Carrots and Sticks: Targeting the Opposition in an Autocratic Regime

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Abstract

Autocratic regimes can use carrots and/or sticks to prevent being overthrown by protests. Carrots, i.e. resource allocation, reduce the probability of protests, but cannot help to end them. Sticks, i.e. repression, reduce the probability that protests overthrow the regime, but also decrease its popularity. Using a difference-in-differences approach, I show that residential construction and military presence increase in protest municipalities after an uprising in 1953 in former East Germany. This cannot be explained by pre-existing differences, demand for housing, or external warfare considerations. Carrots were furthermore used to counteract sticks' negative effect on popularity. More construction is associated with more regime support.

JEL Codes: D72, D74, N44, P26

1 Introduction

The majority of the world's population lives in autocracies (The Economist Intelligence Unit 2022). To stay in power, autocratic rulers need to prevent protests or — if this fails — contain them quickly. In an immediate response to protests, autocracies often resort to violent means, such as employing the military. However, it is less clear to which actions they turn after successfully suppressing protests to prevent future uprisings. On the one hand, they can employ *sticks* and build up an infrastructure that allows them to quickly put an end to any protests, e.g. the military. On the other hand, they can invest in *carrots*, e.g. by improving living standards, and thereby increasing acceptance of the regime and preventing protests. Employing sticks is costly, as it decreases support for the regime, while employing carrots does not help to dissolve existing protests.

This paper studies one particular autocratic regime, the German Democratic Republic (GDR), to explore how autocracies respond to the threat of protest. To identify locations with a high protest potential, I exploit the failed Uprising of June 1953, during which people protested against the regime across the country. I collected a novel data set covering protests, housing construction, and the presence of military units at the municipality-year level to measure the use of carrots and sticks before and after 1953. Housing and military units are arguably among the most salient and visible forms of carrots and sticks in the GDR.

My findings demonstrate that opposition municipalities, i.e. those with protests in June 1953, experienced an increase in both residential construction and military units and that the regime used carrots and sticks as complements. I argue that using only sticks would have increased the dissatisfaction of the population, thus elevating the risk of another uprising. I evaluate the effectiveness of this approach by looking at the first free election after the end of the GDR in December 1990. Protests in 1953 do not predict votes for the former regime party, but municipalities with more residential construction experienced a lower decrease in support for the regime. The government thus effectively used construction to increase support.

Panel A of Figure 1 shows the first key finding: After some municipalities revealed their willingness to openly threaten the regime, residential construction in-

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creased in these locations.[1] On average, protest municipalities experience an additional construction of 0.878 flats per 1,000 inhabitants and year, which is around a third of average yearly construction. Reassuringly, construction levels were nearly identical beforehand, alleviating concerns that differences after 1953 are driven by unobserved differences between protest and non-protest municipalities.

Panel B shows the second key finding: The regime also targeted protest municipalities with sticks by increasing military presence.[2] Since 1953 around 0.2 additional units were stationed in protest compared to non-protest municipalities, which is around 15 % of the average number of military units after 1953. This cannot be explained by pre-existing differences as protest and non-protest municipalities had the same number of military units stationed around them prior to 1953.

These findings are best interpreted as a deliberate political response to the manifestation of opposition, rather than to other correlated factors. First, protest activity is uncorrelated with a number of covariates, such as former support for the regime, population (growth), manufacturing or construction employment shares, and housing demand. Second, results are not driven by other factors, such as demand for residential construction or external warfare. Third, the government played a direct role in these increases, as an increase in state-led construction indicate. Lastly, the findings extend to other forms of carrot and stick, stores selling consumption goods and more establishments of the secret police, indicating that there was a broad strategy of targeting the opposition with carrots and sticks.

Targeting municipalities with carrots led to a relatively higher support for the former regime party in the first free, fair, and secret election in 1990 after reunification. Estimating a cross-sectional model, I find that construction increases popularity of the regime, but military units do not have an effect.

Residential construction and military units in the GDR offer an ideal setting to study the allocation of carrots and sticks in autocratic regimes for three main reasons: First, the Uprising of 1953 revealed the location of a potentially threatening opposition to the government. In authoritarian states, where people usually hide

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1. I restrict the analysis to municipalities with 2,000 and 10,000 inhabitants in 1950. Including all municipalities does not materially alter results (see Figure A1).

2. As military units were mobile and could be used against protesters in close-by municipalities, I consider all units within a 20 km radius around the center of municipalities.

their opposition to the government, protests can be seen as an information signal on local discontent (see Lorentzen 2013).

Second, residential construction and military units in the GDR are relevant measures of carrots and sticks. One of the main complaints of GDR citizens was the lack of adequate housing and there is ample historic evidence that the National People's Army (NPA) was regarded as a force that could be used against citizens. The GDR's planned, socialist economy guaranteed full employment throughout the country and military units did not increase local living standards, alleviating concerns about potential positive spillovers from military units to local surroundings.

Third, while existing autocracies rarely publish reliable information on themselves (Hollyer, Rosendorff, and Vreeland 2011; Martínez 2022), I overcome this problem with a novel, extensive data set at the municipality level based on declassified internal sources that were only available to a selected bureaucrats during the time of the GDR, or on sources that were collected after the fall of the regime.

This paper is connected to the literature on how autocratic rulers react to protests to stay in power.[3] In Acemoglu and Robinson (2005), for example, a ruling elite reacts to the threat of protests with repression or concessions according to the associated costs. Campante, Chor, and Li (2023) show that after local labor unrest due to economic shocks in China, the government pays more attention to maintaining social stability and according to official data on fiscal expenditure public security and social spending increases. My paper adds empirical evidence on local carrots and sticks over a longer horizon (nearly 40 years), and additionally provides evidence on how these policies affected regime support.

This paper also relates to the literature on the allocation of resources in autocracies. Lazarev and Gregory (2003) find evidence for a political gift exchange model in the context of 1930s Soviet Russia. Closest to my paper is Thomson (2017), who examines the reactions of the GDR government to the Uprising of 1953, but focuses

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3. In the more general literature on the tools that autocracies employ to secure their power, sticks are commonly discussed (Acemoglu, Hassan, and Tahoun 2018; Davenport 2007a, 2007b; Escribà-Folch 2013; Gregory, Schröder, and Sonin 2011). Using sticks affects regimes' popularity (Bautista et al. 2023). There is also a literature discussing how carrots can be used to secure power (Desai, Olofsgård, and Yousef 2009; Gandhi and Przeworski 2006; Gandhi 2008), or both carrots and sticks (Gerschewski 2013; Wintrobe 1990). The local use of carrots and sticks before autocratic elections has also received attention (for example Timothy Frye 2019; Alberto Diaz-Cayeros 2003).

on power struggles within the ruling elite. He finds no correlation between protests and food allocation afterwards at the level of counties (*Kreise*), but protest counties seem to receive more unofficial Stasi informants after 1953.

Last, this paper adds to the literature that exploits the GDR as a natural experiment. This literature ranges from macroeconomics (Alesina and Fuchs-Schündeln 2007; Fuchs-Schündeln and Schündeln 2005), the role of media (Bursztyn and Cantoni 2016; Kern and Hainmueller 2009), to the determinants and effects of social ties (Burchardi and Hassan 2013; Crabtree, Darmofal, and Kern 2015; Lichter, Löffler, and Siegloch 2020; Stegmann 2019).

The remainder of the paper is structured as follows: Section 2 gives a short overview of the historical background. Section 3 discusses the data. Section 4 analyzes drivers of protests in 1953. Section 5 containts the empirical analysis for carrots, i.e. construction and stores, and sticks, i.e. military and Stasi presence, followed by their interaction. Section 6 discusses the resulting change in popularity of the regime as measured by voting results. Section 7 concludes.

2 Historical Background

The German Democratic Republic (GDR) was formally founded in 1949 and existed until 1989/90, spanning the eastern part of Germany except for West Berlin, i.e. the former Soviet occupation zone. It was an authoritarian, socialist, and centrally-planned country and ruled by the Socialist Unity Party of Germany (SED).

Uprising of 1953 and Policy Response
The Uprising of 1953 began in Berlin on June 16th, but quickly spread across the whole GDR. Around 700,000 people (10 % of the working population) took part in protests over the next days (Koop 2003, p. 349f). Protesters had a variety of demands, such as reunification, democracy, and higher living standards. Eventually, the Soviet military violently stopped protests, and there were at least 55 casualties.

The Uprising had a long lasting impact on the subsequent history of the GDR. Ruling SED elites began to follow a carrot and stick approach to prevent a second uprising (Diedrich, Ehlert, and Wenzke, 1998, p. 202). There was an immediate

reaction in the construction sector, where planned investments for the construction of manufacturing plants were reassigned in the course of the second half of 1953 to increase residential construction (Buck 2004, p. 151). At the same time, the regime also built up an extensive security apparatus, for example by founding the National People's Army or increasing the size of the secret police.

The events of 1953 haunted the regime until its end: During the increasing instability in August 1989, the Minister for State Security asked "Will June 17th erupt tomorrow?" to which a colonel answered "It won't happen tomorrow, it won't happen, that's what we are here for" (Mitter and Wolle 1990, p. 125).

Housing and Construction in the GDR

Housing was an important pillar of the GDR's social politics. Even though new construction programs were introduced regularly, the gap between demand for housing and its supply could never be closed. In 1945, around 10 % of the housing stock in the GDR was destroyed. In the first post-war years there was only little construction, instead the government expropriated home owners to assign new residents to their houses and (provisionally) repaired destroyed flats. Authorities could ban migration to municipalities in which housing was too scarce, but even in other areas each move between flats within or across municipalities required state approval. Because state-led construction by cooperatives had priority over the renovations and private construction, the housing stock and living standards deteriorated (Melzer and Steinbeck, 1993, p. 11).

The lack of construction largely impacted people's satisfaction with the regime: The largest share of citizens' petitions to the government continuously related to housing (Buck 2004, p. 258f). Residential construction was widely appreciated and people were very satisfied with the quality provided (p. 384). New construction also benefited people beyond the circle of people that moved into it, for example for parents that no longer had to share their apartment with their grown children.

The National People's Army

After World War II, East Germany was initially banned from establishing an army. Re-militarization started indirectly in 1949 when police units with a secret military

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character were created. These highly armed police units only differed from actual army units through their label and were immediately renamed and incorporated in the National People's Army (NPA) after its official foundation in 1956.

The Uprising in 1953 shaped the development of armed forces, which were seen as part of a security apparatus that ensured stability. The NPA officially had the task to take actions against the population in case of unrest. Willi Stoph, Minister of National Defence, even stated in an interview that the NPA had the task to "secure peace internally and externally, [...] to prevent or defeat potential counterrevolutionary provocations on the territory of the GDR" (Glaser 2009, p. 26). When protest activities in 1989 began to spread, the government discussed the potential involvement of military troops (ultimately deciding against it).

Unlike in other settings, not a single municipality in the GDR tried to actively attract military establishments. Only very few people benefited from military establishments economically, while they constituted an economic and social burden for the majority of the population (Kersten et al. 2011, p. 36). Army bases did not benefit local labor markets where full employment was guaranteed by the socialist system. In addition, they were highly unpopular as citizens were aware that the NPA might be targeted against them.

3   Data

Data on authoritarian regimes are often unreliable (Magee and Doces 2015; Martínez 2022), making empirical analysis difficult. In the GDR, official residential construction statistics counted every new space in a retirement home as a new flat, so that official construction was overstated by around 1.2 million units from 1970 to 1989 (Statistisches Bundesamt 1993, p. 6). This would be problematic for the empirical analysis if the spread between actual and recorded construction differs in protest and non-protest municipalities, which might occur if the regime wanted to pretend that it was increasing living standards in certain areas. I therefore collected a novel data set relying only on data collected after the fall of the GDR or collected for internal purposes only.

All variables and data sources are presented in section A.1 in the Appendix.

Residential Construction

A flat is defined as any number of co-joined rooms used as living space, which have their own entrance, thus also including single family houses. Yearly construction levels are normalized by population to make the number of flats across municipalities more comparable.

One might be worried that demolitions bias results. This would only be the case if they occurred between 1946 and 1994 and at a different rate in protest and non-protest municipalities. This seems unlikely. First, there is no evidence for widespread demolitions in the GDR, as the housing stock was already considered too small. Second, available statistics on aggregate demolitions since 1993 (the earliest year available) show that demolition levels were low before 1997 (see Figure A3 in the Appendix). Third, it is also reasonable to expect that mostly buildings that pre-dated the GDR would have been demolished. Construction in protest municipalities would be understated if they experienced more demolitions of buildings built between 1946 and 1989. In this case, my results my results offer a lower bound of the actual increases in housing. Construction would be overstated if there were more demolitions of buildings built between 1946 and 1989 in non-protest municipalities. However, if this happened before 1990, the available housing stock in protest municipalities would have been larger, in line with the interpretation of my results.

