Autocratic Responsiveness to Citizen Demands
Evidence from the GDR's public housing program[*]

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Abstract

Do autocrats use responsiveness to citizen demands to ensure regime survival? To answer this question, we assemble a novel panel of housing-related petitions to the GDR government in combination with data on all residential units constructed between 1945 and 1989. Exploiting the timing of the largest GDR housing program in 1971, we employ a difference-in-differences design to show that the housing program was more expansive in regions with higher rates of petitioning. We then investigate whether the regime relied on responsiveness to underpin political survival along two dimensions. First, we demonstrate that the government was more responsive to petitions submitted in regions where critical export industries were located. In addition, we find that counties with a history of anti-regime protests were more likely to see housing construction in response to petitions. Finally, we show that autocratic responsiveness can lastingly impact regime support. After the demise of the GDR regime, the successor of the East German ruling party received more votes in regions where the housing program was most extensive.

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1 Introduction

How do autocrats use responsiveness to ensure regime survival? According to classic models of governance, the absence of electoral constraints leaves autocrats with limited incentives to respond to citizen demands (Bueno de Mesquita et al. 2003; Powell 2004; Shmuel 2020). Yet, authoritarian regimes routinely offer their citizens alternative, non-electoral pathways to influence policy, such as the Chinese "Mayor's mailbox" or "letters-and-visits" (*xinfang*) systems (Chen 2008; Distelhorst and Hou 2017; Tsai and Xu 2018), or the petitions systems in socialist Bulgaria and Saddam Hussein's Iraq (Dimitrov 2014*b*; Walter 2018). These channels enable citizens to voice discontent or demand improved access to government services, while simultaneously allowing officials to collect information on grievances and popular sentiments toward the regime (Luehrmann 2003).

Prior work on non-democratic institutions has provided ample evidence that officials frequently respond to demands made through these channels (Chen, Pan and Xu 2016). However, several open questions remain. First, is responsiveness to citizen demands merely performative, or does it entail tangible improvements for citizens' livelihoods? Second, do officials respond in a relatively indiscriminate manner, or is responsiveness strategically targeted to counter threats to regime stability? Finally, how does responsiveness affect support for the regime? In this paper, we seek to answer these questions using two novel panel data sets on petitions and housing construction in the former German Democratic Republic (GDR).

Building on the finding that autocratic institutions can indeed generate responsiveness (Manion 2015; Truex 2016), we examine how responsiveness is used to underpin political survival. We propose that authoritarian governments use responsiveness to mitigate two threats from the population. First, regimes are reliant on a functioning economy to extract rents, appease powerful business elites, or generate the revenue needed to retain power (Kim and Gandhi 2010; Tsourapas 2018). Therefore, they target responsiveness to citizens who

can credibly threaten to disrupt key parts of the country's economy. Second, autocrats are more likely to respond to citizens who can credibly threaten to use collective action against the regime. Doing so reduces the risk of mass mobilization that could destabilize the regime (Chen, Pan and Xu 2016; Distelhorst and Hou 2017).

To test this theory, we assemble two novel data sets that offer unique insights into the internal politics of the former GDR and closed authoritarian regimes more broadly. In particular, we focus on responsiveness in the context of housing policy, which was among to most salient social policy issues in the GDR (Schmidt 2013). We construct an annual, county-level panel on all housing units (or *flats*) built by the state between 1945 and 1989. We combine this data with an original panel of all housing-related petitions submitted to the central government between 1963 and 1971. While all petitions were guaranteed a written response, our two data sets allow us to directly link grievances to actual policy outcomes.

Empirically, we exploit the timing of the 1971 GDR housing program, which marked a sharp shift in the country's housing policy and resulted in the construction of an additional 1.6 million flats. Using a difference-in-differences design, we show that the housing program was more expansive in counties with higher rates of petitioning. Importantly, this result holds after accounting for the quality of the housing stock prior to 1971. We take this as evidence that citizen complaints had direct consequences for housing provision. We then show that responsiveness was driven by concerns about political survival. Consistent with our argument, we find that the effect of petitions on housing was more pronounced in two types of counties. First, the government responded particularly strongly to petitions in counties where export industries (henceforth: "critical industries") were located. Second, responsiveness was greater in counties where the threat of popular anti-regime mobilization was high, as measured by population density and a history of anti-regime protest. Finally, we evaluate whether autocratic responsiveness can increase citizen support for the regime. In doing so, we rely on electoral data from the first free and fair elections after the demise of socialist rule in East Germany. We find suggestive evidence that support for the successor

of the East German ruling party was greater in areas where more housing had been built.

This paper unites scholarly work on authoritarian survival (e.g., Magaloni 2006; Svolik 2012), research on responsiveness to citizen requests in democracies (Sjoberg, Mellon and Peixoto 2017; Christensen and Ejdemyr 2020; Dipoppa and Grossman 2020), and scholarship on how accountability and responsiveness can exist even in the least democratic regimes (e.g., Tsai 2007; Truex 2014; Manion 2015). Our paper makes three main contributions.

First, we highlight the role of economic incentives for autocratic responsiveness. Past work has identified several factors that impact authoritarian responsiveness, such as co-ethnicity (Distelhorst and Hou 2014), involvement of upper-level officials (Chen, Pan and Xu 2016), political connections (Tsai and Xu 2018), or electoral incentives (Lueders 2020a). While related research has found evidence that the threat of collective action induces responsiveness (Svolik 2012; King, Pan and Roberts 2013), we argue that economic incentives have largely been overlooked. The GDR achieved popular acquiescence in large part due to relatively generous redistributive programs and socio-economic progress (Dale 2005; Pfaff 2006). However, the GDR relied on foreign capital to finance these programs, making the production of export goods essential (Schmidt 2013). The state's reliance on export revenue gave workers in export-oriented industries considerable bargaining power. As we show, the need to raise foreign capital led the government to prioritize petitions from regions where these industries were located.

Second, our data on housing construction enables us to examine tangible rather than performative responsiveness. By and large, research on autocratic responsiveness documents that officials respond to petitions, or that legislators change their behavior in accordance with citizen preferences (Su and Meng 2016; Malesky and Schuler 2010). However, it remains unclear whether responsiveness is a form of "performative governance" that merely acknowledges citizens' grievances, or whether it lastingly improves citizens' livelihoods (Ding 2020). Our data fills this gap—to our knowledge, we are the first study to present evidence from a comprehensive sub-national panel on autocratic responsiveness. Using this data, we

can measure that responsiveness that, rather than being mere lip service, results in substantive improvements in citizens' livelihoods.

Third, we document that responsiveness has implications for regime support. Our findings complement research that links responsiveness and public goods provision in autocracies to public support (Dickson et al. 2016; Truex 2017; Cho, Lee and Song 2019). Specifically, we show that support for the GDR regime was higher in areas where more housing was built and that this effect outlasted the East German regime. In doing so, we provide evidence that responsive policy decisions can indeed sway popular support in favor of the regime. However, we note that the observed effect size is relatively small. Arguably, the modest effect size is in line with the ultimate fate of the GDR—while the regime had some leverage to appease the populace, it was not able to fully stifle the popular discontents that ultimately brought down the regime.

2 Responsiveness and authoritarian stability

2.1 Autocratic petition systems

Many dictatorships offer their citizens avenues to submit complaints directly to the government. The Bulgarian (Dimitrov 2014*b*), Iraqi (Walter 2018), and Soviet autocratic regimes (Dimitrov 2014*a*), for instance, encouraged citizens to write petitions to the authorities. Today's communist China similarly allows its citizen to ask questions or voice concerns through the "Mayor's mailbox" or "letters and visits (*xinfang*)" systems (Luehrmann 2003; Chen 2008; Dimitrov 2015; Chen, Pan and Xu 2016; Chen and Xu 2017; Distelhorst and Hou 2017; Tsai and Xu 2018). Singapore, in turn, uses constituency service to learn about citizen grievances (Ong 2015).

Authoritarian complaint systems are similar to constituency service in democracies. Like 311 calls in New York and San Francisco (Christensen and Ejdemyr 2020), pothole complaints in San Diego (Burnett and Kogan 2016), or "FixMyStreet" requests in the United

Kingdom (Sjoberg, Mellon and Peixoto 2017; Dipoppa and Grossman 2020), they provide public officials with information about citizens' everyday grievances (Dimitrov 2014a) and permit them to improve service provision (Staadt 1996; Gorgulu, Sharafutdinova and Steinbuks 2020).

But unlike democratic regimes, electoral incentives are only a secondary motivation for politicians to respond (Distelhorst and Hou 2017). Elections in democracies are competitive, and the risk of electoral defeat in the next election incentivizes incumbents to respond to their citizens. The fear that inaction may be punished in the next election creates an "electoral connection" (Mayhew 1987) between incumbents and their constituents and generates congruence between political outcomes and voters' preferences (Cain, Ferejohn and Fiorina 2013). Elections in nondemocracies, by contrast, are less competitive: dictators and their ruling parties routinely win by large margins, while the opposition—if legal at all—is systematically disadvantaged at all stages of the electoral process (Schedler 2006). While contested elections can still provoke some degree of responsiveness in nondemocracies (Lust-Okar 2006), it is scholarly consensus that electoral factors are less important drivers of authoritarian responsiveness (Powell 2004; Schumpeter 1950; Dahl 1971; Shmuel 2020). This draws our attention to the non-electoral incentives for responsiveness in autocratic regimes.

2.2   Responsiveness and authoritarian survival

We propose that concerns about authoritarian survival structure responsiveness to citizen demands in autocratic regimes. Responsiveness is a useful survival strategy because autocratic governments can raise citizen support by responding to and acknowledging citizens' demands. Directly addressing and solving the issue—that is, substantive responsiveness—raises support by delivering on citizens' expectations of the government (Gorgulu, Sharafutdinova and Steinbuks 2020) and producing tangible improvements in the livelihoods of citizens (Dickson et al. 2016; Cho, Lee and Song 2019; Guriev and Treisman 2020). Moreover, even non-substantive responsiveness can improve citizen support. As Ding (2020, pp.

5-6) argues, "performative governance"—that is, "the state's theatrical deployment of visual, verbal, and gestural symbols to foster an impression of good governance before an audience of citizens"—can raise satisfaction when citizen demands exceed government capacity. Additionally, a positive interaction with the government can increase subjective political efficacy (Sjoberg, Mellon and Peixoto 2017; Dipoppa and Grossman 2020) and thus raise regime satisfaction and trust, in particular where expectations about access to the government are low (Truex 2017). It can also signal competence (Gorgulu, Sharafutdinova and Steinbuks 2020), which improves confidence in the regime's ability to deliver a comfortable standard of living in the future, or suppress an uprising.

Autocrats are unlikely to respond to all demands equally. Given limited resources, we expect rational dictators to spend their efforts strategically where it has the greatest impact on authoritarian stability. Specifically, responsiveness can help mitigate two popular threats to the regime.

2.2.1 Threats of collective action

The first threat to authoritarian survival is the *threat of collective action*. Anti-regime protests, as exemplified by collective mobilizations against the autocratic government during the People Power Revolution in the Philippines (Pascual 1990), the Orange Revolution in Ukraine (Way 2005), or the Jasmine Revolution in Tunisia (Schraeder and Redissi 2011), is so dangerous because it is often difficult to predict and contain. Widespread preference falsification makes the dictator ignorant about the true level of support they enjoy in the population (Kuran 1995; Wintrobe 1998). This is why even small protests can bring autocratic downfall "by surprise": they can trigger "informational cascades" (Lohmann 1994) that result in sudden mass and unforeseen mobilization against the regime (Kuran 1991).

To mitigate the threats of collective action, dictators often spend additional resources on areas where the potential for citizen unrest and collective action is high. The goal is to appease citizens and keep regime support so high that the number of citizens willing to

mobilize against the regime is insufficient to sustain an uprising.

Dictators can pursue varied strategies to keep citizen approval high. Some use food price subsidies in urban areas, where collective action is often easier to sustain (Ballard-Rosa 2016). Others have used land reform to lower the risk of rural unrest (Albertus et al. 2016). A third strategy is improved responsiveness to citizen requests. Chen, Pan and Xu (2016), for instance, find in an online field experiment in China that local officials are more likely to respond to complainants that threaten to organize with like-minded citizens. Examining rates of response to complaints in a field audit in China, Distelhorst and Hou (2017) demonstrate that responsiveness is related to local labor unrest.

