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DISCUSSION PAPER SERIES

IZA DP No. 13205

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Olivier Bargain
Princeton University, Bordeaux University, Institut Universitaire de France and IZA

Ulugbek Aminjonov
Bordeaux University

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IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Trust and Compliance to Public Health Policies in Times of COVID-19*

While degraded trust and cohesion within a country are often shown to have large socioeconomic impacts, they can also have dramatic consequences when compliance is required for collective survival. We illustrate this point in the context of the COVID-19 crisis. Policy responses all over the world aim to reduce social interaction and limit contagion. Using data on human mobility and political trust at regional level in Europe, we examine whether the compliance to these containment policies depends on the level of trust in policy makers prior to the crisis. Using a double difference approach around the time of lockdown announcements, we find that high-trust regions decrease their mobility related to non-necessary activities significantly more than low-trust regions. We also exploit country and time variation in treatment using the daily strictness of national policies. The efficiency of policy stringency in terms of mobility reduction significantly increases with trust. The trust effect is nonlinear and increases with the degree of stringency. We assess how the impact of trust on mobility potentially translates in terms of mortality growth rate.

JEL Classification: E71, H12, I12, I18, Z18
Keywords: COVID-19, political trust, policy stringency

Corresponding author:
Olivier Bargain
Center for Health and Well Being
Woodrow Wilson School
20 Prospect Ave
Princeton, NJ 08540
USA
E-mail: obargain@princeton.edu

* Bargain is visiting researcher at Princeton University and affiliated with Bordeaux University (LAREFI), the Institut Universitaire de France and IZA. Aminjonov is affiliated with Bordeaux University. Usual disclaimers apply.

"Maybe our biggest strength in Germany is the rational decision-making at the highest level of government combined with the trust the government enjoys in the population." (Professor Hans-Georg, head of virology at University Hospital in Heidelberg).[1]

1 Introduction

The COVID-19 pandemic has spread rapidly and globally since February-March 2020. Shelter-in-place and social distancing measures have been enacted or recommended all over the world to slow down transmission and reduce both the load on the healthcare system and overall mortality. In this context, the compliance to health policy rules is crucial and may vary with the local context so that policy measures may not be equally effective in different parts of the globe. In particular, the way people abide to containment measures may depend on the degree of confidence in the authorities. Yet little is known about the effect of trust on compliance to health and safety rules. Trust has received a lot of attention in the economic literature (see the survey by Algan and Cahuc, 2014) and beyond (e.g., Fukuyama, 1995). Specific forms of trust are investigated, notably citizens' trust in institutions and decision-makers, which are shown to improve regulation efficiency and voluntary compliance to rules and laws.[2] Recent social movements in France (yellow jackets) and elsewhere have also reminded us that a spreading distrust in institutions can harm social cohesion and economic stability. There are very few studies investigating the role of trust and compliance in the face of a massive pandemic.[3]

Against this background, we exploit regional variation in political trust throughout Europe to test whether confidence in authorities prior to the crisis affects the compliance to lockdown policies, as measured by the change in human mobility. We first provide graphical evidence then adopt a double difference approach around the time of lockdown announcements. We also use the daily intensity of policy stringency as a more continuous source of variation in treatment, both over time and across countries. Most European countries have enacted measures of varying severity, from strict suppression methods (including generalized lockdown, enforced social distancing and the closure of school and non-essential economic activities) to milder mitigation approach (for instance in the UK at first, and in Sweden throughout the period). We check whether trust improves the efficiency of policy stringency. We combine three main data sources: COVID-19 mobility reports from Google, trust data from the European Social Survey (ESS) and policy stringency from the Oxford COVID-19 Government Response Tracker.

[1] https://economictimes.indiatimes.com/news/international/world-news/a-german-exception-why-the-countrys-coronavirus-death-rate-is-low/articleshow/74989886.cms?from=mdr

[2] This literature highlights the relationship between general trust and many outcomes such as trade or economic development. Political trust and civic norms in particular allow cooperation when large-scale collective action is needed. They improve citizen involvement and governmental performance (Knack, 2002, Helliwell and Putnam, 1995, LaPorta et al., 1997, Knack and Keefer, 1997), tax compliance (e.g. Knack and Keefer, 1997, Scholz and Lubell, 1998) or the decision to report crimes (Tyler, 2006).

[3] Some studies examine trust in the health system (Ozawa and Sripad, 2013) and how it affects vaccine hesitancy or the use of healthcare (e.g. Woskie and Fallah, 2019). Blair et al. (2017) provides an original account of how people who distrusted government were less compliant with Ebola control policies.

We find that the decline in mobility around mid-March 2020 is significantly stronger in high-trust regions. We interpret it as the result of better compliance to national health policies in regions that demonstrated higher levels of trust in policy makers prior to the crisis. The effect is especially strong for non-necessary activities (recreation, work and transport) compared to going to the grocery or to the drugstore, i.e. essential activities allowed by most of the national shelter-in-place policies. The effect of trust is similar whether we adopt a simple difference over the lockdown period of March 2020 or a difference-in-difference approach, and whether we use the ESS data on trust in politicians or alternative measure (ESS satisfaction in governments or Eurobarometer trust in government). Next, we observe a significant impact of the stringency of lockdown measures on mobility in European regions but the diminishing effect is larger in high-trust regions. The overall effect of trust coincides on average with this mediating effect on the efficacy of policy stringency. Using a continuous measure of stringency allows detecting nonlinearities: the effect of trust increases with the degree of stringency and we find no evidence of a sign reversal at very low stringency levels (i.e. as would happen if low-trust regions self-isolated more than the rest because they doubt the ability of the government to respond appropriately). Finally, we assess how the impact of trust on mobility translates in terms of death growth rate.

2 Data Sources

To analyze the impact of trust on mobility and, subsequently, on mortality, we mobilize several types of data: the Google mobility index, trust from various sources, the Oxford measure of policy stringency, official information on COVID-related deaths and control variables.

2.1 Mobility

We use the human mobility index by Chan et al. (2020), constructed from the Google COVID-19 mobility reports. These reports aggregate anonymized sets of data from users' mobile device Location History. The mobility index measures how visits to, or length of stay at, different types of location change over time compared to a baseline period corresponding to January 3-February 6, 2020.[4] There are six location categories: (i) retail and recreation, (ii) grocery and pharmacy, (iii) parks (public gardens, dog parks, beaches, etc.), (iv) transit stations (public transport hubs such as subway, bus, train stations), (v) workplaces and (vi) residential areas. For the first five categories, one can expect a significant drop in mobility during the COVID-19 pandemic while the index for private residence, i.e. the length of staying at home, is supposed to increase. Human mobility is tracked by Google daily and in a consistent manner across 131 countries for the period from February 16 to April 5, 2020. For a subset of countries, the information is provided at sub-national level and we combine it with trust data for most of the European regions.

[4] See https://www.google.com/covid19/mobility/

Figure 1a reports mobility at the country level using the index for "retail and recreation", but very similar patterns are obtained with the other activities. The horizontal axis represents the February 16 - April 5 period with March 1 taken as day 0. Early calls for self-isolation were made in Italy, the first European country affected by COVID-19, and we see a decline in mobility in the first days of March for this country. The first strict official lockdown was enacted on March 9 in Italy. Most European countries tend to follow, with a sharp drop in mobility around mid-March and a lower (containment-level) plateau reached within 10 days. There are a few exception (notably a long hesitation in the UK and the mild mitigation policy in Sweden throughout the period). Note that the cross-country variance in mobility is relatively small before lockdowns begin and increase enormously afterwards due to the variety of country responses.