Protest Data

I interpret the incidence of protest activity as a signal that some opposition against the regime existed within a municipality.[4] Protests are coded as a dummy for municipalities for which either a protest, demonstration, strike, or violence against individual persons or institutions between the 16th and 21st of June 1953 is documented (Kowalczuk 2003). Data on the intensity of events are not available. Kowalzcuk notes that it is likely that all places with at least 10,000 inhabitants

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4. This is similar to Lichter, Löffler, and Siegloch 2020, where differences in riot intensity in the GDR counties proxy for the strength of the opposition, and Lorentzen (2013) where local protest activity are seen as an information signal on opposition by different social groups in China.

which experienced some form of protest are included, but potentially not all places with less inhabitants. This exclusion of smaller municipalities is likely to be random, and will therefore only lead to attenuation bias. Figure 2 presents the location of all protests that I could match distinctly to a municipality.

Summary Statistics

Table 1 presents summary statistics for municipalities that had between 2,000 and 10,000 inhabitants in 1950 (see Figure A6 for their location). Restricting the sample in this way makes treatment and control group more comparable especially since the likelihood of protests potentially differs by population. 197 municipalities in the dataset experience a protest, 710 do not.[5]

Protest municipalities have a larger population in all years. In 1950, for example, protest municipalities had on average 4,915 and non-protest municipalities had 3,915 inhabitants. The share of manufacturing and construction workers in 1950 does not differ between municipalities and was around 22 and 5 %, respectively. The share of votes for the SED in 1946 was larger in non-protest municipalities (0.462 compared to 0.444). Around 5.8 % of the population in protest municipalities was looking for a flat in 1954, compared to 5.3 % in non-protest municipalities (no statistically significant difference). There were also no differences in the share of buildings that was destroyed in 1945 between the two groups of municipalities. Protest municipalities were 28 km closer to Berlin, but 12 km further away from any external border of the GDR. The number of observations differs across measures because of idiosyncratic availability of archival records.

Before 1953, construction and military presence is the same in protest and non-protest municipalities. Each year around 1.4 flats were built in and 1 military unit stationed around protest and non-protest municipalities. After 1953, yearly construction and military presence is higher in protest than in non-protest municipalities (3.3 versus 2.4 flats per 1,000 inhabitants and 1.5 versus 1.3 military units stationed within 20 km). Protest municipalities are also have more secret Stasi objects than non-protest municipalities in 1990 (0.40 versus 0.25).

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5. Appendix Figure A7 shows the share of protest and non-protest municipalities for different population bins. Results are also robust for other population bins (see Appendix Table 1).

4 Determinants of Protests

The following linear probability model tests which variables predict protest activity,

$$Protest_m = \beta_1 Controls_m + \beta_2 Population_m + \alpha_c + \varepsilon_m, \qquad (1)$$

where $Protest_m$ is a dummy variable that indicates whether any protest activity occurred in municipality m in 1953, $Controls_m$ are different municipality level controls, namely geographic location, political preferences, population growth, industry structure, housing demand and military presence, and $Population_m$ is population in the year 1950, the closest census year to 1953, in m. α_c are county fixed effects according to county borders in 1953. Standard errors are calculated using county clusters or Conley standard errors with a 30 km threshold. I limit the sample to municipalities that had between 2,000 and 10,000 inhabitants in 1950 in line with the empirical analysis in the following sections.

Table 2 presents the results of Regression 1. All specifications control for population in 1950 — which is correlated with protests at the 1 % level in column 1 to 8 — and county fixed effects. In column 1, I examine geographical factors that could affect protest activity. Protests began in Berlin and spread from there, but there is no significant relationship between distance to Berlin and protest activity, nor did distance to West Germany (excluding Berlin) matter. County capitals, which were the local center of state activity, are more likely to have protests (significant at 1 % level), potentially because protesters could directly protest in front of representatives of the regime. If protesters from surrounding municipalities traveled to county capitals to protest there, we would expect that places closer to county capitals would be less likely to have had protests as inhabitants traveled to the county capitals instead. This is not the case: there is no statistically significant relationship between distance to county capitals and protests.

In 1946, the only democratic election until 1990 took place in the GDR and the ruling party received 48 % of all votes. Neither the vote share for the SED nor turnout in 1946 predict protests (column 2). This suggests that protests in 1953 provided the government with new information on the location of an opposition in municipalities, which they could not infer from the election results in 1946.

Faster population growth after World War II might have led to local discontent. Protest municipalities did not experience different population growth between 1946 and 1950 compared to non-protest municipalities (column 3). The composition of the population in terms of where they are employed does also not exhibit differences: The share of industrial workers or the share of people working in construction does not affect protests (column 4).

An important concern is whether municipalities with a higher demand for housing were more likely to protest. In columns 5 to 7, I examine to what extent housing demand is correlated with protests. I first use information on the share of people searching for a flat in 1954. Protests were more likely in municipalities in which a larger share of the population was searching for a flat (significant at the 5 % level, column 5). However, this measure of demand for housing was gathered after protests took place and might be influenced by them, for example if protests made people more likely to tell the government that they were in need of housing. As a second measure of housing demand, I look at municipal war destruction, which was determined before 1953. As this measure is only available for one region, Saxony, the number of observations drops in column 6. There is no significant relationship between war destruction and protests. As a third measure, I use the number of air strikes that targeted a municipality during World War II as a proxy for war destruction. The coefficient is close to 0 (and precisely estimated), indicating that this does not predict where protests occurred (column 7). These results thus only provide limited evidence that demand for residential construction drove protest activity. The explanatory power of these coefficients as measured by the R^2 is comparable to that of the other potential explanatory variables.

Last, I examine whether the local presence of barracked police units differs between protest and non-protest municipalities. This would be problematic if the existence of the barracked police makes protests less likely, and after 1953 places that did not have any military yet started to receive military units. However, there is no statistical significant relationship between barracked police units in 1952 and protests in 1953 (column 8).

In column 9, I look at all potential correlates simultaneously (excluding war destruction in Saxony, because of the small sample size, and the barracked police

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unit dummy, because they did not exist in 1953 in any municipality in the sample for this regression). Population no longer predicts the occurrence of protests. County capitals are more likely to have protests. Demand for housing in 1954 is no longer statistically significantly correlated with protests in 1953, whereas distance to the West border excluding Berlin now negatively predicts protests.

As protest activity is not correlated to nearly all of these extensive covariates, this eases concerns about omitted variable bias. In addition, this suggests that protests served as an information signal about the position of an opposition for the regime, because protest municipalities were not confined to a specific type of municipality, for example, municipalities with a lot of industrial workers.

5 Empirical Framework and Results

5.1 Carrots: More Residential Construction in Protest Municipalities

The following difference-in-differences (DiD) model analyzes how construction changed in opposition compared to non-opposition municipalities after protests

$$Construction_{mt} = \beta Protest_m \times Post1952_t + \alpha_m + \alpha_t + \varepsilon_{mt}, \qquad (2)$$

where $Construction_{mt}$ is the number of new flats per 1,000 inhabitants in municipality m and year t. $Protest_m$ is a dummy variable that takes the value 1 if a protest occurred in municipality m in 1953. $Post1952_t$ is a dummy for all years after 1952. I choose 1953 as the first year of treatment investment plans for construction were changed immediately after protests in June 1953 so that more means could be used for residential construction (see Section 2).

Protest municipalities might exhibit higher levels of construction at all times or the increase in construction in protest municipalities after 1952 is just part of a general increase in construction. By including municipality, α_m, and time fixed effects, α_t, I exclude all time-constant level differences between municipalities and all increases in construction that occur for all municipalities.

The error term ε_{mt} is calculated in three ways: clustered at the municipality and district level and Conley standard errors with a cutoff of 30 km.[6] I restrict the analysis to municipalities that had between 2,000 and 10,000 inhabitants in 1950 to make control and treatment groups more comparable and to reduce problems of spatial correlations between error terms in DiD settings (Ferman 2023).

Table 3 presents the results of Regression 2.[7] In column 1, I do not include fixed effects. Protest and non-protest municipalities do not have different construction levels before 1953; the coefficient of *Protest1953* is small and not significantly different from zero, in line with the pattern observed in Figure 1. The coefficient of *Post1952* is 1.030 (significant at 1 % level), i.e. yearly construction increased by around 1 flat per 1,000 inhabitants after 1952. There is an additional increase in construction of 0.878 flats per 1,000 capita in protest municipalities (significant at 1 % level). The increase in construction after the Uprising is thus nearly 90 % larger in protest compared to non-protest municipalities.

Including year and municipality fixed effects does not affect the coefficient: protest municipalities see an additional yearly construction of 0.878 flats per 1,000 inhabitants (significant at 1 % level, column 2).[8] Adding county-year fixed effects as many construction decisions were made at this level, does not change magnitude or significance (column 3).[9]

If construction patterns between protest and non-protest municipalities already diverged before the Uprising, this would raise doubts as to whether differences are causally related to protest activity. Figure 3 thus provides more detailed evidence on the timing and presents yearly coefficients with 1946 as the baseline year. Construction does not differ between protest and non-protest municipalities until 1952. Beginning in 1953, construction increases in protest compared to non-protest municipalities. Individual year coefficients are positive, but mostly not statistically

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6. There might exist spatial correlation between municipalities. In contrast to the settings in Kelly (2019), I observe the outcome before the treatment and can control for municipality fixed effects, which accounts for all spatial correlations with are constant over time.

7. Appendix Table A.1 shows results for different size bins, including a specification with all observations. In all instances, the coefficient is significant at the 1 % level.

8. We expect coefficients in column 1 and 2 to be identical, because the analysis is based on a full panel in which treatment occurs at the same point in time for all treated observations.

9. In Appendix Table A2 I addtionally examine the size and amenities of new living units.

significantly different from zero at the 5 % level as this is a demanding specification. Overall construction increased from 1956 to 1960, which benefited protest more than non-protest municipalities. Construction patterns diverge even more after the construction of the Berlin Wall in 1961, but start to converge after 1965 when supply bottlenecks and the reallocation of resources to other sectors decreased overall construction until there are no longer any differences in the early 1980s. At the end of the 1980s, construction in protest municipalities increases compared to non-protest municipalities, indicating that protest municipalities were targeted with carrots until the demise of the GDR.

Political Economy: Who Increased Construction?

To understand the political economy behind the increase in construction in opposition municipalities, it needs to be established whether this was brought about by the regime. While some limited private construction existed — with permissions to build for individuals that could privately obtain the necessary materials — the government strongly favored state-led construction. If the state directly channeled more resources to protest municipalities, state construction would thus increase there. This is in fact the case: column 4 in Table 3 shows that state-led construction goes up by 0.897 flats per 1,000 inhabitants (significant at the 1 % level).

Another way to assess the GDR government's role is to look at construction patterns after the regime ceased to exist. If increases in construction were brought about by the regime, they should disappear after 1990. In column 5, I examine aggregate construction from 1990 to 1994: Construction is around 2.7 flats per 1,000 inhabitants lower in protest municipalities from 1990 to 1994.[10] The negative coefficient is consistent with mean reversion, where non-protest municipalities received less construction until 1990, and thus exhibit a larger need for construction after reunification. Overall, the results show that the increase in construction is likely to be the result of actions by the regime.

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10. Estimating this for the year 1989 gives a coefficient of 0.109 with a standard error of 1.403.

Political Economy: Why did Construction Increase?

There are several potential explanations why the regime increased construction in protest municipalities. Instead of wanting to buy off its opposition, the regime might have targeted places with a higher demand for housing or places with a certain type of workforce. While Table 2 only shows limited evidence that covariates are correlated with the occurrence of protests, I extend the DiD model to the following more generalized approach to see whether omitted variable drive results

$$Construction_{mt} = \beta Protest_m \times Post1952_t + \gamma Controls_m \times Post1952_t +$$
$$\alpha_m + \alpha_t + \varepsilon_{mt}, \tag{3}$$

where $Construction_{mt}$, $Protest_m$, $Post1952_t$, α_t, α_m, and ε_{mt} are defined as before. $Controls_m$ are a number of control variables interacted with a dummy for the period post 1952 (except for population where I can use yearly data).

Results are shown in Table 4. Population differences between protest and non-protest municipalities might drive results, even after restricting the sample to places with a comparable population in 1950. In fact, larger municipalities receive less per 1,000 capita construction, but importantly the main coefficient of interest increases slightly in size and remains significant at the 1 % level (0.947, column 1).

Another important potential omitted variable is demand for housing. Reconstruction efforts after World War II were still far from completed by 1953. To test whether the regime simply started to address the housing shortage after the Uprising, I use three different measures for the local demand for housing: (1) the share of households looking for a flat shortly after protests took place, (2) war destruction for a subset of municipalities, and (3) the number of air raids that targeted a municipality during World War II.

The share of households looking for a flat in January 1954 positively predicts construction after 1952, implying that the regime did in fact target municipalities that had a larger need for construction. Magnitude and significance of the coefficient of protest activity remains unchanged (0.690, 1 % significance level, column 2). However, maybe local officials in protest municipalities reported less demand than actually existed. Therefore, I next turn to the share of buildings destroyed in

1945, which was collected prior to 1953. War destruction negatively predicts construction after 1953, i.e. in municipalities that were destroyed to a larger extent more construction took place. But, even after controlling for war destruction, the protest coefficient remains nearly the same (0.778, significant at 5 % level, column 3). In column 4, I include the number of air raids that targeted a municipality as a control variable, and the coefficient of protests post 1952 remains nearly unchanged (0.891, significant at 1 % level). Air attacks do not not predict construction after 1953, indicating that this might be an imprecise proxy of housing demand. Protest municipalities experience a larger increase in construction than would be predicted based on the regime only being responsive to housing demands.