2.2.2 Threats of economic disruption

The second popular threat that responsiveness can mitigate is the *threat of economic disruption*. A functioning economy is key to authoritarian survival. It ensures the continued support of economic elites who are often part of the dictator's "winning coalition" (Bueno de Mesquita et al. 2003). For instance, Fisman (2001) estimates that political connections to Indonesia's President Suharto were valuable and came with above-average stock-market returns. Yet, failure to deliver such returns raises the risk of elite defections, which threatens regime survival. Additionally, a functioning economy generates the revenue necessary to pay for the dictator's survival strategies. Extant models of authoritarian politics link survival to repression (Davenport 2007; Shen-Bayh 2018) and cooptation (Gandhi 2008; Truex 2014). Both strategies, however, are costly: dictators need the resources to afford a large secret service, police force, and military (Piotrowska 2020; Thomson 2020), while the distribution of clientelistic goods among voters is costly, too (Stokes et al. 2013; Diaz-Cayeros, Estévez and Magaloni 2016). A functioning economy is also needed to uphold any bargain dictators may have struck with their citizens. Some dictators achieve popular acquiescence by promising socio-economic progress (Dale 2005). As the history of the GDR illustrates, popular acquiescence can collapse quickly once the population becomes disillusioned about economic

stagnation or decline (Pfaff 2006).

The extent to which the economy can bolster autocratic survival depends on the cooperation of workers: frequent strikes can deprive the regime of the resources needed to co-opt elites and appease citizens, and it can encourage further anti-regime mobilization (Kim and Gandhi 2010). However, not all industries are equally important. We argue that the threat of economic disruption is largest in "critical industries": industries that are owned by politically connected elites or that generate the revenue that sustains autocratic rule.

The dictator's reliance on the cooperation of workers in critical industries affords these workers bargaining power, for any disruption to the production process in their industry can put autocratic survival at risk. The power that workers in critical industries can have is powerfully illustrated by the mass labor unrest that unfolded following several worker suicides at the "Foxconn City" industrial park in Shenzhen (China) in 2010. The movement's ultimate success in obtaining pay raises was seen as an attempt by the Chinese regime to appease the about 400,000 employees at Foxconn, which is a major supplier for companies like Apple, Dell, and Hewlett-Packard, and thus relies on good international business relations (Barboza 2010). Similarly, a strike by 17,000 shipbuilders in the Gdańsk Shipyard led to the formation of the labor union *Solidarność*, which was instrumental in the ultimate collapse of communist rule in Poland (BBC 2007). Importantly, dictators cannot simply repress strikes in critical industries, as such repression can backfire and exacerbate tensions. For example, the violent termination of a worker strike at Saint Petersburg's Putilov Plant, which produced railway and other products for the Russian government, on Bloody Sunday (22 January 1905) is widely seen as the beginning of the end of Tsar Nicholas II's rule precisely because it led to an unstoppable chain reaction that quickly turned hundreds of thousands of Russian workers against the regime (Pipes 2011).

In sum, we propose that responsiveness to citizen complaints in authoritarian regimes is a way to address two threats emanating from the population: it helps mitigate threats of collective action and threats of economic disruption. We thus expect that complaints have

the strongest effect on government-provided services in areas that house critical industries or have a high collective action potential.

3 The social bargain, petitions, and public housing in the GDR

3.1 The social bargain

The German Democratic Republic was a socialist one-party regime established in the former Soviet occupation zone in East Germany after World War II. Its rule was, in part, founded on an implicit social bargain between the government and its citizens, whereby the government provided citizens with socio-economic progress in return for popular acquiescence (Dale 2005).

The government relied on high redistribution to pay for socio-economic progress and keep popular mood favorable toward the regime. For example, employment guarantees made involuntary unemployment virtually unknown (McAuley 1991; Roller 1997), while many basic consumption goods and services including rent, healthcare, and childcare were heavily subsidized (Schmidt 2013). These welfare programs were extremely costly. The GDR's dependence on imports of basic consumption goods to satisfy consumer demands and of the raw materials needed for industrial production created additional financial burdens (Malycha 2011).

Income taxes alone were insufficient to cover these costs. While the GDR obtained part of the necessary capital through loans from Western governments (Graf 2019), a large amount was generated through exports (Malycha 2011; Schmidt 2013). To that end, the GDR's industrial policy focused on the production of heavy machinery (such as metalworking machines, figuring machines, generators, motors, ships, and trains), electronics (such as calculators, watches, reflex cameras, and vacuum cleaners), and chemical products (such as

fertilizers, pharmaceuticals, and asbestos), which together made up more than 80 percent of exports (Staatliche Zentralverwaltung für Statistik 1978; Boot 1987). Oftentimes, foreign demand had priority over domestic demand, leading to supply shortages of the same consumption goods that were mass-produced in the GDR.

3.2   Petitions

The GDR's petition law gave all East Germans the right to submit petitions to all branches and levels of government. East Germans used this right extensively: historians estimate that between half (Class, Kohler and Krawietz 2018) and one million (Mühlberg 2004) petitions (corresponding to about 8.1 percent of the adult population) were written every year, the vast majority of whom came from ordinary citizens.

The law further stipulated that petitions had to be answered within four weeks. To that end, a large bureaucracy reviewed and responded to petitions. Petitions contained invaluable information about popular grievances, such as supply shortages or the performance of local officials (Mühlberg 2004). This information was aggregated by county and informed political decisions at all levels of government (Staadt 1996).

Table 1 demonstrates the breadth of topics covered in petitions to the GDR's State Council (*Staatsrat*), the country's main executive body. Petitions about housing quality and housing construction were the most frequent, with close to half of all petitions complaining about poor housing conditions, requesting renovations, or asking for a different flat, among many others. The share of housing petitions was already high before the start of the housing program. For example, it was 42.8 percent in 1965 and 48.4 percent in 1966. It remained high in later years, ranging from 38.5 percent (1984) to 67 percent (1979). This high salience of housing-related concerns underscores the importance of public housing construction as a proxy for responsiveness in the GDR. Besides housing, petitions covered a multitude of other everyday grievances ranging from legal questions to economic issues to education, health care,

Table 1: Petition contents in 1971

Petition topic	Number of petitions	Share of total
Total petitions	63,888	100.00%
Housing and construction	27,185	42.55%
Domestic affairs	8,208	12.85%
Legal questions	6,086	9.53%
Criticism of local authorities	6,065	9.49%
Economic issues and finance	4,384	6.86%
Labor and social insurance	4,359	6.82%
Emigration to West Germany	2,783	4.36%
Education, health care, and culture	2,477	3.88%
Trade and supply	2,341	3.66%

Notes: The table shows the relative frequency of topics in the petitions submitted to the GDR State Council in 1971. The data is sourced from the German Federal Archives in Berlin (Archival signature: BArch DA 5/14386("Eingaben - EDV Erfassung nach Bezirken und Sachgebieten. Band 5: 1971" / "Petitions - Electronic records by district and topic. Volume 5: 1971")).

and culture.[1]

There were no repercussions for submitting petitions. On the contrary, as Dimitrov (2014b) argues, the absence of repercussions was a precondition for petitioning. Citizens only write petitions if the expected costs are low, and the chances of success nonzero. Criticism of the socialist system was rare, and critical petitions focused primarily on individual grievances or perceptions of unfair treatment by bureaucrats (Schmidt 2008). Only a very small number of petitioners sought a direct confrontation with the authorities, usually in combination with a demand for an exit visa. Until the last years of the GDR, however, such petitions were infrequent (Lueders 2020b). Rather, most citizens employed a pro-regime language steeped in socialist tropes to support their case. Petitioners argued that unfair treatment by local governments contradicted socialist principles, legal changes were framed as improvements to socialism, and older citizens routinely underscored their lifelong contributions to the Socialist Republic.

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[1]Data compiled from detailed county-level petition statistics in Bundesarchiv BArch DA 5/14386 ("Eingaben - EDV Erfassung nach Bezirken und Sachgebieten. Band 5: 1971" / "Petitions - Electronic records by district and topic. Volume 5: 1971").

3.3   The 1971 housing program

In our empirical analysis, we leverage a sharp shift in the priority of housing policy due to the 1971 housing program. After large-scale destruction in World War II, the GDR faced severe housing shortages during the first decades of its existence (Melzer 1984). Almost all of the housing stock was controlled and distributed by the state—private construction was extremely rare (Rink 2020). While the central government recognized the need to alleviate the apparent housing shortages, new construction was not sufficiently prioritized at first. Rather, internal economic goals and Soviet demands for reparations necessitated a focus on industrial development (Bradford and Rueschemeyer 1988). Often, housing construction prior to 1971 was merely a by-product of new industrial developments that required accommodation for workers. After 25 years of lagging construction, about 600,000 citizens were registered as seeking accommodation in 1971, and the wait for a flat could last up to ten years (Rink 2020).[2]

Leading up to 1971, political elites became increasingly aware that the continued housing shortage could threaten social and economic stability. In early 1971, Erich Honecker succeeded Walter Ulbricht as the leader of the ruling SED party. While Ulbricht's policies had emphasized economic development, especially in high-tech sectors, Honecker's stated goal was to increase living standards and popular satisfaction. A core component of this renewed focus on social policy was the *Wohnungsbauprogramm* (housing construction program) of

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[2]While the situation improved over time, housing availability remained precarious during the 1970s and 80s. As prominent example is the experience of German Chancellor Angela Merkel. When looking for an apartment after she had moved to East Berlin in the late 1970s to work there as a physics researcher, a local bureaucrat recommended that Merkel should move back to her rural hometown, as there was no available housing in Berlin. After replying that there were no jobs for a physicist in her hometown, the bureaucrat told Merkel that she should have thought about that before choosing her profession (Roll 2015).

1971.[3]

The program stipulated that about three million flats were to be constructed or renovated until 1990. Until the mid-1980s, the program primarily consisted of new construction, while renovations became more prevalent after 1985. Most commonly, new construction took the form of prefab housing blocks in large satellite settlements outside of urban centers (Malycha 2011). Retrospective evaluations of the program indicate that the sudden shift in attention after 1971 did, to a degree, alleviate shortages. However, the one-sided focus on new construction resulted in the deterioration of the existing housing stock in inner cities, while extremely low rents led to inefficient space use among tenants. As a result, Tesch (2000) concludes that, while "the nominal goals of the program were fulfilled, the housing question remained a social problem."

In the context of our research design, the 1971 housing construction program offers a unique opportunity to evaluate whether autocrats respond to citizen demands. Given the sharp increase in the priority of housing after 1971, we are able to precisely delineate when we would expect to see differential shifts in construction if the government did take petitions into consideration. The leadership change that immediately preceded the program was accompanied by a clear break with the policy goals of the previous administration. This contrasts with how policy decisions were otherwise made by the regime—i.e. in a slow-moving, inflexible manner. Inertia in government decisions presents an empirical challenge since the exact timing of when we would expect responses from the central government is unclear. In contrast, the 1971 housing program makes it much more straightforward to determine the time frame in which citizen demands would be relevant for policy, and when we would expect the government to become responsive to these demands.

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[3]The program was introduced during the 8th party congress in June 1971. The start of the program is sometimes dated to 1973, when it was formally announced. However, we follow the relevant literature (see e.g. Tesch 2000; Sammartino 2018) and use 1971 as the start date of the program: planning and the first constructions began in late 1971 (Steiner 2007).

4 Data

We construct a comprehensive county-level data set that includes annual housing construction, petitions to the central government, and several additional covariates. We present summary statistics and additional descriptive information in sections A.1 and A.2 in the appendix.

4.1 Petitions to the central government

Our main independent variable is petitions to the *Staatsrat* (State Council), the GDR's main executive body. We focus on petitions to the central government, as construction under the housing program was centrally determined and implemented. East Germans submitted an average of 70,000 petitions to the *State Council* every year.

Most of these petitions were forwarded to the responsible agencies and are thus no longer available. Consequently, we are unable to examine the text and content of individual petitions. Instead, we obtained summary information about the content and volume of petitions by county and year from declassified internal reports. These reports often informed policy decisions by the GDR leadership (Staadt 1996).

To measure baseline demand for housing prior to the housing construction program, we use the number of housing petitions before 1971 (averaged over the years 1963 to 1971), scaled by county population in 1969 (we obtained population data from Class 2017). To ensure that housing petitions do not merely reflect the quality and availability of the housing stock itself, we only use variation in petitions that cannot be explained by regional differences in the pre-existing housing stock. We achieve this through a simple regression procedure, which we describe in more detail in section 5.1.

4.2 Housing construction

Our main outcome is county-level annual housing construction by the GDR government, measured between 1962 and 1989. We source this data from the 1995 German Housing Census (*Gebäude- und Wohnungszählung*), which was conducted by the German Federal Statistical Office (*Statistisches Bundesamt*). The census records every flat that existed in 1994 in the territory of the former German Democratic Republic. In the language of the census, a flat is a set of rooms with a separate entrance. Therefore, a flat can be thought of as a residential unit and may refer to a single-family house or a flat in a multi-unit building. Importantly, the housing census contains information on whether a flat was privately owned in 1990, just after the German reunification. For our analysis, we exclude flats that were privately owned. As a results, our housing construction measure only considers flats that were owned by the state or by organizations affiliated with the state in 1990.

