Remaking the State from Below: Local Government Formation in Ukraine *

Berkeren Büyükeren

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Abstract

Does consolidating local governments while expanding their autonomy improve governance and development? I study Ukraine's 2015-2020 reform, which allowed small local councils to voluntarily amalgamate into newly created *hromadas* with greater fiscal and administrative authority. Councils that were wealthier, more Ukrainian-speaking and more similar to their neighbors were more likely to merge. Exploiting the staggered rollout of the reform, I show that amalgamation improved procurement performance, increased local economic activity, and strengthened civic national identity. The share of highly competitive tenders and the average number of bidders per tender rose, and local public expenditures expanded and shifted toward social sectors. Nightlights per capita increased by about 7%, consistent with higher economic activity. Survey evidence further shows that residents of rural areas, who were most exposed to the reform, were more likely to identify solely as Ukrainian. The gains were particularly pronounced for smaller hromadas and for peripheral local councils within merged units. These findings suggest that consolidating jurisdictions while devolving authority can enhance state effectiveness, stimulate local development and shape civic identity.

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1 Introduction

Governments frequently restructure local jurisdictions to improve governance, enhance public goods provision, and promote economic development. Some countries have encouraged the creation of new units, while others have opted for amalgamation into larger jurisdictions. A central question in public economics is the optimal scale of government: larger jurisdictions can exploit economies of scale and internalize local externalities (Alesina et al., 2004), while smaller jurisdictions may better align policies with local preferences and strengthen accountability (Tiebout, 1956; Oates, 1972). This trade-off is particularly acute in developing countries, where local governments often suffer from both excessive fragmentation and limited autonomy, a dual constraint that undermines state capacity at its foundation. Yet, smaller units can also be prone to elite capture and face weaker administrative capacity, while larger units may suffer from preference misalignment (Besley and Coate, 2003; Brollo et al., 2013). The overall effect of changing jurisdiction size is thus ambiguous.

One form of such reforms is "consolidate-and-decentralize", where local governments are merged into larger units to gain administrative scale while simultaneously being granted greater fiscal and political autonomy. Over the past two decades, similar reforms have been implemented in Japan, Denmark, France, Greece, Estonia, and, more recently, Ukraine. Despite their growing prevalence, we know little about their economic and institutional consequences, including how they affect public service provision, economic activity and citizens' identities.

These questions extend beyond the Ukrainian case and connect to a broader debate on consolidation versus proliferation as tools to reshape local jurisdictions. Recent large-scale mergers in Denmark and Japan sought to capture economies of scale, while splits in Indonesia, Brazil, and Uganda sometimes expanded access to services but also raised coordination challenges (Pierskalla, 2016; Dahis and Szerman, 2023). A growing literature provides evidence on the effects of decentralization or amalgamation in isolation, but we know much less about reforms that combine both. Ukraine's reform provides a rare opportunity to study this bundled design in a context of extreme fragmentation and limited local authority.

I focus on a large-scale territorial reform in Ukraine between 2015-2020, which encouraged the voluntary amalgamation of local councils (LCs) into newly formed administrative units called *hromadas*. Before the reform, Ukraine had over 10,000 local councils, many of them extremely small. The median LC had around 3,000 citizens, and budgets were often insufficient to fund basic services. By contrast, the newly created hromadas typically encompassed several councils, with a median population of around 12,000 and budgets several times larger. The reform consolidated administrative functions by pooling smaller councils into larger units. On the other hand, it decentralized fiscal powers by allowing the newly created hromadas to retain a greater share of their local

tax revenues. In addition, it devolved municipal powers, granting hromadas substantial autonomy over local budgets and service provision. Importantly, the Ukrainian setup was voluntary, which makes it possible to study both the characteristics that drove councils to participate and the consequences of amalgamation. Its staggered rollout across local councils creates quasi-experimental variation in treatment timing, which I exploit to estimate how consolidation and decentralization jointly shape governance, development, and civic identity.

Ukraine provides an ideal setting to study these dynamics. The reform was implemented gradually over five years, allowing me to leverage variation in treatment timing across local councils. Substantial spatial heterogeneity in participation provides insight into the role of pre-existing economic, demographic, and institutional characteristics in shaping willingness to merge. Moreover, Ukraine's highly fragmented local government system before the reform, combined with limited administrative resources and fiscal capacity, makes it particularly well suited to studying how consolidation and decentralization interact to shape local governance and development.

This paper answers the following question: Does consolidating local governments while expanding their autonomy improve governance and development? I begin by documenting which local councils chose to merge and with whom, showing that wealthier and more Ukrainian-speaking councils -and those with economically and linguistically similar neighbors- were more likely to amalgamate, consistent with homophily. I then leverage the reform's gradual implementation to estimate its causal effects. To do so, I study procurement competition (competition type of procurement and bids per tender), local economic activity (per capita nightlight intensity at the council level), and identity outcomes (district-level survey responses). In addition, I show that total per capita public expenditures increased after amalgamation and that the composition of spending shifted toward Social Sectors, particularly education and healthcare, with procurement composition moving in parallel toward Social & Public Services. These compositional results suggest that budgets have been prioritized toward citizen-oriented services. The reform simultaneously expanded jurisdictional scale and devolved fiscal authority, creating a dual treatment that allows me to study how consolidation and decentralization interact. Unlike studies that examine these dimensions separately, my results capture the bundled design that governments often implement in reality.