2.2 Trust and Policy Stringency

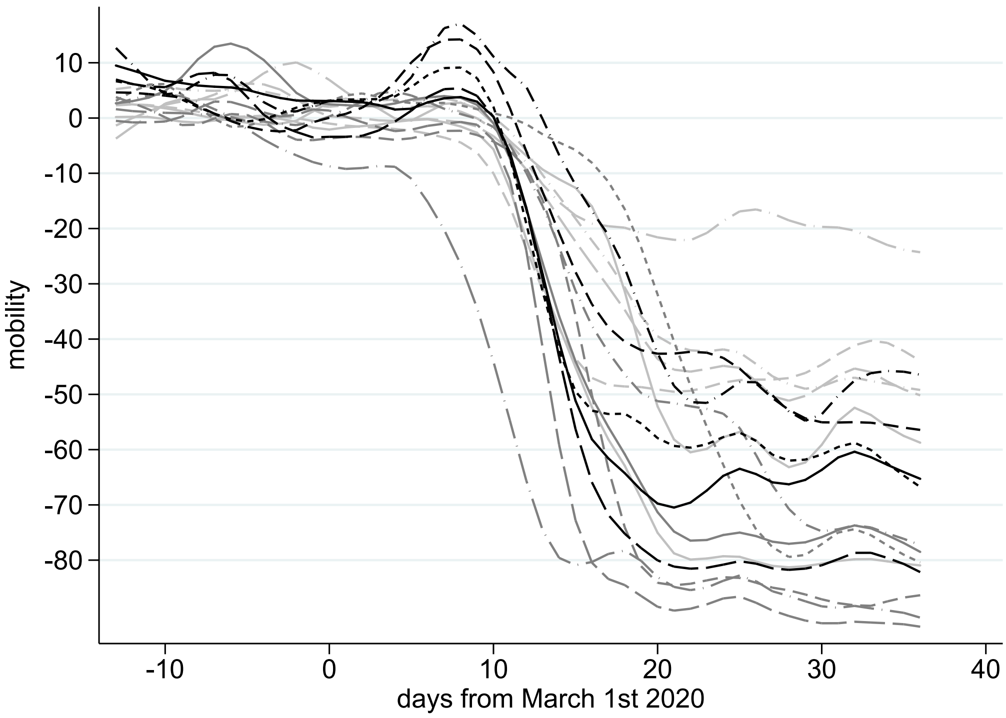
Trust. To measure trust at the regional level, we use the 8th wave of the European Social Survey (ESS), which asks respondents about their trust in politicians in the country on a scale of 0 to 10 (with 0 meaning "No trust at all" and 10 "Complete trust"). For estimations, we aggregate this information at the regional level by calculating the share of respondents whose score is above the country mean. We could use a cutoff that is common to all the countries, such as a fixed score of 5 on the scale – but our aim is to capture regional variation within country especially, which would not be possible with a common threshold (for instance, most of the individual scores are above 5 in Scandinavian countries). Note that our conclusions are robust to alternative ways of aggregating trust at regional level, in particular when using the share of scores above the country median or directly the regional average trust score. As robustness checks, we also use a question from the ESS on individual satisfaction with the work of the national government, as well as the political trust question from the Eurobarometer (the Flash Eurobarometer 472 records the share of those who tend to trust their national government at the regional level).

Note that we use trust measures that are prior to the COVID crisis and hence not affected by the way different governments have managed this crisis.[5] In that sense, we aim to grasp profound differences across European regions in terms of civic norms and trust in the political system. Growing evidence suggest that trust attitudes, like other cultural traits, can persist for surprisingly long periods of time at national and sub-national levels (Bjørnskov, 2007), with regional differences shaped by past political and social developments (Tabellini, 2010). At the same time, we use relatively recent data (2016 for ESS and 2018 for the Eurobarometer) since part of the answer on trust is context-dependent and reflect confidence in the recent governments.

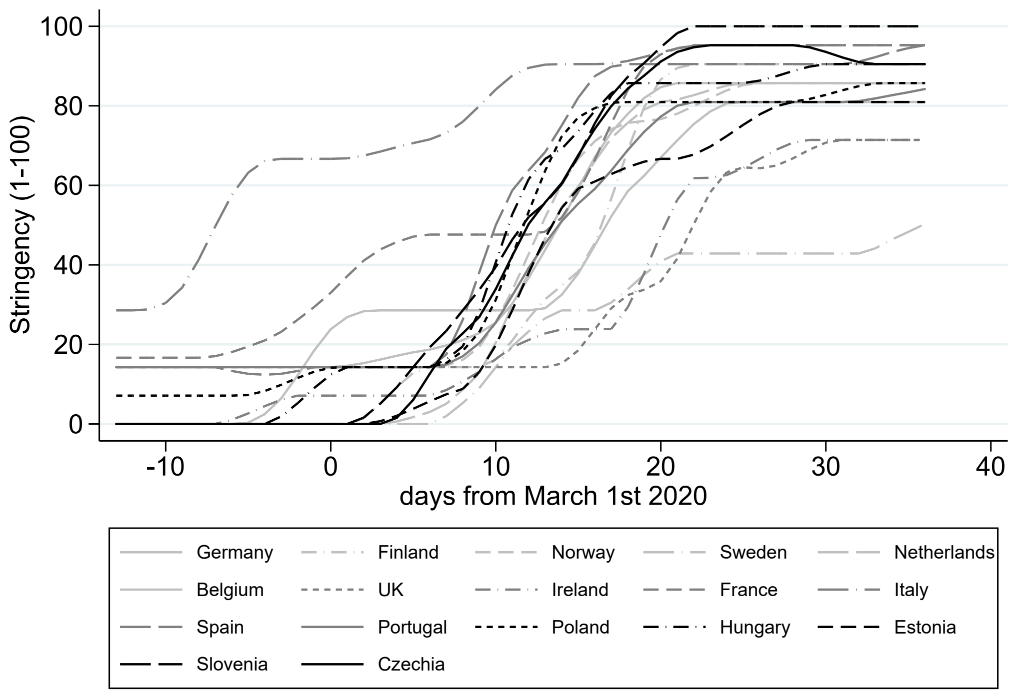
[5]Ongoing research aims to assess how citizens' trust in the government respond to information about the policy response to the pandemic (Khan et al., 2020). Past studies show that effective public intervention to contain Ebola outbreaks might have increased trust in authorities (Flückiger et al., 2019).

Figure 1: Daily Mobility and Lockdown Stringency in Europe around March 2020.

(a) Mobility Trends



(b) Stringency Trends



Source: Google mobility data and stringency data from Oxford COVID-19 Government Response Tracker (OxCGRT).

Policy Stringency. We use data on policy stringency from the Oxford COVID-19 Government Response Tracker (OxCGRT). This tracker implemented by the University of Oxford's Blavatnik School of Government systematically collects information on the measures taken by governments to tackle the pandemic since February 2020.[6] OxCGRT is based on publicly available information on 13 indicators of government response (policies such as school closures, bans on public gatherings or travel, etc., and financial indicators such as fiscal or monetary measures). Each indicator is rescaled to get a score between 0 and 100 (100 representing the highest degree of strictness/restriction). The composite stringency index we use is the daily average value of these indices on a 0-100 scale. Hale et al. (2020) describe the data in detail.[7] In Europe, stringency increases as the number of COVID-19 cases rises exponentially around mid-March. Figure 1b reports country-specific patterns, which mirror national mobility trends and hence indicate the effectiveness of policy measures overall.

