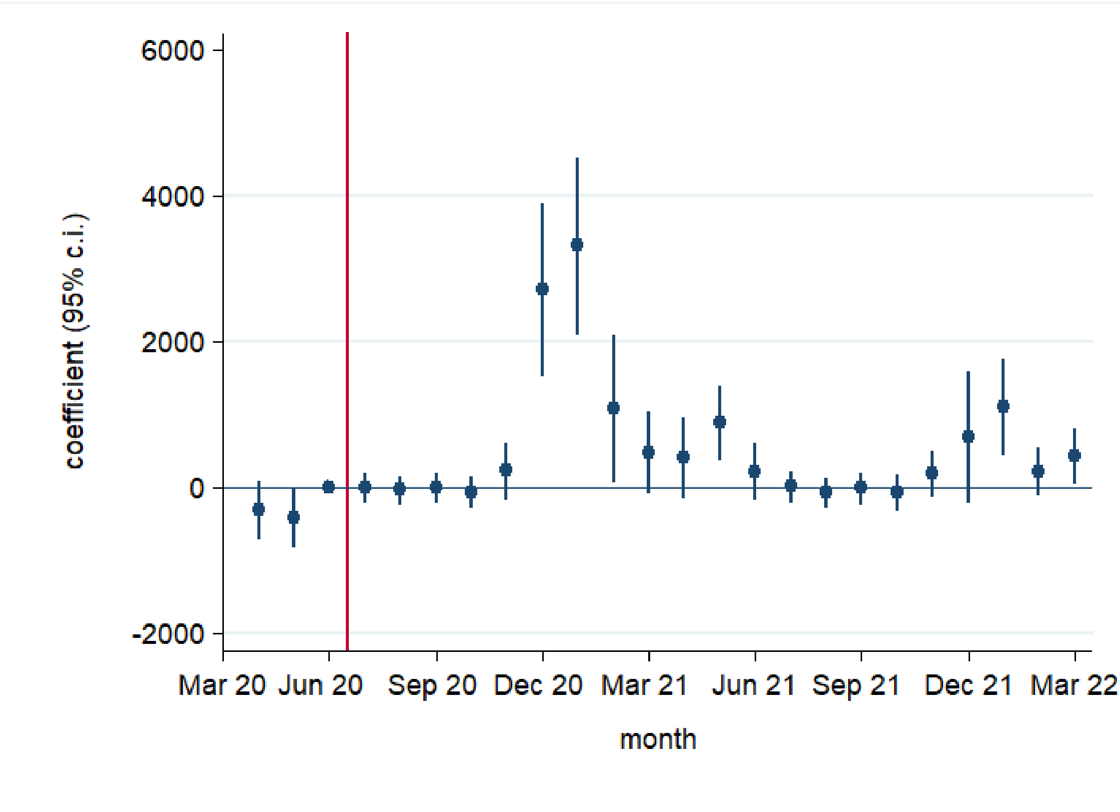
s assigns the 25 month from February 2020 to February 2022 to the dummy *month*. This dummy is 1, if s is assigned and 0 otherwise. Thereby, a monthly comparison to the omitted month [4] is enabled.

To ease the interpretation of the coefficients equation (5.3) is also estimated using the logarithm of the death rate and is listed in *Appendix A*.

5.2. Results Difference-In-Difference

The point estimate of equation (5.2) presents a highly significant increase of the FPÖ vote share based death rate after the invoke by 746. Following the rationale of *section 4* a one standard deviation of the FPÖ vote share explains 0.4 standard deviations of the annualized monthly aggregated COVID-19 death rate per 100,000 inhabitants.

Figure 5.2.: Monthly Coefficient Plot of the Death Rate



[4]The omitted month is June 2020. It aggregates the death number from 1 May to 31 May 2020.

Figure 5.2 shows the estimated β_s-coefficient of equation 5.3 and confirms the pro-cyclical stronger increase of the COVID-19 death rate based on the FPÖ vote share. The figure illustrates small effects during summer times, when the general pandemic situation was stable and death rates were low. The strongest average increases of the corona death rate compared to the omitted month, can be seen in November 2020 with 2,722 and in December 2020 with 3,320 [5]. Further, a considerable effect of 698 and 1,109 appears in November and December 2021.

To address the problem of pre-trends, the coefficient before the omitted are tested jointly for being zero. The calculated *p-value* is 0.11 and hence, the concerns of a pre-invoke effect can be rejected.