The first, and to our knowledge, only prior study to use this data is Mohr (2019), who we follow in all major coding decisions. The housing census also includes additional information on the amenities of flats, their exact location, and the year a flat was constructed.[4] Based on the recorded construction years, we calculated the annual number of flats that were constructed in all 219 counties. We normalized construction by county-level population in 1969, resulting in per-capita flat construction per county and year, which forms our main outcome.

The housing construction data has several key advantages. It is a more objective measure of construction than figures released by the GDR government. Given the prevalent discontent with housing, the government may have exaggerated construction activity in areas where more petitions were submitted—a potential threat to inference that our data circumvents (see e.g. Wallace 2016, for a discussion of the manipulation of official statistics in autocracies). In

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[4]The construction date is truncated at 1933. For flats constructed prior to 1933, we do not know the exact year of construction. For the flats in question, we impute 1910 as the year of construction. In figure A.9, we show that our results are robust to using different years to impute the missing construction years.

addition, the data mitigates the problem that responsiveness may be "performative" (Ding 2020) rather than tangible. While all petitions in the GDR were guaranteed a response, our measure allows us to more directly observe responsiveness that actually improves citizens' livelihoods. Finally, housing was among the most important dimensions of social policy in the GDR (Schmidt 2013). Therefore, we measure responsiveness in the context of a highly salient policy issue that was widely considered to be a key indicator of the regime's performance.

Before moving on, we discuss two drawbacks of the housing construction data. First, it is derived from data on the existing housing stock in 1994, four years after the GDR ceased to exist. Therefore, we cannot capture buildings that were constructed prior to 1990, but were then torn down before the housing census was conducted. This problem is likely minor, as there is no evidence for large-scale demolition of the existing housing stock right after reunification (Kholodilin 2020). Second, the housing census does not contain information on renovation dates. While the 1971 housing program called for both new construction and renovations, the 1994 housing census only records information on construction years but not on renovation activity. Since the housing program primarily focused on new construction (Malycha 2011), we believe that the unobserved renovations only constitute a minor component of responsiveness.

4.3   Threats of collective action and economic disruption

We argue that responsiveness to citizen demands helped the East German regime address two forms of threats originating from the population. The first one—the threat of collective action—refers to citizen mobilization against the regime. To measure this concept, we employ two indicators of the potential of anti-regime mobilization. Our first indicator uses information on protest participation during the only episode of open anti-regime mobilization prior to the collapse of the GDR in 1989: the *People's Uprising* on 17 June 1953. That day, close to one million workers went on strike to protest deteriorating working conditions and rising

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productivity requirements (Thomson 2018). The use of information on this protest assumes that a legacy of protest makes future protest more likely. The underlying grievances and opportunities (e.g., population density, see Thomson 2018) that lead to protest change only slowly and can thus encourage collective mobilization again in the future. In addition, the regime's response to the protests itself may have raised the potential for future anti-regime mobilization. The 1953 uprising was violently suppressed by East German and Soviet troops and led to increased government surveillance (Thomson 2017). Higher repression, however, may backfire and actually result in further protest (Pierskalla 2010), especially if it is seen as illegitimate (Opp and Roehl 1990) or if the victims are visible (Esberg 2020). We obtained data on all locations with at least one protest from Kowalczuk (2003). This information was aggregated by county and scaled by the number of municipalities in each municipality.

Our second indicator is population density. Research shows that the probability of anti-regime mobilization is particularly high in densely populated, urban areas (Buhaug and Urdal 2013). This is because density and urbanization can amplify popular grievances and social tensions by heightening competition for jobs and services (Goldstone 2002) and by bringing together people of different ethnic, cultural, or religious backgrounds (Cincotta, Engelman and Anastasion 2003). As a result, cities house more citizens with a low "revolutionary threshold" that are willing to take to the streets (Kuran 1991). Additionally, density supports citizen coordination and helps overcome obstacles to collective action because it facilitates communication and can thus generate "informational cascades" that trigger revolutions (Lohmann 1994).

Responsiveness to citizen demands also helps address threats of economic disruption. Given the GDR's reliance on foreign capital, these threats were largest in export-oriented industries (see above). Any disruption to the production process in these industries was potentially regime-threatening as it would have cut off the GDR's access to much-needed foreign capital.

To operationalize threats of economic disruption, we use two related variables. Both rec-

ognize the importance of exports to the non-socialist economic area for the GDR's survival. Export revenues were essential to pay for the GDR's welfare regime and expensive imports of raw materials and consumer goods. To generate export revenue, the GDR invested heavily in the production of heavy machinery, electronics, and chemical products. Accordingly, the first variable identifies all counties that the GDR deemed important because they were home to "critical industries" that produced the GDR's main export goods (Boot 1987): counties with state-owned enterprises ("combines") in either of three sectors: mechanical engineering (which produced heavy machinery), electrical engineering (which produced electronics), or the chemical industry (which produced chemical products). The data comes from an internal industry census.[5] The second variable measures export revenue and thus reveals which counties ultimately were important for the regime's economic strategy: it is an indicator of all counties that, according to internal statistics, reported revenue above 50 million (West-German) Deutschmarks from trade with the "non-socialist economic area" (*nichtsozialistisches Wirtschaftsgebiet / NSW*) in 1987. The total export volume of the GDR to the NSW economic area in 1987 amounted to 11.7 billion Deutschmarks (ca. 15.4% of GDP). In figure A.5 in the appendix, we present the spatial distribution of critical and export industries. The data are taken from Ostwald (1990, p. 56).

4.4 Popular support for the GDR regime

We argue that responsiveness to citizen complaints improves popular support and can thus mitigate threats of collective action and economic disruption. Unfortunately, the GDR did not conduct public opinion polls (Niemann 1993), such that we cannot test this argument directly. To evaluate the effects of housing construction on popular support for the GDR regime, we instead use election data at two points in time. The first election we consider is the *People's Chamber* (Volkskammer) election in May 1990, the only free and fair multiparty

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[5]Source: BArch DE 2/30554 ("Erfassung der Arbeits- und Produktionsstätten" / "Census of work places and production facilities").

Table 2: Summary statistics

Variable	Mean	SD	Min	Max	N	Description
Population in 1,000s	78.32	91.42	19.04	1083.86	218	County population in 1969
Stock of flats per 1,000 capita	262.22	72.42	21.69	651.62	216	Number of flats per 1,000 inhabitants prior to the housing program in 1971.
Increase in flats per 1,000 capita, 1972-1989 (absolute)	69.76	62.02	0.00	458.53	219	Absolute increase in flats constructed by the government between 1972–1989 compared to 1945–1971, scaled by county population.
Increase in flats per 1,000 capita, 1972-1989 (rel. to baseline)	141.12	64.54	22.82	556.41	216	Relative increase in flats constructed by the government between 1972–1989 compared to 1945–1971, in percent.
Avg. petitions per 1,000 capita, 1963-1971	1.54	0.41	0.59	3.03	217	This is the mean of annual housing-related petitions to the state council, averaged over the period 1963–1971.
Avg. petitions per 1,000 capita, 1963-1971 (residualized)	0.01	0.38	-0.94	1.60	215	The same as the above variable, after residualizing (see section ?? for more information).
Export revenue > 50 million DM	0.26	0.44	0.00	1.00	217	Equal to one if the total revenue of exports to non-socialist countries is greater than 50 million DM, where DM is the FRG currency.
Critical industry presence	0.12	0.33	0.00	1.00	217	Equal to one if export-relevant industries are located in a given county (see section 4.3).
Share of municipalities w/ protest in 1953	0.20	0.31	0.00	1.00	217	Share of municipalities in a given county with protest events in 1953.
Population density, 1969	321.90	580.06	35.00	4012.35	216	County population density in 1969, inhabitants per km².

Notes: The table presents summary statistics for housing construction, petitions as well as the moderators we discuss. For more summary statistics on trends in housing construction, see also figures 1, A.2, A.1 and A.3. Our measure of housing construction only considers housing constructed by the state, and excludes private housing.

elections in the GDR following the collapse of socialist one-party rule. The second election is the December 1990 *Bundestag* election, held two months after German reunification. In each election, we consider the vote share of the successor party of the socialist ruling party: the Party of Democratic Socialism (PDS). Given its ideological proximity and historical ties to

the Socialist Unity Party of Germany (SED), we use its vote share as a proxy for GDR regime support. This approach is supported by past work showing a close relationship between PDS voting and socialist attitudes, in particular close to reunification (Campbell 2015). Overall, the PDS gained 16.4% of the votes in the *Volkskammer* elections and 11.1% of the East German vote in the *Bundestag* elections. The *Volkskammer* election data were retrieved from archival documents,[6] while the *Bundestag* election data are taken from Bundeswahlleiter (2021).

To verify that differences in PDS support across counties with varying responsiveness do not reflect baseline differences in regime support that precede the housing construction program, we use data from a third election. The 1946 regional elections held in the Soviet Occupation Zone. They were the last relatively free and fair multiparty elections before the establishment of one-party rule in East Germany. The SED garnered only an average of 47.4 percent of the vote (range: 26.6 to 70.7 percent). The data are from Falter (1997).

5 Empirical strategy

We structure our empirical analysis around three sets of questions. First, we investigate whether the GDR regime was responsive to housing petitions. We operationalize 'responsiveness' to petitions as public housing construction under the 1971 housing program (see Section 3.3). Second, we analyze heterogeneity in the level of responsiveness of the regime. Specifically, we test whether the regime was more responsive to petitions from locations with a high potential for economic disruption or collective action. Finally, we explore whether housing construction increased popular support for the regime.

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[6]Source: BArch DE 2/20988 ("Wahlen zur Volkskammer der DDR am 18. März 1990" / "Elections for the People's Chamber of the GDR on 18 March 1990").

5.1 Regime responsiveness

In a first step, we test whether the number of new housing units built per capita was higher in locations where the volume of housing-related petitions was higher prior to 1971. We implement this test using a difference-in-differences (DID) model. Our main specification takes the following form:

$$Y_{it} = \beta_0 T_i + \beta_1 P_{it} + \tau(P_{it} \times T_i) + \varepsilon_{it}$$

where Y_{it} is the total number of flats built by the state in county i in year t, scaled by the pre-treatment county population size in 1969. Our binary treatment variable is T_i, which we define based on the average number of housing-related petitions submitted per capita in a given county between the years 1963 and 1971.[7] We dichotomize this variable using a mean split: counties are defined as treated if the number of petitions over the period of 1963–1971 in a given county is greater than the average number of petitions over the same time period. Finally, $P_{it} = 1$ for county i when $t > 1971$. For our main specification, we aggregate our data within two-year intervals to reduce statistical noise. All of our results are robust to using the original annual data rather than two-year intervals (see section A.7 in the appendix). As additional robustness checks, we estimate model specifications including county and/or period fixed effects (see Table 3). The key parameter of interest is $\hat{\tau}$, the difference in differences estimate for the effect of petitions on housing construction.

To track the evolution of the treatment effect over time, we also estimate a leads and lags specification (see Figure 2). Here we estimate the interaction between the binary treatment and each period indicator separately. As is standard practice in leads and lags regression analyses, we leave out one interaction for the last pre-treatment period (1970/1971), which hence serves as the baseline for all estimated treatment effects in this analysis.

A potential concern about the definition of our treatment variable is that both housing

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[7]We do not observe housing-petitions prior to 1963.

petitions and housing construction could be driven by the underlying quality of the housing stock. Citizens in areas where the quality of the pre-1971 housing stock is lower might be more likely to submit complaints. At the same time, the regime might prioritize such regions in the implementation of the housing program. To address this concern, we only leverage variation in petitions that is orthogonal to objective indicators of housing quality. Specifically, we regressed housing petitions (per capita) in county i on i) the total number of flats per capita, ii) the share of flats with modern heating, iii) the share of flats with a kitchen, iv) the share of flats with in-unit toilets, and v) the average age of flats in the same county.[8] We performed this step separately for each year. The residuals from these models constitute our measure of petitions 'net' of housing quality. For all our analyses, we use this residualized measure of housing petitions to define T_i.

Because we use panel data in a difference-in-differences setup, we account for time-invariant determinants of housing construction by design. We leverage the increase in housing construction after 1971, and test whether this increase was stronger in places where citizens submitted a higher volume of housing-related petitions prior to 1971. Our key identifying assumption is that counties with different levels of housing petitions would have experienced a similar increase in housing construction after 1971 if the number of petitions submitted prior to 1971 in the two groups had been the same.