2.3 COVID-related Deaths and Control Variables

After combining mobility, ESS trust data and policy stringency, our final sample (with non-missing values in key variables) includes 233 regions in 19 European countries over a period of 50 days starting from February 16, 2020.[8] Our estimations additionally control for the number of COVID-19 related deaths reported on the day before, at the country level, as this may alter individual mobility behavior. The data on COVID-19 deaths is obtained from the daily updates of the European Centre for Disease Prevention and Control (ECDC).[9]. We also include regional characteristics, namely the 2019 unemployment rate (taken from EUROSTAT data) and the population density (number of people per square kilometer in the region, taken from EUROSTAT for 2018 and completed by 2016/2017 ESS data when missing).

3 Empirical Approaches and Results

We opt for a step-by-step presentation where we describe the empirical approach and directly provide the corresponding results. We start with the direct effect of trust on mobility, ultimately using the timing of lockdown policies for a difference-in-difference approach confronting high and low trust regions. We then use policy stringency as a more time-varying treatment variable to examine the effect of trust. While our main outcome is human mobility, we also provide suggestive evidence on the potential impact of trust on the mortality growth rate.

[6] https://www.bsg.ox.ac.uk/research/research-projects/coronavirus-government-response-tracker

[7] They show that the positive correlation between stringency and the reported number of COVID-19 cases in early March is driven by Asian countries and tends to disappear as many more countries get infected.

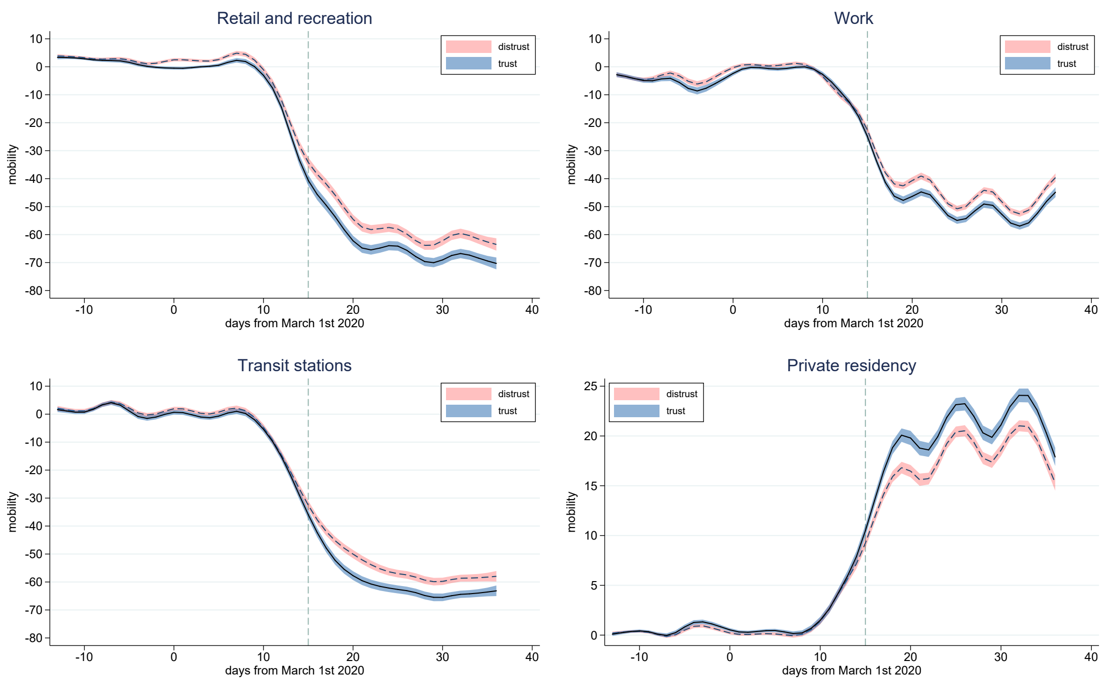
[8] With Eurobarometer trust data, the sample is slightly different, with 171 regions in 18 European countries (it does not contain Estonia and Norway while the ESS data does not include Denmark and Romania).

[9] https://www.ecdc.europa.eu/en/publications-data/download-todays-data-geographic-distribution-covid-19-cases-worldwide

3.1 The Direct Effect of Political Trust on Mobility

Graphical evidence. We first check the direct role of political trust as a shifter of the overall mobility of European citizens around March 2020. In Figure 2, we begin with graphical evidence using regional mobility trends for non-essential activities – likely to be impacted by policy responses to the pandemic (recreation, work, transport) – or, symmetrically, the index of time spent at home. In each graph, we use a local polynomial fit of the daily variation across regions of Europe and its 95% confidence interval (CI). The horizontal axis represents dates with March 1 taken as day 0. We distinguish two groups: regions with an average trust score above national average ('trust') or below ('distrust'). Note that results are very similar whether we use national mean or median. The vertical dashed line represents the average lockdown date in Europe. Before that point, the variance in mobility across European regions is small while it increases much afterwards, reflecting the diversity of behavior and policy responses across Europe as depicted in Figures 1a and 1b.

Figure 2: Daily Mobility and Political Trust (ESS):
Variation across European Regions (local polynomial fit)



Source: authors' calculations based on Google mobility data and ESS data on trust in politicians. Areas represent the 95% CI of average daily mobility across European regions, weighted by 1/number of regions in the corresponding country. Distrust indicates regions, within each country, with trust level below country average.

We see that the relative mobility indices in late February and early March is close to zero, indicating no difference compared to the prior benchmark period (Jan. 3 - Feb. 6). Most importantly, low and high trust groups show very similar trends and only tiny differences in mobility levels at this early stage. We then observe the sharp reduction in mobility (or increase in time spent at home – last graph) following national lockdown measures or recommendations. This drop is more pronounced in the group of regions characterized by higher levels of political trust, and the difference persists until the end of the period of observation. It is also suggestive to see that this pattern mainly concerns non-necessary activities (see appendix Figure A.1a).[10]

With rare exceptions, a similar pattern is found when looking at each country separately (see Figure A.2 in the appendix). It is also confirmed when using alternative measures of appreciation of the political system, including the ESS question on satisfaction with the work of the national government (Figure A.3) and the question on trust in the national government from the Eurobarometer (Figure A.4).

Basic estimations. Given the graphical evidence above, it seems reasonable to start with a simple estimation on the post-lockdown period to characterize the mobility shift induced by trust. Using regional data for the period from March 15 to April 5, we regress the mobility of region i at day t as follows:

$$Mobility_{it} = \alpha^T + \beta^T Trust_i + \gamma^T Death_{it-1} + \delta^T X_i + \theta_t^T + \mu_c^T + \varepsilon_{it}. \tag{1}$$

The regional trust level, $Trust_i$, is a continuous measure, i.e. the proportion of people with trust scores above national average.[11] We control for day dummies θ_t^T, which capture common time trends (for instance the information available to all European citizens on the pandemic situation at any point in time). We also include country dummies μ_c^T, which account among other things for national differences in the overall contagion level (e.g. an early start in Italy), for different national healthcare systems or for long-term trends in political trust at the country level (along other cultural differences). We also control for the number of people deceased from COVID-19 on the previous day, $Death_{it-1}$, which reflects the degree of exposure and the urgency to comply with containment measures.[12] We also include a vector X_i of local factors comprising the local unemployment rate (which mechanically impact on work-related mobility) and urban density (associated with the degree of exposure).

Results are reported in Table 1 for the "retail/recreation" mobility index. All models convey that the mobility of citizens living in high trust regions decreases more than in other regions ($\beta^T < 0$), which we interpret as a higher compliance with national policies encouraging self-isolation. Model (A) only accounts for country and time effects. Note that omitted variables may affect both trust and mobility. For instance, if citizens living in rural areas are older, less mobile and traditionally more in confidence with the political system, then our effect would be upward biased. Adding controls X_i in model (B) should attenuate this concern. The estimate of interest slightly decreases but not significantly so. Another potential issue is the fact that

[10]For visits to the grocery or pharmacy, mobility declines as well but not as much, and there is logically less of a trust and compliance issue so that there is no observable difference between trust groups. Results for visits to the park or other outdoor places are also more ambiguous.