To address these questions, I assemble a novel dataset that links several administrative and survey sources at the local council level. I use the universe of procurement contracts from Prozorro, Ukraine's e-procurement platform, covering more than 3 million tenders since 2015, which I process to measure procurement competition. I combine this with high-resolution VIIRS nightlight data to track local economic activity and with district-level personal income tax data used as a robustness check. Finally, I employ a nationally representative repeated cross-sectional survey that

measures civic identity at the district level. This combination of procurement, economic, and survey data provides a comprehensive view of local government performance, development, and civic identity in a setting of institutional change.

To estimate the effects of amalgamation, I use a difference-in-differences design that exploits the staggered rollout of the reform across local councils. The control group consists of councils that had not yet merged in a given year, including those that never merged over the sample period. This ensures that treated councils are compared to units that faced the same reform environment but adopted at different times. A key challenge is that participation was voluntary, so councils that chose to amalgamate differed systematically from those that did not. I address this in two ways. First, I document the selection patterns directly, showing that wealthier and more Ukrainian-speaking councils were more likely to merge. Second, the difference-in-differences framework compares each council to its own pre-reform trajectory and to other councils in the same institutional environment, which helps mitigate concerns that selection fully drives the results.

Using this design, I find that amalgamation had large effects on institutional capacity and economic outcomes. In procurement, tenders in amalgamated councils became more competitive. The share of direct procurement decreased by about 13%, while highly competitive tenders increased by around 39% compared to not-yet and never-treated councils, with no evidence of differential pre-trends. The number of bidders per tender also rose by roughly 10% relative to the baseline mean. On the fiscal side, total per capita expenditures increased and, crucially, spending was reoriented toward Social Sectors such as education and healthcare. Procurement composition shifted in the same direction, providing consistent evidence across two different domains.

Local economic activity rose gradually, with nightlight intensity per capita increasing by 0.10–0.12 standard deviations four years after treatment. When expressed relative to pre-reform levels, this corresponds to an increase of roughly 7%. This magnitude is comparable to the estimates from Egger et al. (2022), in which they document an increase of 8% in nightlight intensity after a similar reform in Germany. District-level PIT per capita moves in the same direction and magnitude: a full transition from no population in hromadas to complete coverage is associated with an increase in PIT per capita of around 21% relative to the pre-reform mean. Because PIT is collected and administered centrally, and I work with pre-2020 district aggregations, this provides an administrative robustness check that is not mechanically affected by council-level changes in tax shares.

Finally, using nationally representative district-level survey data, I show that residents of rural areas -the main beneficiaries of the reform- became more likely to self-identify solely as Ukrainian, with a 10 percentage point increase in exposure associated with about a 0.8 percentage point rise in this identity. By contrast, I find no corresponding effect on respondents' reported language

of use, which remains stable over time, suggesting that the reform affected civic identity rather than triggering a broad re-labeling of ethnolinguistic categories. This finding extends research on state capacity and nation-building (Alesina et al., 2020), demonstrating that bottom-up institutional reforms can forge civic attachments even in societies with deep ethnolinguistic divisions.

The effects, however, are not uniform. To analyze distributional impacts, I investigate heterogeneity along three dimensions. First, I classify hromadas by size based on the number of member councils and find evidence of diminishing returns to scale: councils in small and medium hromadas experience sizable gains in nightlight intensity, while effects vanish in very large hromadas, suggesting that excessive consolidation may reintroduce coordination frictions. Second, I examine differences in population between capital and non-capital councils within hromadas and show that more peripheral, smaller councils reap larger economic and identity gains than the hromada capitals, consistent with the idea that integration relaxes severe capacity constraints in previously disadvantaged territories. Third, I construct a measure of pre-reform financial self-sufficiency and show that hromadas with higher baseline own-revenue shares experience significantly larger post-reform gains, indicating that decentralization amplifies returns to pre-existing capacity. Overall, these findings point to decreasing returns to scale and to the importance of baseline fiscal strength: moderate consolidation delivers substantial efficiency gains, and the main beneficiaries are smaller and more peripheral units with the institutional capacity to exploit new autonomy. These results speak directly to the design of territorial reforms, highlighting how both the choice of which units are merged and the allocation of autonomy shape their final impact.

Contribution to the Literature. This paper contributes to the literature on territorial reforms and decentralization. Foundational theories emphasize that decentralization allows governments to better align policies with local preferences (Tiebout, 1956; Oates, 1972), but changing jurisdiction size involves a fundamental trade-off: larger units may exploit economies of scale and internalize local externalities (Alesina et al., 2004), while smaller ones may better reflect citizen preferences but suffer from limited capacity and elite capture (Bardhan and Mookherjee, 2000; Brollo et al., 2013). Conversely, centralization can enhance coordination and reduce duplication but risks inefficient allocations when decision-making is distorted by political bargaining (Besley and Coate, 2003; Boffa et al., 2016). While early work on this topic was primarily theoretical due to limited exogenous variation, recent studies exploit quasi-experimental designs to estimate the causal effects of jurisdictional reforms in diverse contexts (Lassen and Serritzlew, 2011; Blom-Hansen et al., 2016; Pierskalla, 2016; Dahis and Szerman, 2023; Bianchi et al., 2023; Cohen, 2024; Cassidy and Velayudhan, 2024; Korczak, Korczak). However, these studies primarily examine consolidation and decentralization separately. By contrast, Ukraine's reform uniquely combined consolidation of

local governments with expanded fiscal and administrative autonomy, allowing me to study how jurisdiction size and local authority interact to shape governance, economic outcomes, and civic identity.