5.2 Heterogeneity

In a second step, we test whether the GDR regime was more responsive to petitions in areas with high potential for i) collective action and ii) economic disruption. Specifically, we analyze heterogeneity in the effect of housing petitions on construction after 1971. We re-estimate our main model including a three-way interaction between our treatment vari-

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[8]For flats built prior to 1932, we do not observe the precise construction year. We impute 1910 as the year of construction for these units. In figure A.9 in the appendix, we demonstrate that our results are robust to alternative choices for the imputed construction year

able T_i, the indicator-variable for the post-1971 period P_{it} and a binary moderator variable M_i. We also include unit and time-period fixed effects in a standard two-way fixed effects specification:

$$Y_{it} = \delta_t + \mu_i + \tau(P_{it} \times T_i) + \lambda(P_{it} \times T_i \times M_i) + \varepsilon_{it}$$

As moderators M_i, we look at i) the presence of critical industries in given county, ii) an indicator of counties with export revenue from trade with the capitalist world, iii) pre-treatment population density as of 1969, and iv) the share of municipalities in a given county that experienced protest in 1953 (see Section 4.3). The latter two variables were dichotomized using a median split. In this analysis, we are mainly interested in treatment effect heterogeneity. The main parameter of interest is hence λ, which gives us the difference in the effect of housing petitions on flat construction between the two groups defined by the respective moderator variable.

5.3 Effects of housing construction on regime support

Finally, we explore whether the housing construction program achieved one of its main goals: to increase popular support for the GDR regime. To do this, we draw on electoral data from two democratic elections that were held in 1990: the last GDR *Volkskammer* elections in March 1990 and the first *Bundestag* elections after reunification in December 1990. We perform a simple analysis in which we examine whether electoral support for the PDS, the successor party of the East German ruling party (SED), was higher in locations that benefited more from the 1971 housing program. Specifically, we estimate cross-sectional OLS models of the following form:

$$Y_{i,j} = \alpha_j + \tau \Delta H_{i,j} + \mathbf{x_{i,j}}\beta + \varepsilon_{ij}$$

$Y_{i,j}$ measures the PDS vote share in county i nested in one of 15 GDR administrative

districts j in each election. To show that our results are not driven by baseline differences in regime support, we use the county-level vote share of the SED in the 1946 state elections in the Soviet occupation zone as a placebo outcome (Falter 1997). ΔH_i measures the change in public housing construction per capita before and after 1971. Specifically, we first calculated the total number of flats constructed (per capita) between 1946 and 1970, and between 1971 and 1989. We subtract these two measures to get the change in housing construction due to the 1971 housing program at the county-level. Our covariate matrix $\mathbf{X}$ includes industry share, population density, the total number of petitions submitted prior to 1971, and the share of municipalities in a given county that experienced protest in 1953 as additional control variables.[9] We include district-level fixed effects α_j in this analysis.

6   Results

6.1   Responsiveness to petitions

We begin by visually examining trends in per-capita housing construction in counties with above- and below-average levels of petitions prior to 1971. In figure 1, we show that post-1971 housing construction was notably greater in counties that sent more petitions to the *State Council* than in those that sent relatively few petitions. Prior to 1971, in the period where the government did not prioritize housing construction, petitions appear to have little effect on construction trends.

Our main regression results in table 3 confirm the differential trends in housing construction that we observe in figure 1. Using a standard multi-period difference-in-differences specification, we show that the GDR government constructed significantly more flats in counties with above-median petitions. Depending on the specification, the magnitude of the effect is between 0.64 and 1.12 additional flats per 1,000 capita and year. This corresponds to an increase of between 0.16 and 0.28 standard deviations in housing construction.

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[9]We obtained data on industry share and population density from Crabtree, Darmofal and Kern (2015).

Figure 1: Housing construction in the GDR over time
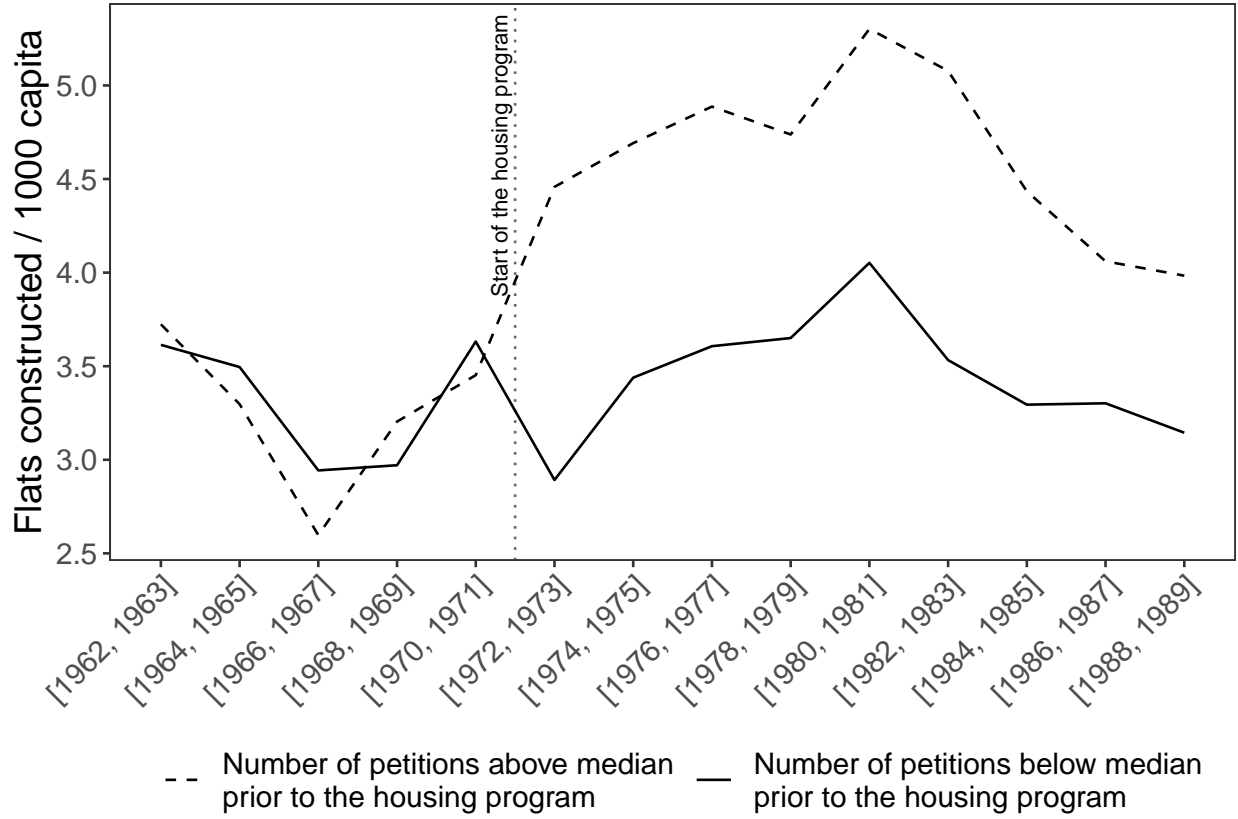
Note: The figure shows trends in average flat construction per 1,000 capita, for counties with above-average per capita petitions prior to 1972, and for counties with below-average per capita petitions prior to 1972. The pre-1972 petition rates are based on residualized average petitions per capita in 1963, 1964, 1965, 1966, and 1971. We average flat construction over two-year periods (see x-axis). The dotted vertical line indicates the start of the housing program. Our measure of housing construction only considers housing constructed by the state, and excludes private housing.

To shed more light on the effect size, we can compare relative differences in housing construction before and after the start of the housing program. Prior to the program, areas with more petitions received about 2.7% more new housing than areas with fewer petitions. After the program start, per-capita housing construction in counties with more petitions was 31% greater than counties with below-average petitioning. Accordingly, the relative gap in housing construction between counties with high and low petitioning rates increased by 28.3 percentage points after 1971. Construction in regions with lower rates of petitioning trailed construction in regions with more petitions by at least three years, on average. Under the
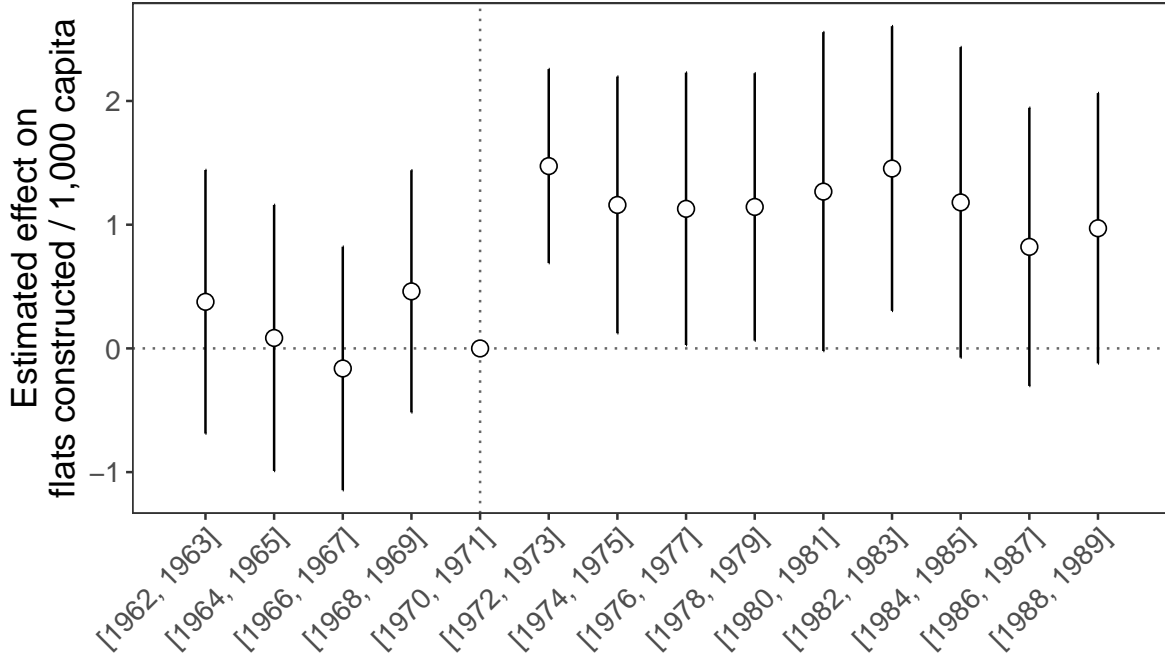
Table 3: Effect of petitions on flat construction

	DV: annual flat construction, per 1,000 capita					
	(1)	(2)	(3)	(4)	(5)	(6)
Petitions * post 1971	0.985***	1.028***	1.124***	0.643*	0.686*	0.751**
	(0.304)	(0.313)	(0.334)	(0.332)	(0.349)	(0.331)
County FE	No	Yes	Yes	No	Yes	Yes
Period FE	No	Yes	No	No	Yes	No
Period * district FE	No	No	Yes	No	No	Yes
Accounting for protest	No	No	No	Yes	Yes	Yes
DV mean	3.754	3.754	3.754	3.754	3.754	3.754
DV SD	4.062	4.062	4.062	4.062	4.062	4.062
R^2	0.016	0.584	0.612	0.266	0.591	0.621
N	3,217	3,217	3,217	3,217	3,217	3,217

Notes: The table contains results from six models, where the DV is annual flat construction per 1,000 capita, averaged over two-year periods. Counties are defined as treated if the number of residualized petitions over the period of 1963–1971 in a given county is greater than the average number of residualized petitions in the same time period. We use residualized petitions to ensure that petitions do not simply measure the quality of the housing stock. Models without county and period fixed effects contain lower order terms, i.e. an indicator for the period after 1971 and the treatment indicator. In models 3 and 4, we add the county–level share of cities with protests in 1953, and interact this variable with the post-1971 indicator. The sample includes all years between 1960 and 1989. Our measure of housing construction only considers housing constructed by the state, and excludes private housing. Standard errors are clustered by county. ***$p < .01$; **$p < .05$; *$p < .1$

housing program, regions with more petitions saw cumulative construction of about 50 flats per 1,000 capita until 1981, and about 75 flats per 1,000 capita in 1985. As we show in figure A.2 in the appendix, in regions where fewer petitions were submitted, 50 additional flats per 1,000 capita was reached only in 1984, while the 75 flats per 1,000 capita mark was never reached during the existence of the GDR.

In addition to the main specifications in table 3, we also estimate a leads and lags specification with period-specific coefficients. The results are shown in figure 2. The coefficients in this figure can be interpreted as differences relative to the last period prior to the start of the housing program. Before 1971, we find that petitions are not associated with differences in housing construction. This finding is consistent with historical accounts of Walter Ulbricht's rule who, as GDR leader until early 1971, emphasized industrial development over

Figure 2: Effect of petitions on housing construction

Note: Leads and lags estimates of the effect of pre-1972 petitions on housing construction. See section 5.1 for more information on the model specification. The DV is annual flat construction per 1,000 capita, averaged over two-year periods. Counties are defined as treated if the number of residualized petitions over the period of 1963–1971 in a given county is greater than the average number of residualized petitions in the same time period. We use residualized petitions to ensure that petitions do not simply measure the quality of the housing stock. The sample includes all years between 1960 and 1989. Coefficients are differences relative to the last pre-treatment period, [1970, 1971]. Our measure of housing construction only considers housing constructed by the state, and excludes private housing. Standard errors are clustered by county.

social progress. After the start of the program, petitions led to significantly higher levels of housing construction. This effect is strongest immediately after the housing program began.