[11]As explained, we aim to fully exploit regional variation in this way but our conclusions are unchanged if we use alternative regional trust aggregates or we opt for low and high trust dummies as in the graphs above.

[12]Mortality figures are at country level. Data at regional level are not systematically available for all the countries. In alternative unreported estimations, we control for the intensity of Google search for "COVID+death" at regional level to proxy the local intensity of concern regarding the risks associated with the pandemic. Our main estimates are barely changed.

we are pooling regional information from many European countries while the number of regions varies by country. To avoid giving more weight to a country with numerous regions, model (C) reweights each observation by the inverse of the number of regions in the corresponding country. The trust effect is again very similar.

Table 1: Effect of Trust on Mobility

	Basic estimation			Difference in Difference				
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Trust	-7.747***	-6.542***	-6.759***	-1.890	1.014	-0.017		
	(1.153)	(1.201)	(1.442)	(2.822)	(2.917)	(2.827)		
Post × Trust				-7.550**	-9.626***	-8.136**	-8.481***	-6.857**
				(3.022)	(3.112)	(3.231)	(3.099)	(3.250)
# daily deaths (t-1)	-0.001***	-0.001***	-0.003***	-0.014***	-0.013***	-0.011***	-0.013***	-0.011***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Regional controls X_i:								
Unemp. Rate		0.128***	0.020*		0.440***	0.463***	-0.068	-0.170*
		(0.067)	(0.069)		(0.097)	(0.095)	(0.159)	(0.101)
Population density		-0.002***	-0.001***		-0.000	-0.000	0.001**	0.002***
		(0.000)	(0.000)		(0.000)	(0.000)	(0.000)	(0.000)
Observations	5,349	4,909	4,909	8,258	7,656	7,656	7,656	7,656
R-squared	0.843	0.855	0.823	0.870	0.872	0.881	0.881	0.891
Day FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Region FE	n.a.	n.a.	n.a.	No	No	No	Yes	Yes
Region reweighting	No	No	Yes	No	No	Yes	No	Yes
Post$\times X_i$	n.a.	n.a.	n.a.	No	Yes	Yes	Yes	Yes
Elasticities with respect to trust:								
Mobility	-0.085	-0.072	-0.074	-0.083	-0.105	-0.089	-0.093	-0.075
Death growth rate	-0.096	-0.081	-0.084	-0.094	-0.119	-0.101	-0.105	-0.085

Note: authors' estimation of Google mobility index (retail and recreation) on trust data (ESS), lagged daily deaths (European Centre for Disease Prevention and Control) and regional control variables (unemployment and population density), for the period March 15-April 5 (basic estimation) or March 1-April 5 (double difference). Post is a dummy indicating the period starting March 15 (average lockdown date). Region reweighting: observations are weighted by (1/# of regions in the corresponding country). Robust standard errors in parentheses. Significance level: *** p<0.01, ** p<0.05, * p<0.1

Difference-in-difference estimations. To go further, we proceed with a difference-in-difference approach. We carry out estimations on the period March 1-April 5, using a treatment period defined as $Post = 1(date > March15)$. National lockdown announcements have taken place in a narrow time window around March 15, as previously seen in Figures 1a and 1b. Note that the next results are very similar if we rather adopt country-specific lockdown dates.[13] The first specification is a natural follow-up of the basic model:

$$Mobility_{it} = \alpha^T + \beta^T Post \times Trust_i + \rho^T Trust_i + \gamma^T Death_{it-1} + \delta^T X_i + \eta^T Post \times X_i + \theta_t^T + \mu_c^T + \varepsilon_{it}. \quad (2)$$

Note that $Post$ alone is absorbed by day dummies θ_t^T. The coefficient β^T is the double difference estimator while ρ^T represents the long-lasting differences (constant selection bias) between regions.[14] A second type of specification fully acknowledges the panel nature of our sample of

[13]These are the times of official lockdown enactment, when available, or the date of national lockdown recommendation (for Finland, Sweden, Netherlands, Hungary), as reported at: www.bbc.com/news/world-52103747.

[14]The parallel trend is verified informally by visual inspections of Figure 2 for the late February-early March period. Formal tests confirm it using placebo regressions carried out over the whole sample of regions or for each

regions and replaces μ_c^T by region fixed effects μ_i^T ($Trust_i$ is absorbed by the latter here):

$$Mobility_{it} = \alpha^T + \beta^T Post \times Trust_i + \gamma^T Death_{it-1} + \delta^T X_i + \eta^T Post \times X_i + \theta_t^T + \mu_i^T + \varepsilon_{it}. \quad (3)$$

Results of the double difference estimations are reported in Table 1. They confirm that high-trust regions decrease their mobility significantly more than low-trust regions. Model (D) controls only for lagged deaths, country fixed effects and time dummies. Model (E) includes the set of controls X_i and their interaction with *Post* (as per equation 2) Model (F) checks the sensitivity to the region reweighting procedure discussed above. Model (G) corresponds to the panel double difference estimation (equation 3) and model (H) is its reweighted version. In all these cases, the estimate of β^T is negative and of a relatively similar order of magnitude as the trust effect obtained from basic estimations on the lockdown period. In model (D)-(F), the coefficient on $Trust_i$ is not significant, indicating no difference in mobility between trust groups prior to the lockdown period. In most models, the number of COVID-related deaths on the previous day is associated with reduced mobility.

The penultimate row reports mobility elasticities with respect to trust, calculated as deviation from the mean (similar results are obtained using log-log specifications after transformation to avoid negative mobility values). It ranges from .072 to .105 across models. Note that the European average trust is .41 and the standard deviation across all regions is .10.[15] Hence, a one standard-deviation increase in regional trust (a 25% variation around the mean) leads to a decrease in mobility between 1.8% and 2.6% across models.

The above results are obtained for mobility related to recreational activities. We replicate the main estimations for the other mobility indices. Results in Table A.1 of the appendix convey very similar conclusions: the drop in mobility associated to work and transport, and the increase in time spent at home, are significantly larger in high-trust regions.