The GDR could have targeted construction or manufacturing workers for ideological reasons in its new social policy after 1953. Column 5 and 6 present coefficients when controlling for the share of construction workers and the share of manufacturing workers. The coefficient of interest remains nearly unchanged (0.749, significant at 5 % level, and 0.864, significant at 1 % level). There is thus no evidence that the increase in construction in protest municipalities was the result of the regime targeting construction or manufacturing workers.

Column 7 tests whether initial support for the regime drives results or whether protests provided the regime with additional information on the opposition. Areas with higher support for the regime party in the election of 1946 received less construction and protests municipalities exhibit higher construction (0.889, significant at 1 % level).

Column 8 controls for all factors simultaneously, and results again remain very similar: protest municipalities are associated with 0.940 additional flats per 1,000 inhabitants in each year after 1952. Taken together, the results provide convincing evidence that construction in protest municipalities increased because of their opposition to the regime, and not because of other local characteristics.

To gauge how results might be biased through unobservables, I apply the approach by Altonji, Elder, and Taber (2005) (using the coefficients from column 8 of Table 4 and column 1 of Table 3). The negative ratio (-15.161) suggests that the coefficient of interest is downward biased, as observables are on average negatively correlated with protest activity.

Targeting the Opposition

Potentially the regime might have directed resources towards opposition municipalities to target its supporters within these locations. Archival evidence suggests that this was not the case, and instead the government ardently tried to alleviate housing concerns of regime opponents. In a report from 1981 the difficulties of finding a flat are discussed as a driving factor why GDR citizens wanted to resettle to West Germany. While individuals that planned to resettle to the West were regarded as regime opponents, the administration elaborately discussed how to solve the underlying housing issues and provided individuals with new flats wherever possible.

To test more formally who was targeted, in absence of information on who moved into the new flats, I compare the results of regression 2 for municipalities with different amounts of local supporters. If the regime wanted to target supporters in hostile regions, we would expect them to channel more resources towards opposition municipalities with a larger supporter base.

First, I compare county capitals, i.e. the seats of county administrations that were staffed by people supporting the regime, and all other municipalities. Columns 1 and 2 of Table 5 show that additional construction does not differ between county capitals and other municipalities (0.520 additional flats, not significant, versus 0.446 additional flats, significant at 5 % level).

Another second way to proxy the amount of local supporters is by turning to voting results in 1946 and comparing areas with voting shares for the SED was below and above the mean. In municipalities with a vote share below the mean, protest municipalities receive 1.378 additional flats per 1,000 inhabitants after 1952 (significant at 1 % level, column 3) and in municipalities with above mean regime support, there is no statistically significant difference between protest and non-protest municipalities after 1952. This is inconsistent with the regime targeting its supporters in hostile regions.

If the regime targeted the opposition because it wanted to increase stability, it would target the opposition not only where but also when it poses the largest threat. Until the construction of the Berlin Wall in 1961, the opposition could choose between *exit* and *voice* (in the words of Albert Hirschman 1970) to show their discontent with the regime. Voicing their opinion, for example in the form of protest,

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decreased stability, while exiting increased stability, because it meant that fewer people in the GDR opposed the regime (Giesecke, 2014, p. 124f). As emigrating was easier for people with a network in West Germany, I proxy the availability of the *exit* strategy by distance to the West border (below/above 50 km). After 1961, the opposition could only *voice* their opinion and distance to the West no longer mattered. I thus compare construction in opposition municipalities close and far from the West border before and after 1961.

Column 5 in Table 5 presents results for municipalities in which the *exit* option was more readily and column 6 for municipalities where this option was less viable available until 1961. In line with the argument that the regime targeted the opposition to increase stability, I find that in opposition municipalities that were close to the border construction does not experience a statistically significant increase in construction from 1953 to 1961 and construction levels only increase once the *exit* option had been made unavailable in 1961. For municipalities where the exit option was not viable, there is an immediate increase in 1953, but nothing changes in 1961. As long as the opposition could leave the country and would thus not threaten stability, the regime did not need to target them. Only where and when the exit option was unavailable, opposition areas were targeted, as would be the case if this was a strategy to increase stability.

Carrots: More Stores in Protest Municipalities

As a second measure of local living standards, I turn to the availability of consumption goods. Desirable consumption goods were usually sold out quickly and to successfully getting hold of them, consumers had to arrive quickly at stores. Thus, the existence of stores is a proxy for the local availability of consumption goods. I estimate the following model

$$NumberStores_{mt} = Protest1953_m \times Protest_t + \gamma Population_{mt} + \alpha_m + \alpha_t + \varepsilon_{mt}, \quad (4)$$

where $NumberStores_{mt}$ is the number of stores in municipality m in year t (1947, 1950, 1955 and 1957/8). $Population_{mt}$ is m's population in t. α_m are municipality and α_t year fixed effects. All 74 municipalities have between 2,000 and 10,000

inhabitants in 1950 and lie in the district of Dresden (see Appendix Figure A4).

Protest municipalities experience a sizable increase of 3.7 stores compared to non-protest municipalities after 1952 (column 6, Table 3). Likely as a result of small sample size, this effect is not significant at conventional significance levels for clustered standard errors, but significant at the 1 % level when using Conley standard errors. These results suggest that the increase in residential construction was part of a broader increase in living standards in opposition municipalities after the Uprising of 1953.

5.2   Sticks: More Army Units

Another way to prevent being overthrown by protests is to target the opposition with tools of repression that can be used to quickly put an end to protest before they spread across the country such as the National People's Army (NPA) in the GDR.

Military units are mobile and can be used against protests in nearby municipalities. For example, during the Uprising in 1953 Soviet troops intervened in municipalities that did not house any military.[11] To account for this, I aggregate military units within 20 km buffers around the center of each municipality. Considering the maximum speed of tanks of around 50 kmh and accounting for some time for troops to get ready, 20 km as the crow flies is a distance that the military would have been reasonably able to reach within an hour.

Panel B of Figure 1 shows the average number of military units within 20 km of protest and non-protest municipalities. Until 1952, there are no differences, but beginning in 1953, protest municipalities experience a larger increase of military units and this difference grows over time. To estimate this relationship , I use the following DiD model

$$Units20km_{mt} = \beta Protest_m \times Post1952_t + \gamma Controls_{mt} + \alpha_m + \alpha_t + \varepsilon_{mt}, \quad (5)$$

where $Units20km_{mt}$ is the aggregated number of military units that exist within a 20 km buffer around the center of municipality m. This is a proxy for the local strength of the military, as information on the number of soldiers are unavailable. $Protest_m$,

---

11. I was unable to find the origin of these troops and am thus unable to calculate travel distance.

*Post*1952$_t$, α_m, α_t, ε_{mt} are defined as above. *Controls*$_{mt}$ are the number of overall and protest municipalities in the buffer (excluding potential protest activity in *m*), and a dummy for whether there have been any Nazi military bases in the buffer, all interacted with *Post1952*$_t$, and population in municipality *m* in year *t*. Again, the analysis is limited to municipalities with 2,000 and 10,000 inhabitants in 1950.

Column 1 in Table 6 compares protest and non-protest municipalities before and after 1952 without any fixed effects. The number of military units in the two types of municipalities does not differ until 1952. After 1952, the number of military units increased by around 0.635 units per municipality (significant at 1 % level). Protest municipalities experienced an additional increase of 0.207 military units (significant at 5 % level).

Column 2 shows that these differences are not driven by time-invariant differences between municipalities, e.g. distance to Berlin, or by overall time effects, e.g. the general build-up of the NPA. After controlling for fixed-effects, protest municipalities have around 0.197 additional military units stationed in and around them after 1952 (significant at 5 % level). Protest municipalities thus experienced a 15 % increase in military units compared to the mean (1.402).

Before 1961, military units were placed according to internal security considerations, whereas after 1961 the military began to focus on external war threats (Diedrich, Ehlert, and Wenzke 1998, p. 24f). If the regime targeted military units after 1952 to protest municipalities to prevent a second uprising, and not because these places were more attractive for military units in general, protests should no longer predict novel military bases after 1961. As municipalities that have units before 1961 will still house these units after 1961, I restrict the analysis to places without any military units until 1961. The coefficient of protests is small and insignificant (column 3), i.e. protest municipalities were only targeted by military units in the time frame during which considerations about internal warfare dominated military location decisions, but not when external warfare considerations mattered. This does not imply that military units became irrelevant as a tool to secure internal stability, as the stock of military units that targeted to protest municipalities before 1961 continued to exist.[12]

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12. There is also no clustering of troops close to the border or in the area close to Fulda through

An additional way to gauge whether military presence in protest municipality increased due to internal as opposed to external warfare considerations is to regard the Soviet military that was stationed in the GDR. Its placement of military units solely followed concerns about potential armed disputes with West Germany (Kersten et al. 2011, p. 26).[13] There is no relationship between protests in 1953 and the presence of Soviet military units within a 20 km radius from 1953 onward (column 4, small and insignificant coefficient, less than 3 % of the mean), indicating that protests did not occur in locations that started to be of increased warfare importance after 1952.

Grid Cell Analysis

The buffers used above are overlapping, and thus units that fall in more than one 20 km radius are double counted. To account for the mobility of troops while eliminating double counting, I additionally run a grid cell analysis where each unit is assigned to a single 0.4×0.4 degree grid cell based on its municipality's geographic center (see Appendix Figure A9). I estimate the following DiD model

$$MilitaryUnits_{gt} = \beta Protest_g \times Post1952_t + \delta Controls_{gt} + \alpha_g + \alpha_t + \varepsilon_{gt}, \quad (6)$$

where $MilitaryUnits_{gt}$ is the number of military units within grid cell g in year t. $Protest_g$, α_g and α_t are defined accordingly. α_g accounts for all differences between grid cells that are constant over time, such as distance to the West German border. $Controls_{gt}$ are the number of municipalities in grid cell g, a dummy for any Nazi military presence in g, both interacted with a post 1952 dummy, and aggregated population in g in t. Standard errors are clustered at the grid cell level in all regressions. Empty grid cells are excluded from the analysis. To make sure that my results are not driven by the location of the grid cell level borders, I run this regression 100 times, each time moving the underlying grid 0.04 degrees east or north.

The median regression coefficient is shown in column 5 of Table 6. Grid cells in

where the GDR was most likely to have attacked West Germany (see Appendix Figure A5). Note that border troops are excluded in the analysis.

13. Appendix Figure A8 shows how presence of Soviet troops in municipalities changed over time.

which protests occurred in 1953 have 1.219 additional units in each year after 1952 (significant at 5 % level). On average, a grid cell contains 2.47 military units, thus the effect amounts to roughly half of the mean. The distribution of coefficient $\hat{\beta}$ for all 100 regressions is presented in Figure A10. Results are robust to other grid cell sizes (see Figure A11 in the Appendix).

Sticks: More Stasi Presence

Next, I turn to the secret police as second measure of sticks. To proxy for the strength of the Stasi on the municipality level, I consider the existence of Stasi objects at the end of the regime in 1989 in the following linear probability model

$$StasiPresence_m = \beta Protest_m + \gamma Controls_m + \alpha_c + \varepsilon_m, \tag{7}$$

where $StasiPresence_m$ is a dummy for any Stasi presence in municipality m in 1989. The Stasi helped to secure stability of the regime by providing it with information on the opposition acquired through secret spying activity, which I proxy by the existence of hidden Stasi objects. Public Stasi objects fulfilled an administrative function, and do not capture differences in local spying intensity, and thus serve as a robustness check. $Controls_m$ are population in 1989, distance to any border of the GDR, a dummy for county capitals, distance to the county capital, and shares of workers employed in industry as well as state administration in 1971. α_c are county fixed effects. Standard errors ε_m are clustered at the county level or take the form of Conley standard errors.

The probability that disguised objects exist is around 8 percentage points higher in protest municipalities (significant at 10 % level, column 7 of Table 6), but there is no difference for public Stasi objects (column 8). This suggests that the GDR government additionally increased their control of the population through the Stasi to be able to prevent opposition groups from organizing.

5.3 Interactions: Using Carrots to Counteract Negative Effects of Sticks

The GDR targeted its opposition with carrots and sticks. Crucially, if carrots were strategically used to alleviate the negative effect of sticks on the regime's popularity, the provision of carrots should increase after sticks enter municipalities. Exploiting the panel dimension of my data set, I test how construction changes before and after additional military units are deployed to municipalities using the following model

$$Construction_{mt} = \beta Protest_m \times Post1952 + \gamma_1 MoreMilitaryUnitsPast_{mt}$$
$$+ \gamma_2 MoreMilitaryUnitsFuture_{mt} + \alpha_m + \alpha_t + \varepsilon_{mt}, \tag{8}$$

where $MoreMilitaryUnitsPast_{mt}$ and $MoreMilitaryUnitsFuture_{mt}$ are dummies measuring whether any additional military units were assigned to municipality m in the past, i.e. the years $t-4$ until t, or in the future, i.e. from $t+1$ until $t+5$. $Construction_{mt}$, $Protest_m$, $Post1952$, α_m, α_t and ε_{mt} are defined as before.