6.2   Responsiveness and threats to regime stability

In the second part of our analysis, we examine whether threats of economic disruption or collective action can induce the government to be more or less responsive to some petitions. In doing so, we interact the binary petition variable with four indicators of threats to the regime. We present the results in table 4. They show that responsiveness to petitions is greater in counties with export ties to the West and critical industries, as well as counties with a history of protest and higher population density.

Table 4: Responsiveness to petitions and threats to regime stability

|	DV: annual flat construction, per 1,000 capita			
	(1)	(2)	(3)	(4)
Petitions * post 1971	0.898***	1.117***	0.529*	0.439
	(0.305)	(0.328)	(0.311)	(0.372)
Petitions * post 1971 * export industry	1.140**			
	(0.526)			
Petitions * post 1971 * crit. industry		1.125**		
		(0.492)		
Petitions * post 1971 * protest			1.408***	
			(0.465)	
Petitions * post 1971 * pop. density				1.425***
				(0.499)
County FE	Yes	Yes	Yes	Yes
Period * district FE	Yes	Yes	Yes	Yes
DV mean	3.754	3.754	3.754	3.754
DV SD	4.062	4.062	4.062	4.062
R^2	0.587	0.586	0.588	0.588
N	3,217	3,217	3,217	3,217

Notes: The table contains results from six models, where the DV is annual flat construction per 1,000 capita, averaged over two-year periods. Counties are defined as treated if the number of residualized petitions over the period of 1963–1971 in a given county is greater than the average number of residualized petitions in the same time period. We use residualized petitions to ensure that petitions do not simply measure the quality of the housing stock. We interact petitions * post with binary indicators for export industries, critical industries, protest intensity in 1953, and higher population density. The sample includes all years between 1960 and 1989. Our measure of housing construction only considers housing constructed by the state, and excludes private housing. Standard errors are clustered by county. ***p < .01; **p < .05; *p < .1

Since all of our moderators are binary, the coefficients on the interaction between the moderator M and the petitions*post term can be interpreted as the mean difference in responsiveness between counties where $M = 1$ and counties where $M = 0$. Accordingly, for counties with export industries, the effect of petitions is about double the effect in counties with a lower presence of export industries. We observe similar differences for counties with critical industries. For our measures of potential for collective action, these differences are

even more pronounced, the effect of petitions on housing construction is about four times as large in counties with a prior history of protest or above-median population densities.

6.3 Did housing construction increase regime support?

Figure 3: Effect of public housing construction on regime approval
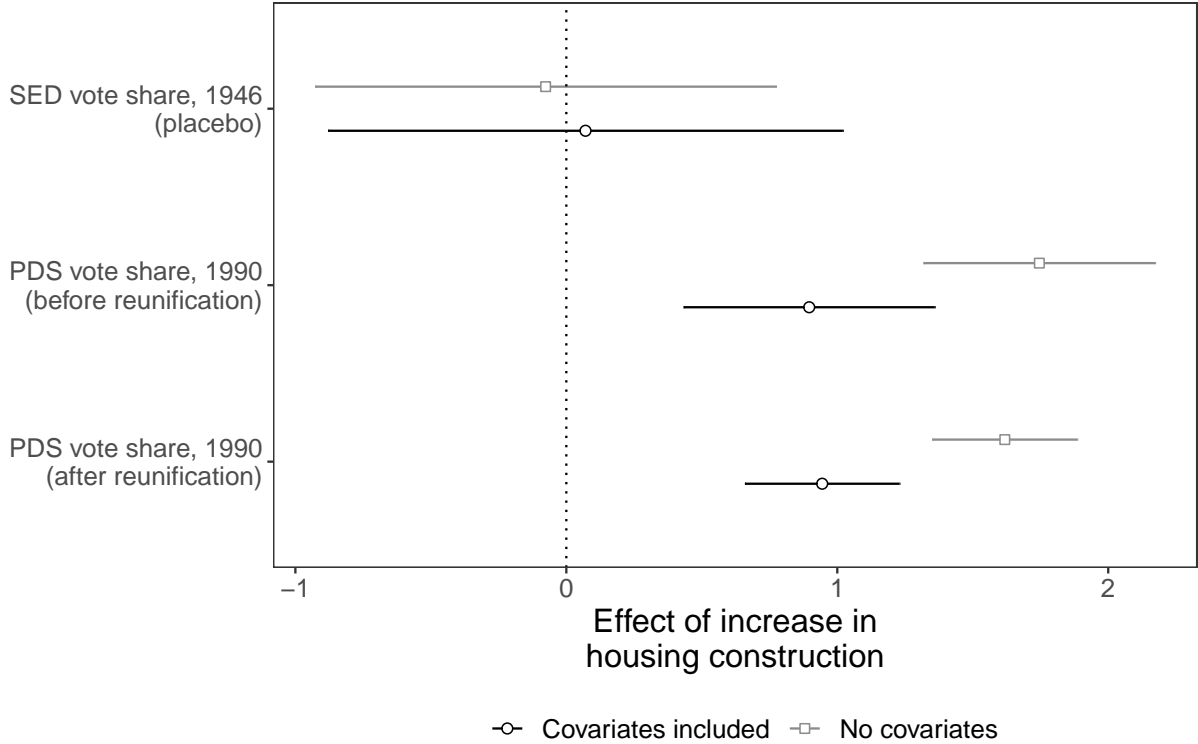
Note: The figure shows the effect estimates from OLS regressions where the outcomes are the vote shares of i) the PDS in the 1990 Volkskammer elections, ii) the PDS in the 1990 federal German elections, and iii) the SED in the 1946 state elections in the Soviet occupation zone. The outcome is measured in percentage points. The treatment is the difference in the total number of flats constructed before and after 1971, scaled by county population size in 1969. Our measure of housing construction only considers housing constructed by the state, and excludes private housing. The treatment was standardized prior to the analysis. Included covariates are population density, industry share, the cumulative sum of housing petitions per capita before 1971, and the share of municipalities in a given county that experienced protest in 1953. All models include district fixed effects. See section 5.3 for more details on the model specification.

We now investigate whether the housing program achieved one of its primary objectives: to increase popular support for the GDR regime. For this analysis, we draw on county-level electoral data right before and right after German reunification in 1990 (see section 5.3 for more details), focusing on the first and only free elections in the GDR in March 1990 and

the first German federal elections after reunification. Our main outcome variable is the vote share of the successor party to the SED, the Party of Democratic Socialism (PDS), which competed in both elections.

Responsiveness to housing petitions likely improved satisfaction among citizens who successfully petitioned for new housing. Responsiveness can raise popular trust in the government among petitioners and signal government competence (Truex 2017; Gorgulu, Sharafutdinova and Steinbuks 2020). Additionally, the housing construction program plausibly increased citizen support in target counties irrespective of whether citizens had written petitions. Compared to the old housing stock, the new flats were modern, often coming with central heating and in-unit toilets and showers (Tesch 2000). These tangible improvements in citizens' livelihoods likely raised approval (Guriev and Treisman 2020). Given the persistent housing shortages in the former GDR, citizens moved infrequently. That is, those who benefited from the housing construction program in 1971 still predominantly lived in the same apartments upon German reunification, such that their housing situation could inform their vote choice in 1990.

We find suggestive evidence that housing construction under the 1971 program modestly increased regime support. Counties that were targeted by the program (i.e. counties that saw a larger increase in the construction of new flats after 1971) saw greater levels of electoral support for the PDS in both 1990 elections. The estimated effect size is modest: a one standard deviation increase in housing construction translates to an increase in the vote share of the PDS of about 1.5 percentage points. This increase equals a 13.5% increase relative to the mean vote share of the PDS in the December 1990 *Bundestag* elections. At the same time, we find no association between the housing program and regime approval prior to the implementation of the policy in 1971. In the 1946 state elections in the Soviet occupation zone, counties that were prioritized by the housing construction program did not show higher levels of electoral support for the ruling SED party. We take these placebo results as evidence that reverse causality does not drive the relationship between housing

construction and regime support in 1990.

6.4   Robustness

In addition to the main results, we conducted five robustness checks to verify that our results are not driven by the choice of specification, sample, operationalization of the petition treatment, or temporal aggregation of housing construction.

First, we show that our main results are robust to alternative specifications in which we flexibly control for district-specific trends in housing construction. The relevant models are models 3 and 6 in table 3 for the main results. For the interaction results, 4 already includes these district-specific trends, while table A.1 in the appendix omits them. Generally, the sign and significance of the relevant coefficients is the same as in the base models without district-specific trends.

Second, we demonstrate that alternative definitions of the petition treatment do not alter our substantive conclusions. We present these results in figures A.6 and A.7, where we re-estimate the main specifications and leads/lags specifications using six alternative treatment definitions. First, we use petitions in 1971 rather than the average number of petitions between 1963–1971 as the basis of the treatment. Second, we estimate alternative specifications that use a binary treatment based on median split rather than mean split, as well as a continuous version of the petition treatment. Across the resulting six methods of defining the treatment, the results mirror our findings in table 3 and figure 2.

Third, we verify that our findings are not driven by regional idiosyncrasies. To do so, we re-estimate the main specification, one-by-one excluding one of the fifteen administrative districts (*Bezirke*), the administrative unit between a county and the country. We present the results in figure A.8 in the appendix. They show that successively dropping individual districts from the sample does not alter our results, indicating that our findings are not driven by any specific district.

Fourth, we verify that our results are not sensitive to the imputed construction year for

buildings where construction years are not known. As discussed previously, construction years are missing for buildings built prior to 1933. In our main specification, we impute 1910 as the construction year. In figure A.9 in the appendix, we show that results are similar when we instead impute 1890, 1900, 1920, or 1932 as construction years.

Fifth, we re-estimate the main specification in tables 3 and 4 using annual data. While the results in the paper are derived from 2-year averages (see e.g. figure 1 for a visual representation), we can run the same models using the original, annually observed data. We present the results in table A.2, which corresponds to tables 3, and table A.3, which corresponds to tables 4 and A.1. Comparing the two-year aggregates with annual data, we find that coefficients for both the main and interaction effects are extremely similar in magnitude, sign, and significance.

7 Discussion

Do authoritarian governments use responsiveness to secure regime survival? In this paper, we present a new panel on housing-related petitions, as well as comprehensive data on housing construction in the former German Democratic Republic. Using a difference-in-differences design, we show that the government responds to petitions by increasing construction. We then demonstrate that the GDR government responded more strongly to petitions from counties with (i) industries that generated much-needed revenue for the regime and with (ii) a higher risk of popular mobilization against the regime. Finally, we show that greater responsiveness increased support for the regime after the demise of the GDR.

Before discussing the implications of our results, we note a drawback of our analysis. We emphasize that results in section 6.3 should be viewed with caution. While we have demonstrated that housing construction after 1971 is uncorrelated with pre-treatment SED support, we nevertheless consider this evidence as merely suggestive. Because we only exploit cross-sectional variation for this analysis, we cannot rule out that the relationship between

the housing program and regime support could be confounded by unobserved factors.

Our results have several important implications for scholarship on authoritarian regimes. Our study is among the first to analyze substantive dimensions of government responsiveness in authoritarian regimes. What is more, we offer an analysis of responsiveness beyond the direct aftermath of citizen demands. Rather, we present evidence of almost two decades of policy responsiveness. We show that responsiveness is more than "performative governance" and can yield tangible improvements in the livelihoods of citizens, even in contexts that give citizens little direct influence in politics. In doing so, we identify a promising new research agenda that explores the consequences of responsiveness for citizens' material well-being across regime types.

The finding that there can be substantive responsiveness to citizen demands even in the most repressive regimes such as the former German Democratic Republic calls for a reappraisal of existing models of government responsiveness. Conventional wisdom holds that the degree of electoral competitiveness determines how responsive governments are to their citizens (Powell 2004; Shmuel 2020). We join a burgeoning literature that shows that accountability and responsiveness are possible even without electoral incentives (Manion 2015; Chen, Pan and Xu 2016; Truex 2016; Distelhorst and Hou 2017). This conclusion implies that there are multiple pathways to responsiveness. Even the most repressive autocracies may seek to improve the livelihoods of their citizens, despite their uncontested elections and disrespect for civil liberties.

Authoritarian responsiveness points to an alternative way for dictators to stay in power: delivering on the social contract with their citizens. One of the main reasons for the longevity of the East German socialist regime was its ability to deliver a good standard of living to its citizens, as powerfully illustrated by the housing program (Dale 2005). A key precondition for such a survival strategy is regime competence (Huntington 1968): the extent to which autocratic regimes can meet citizens' expectations about what they ought to deliver. This paper describes an autocracy whose centralized bureaucracy was very capable of iden-

tifying areas with high housing demand, and of delivering on these demands. Given this centralization of power in some autocracies, it is possible that some authoritarian regimes are even better positioned to deliver than democracies, where power is often decentralized. Quicker and more decisive responses to the COVID-19 pandemic illustrate this "autocratic advantage" (Cheibub, Hong and Przeworski 2020; Stasavage 2020).