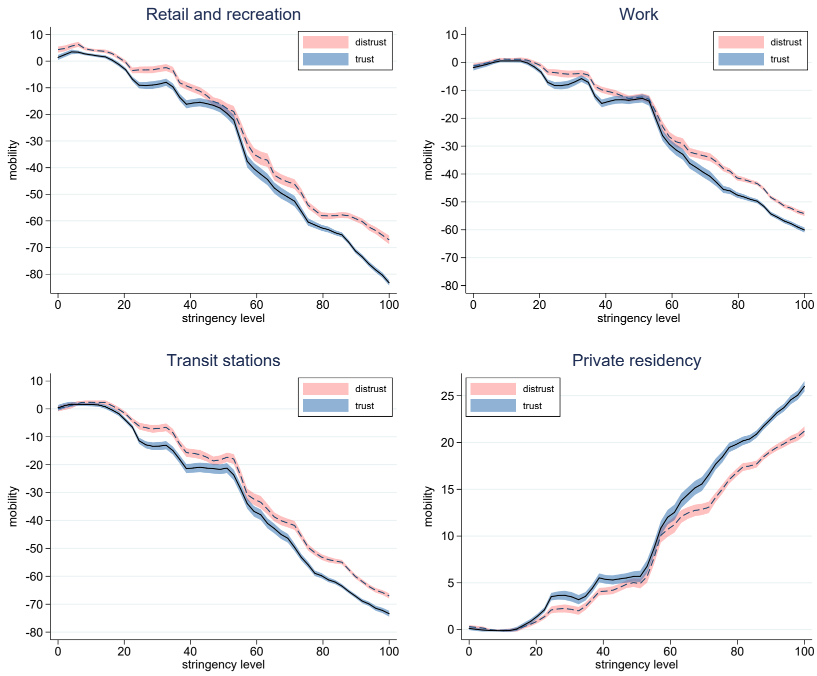
3.2 Policy Stringency and Trust

Graphical evidence. We now explore a more time-continuous variation in the intensity of lockdown policies using daily stringency measures at country level. We start with graphical evidence. Figure 3 reports the negative relationship between mobility and policy stringency, derived from time and regional variation in Europe (as represented by 95% CI). It suggests that for all non-essential activities, stricter lockdown regulations have contributed to drastically reduce human movements and, hopefully, to limit contagion. In high-trust regions, the mobility trends are shifted downward by a significant margin while, symmetrical, time at home (last graph) is shifted upward. The role of trust is nonlinear: the gap between trust groups increase with the stringency degree. Finally, these patterns are not so pronounced for necessary activities

country separately.

[15]The within-country standard deviation varies between .05 and .20, i.e. between 10% and 50% the national mean trust levels. Similar dispersions are obtained using regional trust scores rather than the share of citizens above country mean. Note also that the 90th percentile of the European distribution of region average trust scores is 2.32 times the 10th percentile.

Figure 3: Daily Mobility, Lockdown Stringency and Trust around March 2020



Source: authors' calculations based on Google mobility data, stringency level from Oxford COVID-19 Government Response Tracker (OxCGRT), and ESS data on trust in politicians. Areas represent the 95% CI of average daily mobility across European regions, weighted by 1/number of regions in the corresponding country. Distrust indicates regions, within each country, with trust level below country average.

(see Figure A.1b in the online Appendix), even though policy-defying attitudes by low-trust regions are detected also for these activities at very high stringency levels (especially for visits to the park, which are more restricted than grocery/drugstore visits in some countries).

Empirical approach and results. The double difference approach used pre and post-lockdown time variation and assumed an average policy pressure. We now exploit a time-continuous change in policies using the daily index of stringency, which also captures country heterogeneity in the strictness of lockdown measures across Europe. Estimations are carried out as before on daily regional mobility from March 1 to April 5 and using the same control variables. Different specifications are written as:

$$Mobility_{it} = \alpha^S + Z + \gamma^S Death_{it-1} + \delta^S X_i + \theta_t^S + \mu_c^S + \varepsilon_{it}$$

$$\text{with } Z = \beta_0^S Stringency_{it} \tag{4}$$

$$Z = (\beta_0^S + \beta_1^S Trust_i) Stringency_{it} + \beta_2^S Trust_i \tag{5}$$

$$Z = (\beta_0^S + \beta_{1i}^S Trust_i) Stringency_{it} + \beta_2^S Trust_i \tag{6}$$

$$\text{with } \beta_{1i}^S = \beta_1^{HS} HighStringency_{it} + \beta_1^{LS} LowStringency_{it}.$$

The first model, in equation (4), simply aims to gauge the average effect of stringency. Results are presented in Table 2. As expected, higher stringency is associated with less mobility (column

a) and this result is not sensitive to region reweighting (column b).

Equation (5) captures how political trust may increase the stringency impact on mobility. Results in Table 2 go as follows. Trust significantly increases the diminishing effect of stringency (column c): high trust regions tend to comply more to policy stringency on average. This effect holds with region reweighting (column d). As in the double difference approach, the coefficient on $Trust_i$ is not significant (no mobility difference between trust groups prior to the enforcement of lockdown policies). We also suggest a variant of this model where $Trust_i$ is replaced by region fixed effects (as for the panel version of the double difference approach). It leads to similar results, with larger estimates of the coefficient of interest β_1^S (columns e and f).

The elasticity of mobility with respect to trust, calculated around mean stringency and mean trust level, ranges between .054 and .087 across models (c)-(f). For the most flexible models (d) and (f), this average elasticity fully coincides with the direct effect of trust obtained by the corresponding difference-in-difference model (i.e. with region fixed effects). We also replicate estimations for all types of activities (Table A.2 in the online appendix). The mediating effect of trust on the efficacy of stringency is significant for the decrease in non-essential activities (recreation, work and transport) and for the increase in time spent at home. Elasticities range from .077 to 0.111 and broadly coincide with the direct trust effect.

Finally, equation (6) aims to test the nonlinearity observed in Figure 3. In Table 2, specification without (column g) or with region reweighting (column h) both convey that the impact of trust is larger at high stringency level. Equality tests reject the null with a p-value near zero in both cases. This result confirms the increasing gap between high and low trust groups seen in Figure 3. We also formally test that there is no sign reversal at very low stringency levels. This could happen in situations where low-trust regions self-isolate more than the rest because they doubt the ability of the government to respond appropriately to the crisis.[16]

Potential limitations. A number of papers have studied the role of trust with respect to policy design and the degree of law-abidingness of the citizens (Algan and Cahuc, 2009). In our context, the endogeneity of policy stringency to the country level of political trust can be questioned. As a merely suggestive check, we regress stringency on trust and standard controls (unemployment, population density) at country level and find no effect of trust on stringency (p-value: .98). Most importantly, even if national policy stringency was endogenous to trust, our approach above relies primarily on region-time variation in trust (models c-d), with country fixed effect controlling for differences in overall levels of stringency and trust across countries, or just on time variation within regions (models e-f).[17]

[16]This interpretation is actually related to very recent studies on political orientation in the US, showing that Democrats tend not to follow the President's directive and exert more social distancing than Republicans (e.g. Allcott et al., 2020 or Painter and Qiu, 2020).

[17]Another potential limitation is the fact that stringency is measured at national level. Given the emergency, lockdown policies have been implemented nationwide in most countries, even in federal states such as Austria, Belgium or Germany. Stringency may however vary (e.g. severe restrictions in Bavaria). Further work could explore regional policy measures but more disaggregated trust data would be required for identification.

Table 2: Effect of Stringency on Mobility

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Stringency	-0.510***	-0.493***	-0.407***	-0.376***	-0.385***	-0.358***	-0.417***	-0.382***
	(0.014)	(0.015)	(0.024)	(0.025)	(0.025)	(0.028)	(0.018)	(0.018)
Stringency × Trust			-0.080*	-0.091**	-0.128***	-0.120**		
			(0.044)	(0.046)	(0.049)	(0.054)		
Trust			0.231	1.007				
			(3.610)	(3.755)				
Stringency (high) × Trust							-0.110***	-0.101***
							(0.018)	(0.018)
Stringency (low) × Trust							0.071***	-0.025
							(0.024)	(0.026)
# daily deaths (t-1)	-0.025***	-0.022***	-0.022***	-0.019***	-0.022***	-0.019***	-0.021***	-0.018***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Observations	7,656	7,656	7,656	7,656	7,656	7,656	7,656	7,656
R-squared	0.894	0.898	0.896	0.901	0.904	0.911	0.896	0.901
Country FE	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Region FE	No	No	No	No	Yes	Yes	No	No
Regional controls X_i	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Region reweighting	No	Yes	No	Yes	No	Yes	No	Yes
Elasticities with respect to trust:								
Mobility			-0.054	-0.062	-0.087	-0.082		
Death growth rate			-0.062	-0.070	-0.099	-0.092		

Note: authors' estimation of Google mobility index (retail and recreation) on stringency index (Oxford COVID-19 Government Response Tracker) and trust data (ESS). All estimations include lagged daily deaths (European Centre for Disease Prevention and Control), day fixed effects and, as indicated, either regional control variables (unemployment and population density) and country fixed effects or regional fixed effects. Estimations are conducted on the period from March 1 to April 5, 2020. Region reweighting: observations are weighted by (1/# of regions in the corresponding country). Robust standard errors in parentheses. Significance level: *** p<0.01, ** p<0.05, * p<0.1

3.3 Trust and COVID-19 Death Growth Rate

We provide suggestive evidence on how trust translates into a slower epidemic growth through mobility reduction. Clearly, it is not possible to find a relationship between current mobility and future deaths, as both are highly correlated with the current mortality level. However, it is possible to establish how the upcoming death growth rate responds to the instantaneous mobility index, reflecting the efficiency of lockdown policies. Note that other factors are excluded (in March-April, none of the European countries had reached a level of infection leading to collective immunization). Our calculations are purely indicative given the medical uncertainty on key parameters.