Results in Table 7 provide evidence that the regime used carrots to counteract sticks' negative effect on popularity: Municipalities with military units experience higher construction levels (1.634 additional flats, significant at 5 % level, column 1). When the number of military units increased in a municipality within the last years, residential construction increases by 1.413 flats per 1,000 inhabitants (significant at 10 % level, column 2). There is no anticipation effect (column 3). These patterns remain unchanged when including past and future new military units (column 4). As I control for municipality fixed effects, result demonstrates how construction changes within the same municipality after additional military units enter.

The increase in construction after additional military units enter a municipality might reflect construction to house the military units. In the GDR, only higher ranked soldiers were allowed to live in flats instead of barracks on base (Kersten et al. 2011, p. 34). I restrict the analysis to flats that have a kitchen to exclude barracks, which would not feature a kitchen in every living unit. The coefficients remain nearly unchanged, indicating that results are not driven by the construction for military units (column 5).

In all specifications in column 1 to 5, the interaction term of protest 1953 and a post 1952 dummy is significant, i.e. differences in military presence do not fully account for higher construction levels in protest municipalities. The regime used construction to target its unpopularity in regions in which it put the military, but channeled additional construction to opposition municipalities.

6 Effectiveness: Popularity at the End of the GDR

A natural question that comes to mind is how effective this policy of carrots and sticks was in ensuring the regime's survival until 1989.[14] I examine voting results in the first election after reunification that also had the role of a referendum on the future of the former GDR. Voting results for the official successor of the former regime party, now called PDS, provide a measure of local attitudes towards the regime. Figure 4 shows that more construction activity after 1953 is associated with relatively higher support of the former regime. The following regression tests this more formally

$$
\begin{aligned}
\%VotesPDS_m = {} & \beta_1 Protest1953_m \\
& + \beta_2 Construction_m + \beta_3 Construction_m \times Protest1953_m \\
& + \beta_4 Military20km_m + \beta_5 Military20km_m \times Protest1953_m \\
& + \beta_6 Construction_m \times Military + \beta_7 Construction_m \times Military \times Protest1953_m \\
& + \gamma Controls_m + \alpha_c + \varepsilon_m,
\end{aligned} \tag{9}
$$

where $\%VotesPDS_m$ is the voting share of the former regime party in 1990 in municipality m. $Construction_m$ is standardized yearly construction per 1,000 inhabitants in m. $Military20km_m$ is a dummy for the presence of military units within a 20 km of m in 1989. $Controls_m$ are voting share for the SED in 1946, a dummy for county capitals, distance to county capital, distance to West border, distance Berlin, population 1989, share manufacturing workers in 1971. α_c are county fixed effects.

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14. There were no other large scale protests until 1989. Protests in 1953 and 1989 were very different: While they erupted spontaneously and locally in 1953, protests were planned and people could thus travel to protests in 1989, indicating that they are unlikely to depict local attitudes.

Standard errors are clustered at the county level.

Table 8 presents results of Regression 9. As the regime party lost support in the whole country, positive coefficients do not indicate an increase in popularity. Municipalities in which more construction occurred experienced a smaller decrease in voting shares of the regime (significant at 1 % level), whereas the presence of military units does not affect votes for the former regime party (column 1). As the GDR military was not targeted against its population during the peaceful revolution, voters might no longer have perceived it as a threat in 1990.

In column 2, I add the interaction between construction and military. Again, only construction exhibits a positive link with voting shares (significant at 5 % level). Using both tools jointly does not have a different effect from using each tool on its own, the relevant coefficient is small and insignificant. Results in column 3 show that the relationship between construction, military, and their interaction does not differ between protest and non-protest municipalities. Overall, these results indicate that the regime successfully employed policies to revoke opposition in protest municipalities.

7   Conclusion

Many autocracies survive for a long time after protests nearly overthrow them. This paper looks at the GDR to shed light on how regimes can react to protests to increase stability. In 1953, municipalities across the country signaled their opposition by engaging in protests. The regime reacted with a policy of carrots and sticks to this: Construction of flats per capita and the presence of military units increased in protest compared to non-protest municipalities. This increase cannot be explained by differences in the demand for additional housing, the share of construction workers, or the share of manufacturing workers. The GDR's military was seen as measures that can be directed against opposing citizens and municipalities had no economic incentives to try to attract it. Municipalities with more construction exhibit a higher support for the former regime in 1990. By using both tools, the regime was able to alleviate the negative effects of sticks on popularity, while also ensuring that it had the means to stop protests should they occur.

Many current autocracies are known to turn to carrots to secure their power, for example China or the United Arab Emirates. The findings of this paper help to understand how this affects regimes' popularity. At the same time, there are still many open questions for future research about the use of carrots and sticks in autocratic settings: While in the the GDR regime did not feel threatened by the military, numerous autocratic leaders fear military coups against them and this is likely to translate into a reluctance to rely on the military too much to secure power. Rich autocracies might face different budget constraints when deciding on the allocation of resources than poor ones.

References

Acemoglu, Daron, Tarek A. Hassan, and Ahmed Tahoun. 2018. "The Power of the Street: Evidence from Egypt's Arab Spring." *The Review of Financial Studies* 31 (1): 1–42.

Acemoglu, Daron, and James A. Robinson. 2005. *Economic Origins of Dictatorship and Democracy.* Cambridge, MA: Cambridge University Press.

Alberto Diaz-Cayeros, Barry R. Weingast, Beatriz Magaloni. 2003. "Tragic Brilliance: Equilibrium HegemonyAnd Democratization in Mexico." *Working Paper.*

Alesina, Alberto, and Nicola Fuchs-Schündeln. 2007. "Goodbye Lenin (or not?): The Effect of Communism on People's Preferences." *American Economic Review* 97 (4): 1507–1528.

Altonji, Joseph G, Todd E Elder, and Christopher R Taber. 2005. "Selection on observed and unobserved variables: Assessing the effectiveness of Catholic schools." *Journal of Political Economy* 113 (1): 151–184.

Banerjee, Abhijit, Raghabendra Chattopadhyay, Esther Duflo, Daniel Keniston, and Nina Singh. 2021. "Improving Police Performance in Rajasthan, India: Experimental Evidence on Incentives, Managerial Autonomy, and Training." *American Economic Journal: Economic Policy* 13 (1): 36–66.

Bautista, Maria Angélica, Felipe González, Luis R. Martínez, Pablo Muñoz, and Mounu Prem. 2023. "The Geography of Repression and Opposition to Autocracy." *American Journal of Political Science* 67 (1): 101–118.

Bittorf, Matthias. 2014. *Kontinuität und Wandel in Nordthüringen: Das östliche Eichsfeld und der Landkreis Nordhausen 1989-1990.* Marburg: Tectum Wissenschaftsverlag.

Buck, Hannsjörg F. 2004. *Mit hohem Anspruch gescheitert – Die Wohnungspolitik der DDR.* Vol. 122. Dokumente und Schriften der Europäischen Akademie Otzenhausen. Münster: LIT Verlag.

Burchardi, Konrad B., and Tarek A. Hassan. 2013. "The Economic Impact of Social Ties: Evidence from German Reunification." *The Quarterly Journal of Economics* 128 (3): 1219–1271.

Bursztyn, Leonardo, and Davide Cantoni. 2016. "A Tear in the Iron Curtain: The Impact of Western Television on Consumption Behavior." *Review of Economics and Statistics* 98 (1): 25–41.

Campante, Filipe R, Davin Chor, and Bingjing Li. 2023. "The Political Economy Consequences of China's Export Slowdown." *Journal of the European Economic Association* Forthcoming.

Crabtree, Charles, David Darmofal, and Holger L. Kern. 2015. "A Spatial Analysis of the Impact of West German Television on Protest Mobilization during the East German Revolution." *Journal of Peace Research* 52 (3): 269–284.

Davenport, Christian. 2007a. "State Repression and Political Order." *Annual Review of Political Science* 10:1–23.

———. 2007b. "State Repression and the Tyrannical Peace." *Peace Research* 44 (4): 485–504.

Desai, Raj M., Anders Olofsgård, and Tarik M. Yousef. 2009. "The Logic of Authoritarian Bargains." *Economic & Politics* 21 (1): 93–125.

Diedrich, Torsten, Hans Ehlert, and Rüdiger Wenzke, eds. 1998. *Im Dienste der Partei. Handbuch der bewaffneten Organe.* Berlin: Ch. Links.

Escribà-Folch, Abel. 2013. "Repression, Political Threats, and Survival under Autocracy." *International Political Science Review* 34 (5): 543–560.

Ferman, Bruno. 2023. "Inference in difference–in–differences: How much should we trust in independent clusters?" *Journal of Applied Econometrics.*

Fuchs-Schündeln, Nicola, and Matthias Schündeln. 2005. "Precautionary Savings and Self-Selection: Evidence from the German Reunification "Experiment"." *The Quarterly Journal of Economics* 120 (3): 1085–1120.

Gandhi, Jennifer. 2008. *Political Institutions under Dictatorship.* Cambridge University Press.

Gandhi, Jennifer, and Adam Przeworski. 2006. "Cooperation, Cooptation, and Rebellion Under Dictatorship." *Economics & Politics* 18 (1): 1–26.

Gerschewski, Johannes. 2013. "The Three Pillars of Stability: Legitimation, Repression, and Co-Optation in Autocratic Regimes." *Democratization* 20 (1): 13–38.

Giesecke, Jens. 2014. *The History of the Stasi: East Germany's Secret Police, 1945-1990.* New York: Berghahn Books.

Glaser, Günther. 2009. *Armee gegen das Volk? Zeitgenössische Studie mit Dokumenten zur Einsatzplanung des Militärs im Inneren der DDR (1949-1965/66).* Frankfurt am Main: Peter Lang.

Gregory, Paul R., Philipp J. H. Schröder, and Konstantin Sonin. 2011. "Rational Dictators and the Killing of Innocents: Data from Stalin's Archives." *Journal of Comparative Economics* 39 (1): 34–42.

Hirschman, Albert O. 1970. *Exit, Voice and Loyality – Responses to Decline in Firms, Organizations and States.* Cambridge, MA: Harvard University Press.

Hollyer, James R., B. Peter Rosendorff, and James Raymond Vreeland. 2011. "Democracy and Transparency." *The Journal of Politics* 73 (4): 1191–1205.

Kelly, Morgan. 2019. "The Standard Errors of Persistence." *Working Paper* (June).

Kern, Holger Lutz, and Jens Hainmueller. 2009. "Opium for the Masses: How Foreign Media Can Stabilize Authoritarian Regimes." *Political Analysis* 17 (4): 377–399.

Kersten, Olaf, Hans-Georg Löffler, Reinhard Parchmann, and Siegfried Stoof. 2011. *Garnisonen der NVA und GSTD - Zur Nutzung der militärischen Standorte von 1871 bis 2010.* Verlag Dr. Köster.

Khan, Adnan Q., Asim Ijaz Khwaja, and Benjamin A. Olken. 2019. "Making Moves Matter: Experimental Evidence on Incentivizing Bureaucrats through Performance-Based Postings." *American Economic Review* 109 (1): 237–70.

Koop, Volker. 2003. *Der 17. Juni.* Berlin: Siedler Verlag.

Kowalczuk, Ilko-Sascha. 2003. *17. Juni 1953 - Volksaufstand in der DDR. Ursachen - Abläufe - Folgen.* Bremen: Edition Temmen.

Lazarev, Valery, and Paul Gregory. 2003. "Commissars and Cars: A Case Study in the Political Economy of Dictatorship." *Journal of Comparative Economics* 31 (1): 1–19.

Lichter, Andreas, Max Löffler, and Sebastian Siegloch. 2020. "The Long-Term Costs of Government Surveillance: Insights from Stasi Spying in East Germany." *Journal of the European Economic Association* 19 (2): 741–789.

Lorentzen, Peter L. 2013. "Regularizing Rioting: Permitting Public Protest in an Authoritarian Regime." *Quarterly Journal of Political Science* 8 (2): 127–158.

Magee, Christopher S. P., and John A. Doces. 2015. "Reconsidering Regime Type and Growth: Lies, Dictatorships, and Statistics." *International Studies Quarterly* 59 (2): 223–237.

Martínez, Luis R. 2022. "How Much Should We Trust the Dictator's GDP Growth Estimates?" *Journal of Political Economy* 130 (10): 2731–2769.

Melzer, Manfred, and Wolfgang Steinbeck. 1993. *Wohnungsbau und Wohnungsversorgung in beiden deutschen Staaten – Ein Vergleich.* Vol. 74. Beiträge zur Strukturforschung. Deutsches Institut für Wirtschaftsforschung.

Mitter, Armin, and Stefan Wolle. 1990. *Ich liebe euch doch alle!: Befehle und Lageberichte des MfS Januar-November 1989.* Berlin: Basis Druck Verlag.

Statistisches Bundesamt. 1993. *Wohnungsbau und Wohnungsbestand 1970 bis 1990.* Vol. 2. Sonderreihe mit Beiträgen für das Gebiet der ehemaligen DDR. Wiesbaden: Statistisches Bundesamt.

———. 1995. *Gemeinden 1994 und ihre Veränderungen seit 01.01.1948 in den neuen Ländern.* Wiesbaden: Metzler Poeschel.