The Difference-In-Difference approach provide evidence for the causal effect of the FPÖ vote share on the COVID-19 death rate. The point estimate of the political u-turn indicates a high significant positive impact. Moreover, the consideration of the monthly coefficient plot refines the analysis and points out the pro-cyclical effect regarding the overall pandemic situation.

[5] Because of the previous explained aggregation of data this peak is represented by the value of January 2021.

6. Conclusion

In this thesis the effects of the FPÖ vote share on the COVID-19 mortality in the 94 Austrian districts is evaluated. First the potential correlation between the two is observed with a standard ordinary least squares regression. In the further, the model is attached by the introduction of an instrumental variable to provide causality. Finally, the effect of the political u-turn of the FPÖ is estimated with a Difference-In-Difference model. All three approaches provide positive high significant effects of the FPÖ vote share on the corona death rate per 100,000 inhabitants. Additionally, evidence for a pro-cyclical stronger increase in the monthly corona death rate based on the FPÖ vote share is found.

As the magnitude of the effects seems quite high, there may be some unobserved driver of the death rate. Hence, the implementation of additional meaningful controls in the cross-sectional (OLS, IV) analysis could improve the estimates as well as the introduction of monthly controls in the panel data based model.
Moreover, a combination between the IV and the Diff-In-Diff approach could provide additional evidence for the causal effect of the FPÖ vote share on the COVID-19 death rate.

Finally, even though the econometrics permits an indication of a causal relationship and Grewenig et al. (2020) provides evidence for the reverse effect of exogenous policy preferences, the numerical implementation of the FPÖ vote share of the 2019 (respectively 2017) council election, as civil disobedience remains a hard assumption.

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A. Appendix

Table A.1.: Difference-In-Difference Estimation Results

	(1)
VARIABLES	Difference-In-Difference
FPÖ19#D	745.9***
	(101.3)
Constant	-27.95*
	(14.37)
Observations	2,350
R-squared	0.633

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: This table reports the point estimation results of the equation (5.2).

Figure A.1.: Monthly Coefficient Plot of the Death Rate

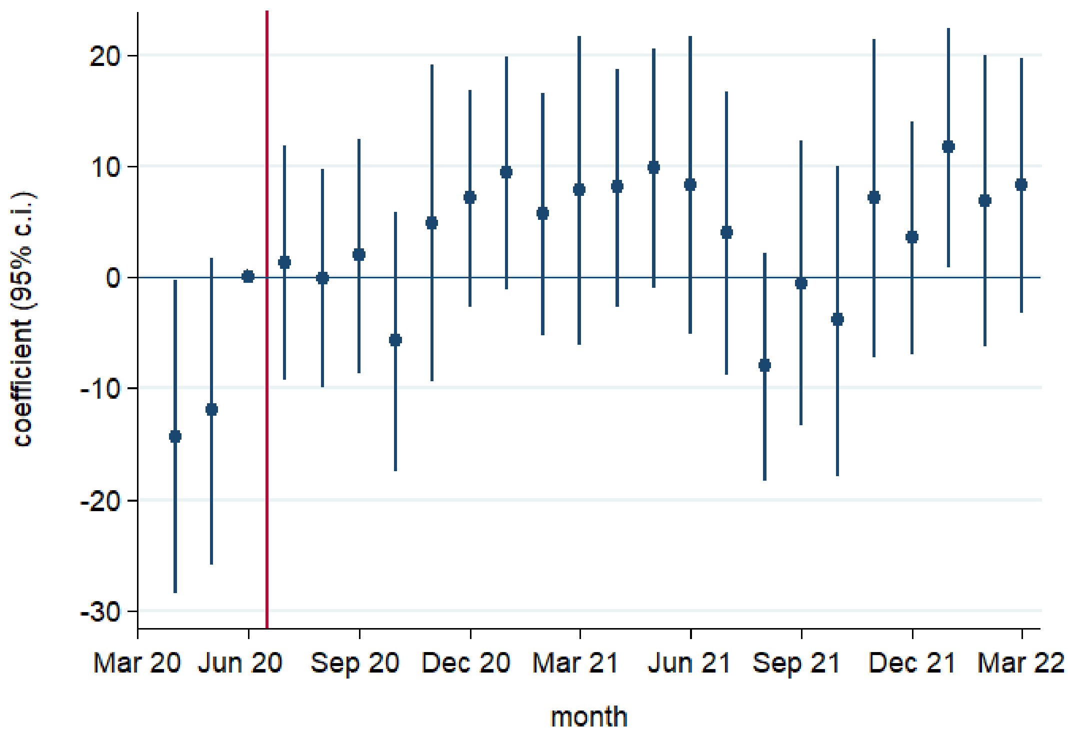

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Figure A.1. shows the estimated β_s-coefficient of equation 5.3 with logarithmic death rate. The test for joint significance can't be rejected under the 5%-level here. Hence there were already pre-invoke effects which makes further interpretations unreliable.