Using international data, Soucy et al. (2020) also point to an impact of the reduction in human mobility on the infection growth rate. They find that a 10% decrease in relative mobility in the second week of March was associated with a 11.8% relative decrease in the average daily death growth rate in the fourth week of March, i.e. an elasticity of 1.18. We obtain similar results when focusing on Europe. We also suggest an alternative calculation based on daily mobility data throughout March and until April 5, fully exploiting the variation in containment policies over time and across countries. For each day, we compare the current cumulated death toll attributed to COVID-19 to that of 2 weeks ahead, and divide the corresponding growth rate by 14 to obtain a daily upcoming death growth rate. This growth rate is regressed on the instantaneous mobility index, day fixed effects and country fixed effects.

We find a significant estimate of .021 (std. err. of .0016). It yields an elasticity of death growth rate with respect to mobility of 1.19, which is very similar to Soucy et al. (2020). We combine it with our previous estimates to compute an elasticity of death growth rate with respect to trust, systematically reported in the last row of all the previous tables. Take for instance the difference-in-difference approach with regional fixed effects as baseline model. For recreational mobility, we find an elasticity of .110 in this case, i.e. doubling trust would lead to a 11% decrease in the mortality growth rate. This corresponds to a decrease from 39.1% to 34.7% in the median daily death growth rate, i.e. a doubling in the number of deaths in 2.88 days rather than 2.56 days. To get a notion of how it translates in terms of death toll, note that there was a total of 2,000 cumulated deaths mid-March in Europe and around 90,000 by mid-April (ECDC figures). Consider a benchmark variation of +25% in trust (1 standard deviation): with the baseline model, this leads to a 2.8% decrease in the mortality growth rate and 4,435 less deaths by April 15. Robustness checks confirm these orders of magnitude.[18]

4 Conclusion

Trust in governments is an important determinant of citizens' compliance with public health policies, especially in times of crisis. This relationship, rarely studied in the literature, deserves a particular attention in the present context of global pandemic. COVID-19 has forced governments to take drastic measures all over the world. Lockdown policies are often very constraining and must receive a large support by the population to be efficient – this support is not guaranteed and certainly not homogenous. Using mobility data at regional level in Europe, we show that higher political trust is associated with a larger reduction in non-essential mobility following the implementation of containment policies in March 2020. This effect is interpreted as a higher level of compliance to national directives in high-trust regions. It coincides in magnitude with the effect of trust on the efficacy of policy stringency.

Persistent differences in regional attitudes towards national policy makers are important and should be taken into account by authorities for policy design and especially for the implementation of nationwide emergency policies. This is relevant in the present context for both the enforcement of lockdown policies and the necessary roll back of these measures at the time we write these lines. Notice that regional diversity captures only one dimension of the heterogeneity in civic values within countries. Further research should attempt to exploit more local or individual data on mobility and compliance to health policies such as social distancing measures.[19] The fact that variation in trust at a broad regional level already yields significant differences in mobility responses to recent health policies is striking. New research could go further to identify relevant social groups and connect this issue with the work on conflicts. Recent episodes of social unrest (e.g. the yellow jackets in France) point to groups that show more socio-economic

[18] A two-week lag for the death growth rate calculation is the average known duration between infection and public report. Results are similar when using 1 or 3 weeks. Robustness checks also include taking out countries with less than 100 cumulated deaths at the end of the period.

[19] The conclusion of the present paper is corroborated by a survey on Danish citizen showing that the 'willingness to distance' depends on political trust, among other determinants (Olsen and Hjorth, 2020).

vulnerability and less adherence to the political system (Algan et al., 2019).

The present paper also relies on policy stringency. Much remains to be known about the causes and consequences of the great diversity of national policy responses to the pandemic. All the more so as many governments will be accountable to their population regarding the management of this crisis and the chosen tradeoff between death toll, economic downturn and other consequences of the lockdown in terms of health and mental health.

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Appendix

Table A.1: Effect of Trust on Alternative Mobility Measures

	Retail and recreation	Work	Transit stations	Private residence
	(i)	(ii)	(iii)	(iv)
Basic model				
Trust	-5.295***	-4.712***	-9.404***	2.321***
	(1.478)	(1.056)	(1.347)	(0.467)
Difference in difference				
Trust	1.014	1.775	-2.768	-0.283
	(2.917)	(1.983)	(2.362)	(0.850)
Post × Trust	-9.626***	-9.873***	-10.140***	3.951***
	(3.112)	(2.140)	(2.629)	(0.925)
Difference in difference (with regional FE)				
Post × Trust	-8.481***	-9.248***	-9.239***	3.778***
	(3.099)	(2.106)	(2.536)	(0.905)
Observations	7,656	7,636	7,351	7,153
Mean mobility index	-37.4	-27.6	-36.2	11.1
Elasticities with respect to trust (DD model with regional FE):				
Mobility	-0.093	-0.137	-0.105	-0.062
Death growth rate	-0.105	-0.155	-0.118	-0.070

Note: authors' estimation of Google mobility index (for different types of activity as indicated) or index of time spent in private residence on trust data (ESS). All estimations include lagged daily deaths (European Centre for Disease Prevention and Control), regional control variables (unemployment and population density), country fixed effects and day fixed effects. Estimations are conducted on the period from March 1 to April 5, 2020. Post is a dummy indicating the period starting March 15 (average lockdown date). Robust standard errors in parentheses. Significance level: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

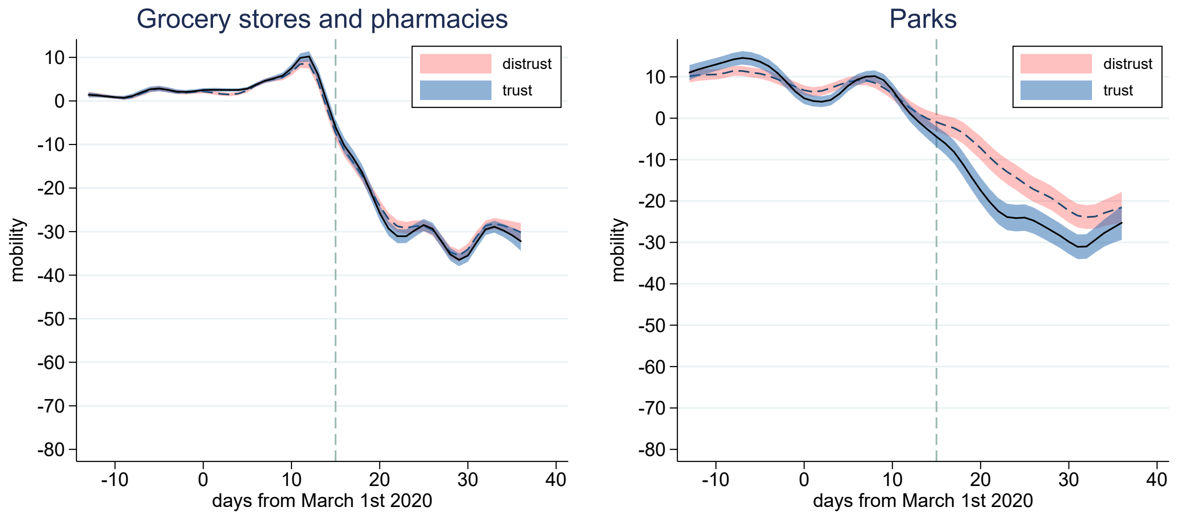
Table A.2: Effect of Stringency on Alternative Mobility Measures