———. 2018. *Gebäude und Wohnungen – Bestand an Wohnungen und Wohngebäuden - Bauabgang von Wohnungen und Wohngebäuden - Lange Reihen ab 1969-2017.*

Stegmann, Andreas. 2019. "When East Meets West: Interpersonal Contact and the Demand for Democracy." *Working Paper.*

The Economist Intelligence Unit. 2022. "Democracy Index 2022 – Frontline democracy and the battle for Ukraine."

Thomson, Henry. 2017. "Repression, Redistribution and the Problem of Authoritarian Control: Responses to the 17 June Uprising in Socialist East Germany." *East European Politics and Societies and Cultures* 31 (1): 68–92.

Timothy Frye, David Szakonyi, Ora John Reuter. 2019. "Hitting Them With Carrots: Voter Intimidation and Vote Buying in Russia." *British Journal of Political Science* 49 (3): 857–881.

Wintrobe, Ronald. 1990. "The Tinpot and the Totalitarian: An Economic Theory of Dictatorship." *American Political Science Review* 84 (3): 849–872.

Xu, Guo. 2018. "The Costs of Patronage: Evidence from the British Empire." *American Economic Review* 108 (11): 3170–98.

8 Figures and Tables

8.1 Figures
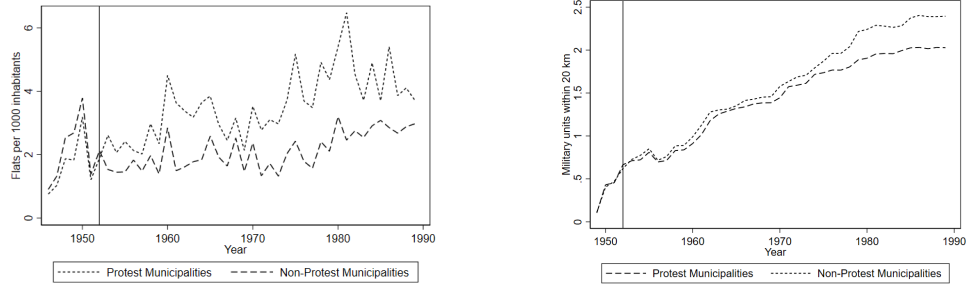
Panel A: Flat Construction Panel B: Military Units

Figure 1: Construction and Military Presence

Note Panel A shows average construction of flats per 1,000 inhabitants and Panel B average number of military units within 20 km in protest and non-protest municipalities with 2,000 and 10,000 inhabitants in 1950. The vertical lines indicate the year 1952. Data sources: see Section A.1.
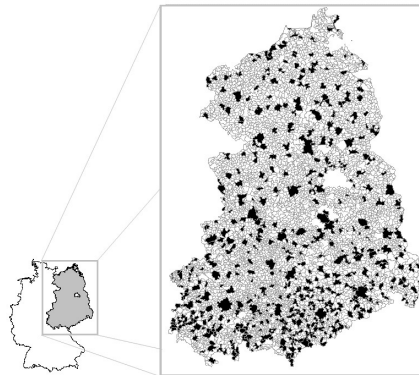

Figure 2: Protests in the GDR during the Uprising of 1953

Note The map on the left shows the location of the former German Democratic Republic in current day Germany. On the right map, each black area denotes a municipality that had a protest event during the Uprising of 1953. Berlin is excluded from the analysis. Municipality borders are from 1997. Data sources: see Section A.1.
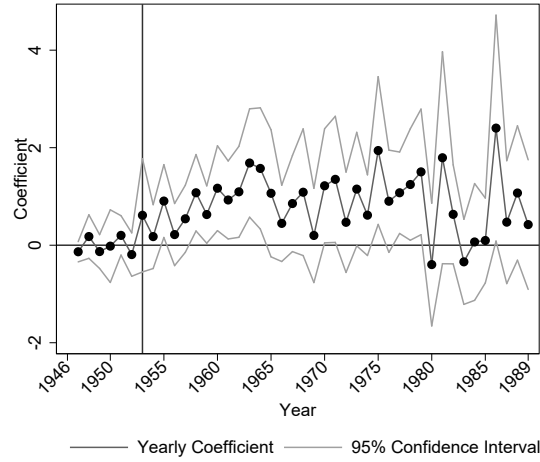
Figure 3: Difference-in-Difference Estimator: Yearly coefficients, 2,000 to 10,000 inhabitants

Note The figure shows the coefficients of the regression $Construction_{mt} = \Sigma_\tau Protest1953_m \times Time_\tau + \alpha_m + \alpha_t + \varepsilon_{mt}$, where $Construction_{mt}$ is construction per 1,000 inhabitants, $Protest1953$ is a dummy for protest municipalities, $Time_\tau$ is a dummy for year τ from 1947 to 1989. 1946 is the omitted category. α_m are municipality and α_t year fixed effects. Analysis is limited to municipalities that had between 2,000 and 10,000 inhabitants in 1950. Data sources: see Section A.1.
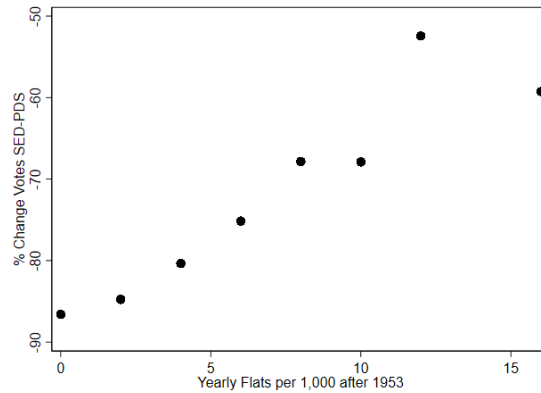
Figure 4: Construction and percent change in votes for regime

Note: The figure shows the average percentage change in votes for the regime party between 1946 and 1990 for different bins of the average construction after 1953. Bins are 0–2, ..., 12–14, and 14–15 yearly flats per 1,000 inhabitants. Percentage change in votes is votes for the PDS in 1990 minus votes for the SED in 1946. Analysis is limited to municipalities that had between 2,000 and 10,000 inhabitants in 1950. Data sources: see Section A.1.

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8.2 Tables

Table 1: Summary Statistics

|	Protest Municipalities			Non-Protest Municipalities			
	N	Mean	SD	N	Mean	SD	Difference
Panel A: Charactersitics of Municipalities							
Population 1946	197	4966	2288	710	3841	1644	1125***
Population 1950	208	4915	2226	744	3915	1690	1000***
Population 1964	207	4683	2745	734	3445	1703	1238***
Population 1971	205	4719	2895	738	3385	1743	1334***
Share Manufacturing 1950	104	0.228	0.013	329	0.213	0.123	0.015
Share Construction 1950	118	0.049	0.019	478	0.045	0.032	0.004
Share Votes SED 1946	187	0.444	0.090	696	0.462	0.101	-0.018**
Share Buildings Destroyed 1945	46	0.073	0.135	287	0.056	0.133	0.017
Share Looking for Flat 1954	166	0.058	0.043	522	0.053	0.035	0.005
Distance to Berlin	208	138	63	744	166	59	-28***
Distance to any Border	208	48	30	744	36	29	12***
Panel B: Outcomes before 1953							
New Flats per Capita per Year	208	1.424	2.522	744	1.332	3.495	0.092
Military Units < 20 km per Year	208	0.373	0.603	744	0.409	0.674	-0.036
Panel C: Outcomes after 1953							
New Flats per Capita per Year	208	3.332	7.649	744	2.362	6.024	0.97*
Military Units < 20 km per Year	208	1.505	1.475	744	1.416	1.332	0.089
Secret Stasi Object 1990	193	0.399	0.491	720	0.247	0.432	0.152***

Note Mean and standard deviation for municipalities with and without any protest activity in 1953. Sample is limited to municipalities with 2,000 to 10,000 inhabitants in 1950. The column *difference* reports the difference in means between the two groups. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively. Data sources: see Section A.1.

Table 2: Where Do People Protest? 2,000-10,000 inhabitants in 1950

	Location	Polit. Preferences	Pop. Growth	Industry	Housing Demand			Mil. Presence	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Distance Berlin	-0.252								0.170
	[0.220]								[0.508]
	{0.204}								{0.332}
Distance West Border	0.184								1.060**
	[0.202]								[0.455]
	{0.195}								{.}
Distance County Capital	-0.326								0.037
	[0.310]								[0.734]
	{0.253}								{0.675}
County Capital	0.361***								0.427***
	[0.091]								[0.128]
	{0.070}								{0.097}
Share Votes SED		0.078							-0.176
		[0.191]							[0.433]
		{0.170}							{0.455}
Turnout 1946		0.414							-0.030
		[0.412]							[1.004]
		{0.320}							{0.495}
Population Growth, 1946 to 1953			-0.001						-0.187
			[0.009]						[0.422]
			{0.007}						{0.462}
Share in Manufacturing				0.104					0.358
				[0.263]					[0.346]
				{0.276}					{0.279}
Share in Construction 1950				0.350					0.638
				[0.487]					[0.672]
				{0.388}					{0.562}
Share Households Searching Flat					1.023**				1.151
					[0.397]				[0.821]
					{0.335}				{0.783}
War Destruction						0.179			
						[0.132]			
						{0.125}			
Air Raids							0.000		
							[0.000]		
							{0.000}		
Barracked Police Units 1953								-0.003	
								[0.175]	
								{0.129}	
Population 1950	0.034***	0.049***	0.049***	0.037***	0.040***	0.027**	0.044***	0.044***	0.007
	[0.009]	[0.010]	[0.010]	[0.014]	[0.010]	[0.012]	[0.009]	[0.009]	[0.018]
	{0.008}	{0.011}	{0.011}	{0.013}	{0.011}	{0.013}	{0.010}	{0.009}	{0.018}
County FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mean Dep. Variable	0.212	0.205	0.211	0.239	0.234	0.137	0.213	0.212	0.270
Observations	1,030	950	975	444	743	401	1,018	1,030	292
Adj. R²	0.189	0.167	0.184	0.149	0.179	0.159	0.164	0.164	0.157

Note Estimation results of regression 1. Standard errors clustered at the county level reported in parentheses, Conley standard errors are in curly brackets. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively. Data sources: see Section A.1.

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Table 3: Carrots: Difference-in-Differences Estimators Construction

	Flat construction per 1,000 inhabitants					Stores
	All			State	1990 - 94	1948-1958
	(1)	(2)	(3)	(4)	(5)	(6)
Protest 1953	0.091				-3.026	
	(0.120)					
	[0.111]				[2.914]	
	{0.084}					
Post 1952	1.030***					
	(0.078)					
	[0.100]					
	{0.085}					
Protest53	0.878***	0.878***	0.861***	0.897***		3.694
× Post1952	(0.223)	(0.223)	(0.248)	(0.221)		(2.235)
	[0.225]	[0.182]	[0.220]	[0.079]		[2.849]
	{0.130}	{0.132}	{0.150}	{0.013}		{0.432}
Year FE		✓	✓	✓		✓
Municipality FE		✓	✓	✓		✓
County FE					✓	
County × Year FE			✓			
Controls					✓	✓
Observations	41,888	41,888	41,888	41,888	633	296
Adj. R^2	0.009	0.075	0.081	0.076	0.107	0.799

Note The dependent variable is the number of newly constructed flats per 1,000 inhabitants per year and municipality. *Protest1953* is an indicator variable whether any protest activity occured in the municipality in 1953. *Post1952$_t$* is an indicator variable for all years after 1952. In column 4 the dependent variable only consists of flats that have been constructed by the state. In column 5 the dependent variable is aggregate construction from 1990 to 1994. Controls in column 5 are a dummy for military presence, county capital, the share of workers that work in manufacturing in 1971, distance to Berlin, share of population looking for flat in 1954 and the share of people voting for the SED in 1946. In column 6 the dependent variable is the number of *Konsum* and *HO* stores in municipality *m*. Standard errors in parenthesis are clustered at the municipality level. Standard errors in square brackets are clustered at district level. Standard errors in curly brackets are Conley standard errors. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively, based on the first standard errors shown. Data sources: see Section A.1.