Our findings call for a re-definition of popular threats to the survival of authoritarian regimes. While we agree about the dangers that popular anti-regime mobilization poses for the dictator (Kuran 1991; Svolik 2012), we emphasize that citizens can also threaten authoritarian stability by undermining its economic power base (Kim and Gandhi 2010). Such a strategy is less high-stakes than threatening an uprising, but may be equally effective: instead of publicly challenging the regime, citizens can engage in more subtle "everyday forms of resistance" to obtain services from the autocratic government (Scott 1986). Importantly, threats of economic disruption afford citizens an active role in authoritarian politics: citizens threaten a transgression in order to achieve their preferred response from the government. More work is needed to model and understand the dynamics of citizen-government interactions in authoritarian regimes.

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A Supporting information (Online Only)

Contents

A.1 Housing construction trends

Figure A.1: Annual housing construction in the GDR, 1960–1989
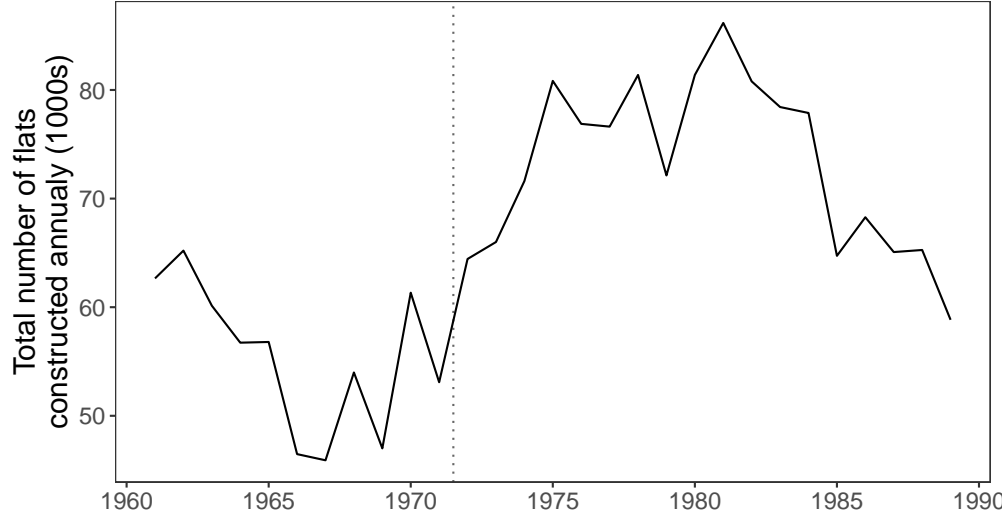
Note: The figure shows the total number of flats constructed annually by the GDR government between 1960 and 1989. The dotted vertical line indicates the start of the housing program.

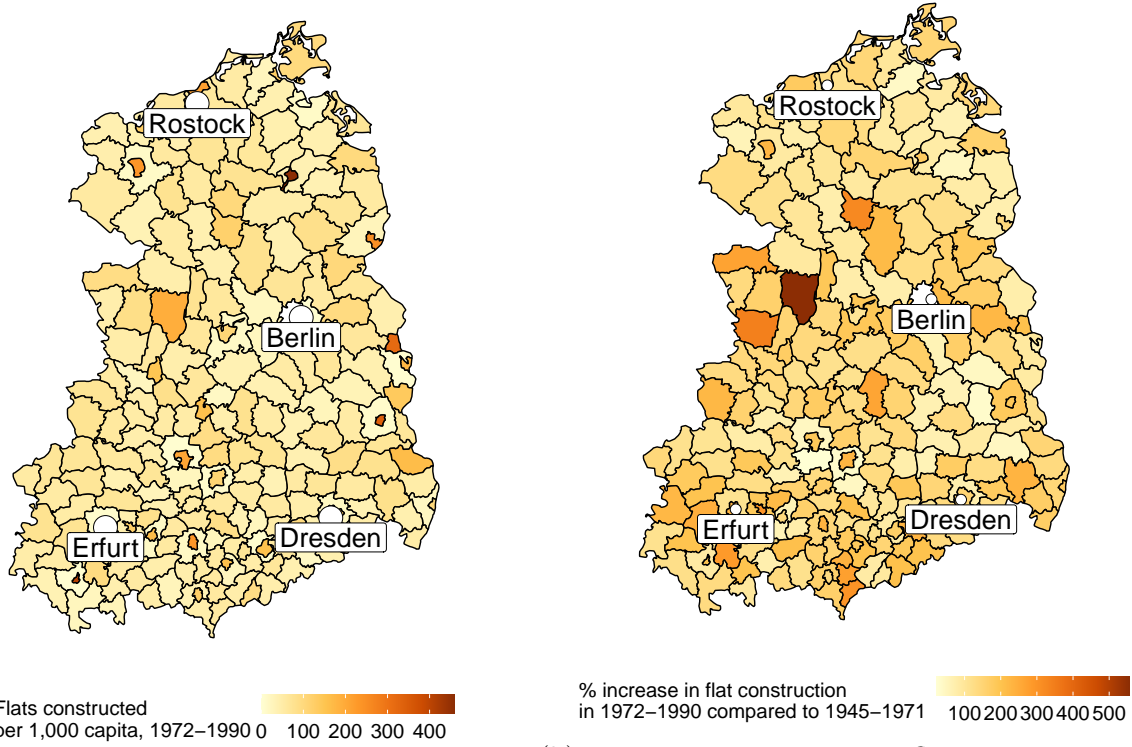Figure A.2: Cumulative housing construction after 1971
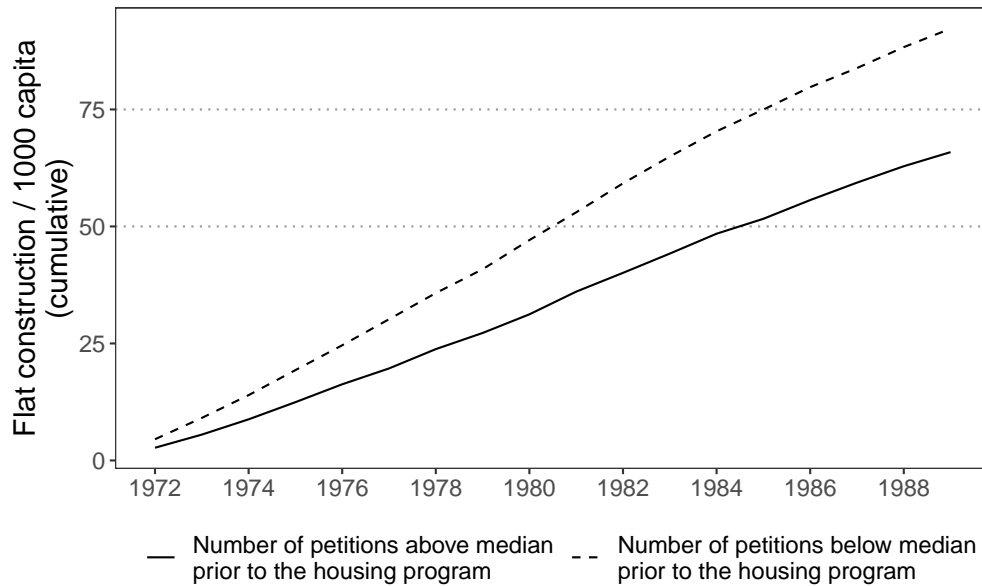
Note: The figure shows the cumulative per capita number of flats constructed by the GDR government after 1971. We show cumulative trends separately for counties with above- and below-average rates of housing petitions. The dotted vertical lines indicate a total of 50 and 75 flats per capita, corresponding to the discussion in the results section.

Figure A.3: Trends in housing construction
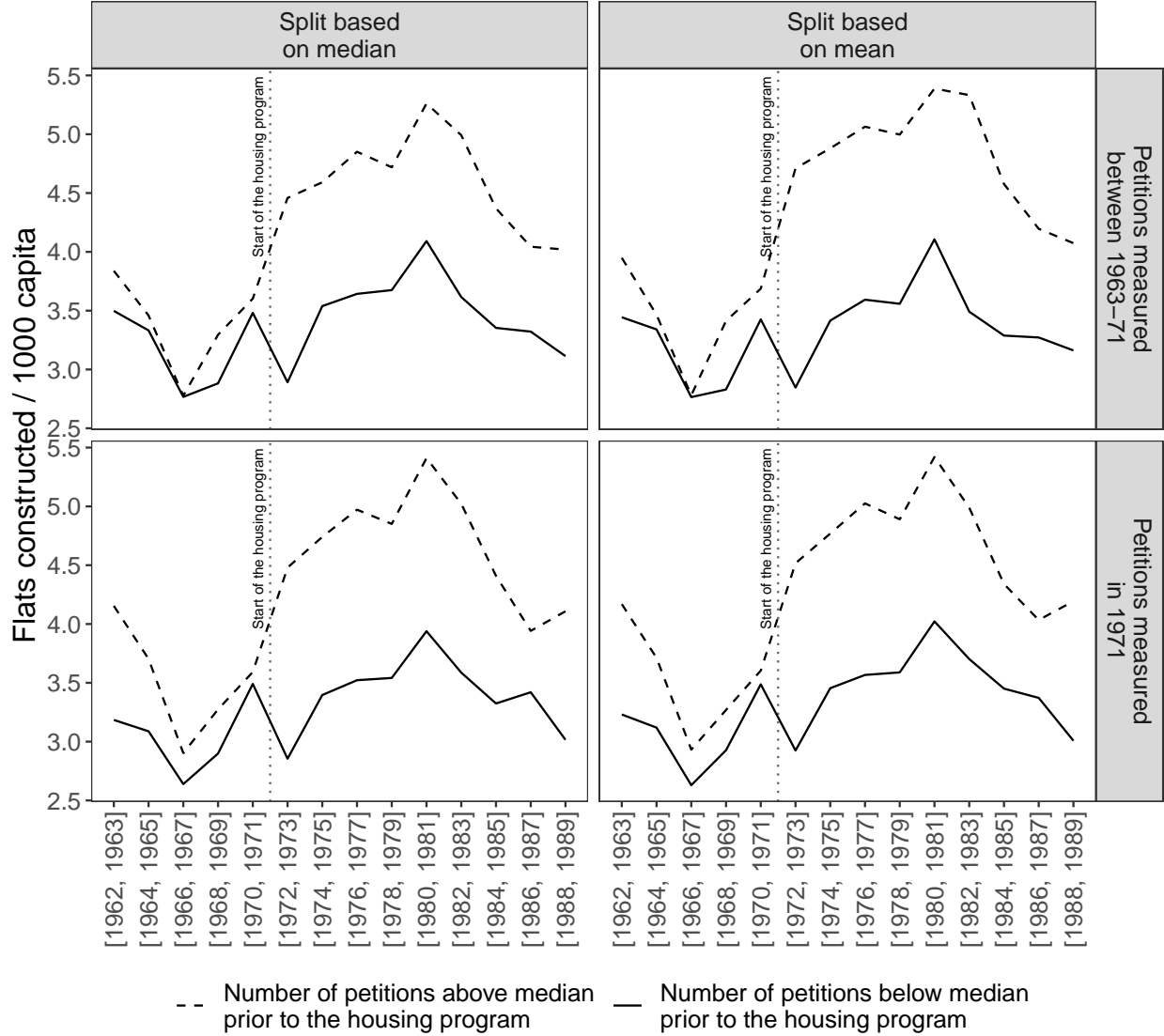
Note: The figure shows trends in average flat construction per 1,000 capita, for counties with above-average per capita petitions prior to 1972, and for counties with below-average per capita petitions prior to 1972. The pre-1972 petition rates are based on residualized average petitions per capita in between year y and 1971, where y varies by row. Each column corresponds to a different way of splitting the sample into counties with a greater or smaller rate of petitions. We average flat construction over two-year periods (see x-axis). The dotted vertical line indicates the start of the housing program. Our measure of housing construction only considers housing constructed by the state, and excludes private housing.

Figure A.4: Spatial distribution of housing construction after 1971

Flats constructed
per 1,000 capita, 1972–1990 0   100 200 300 400

% increase in flat construction
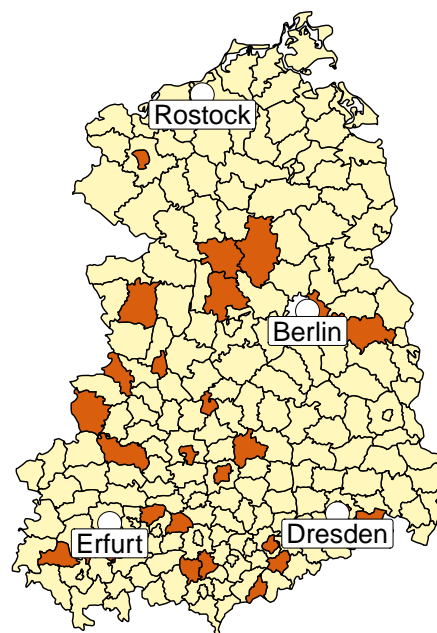in 1972–1990 compared to 1945–1971   100 200 300 400 500

(a) Per-capita number of flats constructed between 1972 and 1990, by county. For a description of the data, see section 3.3 in the manuscript. Our measure of housing construction only considers housing constructed by the state, and excludes private housing.