Second, it connects territorial reforms to research on public goods provision, economic development, and identity formation. A growing literature shows that improved institutions and expanded local capacity can enhance state effectiveness, technology adoption, and service delivery (Lewis-Faupel et al., 2016; Banerjee et al., 2020; Olken, 2010; Martinez-Bravo, 2014; Martinez-Bravo et al., 2022). At the same time, better economic opportunities and local governance can shape citizens' broader civic attachments: Alesina et al. (2020) and Caprettini and Voth (2023) show that improved local conditions foster civic identity and nation-building. In the Ukrainian context, Arends et al. (2023) find that decentralization increased trust in local governments and strengthened institutional resilience after the invasion. Hamaniuk, Herrmann, and Rosel (Hamaniuk et al.) document the fiscal returns, finding improved tax compliance. I extend this literature by providing causal evidence that local government consolidation, through its effects on local governance and economic activity, is associated with stronger civic national identity, particularly in rural areas where reforms had the largest impact.

Third, this paper contributes to research on the drivers of municipal integration. A large literature highlights the role of neighbors' characteristics, geographic proximity, and fiscal incentives in shaping consolidation decisions (Weese, 2015; Bel and Warner, 2016; Gordon and Knight, 2009; Di Porto and Paty, 2018). Empirical work documents how resistance to integration is often driven by concerns about fiscal losses or diminished autonomy (Sørensen, 2006; Bergholz and Bischoff, 2018), while linguistic, cultural, and economic differences can further fragment local preferences (Lapointe, 2018). Tricaud (2021) shows that France's 2010 territorial reform faced systematic opposition from municipalities fearing reductions in public services or construction-related disruptions. Building on this literature, I exploit Ukraine's staggered rollout to document which councils chose to merge, showing that wealthier and more Ukrainian-speaking councils, particularly those with economically and linguistically similar neighbors, were disproportionately likely to amalgamate, consistent with homophily-driven integration. I then link these selection patterns to heterogeneous treatment effects, showing that both who merges and how units are grouped ex ante shape the distribution of gains ex post.

The rest of the paper is organized as follows. Section 2 gives context for the administrative structure, the territorial reform and the national identity in Ukraine. Section 3 describes the data. Section 4 describes the empirical strategy. Section 5 first displays the determinants of participation and then my baseline difference-in-differences results. Section 6 studies the mechanisms behind

the baseline results. Section 7 investigates the heterogeneity of the baseline results for economic activity. Section 8 concludes.

2 Background

2.1 Administrative Structure of Ukraine

Since independence in 1991, Ukraine has maintained a highly centralized governance structure similar to other former Soviet states. Local councils had little fiscal or administrative authority, with even minor decisions requiring approval from higher-level governments. This centralized system fostered inefficiency, weak public goods provision, and chronic corruption. Transparency International consistently ranks Ukraine among the most corrupt countries worldwide, and surveys show that trust in the central government has been extremely low. In contrast, trust in local authorities and community organizations has historically been higher, suggesting that citizens perceived governance closer to them as more legitimate.

Before the reform, the administrative structure consisted of three tiers: regions (*oblasts*), districts (*rayons*), and local councils (*radas*). Ukraine had 24 regions (plus Crimea and two special-status cities), 672 districts, and roughly 11,250 local councils. Local councils were extremely fragmented: 92 percent governed populations of fewer than 3,000 people, and many had fewer than 500. These units lacked independent fiscal capacity and were heavily reliant on transfers from districts and regions. This combination of centralization and fragmentation motivates the reform and underpins my identification strategy based on variation in the timing and intensity of amalgamation. Table A10 and A11 summarize the institutional roles of local councils, hromadas, and districts before and after the reform.

2.2 The Territorial Reform

The reform was introduced in 2015 in the aftermath of the Euromaidan protests and subsequent political transition, which were regarded as crucial steps in Ukraine's path towards EU accession and full democratization.[1] Its aim was to empower local governments, reduce corruption, and improve service delivery by restructuring administrative boundaries and devolving fiscal authority.

The reform encouraged the voluntary amalgamation of small councils into larger units called hromadas. Amalgamation proposals originated from councils themselves but required approval from regional administrations. To guide the process, the government published prospective plans

[1] Ukraine's path to EU accession paved with reforms. *The Kyiv Independent,* February 2, 2024.

indicating feasible consolidations. Between 2015 and 2020, 980 hromadas were created, 820 of which followed these plans.[2] In July 2020, the process became mandatory, bringing the total number of hromadas to 1,469 and reducing the number of districts from 672 to 136. This process has also included the reformation of hromadas, where some LCs were added to pre-existing hromadas, some new hromadas were created, and some were liquidated. The evolution of the number of hromadas is presented in Figure 2. Figure 1 provides a visual representation of these administrative changes as of December 2019, illustrating the extent of territorial restructuring across Ukraine. Local elections took place with the new administrative structure in October 2020, showing a positive relationship between the reform and voter mobilization in the local elections (Vlasenko, 2022). After their formation, the hromadas held their first elections, which differed from the pre-existing local elections. To facilitate the amalgamation process, by law, when new communities are annexed to a pre-existing hromada, the election of the hromada head was not rerun. The election for the council deputies of the respective hromada was only held in the newly annexed territories.