B. Appendix

Table B.1.: Baseline Model Estimation Results (2017 national council election data)

	(1)	(2)	(3)	(4)
VARIABLES	OLS	OLS with FE	OLS with controls	OLS with controls and FE
FPÖ vote share	719.7***	410.1***	698.0***	471.9***
	(115.9)	(138.3)	(119.5)	(142.6)
pop under 15			1,728**	2,615***
			(754.6)	(873.0)
pop 16 to 29			2,146***	2,297***
			(565.1)	(610.5)
pop 60 to 74			2,207***	2,386***
			(831.7)	(888.1)
pop 75 and older			1,373**	1,506**
			(611.3)	(675.5)
Constant	-36.93	47.39	-1,143***	-1,276***
	(32.00)	(38.09)	(311.9)	(342.8)
Observations	94	93	94	93
R-squared	0.295	0.437	0.432	0.545

Standard errors in parentheses

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

Notes: This table reports the estimation results of the first-stage regression based on equation (3.1) and (3.2). The FPÖ vote share is from the election results of the 2017 national council elections.

Table B.2.: First-Stage Regression (2017 national council election data)

	(1)	(2)
VARIABLES	OLS	OLS with FE
IV	0.106***	0.0779**
	(0.0297)	(0.0308)
Constant	0.201***	0.220***
	(0.0206)	(0.0214)
Observations	94	93
R-squared	0.122	0.416

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: This table reports the estimation results of the first-stage regression based on equation (4.2). The FPÖ vote share is from the election results of the 2017 national council elections.

Table B.3.: 2-Stage Least Squares Estimation Results (2017 national council election data)

	(1)	(2)	(3)	(4)
VARIABLES	IV	IV with FE	IV with controls	IV with controls and FE
FPÖ vote share	1,225***	1,667**	148.4	904.3
	(360.3)	(691.2)	(735.4)	(607.0)
pop under 15			2,060**	2,542***
			(923.0)	(856.3)
pop 15 to 29			2,276***	2,370***
			(632.2)	(603.0)
pop 60 to 74			3,324*	1,709
			(1,722)	(1,266)
pop 75 and older			897.2	2,057**
			(909.0)	(1,000.0)
Constant	-174.7*	-284.3	-1,201***	-1,316***
	(98.48)	(175.4)	(344.6)	(335.2)
Observations	94	94	94	94
R-squared	0.150		0.296	0.493

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: This table reports the estimation results of the first-stage regression based on equation (4.3). The FPÖ vote share is from the election results of the 2017 national council elections.

Table B.4.: Difference-In-Difference Estimation Results (2017 national council election)

VARIABLES	(1) Difference-In-Difference
FPÖ17#D	509.6***
	(75.76)
Constant	-37.03**
	(17.14)
Observations	2,350
R-squared	0.632

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: This table reports the point estimation results of the equation (5.2). The FPÖ vote share is from the election results of the 2017 national council elections.