(b) Percentage increase in flat construction, comparing flats constructed between 1945 and 1971 (prior to housing program) and 1972 and 1990 (during the housing program). Our measure of housing construction only considers housing constructed by the state, and excludes private housing.
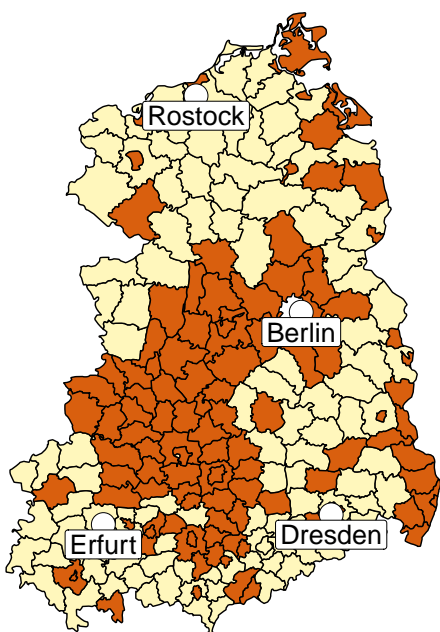
A.2 Summary statistics

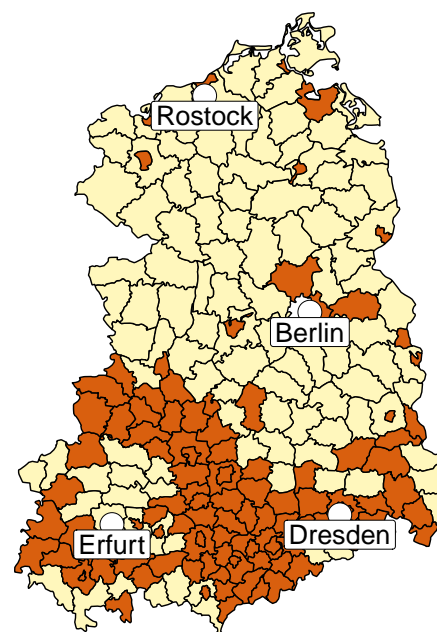Figure A.5: Spatial distribution of collective action and economic disruption variables

Export revenue to
the West < 50 million

Export revenue to
the West > 50 million
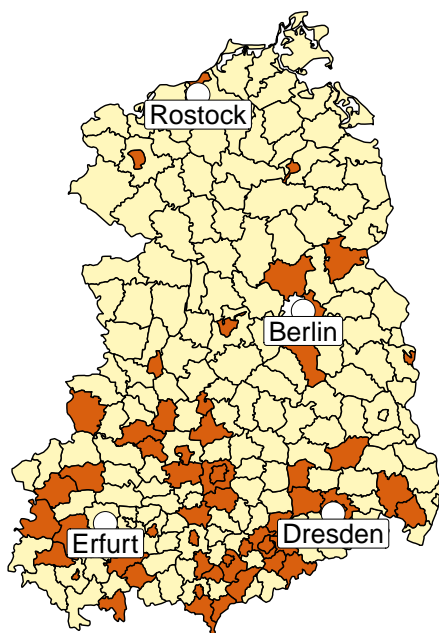
(a) Presence of export industries by county

No critical industry
present

Any critical industry
present

(b) Critical industry presence by county

1953 protest participation
below median

1953 protest participation
above median

(c) 1953 protest participation by county

Population density
below median (1969)

Population density
above median (1969)

NA

(d) Population density by county

A.3 Interaction results without district-specific trends

The following table follows the specifications used for table 4. The only difference is that we use period rather than period*district fixed effects. As a result, the estimated time trend in housing construction is restricted to be the same for all counties.

Table A.1: Responsiveness to petitions and threats to regime stability with uniform time trends across counties

	DV: annual flat construction, per 1,000 capita			
	(1)	(2)	(3)	(4)
Petitions * post 1971	0.556	0.826**	0.293	0.038
	(0.340)	(0.338)	(0.374)	(0.433)
Petitions * post 1971 * export industry	1.324**			
	(0.515)			
Petitions * post 1971 * crit. industry		1.269***		
		(0.475)		
Petitions * post 1971 * protest			1.268***	
			(0.464)	
Petitions * post 1971 * pop. density				1.580***
				(0.484)
County FE	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes
DV mean	3.754	3.754	3.754	3.754
DV SD	4.062	4.062	4.062	4.062
R^2	0.586	0.585	0.586	0.588
N	3,217	3,217	3,217	3,217

Notes: The table contains results from six models, where the DV is annual flat construction per 1,000 capita, averaged over two-year periods. Counties are defined as treated if the number of residualized petitions over the period of 1963–1971 in a given county is greater than the average number of residualized petitions in the same time period. We use residualized petitions to ensure that petitions do not simply measure the quality of the housing stock. We interact petitions * post with binary indicators for export industries, critical industries, protest intensity in 1953, and higher population density. The sample includes all years between 1960 and 1989. Standard errors are clustered by county. ***$p < .01$; **$p < .05$; *$p < .1$

A.4 Alternative treatment definitions

In this section, we present results using alternative definitions of the petition treatment. We use a total of six definitions, which are based on two ways of defining the petition time frame, and three different ways to code the treatment. For the time frame, we use either the average (residualized) number of petitions per capita over the period of 1963–1971, or the just the average residualized per capita petitions submitted in 1971. For the treatment coding, we use either the raw version, i.e. a continuous measure of petitions, a binary version based on a mean split, and a binary version based on a median split. The main results presented in the paper are based on the 1963–1971 time frame using a mean split.

Figure A.6: Main results for alternative treatment definitions
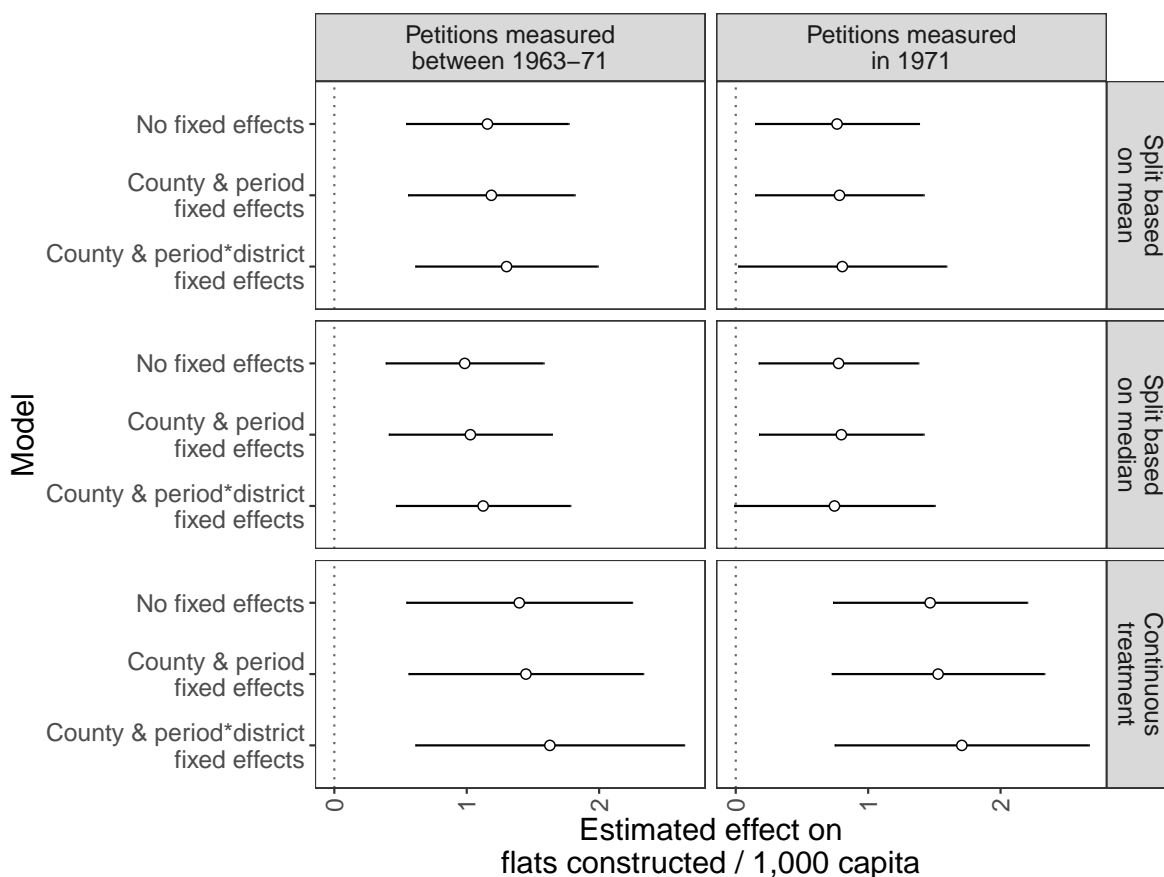
Note: Estimates of the effect of pre-1972 petitions on housing construction. The specifications are the same as presented in table 3, but using alternative treatment definitions. See also section 5.1 for more information on the specification. The DV is annual flat construction per 1,000 capita, averaged over two-year periods. The treatment varies according to the number of years that we use to measure petitions and whether the treatment is binary or not. We use residualized petitions to ensure that petitions do not simply measure the quality of the housing stock. The sample includes all years between 1960 and 1989. Standard errors are clustered by county.

Figure A.7: Leads and lags results for alternative treatment definitions
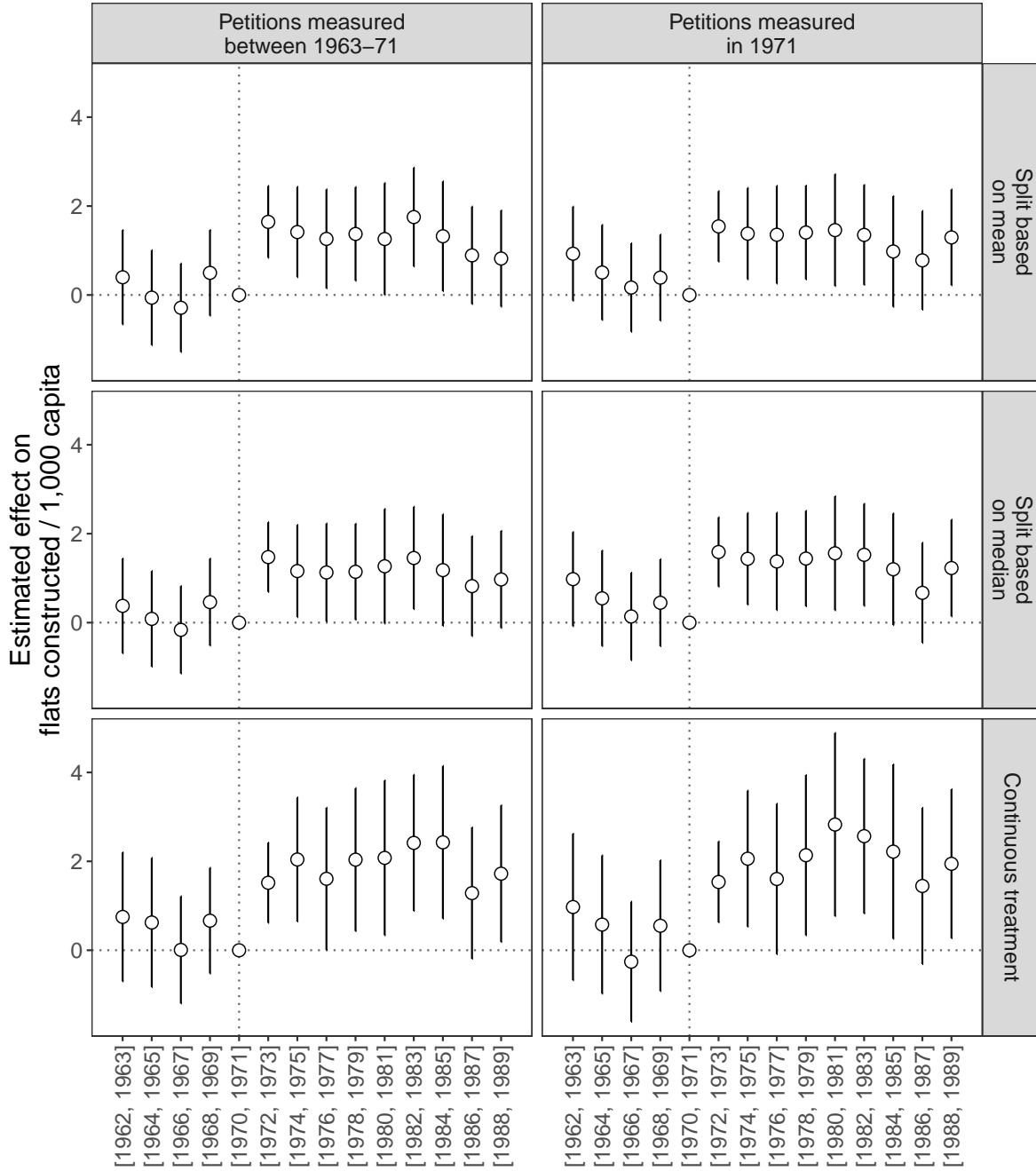
Note: Leads and lags estimates of the effect of pre-1972 petitions on housing construction. See section 5.1 for more information on the specification. The DV is annual flat construction per 1,000 capita, averaged over two-year periods. The treatment varies according to the number of years that we use to measure petitions and whether the treatment is binary or not. We use residualized petitions to ensure that petitions do not simply measure the quality of the housing stock. The sample includes all years between 1960 and 1989. Coefficients are differences relative to the last pre-treatment period, [1970, 1971]. Standard errors are clustered by county.