Table 4: Carrots: Difference-in-Differences Estimators Construction with Controls

		Housing Demand			Industry Shares 1950			
	Population	Share Looking for Flat	War Destruction	Air Attacks	Construction	Manufacturing	Share SED	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Protest 53 × Post 52	0.947***	0.690***	0.778**	0.891***	0.749**	0.864***	0.889***	0.940***
	(0.229)	(0.233)	(0.332)	(0.224)	(0.303)	(0.314)	(0.238)	(0.357)
	[0.191]	[0.181]	[0.261]	[0.183]	[0.247]	[0.260]	[0.196]	[0.294]
	{0.134}	{0.149}	{0.226}	{0.132}	{0.170}	{0.177}	{0.139}	{0.223}
Control$_t$	-0.171**							
	(0.078)							
	[0.074]							
	{0.058}							
Control × Post 52		8.074***	-1.699*	-0.006	-3.280	2.991***	-2.281**	
		(2.349)	(0.900)	(0.006)	(3.576)	(1.037)	(1.027)	
		[2.337]	[0.980]	[0.005]	[4.076]	[1.081]	[1.024]	
		{2.089}	{0.595}	{0.004}	{3.199}	{0.673}	{0.688}	
Mun FEs	✓	✓	✓	✓	✓	✓	✓	✓
Time FEs	✓	✓	✓	✓	✓	✓	✓	✓
Observations Observations	41,888	30,272	14,652	41,888	26,224	19,052	38,852	12,716
Adjusted R-squared	0.076	0.067	0.055	0.075	0.072	0.082	0.075	0.066

Note The dependent variable, is the number of newly constructed flats per 1,000 inhabitants per year and municipality. *Protest1953* is an indicator variable whether any protest activity occured in the municipality in 1953. *Post1952$_t$* is an indicator variable for all years after 1952. *Controls$_m$* are the share of the population looking for a flat in 1954, war destruction in Saxony, number of air attacks during World War II, Share of Workers in construction and manufacturing in 1950 and the share of votes for the SED in 1946 in columns 1 to 6, respectively. Standard errors in parenthesis at the municipality level. Standard errors are clustered at district level. Standard errors in square brackets are clustered at the municipality level. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively, based on the first standard errors shown. Data sources: see Section A.1.

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Table 5: Carrots: Heterogeneous Effects

	County Capital		Votes SED		Dist. West Germany	
	no	yes	below mean	above mean	close	not close
	(1)	(2)	(3)	(4)	(5)	(6)
Protest 1953	0.446**	0.52	1.378***	0.364	0.364	0.791***
× Post 1952	(0.212)	(1.324)	(0.318)	(0.301)	(0.328)	(0.232)
	[0.167]	[1.36]	[0.261]	[0.237]	[0.328]	[0.210]
	{0.131}	{0.892}	{0.180}	{0.186}	{0.276}	{0.195}
Protest 1953					0.919*	0.053
× Post 1961					(0.543)	(0.270)
					[0.519]	[0.215]
					{0.288}	{0.202}
Obs	40539	1349	19404	22484	11308	30580
Adj. R^2	0.063	0.115	0.101	0.059	0.1	0.069

Note The dependent variable is the number of newly constructed flats per 1,000 inhabitants per year and municipality. *Protest1953* is an indicator variable whether any protest activity occurred in the municipality in 1953. *Post1952$_t$* is an indicator variable for all years after 1952. In columns 1 and 2, the sample is split in county capitals and non-county capitals. In columns 3 and 4, the sample is split by whether the voting share for the SED was below or above the mean in 1946. In column 5 and 6, the sample is split by the distance to West Germany where municipalities fewer than 50 km away from West Germany are considered close and all others are considered not close. Standard errors in parenthesis are clustered at the municipality level. Standard errors in square brackets are clustered at district level. Standard errors in curly brackets are Conley standard errors. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively, based on the first standard errors shown. Data sources: see Section A.1.

Table 6: Sticks: Military Units and Stasi

	Number military units within 20 km				Grid Level	Stasi Objects	
	NPA			Soviet	Analysis	Secret	Public
	1949 to 1989		From 1961	1949 to 1989	1949 to 1989	In 1989	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Protest 1953	-0.072		0.063			0.078*	-0.013
	(0.053)		(0.113)				
	[0.051]		[0.134]			[0.040]	[0.029]
	{0.037 }		{ 0.025}			{0.026}	{0.024}
Post 1952	0.635***						
	(0.129)						
	[0.217]						
	{0.159}						
Protest 1953	0.207**	0.197**		0.018	1.219**		
× Post 1952	(0.102)	(0.099)		(0.066)	(0.576)		
	[0.122]	[0.088]		[0.057]			
	{0.046}	{0.054}		{0.024}	{0.287 }		
Controls	✓	✓	✓	✓	✓	✓	✓
Year FEs		✓	✓	✓			
Mun FEs		✓		✓			
Grid FEs					✓		
County FEs						✓	✓
Observations	39,606	39,606	26,068	42,504	4838	913	913
Adj. R^2	0.092	0.782	0.091	0.809	0.827	0.287	0.386

Note The dependent variable in column 1 to 3 is the aggregated number of NPA military units within a 20 km buffer around a municipality's geographic center and in column 4 the number of Soviet military troops. *Protest 1953* is an indicator variable whether any protest activity occurred in the municipality in 1953. *Post 1952* is an indicator variable for all years after 1952. Controls for column 1 to 5 are the number of protests within 20 km, the number of municipalities within 20 km, a dummy for former Wehrmacht units within 20 km and/or their interaction with a post 1952 dummy as well as population in a municipality in year t. Column 6 shows the median regression result of the grid level regression, as outlined in 6. Column 7 looks at a dummy for the existence of public Stasi objects in 1989, in column 8 for the existence of secret Stasi object in 1989. Control variables in columns 7 and 8 are population in 1950, distance to any border of the GDR, a dummy for county capitals, distance to the county capital, share of workers employed in industry in 1971 and share of workers employed in state administration in 1971, in addition to county fixed effects according to 1989 county borders. Standard errors in parenthesis are clustered at the municipality level. Standard errors in square brackets are clustered at district level. Standard errors in curly brackets are Conley standard errors. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively, based on the first standard errors shown. Data sources: see Section A.1.

Table 7: Reaction of Carrots to Sticks

	Construction per 1,000 inhabitants				
	All				With Kitchen
	(1)	(2)	(3)	(4)	(5)
Protest 1953	0.823***	0.899***	0.900***	0.900***	0.889***
× Post 1952	(0.239)	(0.244)	(0.244)	(0.244)	(0.244)
	[0.214]	[0.212]	[0.211]	[0.212]	[0.212]
	{0.172}	{0.172}	{0.171}	{0.172}	{0.171}
Military in	1.634**				
Municipality	(0.688)				
	[0.664]				
	{-0.478}				
Military in	1.017				
Municipality	(1.375)				
× Protest 1953	[1.416]				
	{0.983}				
More Military		1.413*		1.437*	1.441*
in prior 5 years		(0.776)		(0.785)	(0.784)
		[0.76]		[0.768]	[0.767]
		{0.57}		{0.57}	{0.57}
More Military		0.097	0.251	0.249	
in next 5 years		(0.71)	(0.725)	(0.725)	
		[0.693]	[0.704]	[0.704]	
		{0.66}	{0.659}	{0.659}	
Observations	39,032	41,888	41,888	41,888	41,888
Adj. R^2	0.077	0.076	0.076	0.076	0.076

Note The dependent variable in in column 1 to 4 is the number of newly build flats per 1,000 inhabitants and in column 5 the number of newly constructed flats with a kitchen per 1,000 inhabitants in municipality m and year t . *More Military in prior 5 years* is a dummy for whether any additional military troops were assigned to a municipality between the current year and the four years before. *More Military in next 5 years* is a dummy for whether any additional military units entered a municipality in the following one to five years. Standard errors in parenthesis are clustered at the municipality level. Standard errors in square brackets are clustered at district level. Standard errors in curly brackets are Conley standard errors. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively, based on the first standard errors shown. Data sources: see Section A.1.

Table 8: Effectiveness: Voting in 1990

	% Votes for Former Regime Party 1990		
	(1)	(2)	(3)
Protest 1953	0.002	0.002	-0.004
	(0.003)	(0.003)	(0.006)
Std Construction pc after 1953	0.011***	0.017**	0.017**
	(0.002)	(0.007)	(0.008)
Std Construction pc after 1953			0.003
× Protest 1953			(0.011)
Dummy military < 20 km	-0.003	-0.003	-0.005
	(0.003)	(0.004)	(0.005)
Dummy military < 20 km			0.008
× Protest 1953			(0.006)
Std Construction pc after 1953		-0.007	-0.009
× Dummy Military < 20 km		(0.007)	(0.008)
Std Construction pc after 1953			0.001
× Dummy Military < 20 km ×			[0.001]
Protest 1953			
Controls	✓	✓	✓
County FE	✓	✓	✓
Observations	881	881	881
Adj. R^2	0.574	0.580	0.582

Note The dependent variable is the share of votes for the former regime party in December 1990 in municipality *m*. *StdConstruction* is standardized yearly construction per 1,000 inhabitants. *DummyMilitary$_m$* is a dummy for whether there were any military units within a 20 km radius of *m* in 1989. *Protests1953* is a dummy for protest activity in *m* in 1953. *Controls$_m$* are a dummy for county capitals, distance to county capital, distance to West border, distance Berlin, population 1989, share manufacturing workers in 1971. Standard errors clustered at the county level reported in parentheses. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively. Data sources: see Section A.1.

A Appendix For Online Publication

A.1 Data Appendix

Residential Construction and Housing Demand

Data on residential construction are from the building and flat census of 1995 (*Gebäude- und Wohnungszählung*), which was conducted by the Statistical Offices of the German Federal States in former East Germany. The census includes every flat — occupied or unoccupied — existing in 1994. A flat is defined as any number of co-joined rooms used as living space, which have their own entrance, and can be thought of as a residential unit. A single family house would map into one residential unit, labeled as one flat.

Flat data include information on the construction year, ownership structure before reunification, and several measures of housing quality, i.e. the heating system, the number of rooms and information on the size of flats. Using the information on the year of construction, I am able to create a panel of construction activity at the municipality-year level. I classify all flats that were labeled as either municipal, public property, belonging to workers' and charitable socialist building cooperative societies, agricultural production cooperatives or were state-owned as state flats. Ownership of flats is measured for the day before the reunification of West and East Germany, thus capturing the ownership structure during the existence of the GDR in most cases.

I normalize construction levels by population to make the number of flats comparable across municipalities. My dataset includes population data for 1946, 1950, 1964, and 1971. 1946 population data are from Falter (1999) and 1964 population data are from publications of official GDR statistics (Staatliche Zentralverwaltung für Statistik 1966). Population data from 1950 and 1971 are from archived internal records of the Statistical Office, which I digitized.[15] Based on the available years, I interpolate and extrapolate population years linearly for all other years.[16]

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15. These records are available at the Bundesarchiv Berlin-Lichterfelde. The population census 1950 can be found in the records DE/2/22320-DE/2/33232 and the 1971 population census in the records DE/2/33057-DE/2/33062.

16. Population data for 1990 are also available at the municipality level. However, these numbers show population after the introduction of freedom of movement. If people from areas with and with-

I also collected measures of housing demand at the municipality level around 1953: the share of the population looking for flats from the flat demand census in January 1954,[17] war destruction in Saxony (one region of the GDR) in 1945,[18] and the number or air strikes that were targeted during a municipality during World War II from Robertson, Burr, and Barth (2013).

Stores

The number of stores in a municipality is an additional outcome to proxy for the availability of consumption goods. I look at *Konsum* stores, a cooperative retail chain, and *Handelsorganisation (HO)* stores, a national retail business owned by the state. These stores sold consumption goods, such as groceries or clothing, to private individuals. Data on these stores were collected from local phone books.[19] I only include municipalities in the analysis in which the local administration had a phone number, to account for the fact that some municipalities in the beginning did not have access to the phone network yet and thus no stores could be listed even if they existed.[20] I have information on these stores for 1947, 1950 and 1955, 1957/8 in the greater area of Dresden (see Appendix Figure A4).

Military Units and Stasi Presence

Information on military units in the GDR comes from Kersten et al. 2011, who provide information on the history of military establishments in East Germany. From this, I extracted information on the location, foundation, and closing year of National People's Army units, the presence of barracked police establishments and Soviet military troops, as well as the historic presence of Wehrmacht establishments. I exclude all border units (see Appendix Figure A5 for the location of all

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out opposition left the area of the former GDR at different rates, this would then bias the interpolated population estimates after 1971. If the extrapolation of population generates a negative population value, I exclude the municipality for all years.

17. The survey provides a snapshot of the situation on January 31st, 1954, i.e. around 6 months after the protests. The records are available at the Bundesarchiv Berlin-Lichterfelde DE/2/1-13.

18. From the record DH/1/45781 at the Bundesarchiv Berlin-Lichtenfelde.

19. The phone books are available at the library of the Deutsches Museum in Munich ZB 1622.

20. It could also be the case that not all stores have a phone number. If the probability that a store is listed in the phone book does not differ for stores in protest and non-protest municipalities, this will only affect the precision of estimates.

non-border troops). I turn to the count of military units to get a proxy for the size of the military stationed in and around a municipality. Military units could for example be motor rifle troops or missile brigades. I supplement this with information from an historical account on the barracked police (Diedrich and Wenzke 2001), a location database on the National People's Army and the Soviet forces by the Military History Research Institute (*Militärgeschichtliches Forschungsamt*),[21] and the online catalog of the Military Archive in Germany.[22]

As a second measure of a stick, I turn to the GDR's secret police, known as the Stasi. Information on Stasi activity over time at the municipality level is not available.[23] I use data on the presence of Stasi objects at the municipality level in 1989 as a proxy for overall Stasi presence from a list of all former Stasi objects that were dissolved in 1990 that was published in a German newspaper in June 1990 (taz 1990). Objects can be differentiated according to whether they were public, such as office buildings, or disguised, e.g. in the case of flats that were used for clandestine meetings.