There have been several incentives for the LCs to join the amalgamation process. Firstly, tax benefits were introduced for the units that became a part of hromada. Amalgamated hromadas receive 60% of PIT (up from 25% pre-reform), while non-amalgamated councils lost their share. Personal income tax has the largest share of local tax revenues in Ukraine, accounting for 67% of the local tax revenues.[3] Before the reform, 50 and 25% of the PIT revenues were allocated to the district and regional governments, respectively. In addition to this, hromadas also gained control over 100% of property taxes and excise taxes on retail sales of alcohol, tobacco and fuel.[4] Secondly, the hromadas gained more municipal autonomy and had a chance to have more hands-on administration in education, health care, and social assistance. Finally, contrary to the pre-reform fiscal structure, the transfers became more transparent compared to region and district-level financing. This is thanks to the direct connection between the hromadas and the central budget of Ukraine, which did not exist before. Prior to the reform, LCs relied on the windfall of the tax revenues and subventions from the district and regional governments, which were also provided to them by the central government. Several pre-reform facts help us understand the need for fiscal decentralization in Ukraine. In 2015, the subnational governments accounted for 32% of public tax revenues in OECD countries, compared to only 18% in Ukraine in 2015 (OECD, 2017). Within this revenue structure, the grants and subsidies corresponded to 60% of subnational government revenues in 2015 (The OECD average is 38% in 2014).

[2] The Impact of Legislation on OTG: Does Compliance with Formal Norms Really Create Capable Communities?. *Vox Ukraine,* May 13, 2020.

[3] Execution of Local Budget Revenues . *The Ministry of Finance of Ukraine,* October 3, 2023.

[4] Explaining Ukraine's Resilience to Russia's Invasion: The Role of Local Governance and Decentralization Reform *Decentralization.ua,* September 13, 2023.

On the other hand, anecdotal evidence suggests that some LCs hesitated to amalgamate mainly due to economic and sociocultural factors. Regarding economic factors, several LCs were reluctant because they did not want to share their economic resources with the potential candidates. Conversely, some LCs were concerned about losing their autonomy over the local budget and relocating or closing the facilities in their area. Adjacent to economic factors, the prospect of empowering local elites was a cause for concern among LC inhabitants. Sociocultural factors, especially in relatively more heterogeneous regions, led to hesitation due to differing ethnic, linguistic, cultural, and religious characteristics. Last but not least, on the side of the local government officials, some region and district civil servants preferred to maintain their autonomy rather than forming a new unit, despite the potential for greater inefficiency as standalone LCs.

2.3 National Identity in Ukraine

Ukraine has historically had a considerable Russian ethnic and linguistic minority. The 2001 Ukrainian Census, the latest available, indicates that 29% of the population were native Russian speakers and 17% were ethnically Russian. According to the KIIS OMNIBUS Survey 2013, 26.6% of Ukrainians self-identified as ethnically Russian across a spectrum from fully Russian to fully Ukrainian.

After the Euromaidan protests and invasion of Eastern Ukraine in 2014, Ukrainian views on Russia and self-declared national identity started to change (Korovkin and Makarin, 2023; Abramenko et al., 2024). With the full-scale invasion, there have been dramatic changes in both national identity and the use of language. Self-reported national identity has shifted gradually towards Ukrainian in nationwide surveys since 2014, peaking after the Russo-Ukrainian War that started in 2022.

The local governance reform has been fundamental in resisting the full-scale invasion of Ukraine. Roger Myerson, the Nobel Prize winner in 2007, argued that the reform promoted locally elected leaders, which helped organize local territorial defense.[5] Furthermore, scholars from the Kyiv School of Economics argued that the territorial reform improved the organization of defense and "brought the country back together." [6] Rabinovych et al. (2023) show a positive correlation between increased local governance and resilience against the Russian Federation's invasion in 2022.

[5] Roger Myerson: The reform of local self-government became one of the main factors that strengthened the resolve of Ukrainians to fight for their country. *Decentralization.ua,* October 24, 2022.

[6] The Source of Ukraine's Resilience. *Foreign Affairs,* June 28, 2022.

3 Data

3.1 Hromada Formation Data

I construct a comprehensive dataset on the LCs' date of joining a hromada, their coordinates and their population. The Ukrainian Center for Social Data provided the amalgamation dates. The coordinates of each LC and their population are available at the Humanitarian Data Exchange and the Ukrainian Census of 2001, respectively. The data is originally at the settlement level, the smallest administrative unit in the country. It includes each settlement's coordinates and all the other information mentioned above. However, since amalgamation decisions were made at the LC level, I focus on it as the smallest relevant unit of observation. For the analysis of PIT collection and national identity, due to the lack of more granular outcomes, the treatment is constructed at the district level.

I drop all the districts and their LCs that were occupied in the Donbas War in 2014. Additionally, I effectively exclude the Autonomous Republic of Crimea and the city of Sevastopol since they declared independence by referendum in March 2014. In addition, I drop all the settlements with a population of fewer than 70.