	Retail and recreation	Work	Transit stations	Private residence
	(i)	(ii)	(iii)	(iv)
Stringency	-0.385***	-0.178***	-0.260***	0.052***
	(0.025)	(0.020)	(0.021)	(0.008)
Stringency × Trust	-0.128***	-0.121***	-0.111***	0.034**
	(0.049)	(0.036)	(0.041)	(0.015)
Observations	7,656	7,636	7,351	7,153
R-squared	0.904	0.905	0.922	0.906
Mean mobility index	-37.4	-27.6	-36.2	11.1
Elasticities with respect to trust:				
Mobility	-0.087	-0.082	-0.076	0.023
Death growth rate	-0.099	-0.093	-0.086	0.026

Note: authors' estimations of Google mobility index (for different types of activity as indicated) or index of time spent in private residence on stringency index (Oxford COVID-19 Government Response Tracker) and trust data (ESS). All estimations include lagged daily deaths (European Centre for Disease Prevention and Control), regional fixed effects and day fixed effects. Estimations are conducted on the period from March 1 to April 5, 2020. Robust standard errors in parentheses. Significance level: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

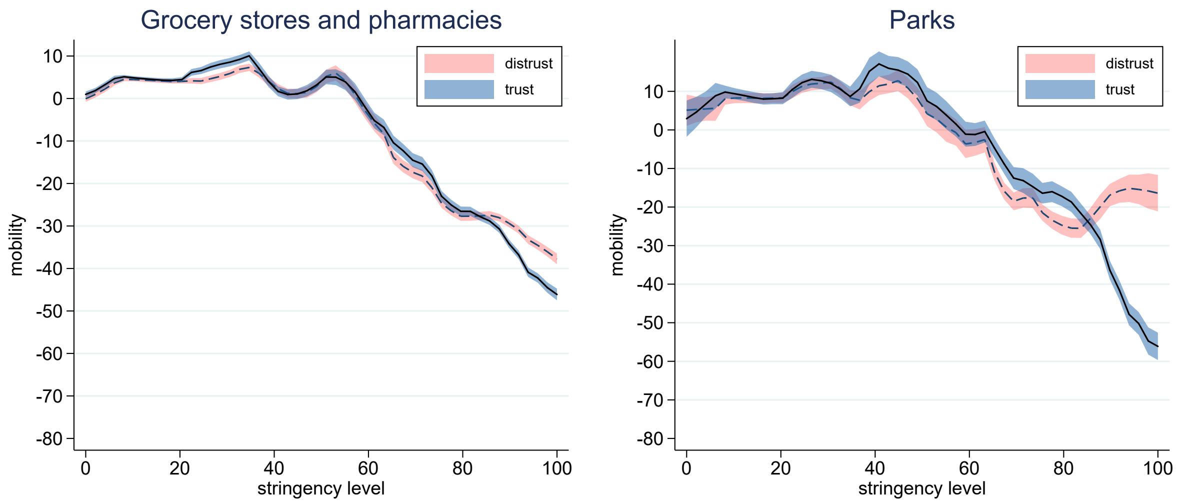
Figure A.1: Daily Mobility, Lockdown Stringency and Trust (Necessary Activities).

(a) Mobility Trends.



Source: authors' calculations based on Google mobility data and ESS data on trust in politicians. Areas represent the 95% CI of average daily mobility across European regions, weighted by 1/number of regions in the corresponding country. Distrust indicates regions, within each country, with trust level below country average.

(b) Stringency Trends.



Source: authors' calculations based on Google mobility data, stringency level from Oxford COVID-19 Government Response Tracker (OxCGRT), and ESS data on trust in politicians. Areas represent the 95% CI of average daily mobility across European regions, weighted by 1/number of regions in the corresponding country. Distrust indicates regions, within each country, with trust level below country average.

Figure A.2: Daily Mobility (Retail and Recreational) and Trust within Countries.