Protest Data

Data on protests in 1953 are from Kowalczuk (2003), who provides a list of 698 places for which either a protest, demonstration, strike, or violence against individual persons or institutions between the 16th and 21st of June 1953 is documented in archival records. As data on the intensity of events are not available, I generate a dummy variable that takes the value 1 if some event occurred within a municipality. Figure 2 in the main text presents the location of all protests that I could match distinctly to a municipality. Overall, I can match protests to 494 municipalities according to 1997 boundaries (see more on the construction of municipality borders below), but in my main analysis I restrict the sample to municipalities that had between 2,000 and 10,000 inhabitants, of which 208 had protests.

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21. The database can be accessed under http://www.mgfa.de/html/standorte_einleitung.php (last visited January 23, 2018).

22. The catalog can be accessed under https://invenio.bundesarchiv.de/basys2-invenio/login.xhtml (last visited January 23, 2018).

23. A paper that does look at local Stasi activity is Lichter, Löffler, and Siegloch (2020). The authors examine the effects of spying density on trust and use information on Stasi activity at the county level in the 1980ies.

Other variables

Additional variables are the voting shares for different parties in 1946, the only free election in the GDR until 1990, from Falter (1999). I collected the share of people working in manufacturing and in construction at the municipality level from occupational censuses for the years 1950 and 1971 from archival records.[24] In addition, I collected information on the names and years in office of chairmen of the county councils by contacting all relevant county archives,[25] and enhancing this with information from historical literature, historical newspapers, and Wikipedia articles. Voting results in 1990 are from Falck, Gold, and Heblich (2014).

Municipality Borders

The empirical analysis is conducted at the municipality level according to the municipality borders in 1997.[26] Using information provided by the National Statistical Office (Statistisches Bundesamt 1995) and the Statistical Offices of the Federal States,[27] all municipalities were aggregated according to their 1997 boundaries. I exclude all municipalities which had given up some parts of their area between 1948 and 1997 if I could not precisely identify which areas left and which stayed within the municipality. I also exclude the municipalities that received these areas with undefined boarders. This affects mostly large municipalities, which are more likely to have experienced changes in their borders. I do this to make sure that population figures at the municipality level represent the local population. Overall, I match approximately 5,000 municipalities out of 5,792 municipalities that existed in the borders of former East Germany in 1997.

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24. Data of the job census 1950 do not span the entire GDR, as some of the archival records were of such bad quality that they could not be accessed. For some municipalities it was also not possible to get information on all sectors for the same reason. It can be assumed that this is random.

25. Of 69 contacted county archives, 57 replied.

26. 1997 is the first year for which official geocoded maps with municipality borders exist.

27. Anna Gumpert and Nadja Dwenger kindly shared this information with me.

References

Diedrich, Torsten, and Rüdiger Wenzke. 2001. *Die getarnte Armee - Geschichte der Kasernierten Volkspolizei der DDR 1952-1956.* Vol. 1. Militärgeschichte der DDR. Berlin: Ch. Links.

Falck, Oliver, Robert Gold, and Stephan Heblich. 2014. "E-lections: Voting Behavior and the Internet." *American Economic Review* 104 (7): 2238–65.

Falter, Jürgen. 1999. *Die Landtagswahlen von 1946 in der Sowjetischen Besatzungszone.* GESIS Datenarchiv, Cologne. ZA2879 Datenfile.

Kersten, Olaf, Hans-Georg Löffler, Reinhard Parchmann, and Siegfried Stoof. 2011. *Garnisonen der NVA und GSTD - Zur Nutzung der militärischen Standorte von 1871 bis 2010.* Verlag Dr. Köster.

Kowalczuk, Ilko-Sascha. 2003. *17. Juni 1953 - Volksaufstand in der DDR. Ursachen - Abläufe - Folgen.* Bremen: Edition Temmen.

Lichter, Andreas, Max Löffler, and Sebastian Siegloch. 2020. "The Long-Term Costs of Government Surveillance: Insights from Stasi Spying in East Germany." *Journal of the European Economic Association* 19 (2): 741–789.

Lorentzen, Peter L. 2013. "Regularizing Rioting: Permitting Public Protest in an Authoritarian Regime." *Quarterly Journal of Political Science* 8 (2): 127–158.

Robertson, J. A., R. Burr, and B. Barth. 2013. *USAF Theater History of Operations Report Database.* online. www.afri.au.af.mil/thor.

Staatliche Zentralverwaltung für Statistik. 1966. *Verzeichnis der Gemeinden und Ortsteile der Deutschen Demokratischen Republik.* Berlin: Staatliche Zentralverwaltung für Statistik.

Statistisches Bundesamt. 1995. *Gemeinden 1994 und ihre Veränderungen seit 01.01.1948 in den neuen Ländern.* Wiesbaden: Metzler Poeschel.

taz. 1990. "Heimatkunde – die unendlich lange Liste ehemaliger Stasi-Objekte." *taz Sonderdruck.*
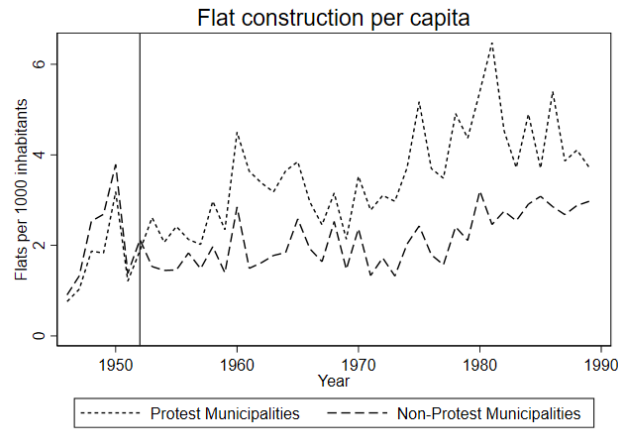
A.2 Figures

Figure A1: Flat Construction per Capita at the Municipality Level - Extended Sample

Note The figure shows average construction of flats per 1,000 inhabitants from 1946 to 1989 in protest and non-protest municipalities for all municipalities. The vertical line indicates the year 1952. Data sources: see Section A.1.
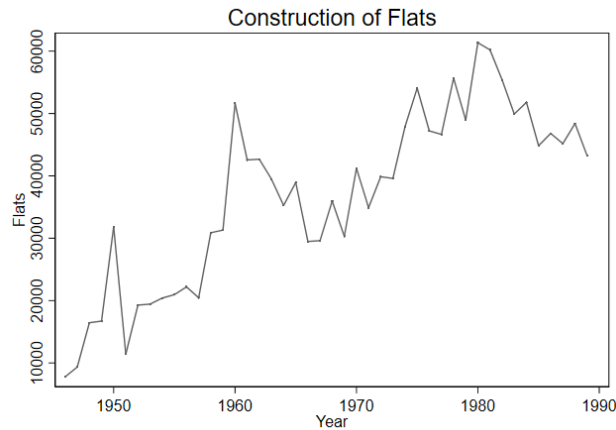
Figure A2: Overall Flat Construction

Note The figure shows overall new flat construction from 1946 to 1989 based on the data used in this paper. After the end of World War II, construction of flats increased until 1950, dropped and then remained relatively constant until 1958. In 1951, the first five year plan of the GDR was implemented, which laid out target construction levels until 1956. Aggregate construction could thus not be raised directly after the Uprising of 1953, but reassigned between sectors (e.g. construction of manufacturing plants versus construction of flats) and municipalities. Construction levels increased in 1958, when the second five year plan was introduced with some delay. After 1961 flat construction declined until 1970. In 1970, the government launched a comprehensive housing construction program to solve the problem of housing shortages until 1990. Construction increased until 1981, after which a new five year plan began to prioritize exports. Consequently, all domestic investments, including those in housing, were cut. Data sources: see Section A.1.
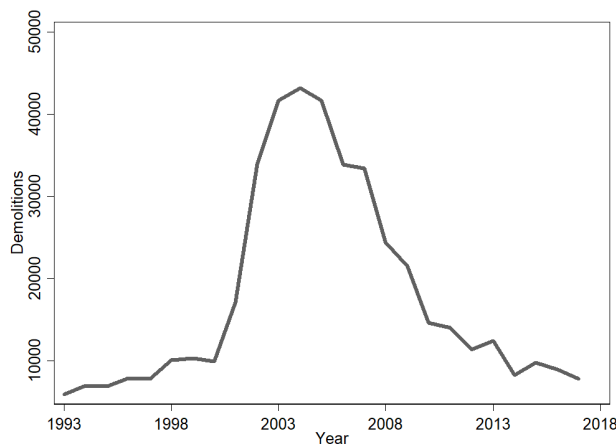

Figure A3: Demolitions in East Germany

Note: The figure shows the aggregate number of demolitions of buildings in former East Germany from 1993 to 2017. This includes East Berlin. Data sources: Statistisches Bundesamt (2018).

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Figure A4: Map with municipalities with phone access from 1947 to 1955
Note: The figure shows municipalities with phone access in the dataset. Municipality borders are from the year 1997. Data sources: see Section A.1.
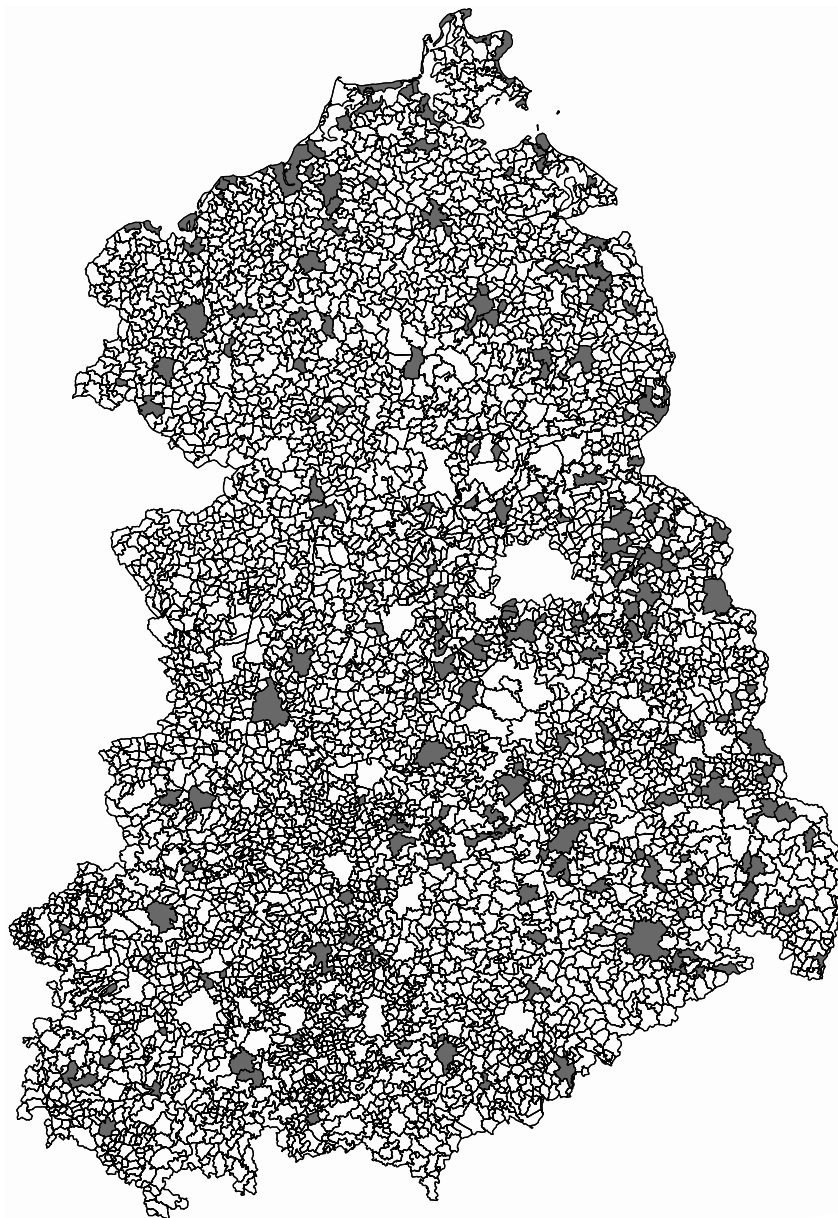
Figure A5: Map with municipalities with military troops, excluding border troops
Note: The figure shows municipalities with phone access in the dataset. Municipality borders are from the year 1997. Data sources: see Section A.1.