Figure B.1.: Monthly Coefficient Plot of the Death Rate

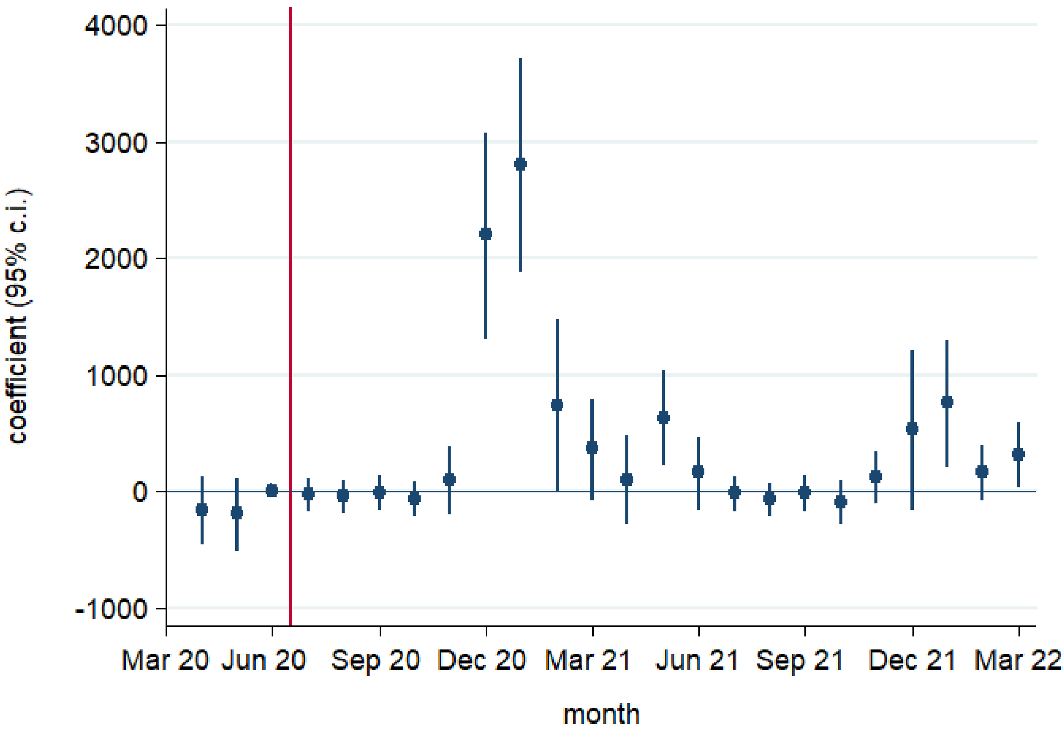

Figure B.1. shows the estimated β_s-coefficient of equation 5.3. The FPÖ vote share is from the election results of the 2017 national council elections.

Figure B.2.: Monthly Coefficient Plot of the Death Rate

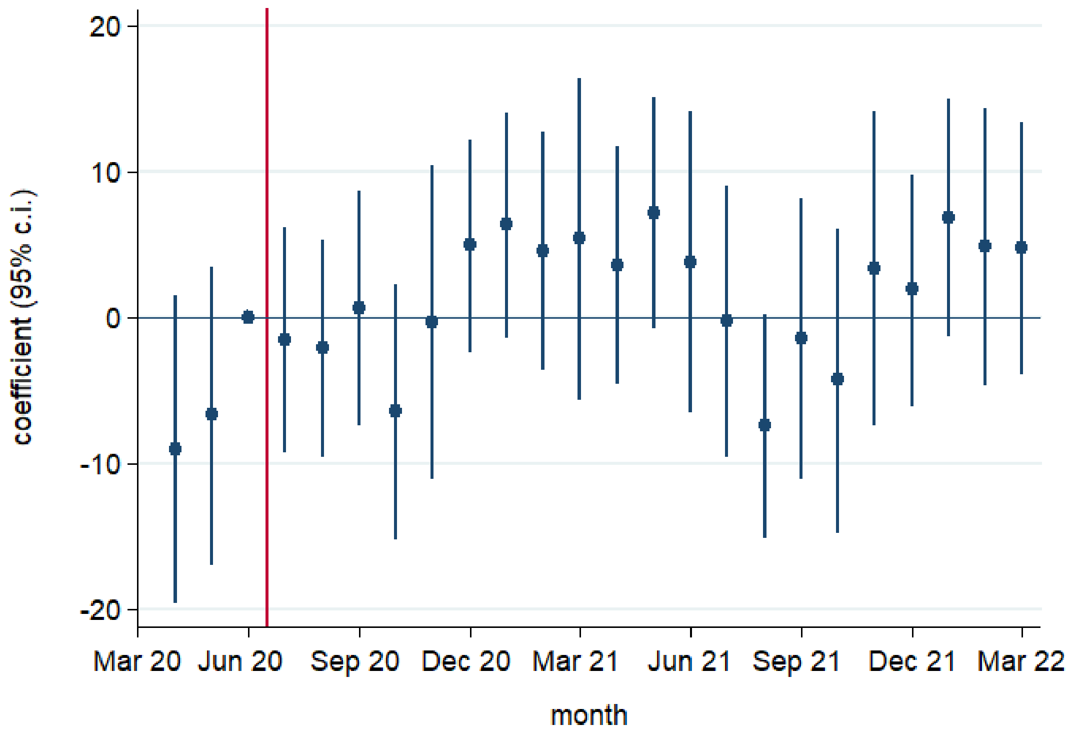

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Figure B.2. shows the estimated β_s-coefficient of equation 5.3 with logarithmic death rate. The FPÖ vote share is from the election results of the 2017 national council elections.