3.2 Public Procurement Data

Public procurement accounts for approximately 13–15% of Ukraine's GDP. [7] In 2015, the country transitioned to Prozorro, an online e-procurement system designed to increase transparency and reduce corruption in public contracting.[8]

My analysis focuses on public procurement tenders registered in Prozorro from February 2015 to December 2019. I exclude tenders organized by cities of regional significance, which operate under different administrative and fiscal conditions, as well as tenders in Kyiv and in councils with fewer than 300 residents. The resulting dataset contains over 720,000 tenders from more than 10,000 contracting authorities and about 85,000 unique suppliers, covering roughly half of the local councils in my analytical sample. Contracting authorities range from schools and hospitals purchasing heating or medical supplies to local councils contracting road repairs or waste management services. The threshold for full competitive procedures is around 8,000 US dollars. At the national level, about 60% of total tender value is above this threshold, although these above-threshold tenders account for only about 6% of the number of tenders.[9] Because I exclude large

[7] Among the priorities of the Ministry of Economy is the stimulation of the development of local producers through public procurement. *Ministry of Economy of Ukraine,* February 28, 2024.

[8] By law, since August 2016, procurement contracts must be announced and executed through Prozorro.

[9] https://thedocs.worldbank.org/en/doc/828301490813177880-0310022017/original/UseofeGPforopenDataOlexandr.pdf

cities and very small councils, my sample is predominantly suburban and rural and therefore differs from the national distribution of tenders.

The raw data provide detailed information on initial (reserve) and final contract prices, the number of participants, the number of lots per tender, the number of bids per lot, the type of lot, and the tendering procedure. Nearly two-thirds of tenders in my sample are non-competitive, including single-bidder auctions and direct-award contracts. I classify non-competitive procedures into three categories: reporting, negotiation, and quick negotiation. Negotiation contracts are direct awards used when only one supplier is available or when an open tender fails due to a lack of bidders; quick negotiation contracts follow the same procedure but with shorter timelines, typically used in emergencies such as armed conflict or public health crises. Reporting contracts, hereby called *"Direct Procurement"*, which account for 95% of non-competitive procurement and 77% of all contracts, are simple direct purchases in which only the final contract is published in Prozorro and neither competition nor justification is required.

Competitive procurement includes below-threshold and above-threshold tenders. Below-threshold procurements (under 200,000 UAH for goods and services and 1.5 million UAH for works) did not require open competition before 2020 and could be directly awarded or conducted through a simplified procedure, again with only the final contract reported in Prozorro. Above-threshold procurements, exceeding these limits, are subject to full competitive bidding rules and are further classified into Above-Threshold UA, Above-Threshold EU, and Above-Threshold UA Defense.

A practical challenge is that the legal procurer in Prozorro can be a wide range of entities, including schools, hospitals, district administrations, or local councils themselves. To link each procurer to the appropriate tier of government, I construct a classification based on the institution's founding authority. I distinguish between local-council procurers (institutions subordinated to village, settlement, or small city councils), district procurers (district councils and administrations), regional procurers (oblast councils and administrations), and central government institutions. The classification combines automated text-based rules with checks assisted by a large language model (using the OpenAI API), which is explicitly instructed to identify the founding body rather than the institution's function.

For the main analysis, I construct a panel at the local council-year level from the Prozorro data. For each council and year, I aggregate all competitive tenders organized by procurers subordinated to that council and compute several measures of procurement performance. First, to study contract types, I calculate the value shares of direct procurement and of highly competitive contracts in total procurement value for each council–year. Second, restricting to competitive tenders, I compute the average number of bids per tender in each council-year pair to capture the intensity of competition.

Third, I count the number of new entrants that participate in a council's tenders for the first time in the sample period, at the council–year level.

Finally, to capture compositional changes in what councils purchase, I group tenders into four broad categories based on their CPV (Common Procurement Vocabulary) codes, the standard EU system for classifying the subject of contracts. Starting from 46 distinct CPV divisions, I aggregate them into: (i) Infrastructure and Construction, covering construction, engineering, transportation, and related services; (ii) Energy and Industry, including energy and chemical products as well as furniture, office supplies, computing equipment, and industrial machinery; (iii) Social and Public Services, encompassing medical and health services, public utilities, government services, research and education, and leisure and cultural activities; and (iv) Food and Agriculture, capturing tenders related to agricultural products and food.

Public finances

I use administrative data on local public finances from the World Bank BOOST Initiative, compiled in cooperation with the Ministry of Finance of Ukraine. The dataset reports annual revenues and expenditures for all local budgets at the council level. Revenue data are available from 2015 to 2018, while expenditure data cover 2013 to 2020.

For the revenue side, I focus on personal income tax (PIT), the largest single source of local tax revenue in Ukraine. PIT accounts for roughly two thirds of all local tax revenues and is centrally administered, making it a natural proxy for the local tax base and fiscal capacity.[10] To match the rest of the analysis, I aggregate all PIT booked to district, hromada, and council budgets within pre–2020 district boundaries, excluding cities of oblast significance. I then construct district-level PIT per capita by dividing this aggregate by the corresponding district population in each year. This aggregation removes mechanical changes in council-level tax shares induced by the reform and yields a consistent district-level measure over time.