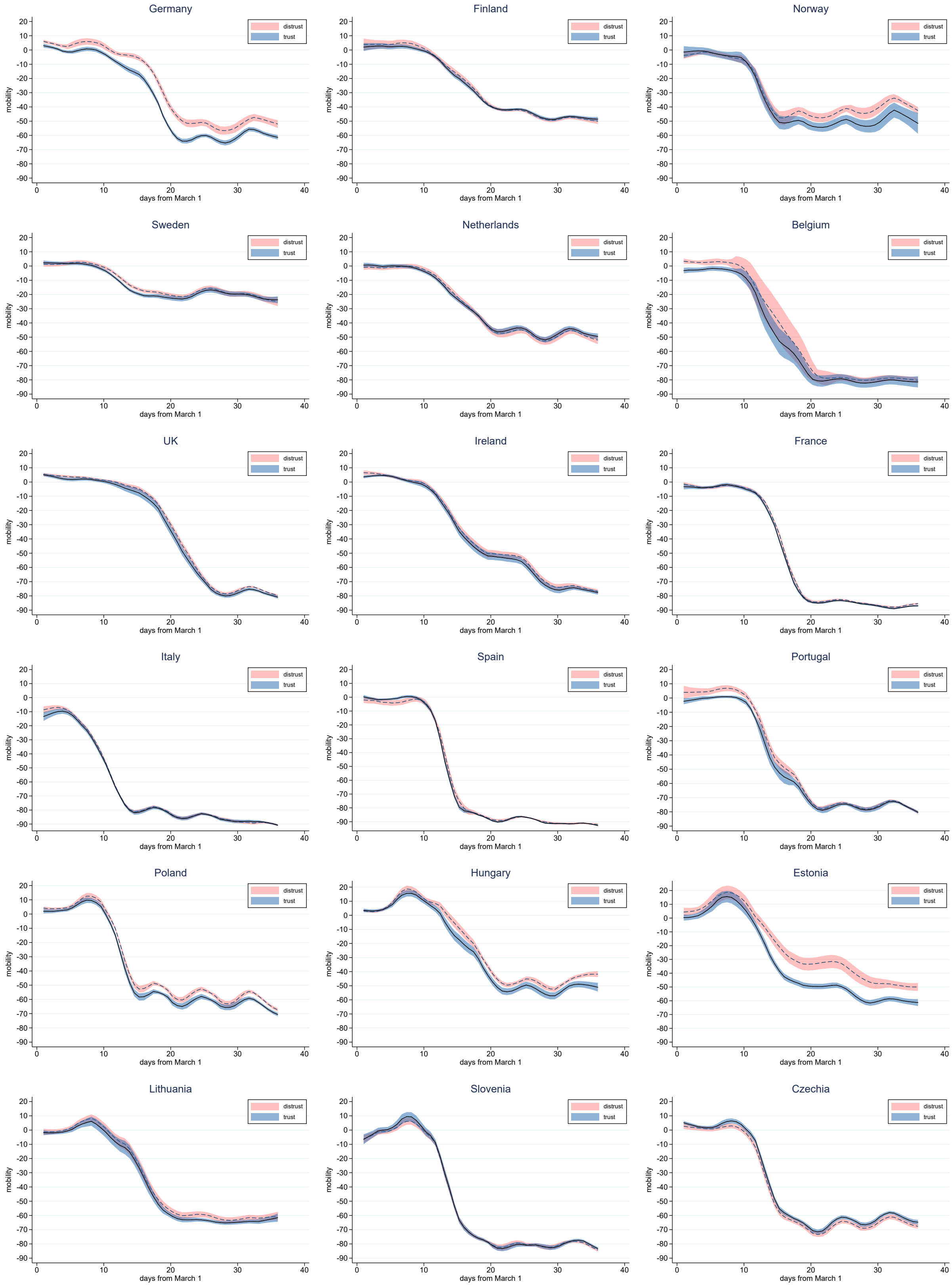
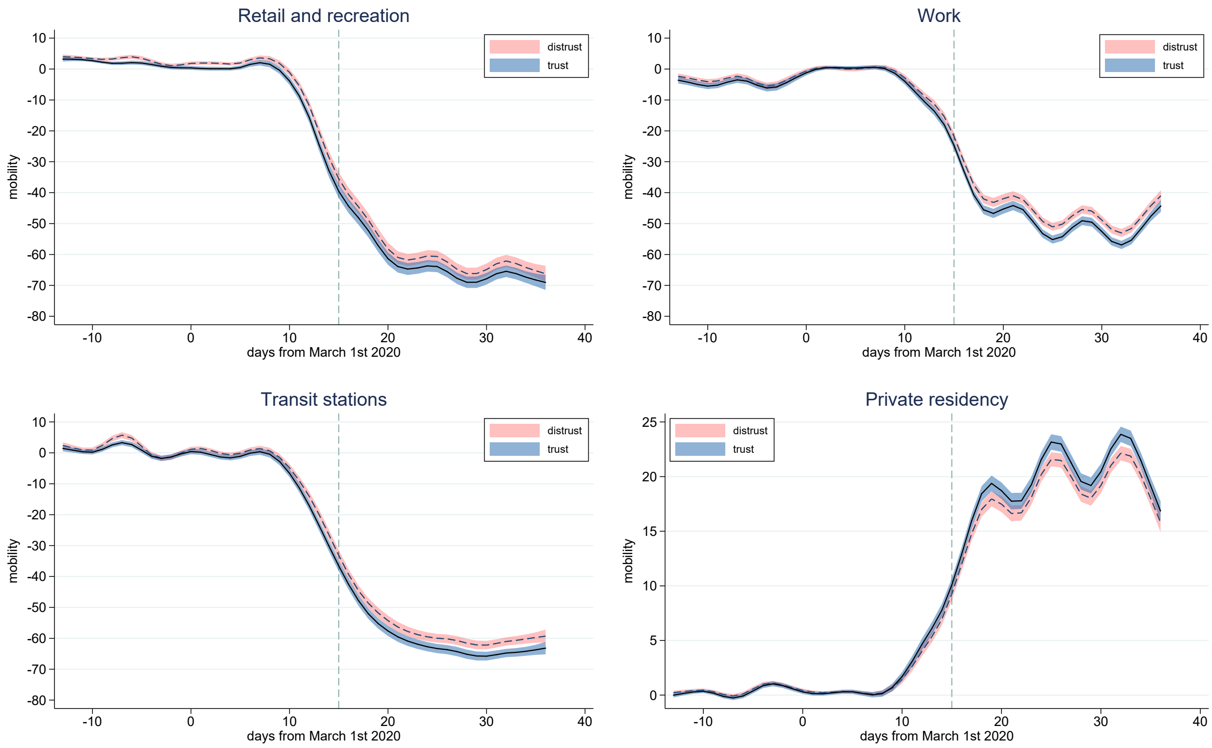
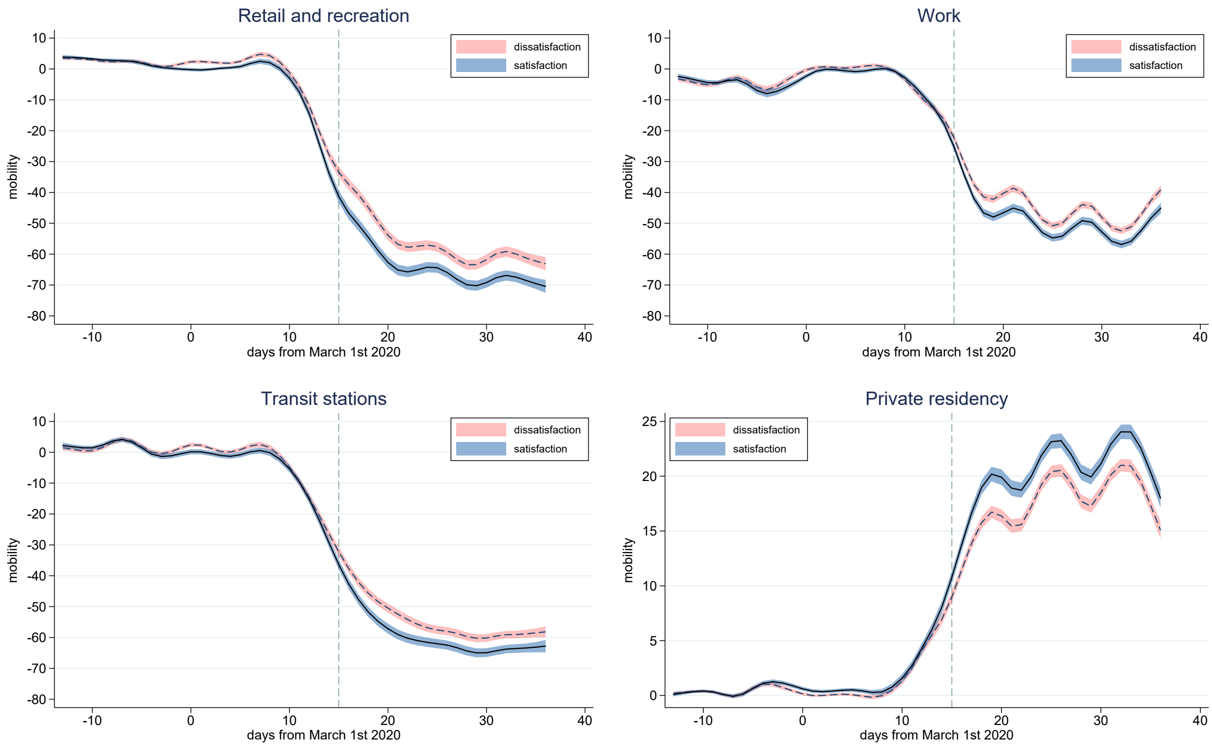


Figure A.3: Daily Mobility and Political Trust (Eurobarometer): Variation across European Regions (local polynomial fit)



Source: authors' calculations based on Google mobility data and EUROBAROMETER data on trust in government. Areas represent the 95% CI of average daily mobility across European regions, weighted by 1/number of regions in the corresponding country. Distrust indicates regions, within each country, with trust level below country average.

Figure A.4: Daily Mobility and Satisfaction in Governments (ESS): Variation across European Regions (local polynomial fit)



Source: authors' calculations based on Google mobility data and ESS data on satisfaction with government. Areas represent the 95% CI of average daily mobility across European regions, weighted by 1/number of regions in the corresponding country. Dissatisfaction indicates regions, within each country, with satisfaction level below country average.