A.5 Dropping districts one-by-one

In this additional analysis, we re-estimate the main model fifteen times, where each specification uses a sample that excludes one of the fifteen GDR administrative districts districts, the administrative unit between the country and counties. We do this for three ways of estimating the main model, which are indicated on the right-hand side labels of figure A.8.

Figure A.8: Main results, excluding each administrative district one-by-one
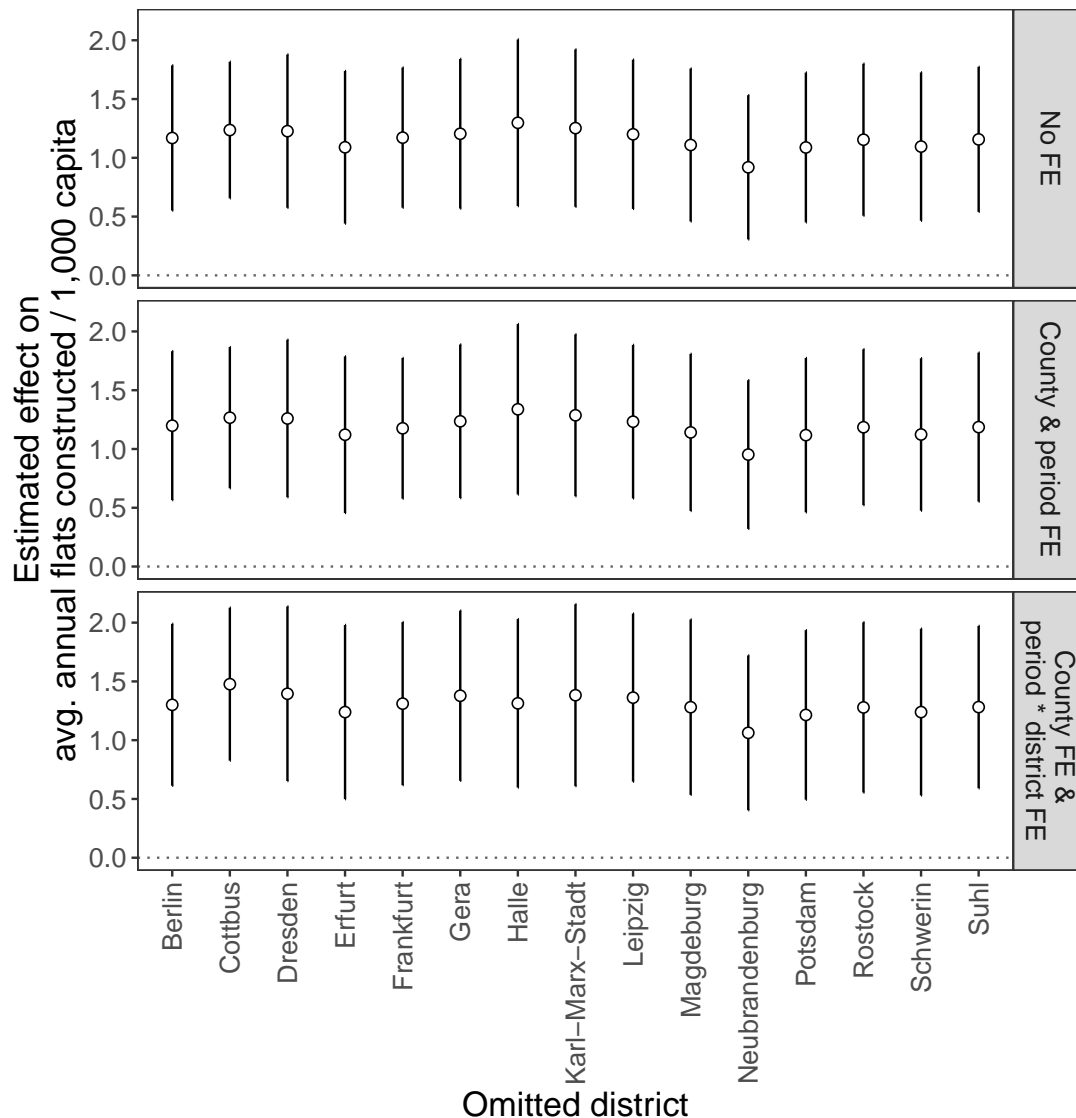
Note: The figure shows results from successively excluding each of the 15 administrative districts from the main specification. The specifications used in each successive panels correspond to models 1, 2, and 3 in table 3.

A.6 Alternative ways to impute construction years

As described in section 3.3, our data does not have information on construction years for buildings built prior to 1933. For the main specifications in the paper, we impute 1910 as the year of construction. We now show results from the main specifications (see table 3), using alternative imputed construction years. We impute the following years: 1890, 1900, 1910, 1920, as well as 1932, which is the upper bound for the construction years. We present the results below.

Figure A.9: Main results, using different years to impute missing construction years
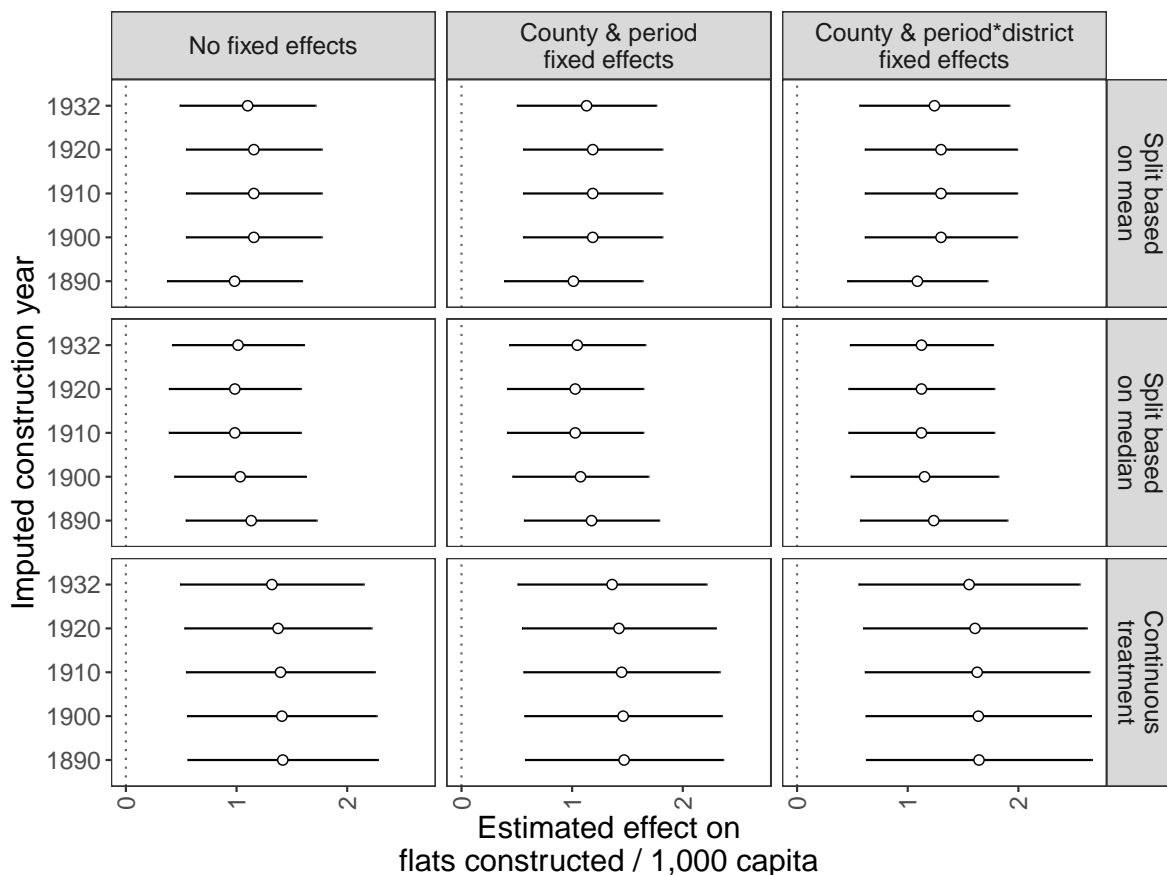
Note: The figure shows results from using different years to impute construction years for buildings built prior to 1933. Column are different model specifications, while row correspond to different treatment defintions. The y-axis is is the year we impute. The main results are in the paper are based on using 1910 as the imputed construction year.

A.7 Results using annual data

As discussed in the paper, our main results derive from a panel where annual construction is averaged over two-year periods. The following tables contain the same specifications as presented in tables 3, 4 and A.1, using annual instead of aggregated data.

Table A.2: Effect of petitions on flat construction, annual data

	DV: annual flat construction, per 1,000 capita					
	(1)	(2)	(3)	(4)	(5)	(6)
Petitions * post 1971	0.920***	0.961***	1.101***	0.537*	0.591*	0.705**
	(0.294)	(0.303)	(0.325)	(0.285)	(0.310)	(0.297)
County FE	No	Yes	Yes	No	Yes	Yes
Period FE	No	Yes	No	No	Yes	No
Period * district FE	No	No	Yes	No	No	Yes
Accounting for protest	No	No	No	Yes	Yes	Yes
DV mean	3.761	3.761	3.761	3.761	3.761	3.761
DV SD	4.372	4.372	4.372	4.372	4.372	4.372
R^2	0.016	0.497	0.527	0.23	0.504	0.535
N	6,109	6,109	6,109	6,109	6,109	6,109

Notes: The table contains results from six models, where the DV is annual flat construction per 1,000 capita. Counties are defined as treated if the number of residualized petitions over the period of 1963–1971 in a given county is greater than the average number of residualized petitions in the same time period. We use residualized petitions to ensure that petitions do not simply measure the quality of the housing stock. Models without county and period fixed effects contain lower order terms, i.e. an indicator for the period after 1971 and the treatment indicator. In models 3 and 4, we add the county–level share of cities with protests in 1953, and interact this variable with the post-1971 indicator. The sample includes all years between 1960 and 1989. Standard errors are clustered by county. ***p < .01; **p < .05; *p < .1

Table A.3: Interaction models using annual data

	DV: annual flat construction, per 1,000 capita							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Petitions * post 1971	0.478 (0.332)	0.760** (0.330)	0.222 (0.367)	0.437 (0.367)	0.898*** (0.302)	1.125*** (0.329)	0.526* (0.308)	0.437 (0.367)
Petitions * post 1971 * export industry	1.356*** (0.515)				1.136** (0.526)			
Petitions * post 1971 * crit. industry		1.253*** (0.478)				1.065** (0.496)		
Petitions * post 1971 * protest			1.273*** (0.465)				1.407*** (0.465)	
Petitions * post 1971 * pop. density				1.424*** (0.498)				1.424*** (0.498)
County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes	No	No	No	No
Period * district FE	No	No	No	No	Yes	Yes	Yes	Yes
DV mean	3.761	3.761	3.761	3.761	3.761	3.761	3.761	3.761
DV SD	4.372	4.372	4.372	4.372	4.372	4.372	4.372	4.372
R^2	0.499	0.498	0.499	0.498	0.498	0.497	0.499	0.498
N	6,109	6,109	6,109	6,109	6,109	6,109	6,109	6,109

Notes: The table contains results from six models, where the DV is annual flat construction per 1,000 capita. Counties are defined as treated if the number of residualized petitions over the period of 1963–1971 in a given county is greater than the average number of residualized petitions in the same time period. We use residualized petitions to ensure that petitions do not simply measure the quality of the housing stock. We interact petitions * post with binary indicators for export industries, critical industries, protest intensity in 1953, and higher population density. The sample includes all years between 1960 and 1989. Standard errors are clustered by county. ***p < .01; **p < .05; *p < .1