On the expenditure side, I use the longer 2013–2020 series in two ways. First, I construct total and functional expenditure aggregates for each council and hromada, and then re-map them to the evolving hromada structure based on realized post-reform boundaries. This allows me to track the evolution of public spending before and after amalgamation at the treated and comparison units. Expenditures are classified according to the UN's Classification of the Functions of Government (COFOG). I rely on the top-level functional code *func1*, which allocates spending to general public services, public order and safety, economic affairs, environmental protection, housing and community amenities, health, recreation and culture, education, and social protection. To align these

[10] Execution of Local Budget Revenues, Ministry of Finance of Ukraine, October 3, 2023.

categories with the procurement data, I group the underlying COFOG items into four broad sectors: Administrative & Security, Social Sectors, Municipal & Environment, and Economic Activity.

Second, I use the pre-reform revenue and expenditure data to construct a measure of baseline financial self-sufficiency for each hromada, as described in Section 7. Specifically, for each council I compute the share of own revenues -defined as all revenues excluding intergovernmental transfers and subsidies- in total revenues in the year prior to amalgamation. I then average this share across the member councils of a hromada. This measure captures the extent to which a hromada's members were able to finance their budgets from local sources before consolidation.

3.3 Nightlights Intensity Data

I employ VIIRS Nighttime Lights data from 2013 to 2020 to measure the effects of amalgamation on local economic activity at the LC level. To account for differences in population size, I normalize an LC's total luminosity by its population. Since per capita luminosity values are often small, I scale the resulting measure by a factor of 100 for interpretability. The transformation does not affect relative differences but simplifies coefficient interpretation.

To mitigate the influence of extreme values, I trim the top 2.5% of observations in the main analysis, as these outliers likely result from sensor artifacts and data processing errors.[11] For the descriptive analysis and voluntary amalgamation regressions, I apply a symmetric 5% trim at both ends of the distribution to reduce distortions from extreme low and high values. Additionally, approximately 15% of observations report zero luminosity, likely due to measurement issues rather than true economic inactivity. These cases are effectively excluded from the analysis.

3.4 KIIS OMNIBUS Survey

The OMNIBUS Survey of the Kyiv International Institute of Sociology is a nationally representative repeated cross-section survey, conducted multiple times in a year. The respondents' addresses are at the district level and the survey includes questions on language and self-reported national identity. The survey has been used in several other studies, including Korovkin and Makarin (2023) and Abramenko et al. (2024).

There are more than 1 million respondents in my timespan and the respondents' locations are coded at the district level. The data spans from 2010 to 2020. Each wave has a different set of questions, but some are present in every wave, e.g., self-declared national identity and reported/self-declared language use. I only focus on self-declared national identity because Russian has been

[11] Gibson et al. (2020) provide a comprehensive investigation on the quality of nightlight datasets.

the mother tongue of many individuals, especially in the eastern part, albeit they identify as fully Ukrainian. I create a binary variable equal to 1 if the respondent identifies Ukrainian only. The original survey question was based on whether you feel only Russian, more Russian than Ukrainian, in between, more Ukrainian than Russian or only Ukrainian. I collapse it into a binary variable equal to 1 if the respondents identified Ukrainian only.

Table 1 reports summary statistics for baseline characteristics and key outcome variables for treated and comparison councils using pre-reform values.

4 Empirical Strategy

To estimate the effects of the reform, I exploit the staggered rollout of amalgamation across local councils. Variation in treatment timing provides a natural difference-in-differences design that compares outcomes in councils that joined a hromada in different years, including those that never merged.

I distinguish between (i) outcomes observed at the local-council level (procurement and night-lights), for which I use staggered difference-in-differences estimators in the spirit of Callaway and Sant'Anna (2021) and Wooldridge (2021), and (ii) outcomes observed at the district level (PIT and civic identity), for which I estimate two-way fixed effects models with a continuous treatment equal to the district's population share living in hromadas.

4.1 Council-Level Outcomes: Procurement and Nightlights

For council-level outcomes,procurement measures and per-capita nightlight intensity, I estimate cohort-specific average treatment effects using a staggered difference-in-differences framework. Specifically, I estimate:

$$y_{ut} = \alpha_u + \lambda_t + \sum_{g \in \mathcal{G}} \sum_{e \neq -1} \delta_{ge} \, \mathbb{1}\{G_u = g\} \, \mathbb{1}\{t = g + e\} + \varepsilon_{ut}, \tag{1}$$

where y_{ut} is a procurement measure or per capita luminosity for council u in year t, α_u and λ_t are council and year fixed effects, and G_u is the year in which council u amalgamates into a hromada. The coefficients δ_{ge} capture the change in y_{ut} for councils that first become treated in year g, e years relative to their treatment year, compared with councils that are not yet treated or never treated.

A growing literature shows that conventional two-way fixed effects (TWFE) estimators can yield biased estimates of the average treatment effect on the treated (ATT) in staggered designs

when treatment effects are heterogeneous across cohorts and over time. This "negative weights" problem arises because TWFE implicitly compares already-treated units to later-treated ones.To address this, I follow Callaway and Sant'Anna (2021) and estimate group-time average treatment effects, $\text{ATT}(g,t)$, for each cohort g and calendar year t, using only appropriate comparison units. In the baseline specification, the comparison set consists of councils that are not yet treated in year t, including those that are never treated.