Figure A6: Map with all municipalities in the sample with population 2,000 to 10,000

Note: The figure shows all municipalities that could be merged and which had a population between 2,000 and 10,000 inhabitants in 1950. Municipality borders are from the year 1997. Data sources: see Section A.1.
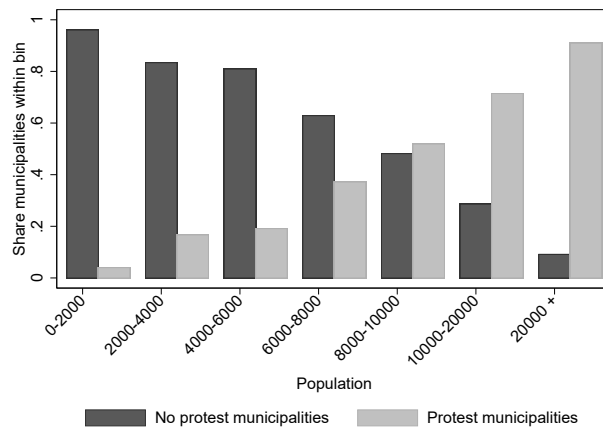
Figure A7: Share of municipalities with different size of population

Note: The figure shows the share of municipalities without and with protests by different population bins based on population numbers in 1950. Data sources: see Section A.1.
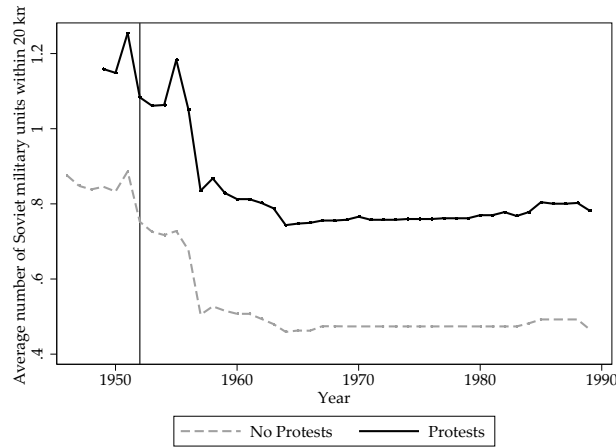
Figure A8: Number Soviet Military Units in Protest and Non-Protest Municipalities
Note The figure shows the average number of military units within 20 km of a municipality from 1949 to 1989 in protest and non-protest municipalities for municipalities that had between 2,000 and 10,000 inhabitants in 1950. The vertical line denotes the year 1952. Data sources: see Section A.1.
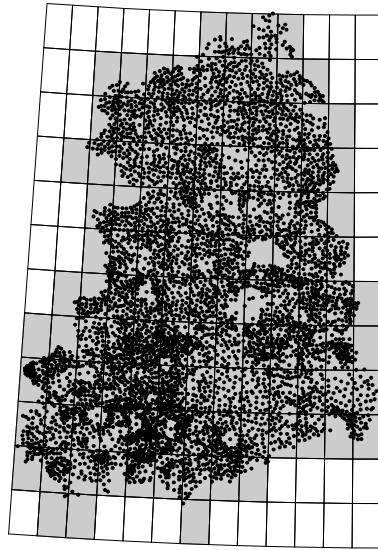
(a) Grid Cell Analysis: First Grid
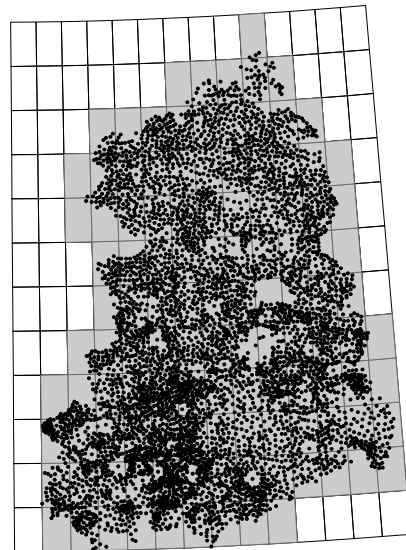
(b) Grid Cell Analysis: Last Grid

Figure A9: Grid Cells

Note The figure shows grid cells of size 0.4 times 0.4 degrees. Each dot represents one municipality. For the empirical analysis I only employ grid cells in which at least one municipality is located, i.e. gray grid cells. The figure on the left shows the starting grid. I generate 100 grids by moving this grid east and south in 0.04 degree steps. The figure on the right shows the last grid. Data sources: see Section A.1.
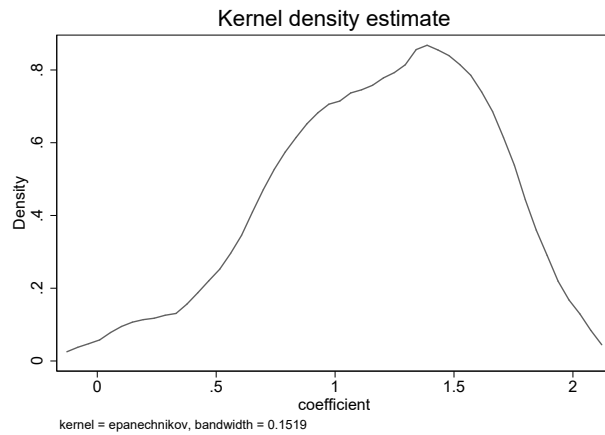
Figure A10: Grid Cell Analysis: Distribution of coefficients

Note: The figure shows the distribution of coefficients of Regression 6. Standard errors are clustered at the grid cell level. I run this regression 100 times, each time moving the underlying grid 0.04 degrees east or 0.04 degrees north. All coefficients are significant at the 5 percent level, see figure A11 in the Appendix. Data sources: see Section A.1.
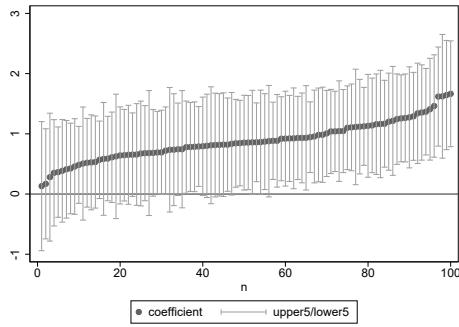
(a) 0.35 × 0.35
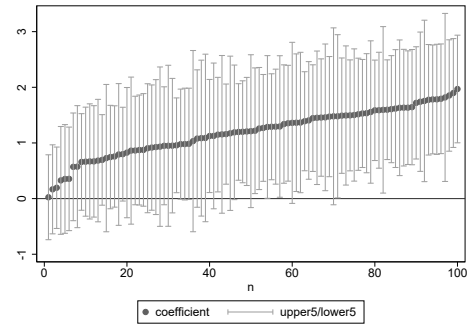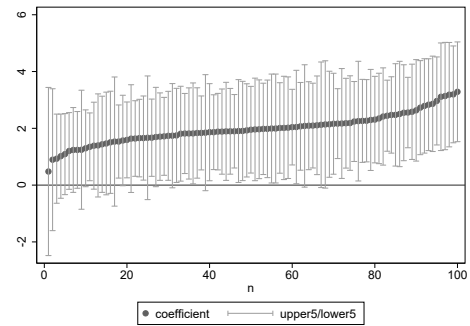
(b) 0.4 × 0.4
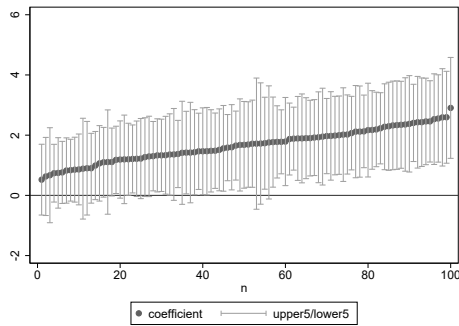
(c) 0.45 × 0.45

(d) 0.5 × 0.5

Figure A11: Grid Analysis using different grid sizes

Note: The figure shows coefficients of regression 6 with 95 % confidence intervals for different grid sizes. Data sources: see Section A.1.

A.3 Tables

Table A1: Carrots: Difference-in-Differences Estimators Construction, Different Population Bins

| | Construction per 1,000 inhabitants | | | | | | | | | | |
| | Population Bins | | | | | | | | | | |
	0-10	0-15	0-20	2-15	2-20	4-10	4-15	4-20	from 2	from 4	all
Protest 1953 × Post 1952	1.248***	1.489***	1.574***	1.119***	1.195***	1.434***	.589***	1.574***	1.501***	1.814***	1.874***
	(-0.196)	(-0.188)	(-0.181)	(-0.211)	(-0.2)	(-0.324)	(-0.338)	(-0.309)	(-0.186)	(-0.239)	(-0.17)
	[-0.197]	[-0.185]	[-0.175]	[-0.18]	[-0.17]	[-0.279]	[-0.318]	[-0.295]	[-0.162]	[-0.219]	[-0.16]
	{-0.132}	{-0.124}	{-0.119}	{-0.125}	{-0.119}	{-0.193}	{-0.206}	{-0.193}	{-0.109}	{-0.151}	{-0.11}
Muns	4785	4847	4871	1014	1038	392	303	327	1102	542	4935
Obs	210540	213268	214324	44616	45672	17248	13332	14388	48488	23848	217140
Adj R²	0.049	0.051	0.052	0.084	0.086	0.102	0.122	0.124	0.099	0.133	0.054

Note Equivalent to Column 2 of Table 2, but using different population bins according to municipalities' population in 1950. Standard errors in parenthesis are clustered at the municipality level. Standard errors in square brackets are clustered at district level. Standard errors in parenthesis are clustered at the municipality level. Standard errors in square brackets are clustered at district level. Standard errors in curly brackets are Conley standard errors. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively, based on the first standard errors shown. Data sources: see Section A.1.

Table A2: Carrots: Quality of Flats

				Share of Flats with				
	Modern Heating	Kitchen	Toilet	Bathroom	>3 rooms	<40m²	40 to 100m²	>100m²
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Protest 1953 × Post 1952	0.002	0.001	-0.037***	-0.015*	-0.011	-0.001	0.056***	-0.055***
	(-0.014)	(-0.002)	(-0.009)	(-0.008)	(-0.010)	(-0.004)	(-0.014)	(-0.015)
	[-0.014]	[-0.002]	[-0.009]	[-0.008]	[-0.009]	[-0.004]	[-0.013]	[-0.013]
	{-0.011}	{-0.002}	{-0.008}	{-0.007}	{-0.009}	{-0.004}	{-0.011}	{-0.012}
Time FE	✓	✓	✓	✓	✓	✓	✓	✓
Municipality FE	✓	✓	✓	✓	✓	✓	✓	✓
Observations	34,594	34,594	34,594	34,594	34,594	34,594	34,599	34,594
Adj. R²	0.153	0.010	0.204	0.150	0.057	0.020	0.161	0.167

Note Estimation results for $Quality_{mt} = \beta Protest1953_m \times Post1952 + \alpha_m + \alpha_t + \varepsilon_{mt}$ for municipalities between 2,000 and 10,000 inhabitants in 1950. The dependent variables is the share of newly constructed flats per year and municipality with a given quality attribute as indicated by the column header. SStandard errors in parenthesis are clustered at the municipality level. Standard errors in square brackets are clustered at district level. Standard errors in curly brackets are Conley standard errors. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively, based on the first standard errors shown. Data sources: see Section A.1.

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Table A3: Channels: Chairmen of County Councils

	Duration of term		Characteristics of Chairmen				
	Survival Analysis	Replacement	PhD	Appointment Before	Order of Merit Ever	Order of Merit Before	Distance Place of Birth to County Capital
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Share Protests	-0.347 [0.410]						
Share Protest × Post Protest 1953 Share-Protest Post1953		-0.026 [0.056] {0.055}	0.023 [0.040] {0.041}	0.076 [0.165] {0.110}	-0.011 [0.081] {0.076}	0.019 [0.015] {0.017}	-2.375* [1.344] {0.822}
County FEs		✓	✓	✓	✓	✓	✓
Year FEs		✓					
Appointment Year FEs			✓	✓	✓	✓	✓
Mean Dep. Var		0.131	0.030	0.080	0.064	0.004	1.527
Observations	368	4,018	528	528	528	528	83
Adj. R^2		0.065	0.316	0.301	0.296	0.359	0.808

Note Column 1 presents the estimates of a Cox Hazard model analyzing the survival of county chairmen who were in power during the protests in 1953. *ShareProtests* is the share of municipalities within a county that had a protest in 1953. Column 2 shows the results of the regression $Replacement_{ct} = \beta ShareProtests_c \times PostProtest1953_t + \alpha_c + \alpha_t + \varepsilon_{ct}$ where $Replacement_{ct}$ is a dummy that takes on value 1 if in a given year t the chairmen of county c is replaced non-temporarily, *ShareProtests$_c$* is the share of protest municipalities in 1953 in county c, $PostProtest1953_t$ is a dummy that takes on 1 after the Uprising in 1953 and α_c and α_t are county and time fixed effects. The unit of analysis is the county times year. For columns 3 to 6 the underlying model is $ChairmenCharacteristic_{ct} = \beta_3 ShareProtests_c \times PostProtest1953_t + \alpha_c + \alpha_t + \varepsilon_{ct}$, where $PostProtest1953_t$ is a dummy indicating whether chairmen of county c after the Uprising 1953. α_t are appointment year fixed effects. The remaining variables are defined as before. The units of observation is the new chairmen in year t. In column 3 the dependent variable is a dummy whether a chairman held a doctoral degree, in column 4 a dummy that takes on value 1 if the chairmen has served as chairmen in another county before, in column 5 a dummy whether he received an Order of Merit for his work as chairmen before he was appointed at the county, in column 6 a dummy whether he received an Order of Merit for his work as chairmen ever, and in column 7 the geodetic distance between the place of birth of the chairmen and the county capital. Standard errors in square brackets are clustered at the county level reported in parentheses. Standard errors in curly brackets are Conley standard errors. *, **, and *** denote significance on the 10 percent, 5 per cent, and 1 percent level, respectively. Data sources: see Section A.1.

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