The identifying assumption is a group-specific parallel trends condition: in the absence of amalgamation, outcomes for councils treated in cohort g would have evolved along the same trends as outcomes for not-yet-treated councils. I provide support for this assumption by presenting event-study plots that show flat and statistically insignificant pre-treatment coefficients.

When I apply this framework to other units in the analysis, I redefine u and G_u accordingly. For hromada-level expenditure outcomes, I construct "pseudo-hromadas" by aggregating councils to their eventual borders in all years and set G_u to the year in which the hromada is formally created. For district-level robustness checks (e.g., district-level procurement), I define cohort G_u as the first year in which at least 15% of the district's population lives in hromadas and estimate the same type of event-study, using not-yet-treated and never-treated districts as the comparison group.

4.2 Heterogeneity in Effects

To study how effects vary with hromada size, the relative size of councils within hromadas, and pre-reform financial capacity, I employ the extended two-way fixed effects framework proposed by Wooldridge (2021). Specifically, I estimate:

$$y_{ut} = \alpha_u + \lambda_t + \sum_{g \in \mathcal{G}} \sum_{e \neq -1} \mathbb{1}\{G_u = g\}\, \mathbb{1}\{t = g + e\}\, (\delta_{ge} + \gamma_{ge} Z_u) + \varepsilon_{ut} \tag{2}$$

where Z_u is a time-invariant characteristic measured prior to treatment (e.g., an indicator for belonging to a small vs. large hromada, a tercile of population difference relative to the hromada capital, or a tercile of pre-reform financial self-sufficiency). The coefficients γ_{ge} capture how the dynamic treatment effects vary with Z_u across cohorts and event times. The rest of the specification follows the baseline equation, Equation 1. In these specifications, the comparison group consists of not-yet-treated and never-treated units, following Wooldridge (2021).

As in the baseline, identification relies on a parallel trends assumption conditional on Z_u: absent the reform, outcomes for treated and comparison councils with the same value of Z_u would have evolved along similar trends. I again provide event-study evidence supporting the plausibility of this assumption.

4.3 District-Level Outcomes: PIT and Civic Identity

For outcomes observed at the district level,personal income tax (PIT) revenues and civic national identity, I estimate two-way fixed effects models with a continuous treatment equal to the share of the district's population living in hromadas.

Let d index pre-2020 districts and t years (or survey waves). Define

$$\text{PopShare}_{dt} = \frac{\text{Population in hromadas in district } d \text{ at time } t}{\text{Total population in district } d \text{ at time } t}.$$

For PIT, the outcome y_{dt} is PIT revenue per capita in district d and year t. I estimate

$$y_{dt} = \alpha_d + \lambda_t + \beta\, \text{PopShare}_{dt} + X'_{dt}\theta + \varepsilon_{dt}, \tag{3}$$

where α_d and λ_t are district and year fixed effects, and X_{dt} includes time-varying regional controls (e.g., inflation and gross regional product). Aggregating PIT to the district level eliminates the mechanical changes in council-level tax shares generated by the reform and ensures that changes in y_{dt} reflect movements in the underlying tax base rather than accounting reallocations.

For civic national identity, the unit of observation is an individual respondent i in district d and survey wave w. The outcome y_{idw} is a binary indicator equal to one if the respondent identifies only as Ukrainian. I estimate

$$y_{idw} = \alpha_d + \lambda_w + \beta\, \text{PopShare}_{dw} + X'_{idw}\theta + \varepsilon_{idw}, \tag{4}$$

where α_d and λ_w are district and survey-wave fixed effects, and X_{idw} includes individual covariates (gender, age, education, and an indicator for rural residence) and regional covariates (inflation, gross regional product, and the share of refugees from Crimea and Donbas in the district).

Analyzing PIT and civic identity at the district level is motivated by both data availability and conceptual considerations. For PIT, the aggregation removes council-level tax multiplier changes induced by the reform. For civic identity, the survey data are only available at the district level. The identifying assumption in both cases is that, absent the reform, districts with different values of PopShare_{dt} would have followed parallel trends in PIT per capita and in the share of respondents identifying only as Ukrainian. For the civic identity result, I provide supporting evidence using event-study plots constructed from discretized versions of PopShare_{dt}.

5 Main Results

5.1 Determinants of Participation

To understand the dynamics of voluntary amalgamation, I estimate how pre-reform characteristics predict participation. Table 2 shows that wealthier councils (with higher nightlight intensity) and those with a larger share of native Ukrainian speakers were more likely to amalgamate voluntarily. A one standard deviation increase in nightlight intensity corresponds to a 2.5 percentage-point increase in the probability of voluntary amalgamation. Similarly, a one standard deviation increase in the share of native Ukrainian speakers is associated with a 1.6 percentage point increase.

Second, I constrain the sample to only treated units and re-estimate the specification in Table 2 separately for each cohort. The results, presented in Table A1, reveal no clear trend in the timing of amalgamation among treated units.

Moreover, as shown in Table A3, councils that were more similar to one another -particularly in terms of economic activity and linguistic composition- were significantly more likely to merge into the same hromada, indicating the role of homophily in consolidation. These patterns are informative not only for understanding participation but also for interpreting heterogeneous effects. In the analysis that follows, I use some of the variables examined here—such as pre-reform wealth and population size—to study how initial conditions shape the gains from amalgamation. In this sense, the participation results provide both motivation and empirical input for the heterogeneity analysis.

5.2 Effects of Amalgamation

In this section, I present the effects of amalgamation on public procurement, economic activity, personal income tax collection and civic national identity. I also provide event study figures that support the parallel trends assumption.

5.2.1 The Effects on Local Governance

Public Procurement. Public procurement is a natural starting point for evaluating the effect of amalgamation on local governance. It is one of the main channels through which local governments allocate resources, spanning construction, education, healthcare, and infrastructure. It is also widely used as a proxy to assess local government quality (Bandiera et al., 2009; Gerardino et al., 2024). In many developing countries, procurement has been a focal point of corruption and inefficiency. Improvements in procurement outcomes, therefore, provide a direct measure of whether consolidation and increased autonomy translated into more effective governance.

In Ukraine, procurement constitutes roughly 15% of GDP. The introduction of the nationwide e-public procurement platform Prozorro in 2015 greatly improved transparency, allowing me to assess how the reform impacts procurement outcomes.

As procurers in the platform can range from schools and hospitals to municipal utilities, I classify each unit according to its founding authority: local councils, districts, regions, or the central government. Throughout the analysis, I exclude the central government procurement to focus exclusively on the local contracts.

I first study the value-weighted share of direct and highly competitive procurement in each council-year. In a given local council-year pair, I calculate the value-weighted share of procurement type. Panel (A) of Table 3 shows that treated councils experienced a decrease in direct procurement and a corresponding increase in highly competitive tenders. The share of highly competitive tenders increases by about 39% relative to the mean among never- and not-yet treated councils, while direct procurement falls by roughly 13% . Before the reform, less than one in ten tenders were highly competitive. The event study dynamics, presented in Figure 3, show flat pre-trends.

I then turn to the number of bids per tender in the competitive tenders. An increase in the number of bids per tender would indicate more competitive auctions and better value for public money. Unlike the previous specification, the tenders are not value-weighted. Panel (A) of Table 3 displays that treated councils experienced an increase in the number of bids per tender, an increase of around 10% of the baseline mean. Panel (a) of Figure 4 displays flat pre-trends and gradual post-treatment increases, indicating that treated units learn to coordinate procurement and exploit economies of scale in contracting.

A potential concern is that ex post hromada capitals may mechanically drive the results, as they often serve as procurement organizers for neighboring councils after amalgamation. If so, the observed improvements could partly reflect the centralization of the procurement rather than real performance gains. To mitigate this concern, I aggregate tenders at the district level and use the share of the population living in hromadas as treatment. In particular, I define a district-year as treated if at least 15 percent of the district's population lives in hromadas in year t, and estimate district-level regressions with this indicator as the treatment. As presented in Panel (B) of Table 3, the district-level results are similar to the council-level ones, albeit somewhat smaller in magnitude.

Public Expenditures. Beyond procurement, another way to assess changes in local governance is to investigate public expenditures. They reflect both the fiscal capacity of local governments and their ability to allocate resources effectively to services for their inhabitants. To analyze this, I construct "pseudo-hromadas": for every year, I aggregate the budgets of all local councils that will eventually belong to the same hromada, so that fiscal outcomes are consistently measured on

post-reform borders in both the pre- and post-reform periods. I then estimate event-study effects on log per capita spending for these pseudo-hromadas and, in parallel, for districts.

Figure 6 shows that total per capita expenditures at the hromada level increase sharply after amalgamation, while district-level spending falls. The post-reform average effect on hromada spending is about 1.19 log points, corresponding to an increase of roughly 230% (a bit more than tripling) relative to the pre-reform level. In contrast, district spending falls by 0.28 log points (about 25%). Because the units are defined on constant borders and outcomes are in logs, this pattern is interpreted as a shift of resources and responsibilities from districts to hromadas rather than a purely mechanical jump from relabeling local councils. In other words, the reform shifted budgets from districts to hromadas and expanded the fiscal space available at the newly empowered tier of government.

To study composition, I group eight functional codes into four broad categories: Administrative & Security, Social Sectors, Municipal & Environmental, and Economic Activity–related spending. Table 4 shows that, within hromadas, post-reform spending rises across all categories, with the largest relative gains in Social Sectors, where per capita spending increases by about 1.78 log points (roughly 500%, or about a six-fold increase). Administrative & Security and Economic Activity–related spending rise by about 0.73 and 0.81 log points, implying increases of roughly 100–130%, and Municipal & Environmental spending increases by about 0.44 log points (around 55–60%). At the district level, all four components decline by around 20–50%. Given that pre-reform pseudo-hromadas start from lower spending levels in social functions, the log specification indicates that part of the effect reflects convergence toward higher social spending rather than a complete reorientation of the budget. Together with the district results, these suggest that the reform not only reallocated expenditures from districts to hromadas but also tilted the newly controlled resources towards social and municipal services in territories that gained autonomy.

5.2.2 The Effects on Economic Activity

To assess how amalgamation affected local economic activity, I first use nightlight intensity data, a widely adopted proxy for economic activity in development economics (Gibson et al., 2020). Figure 5 shows that treated areas experienced a sustained increase in per capita nightlight intensity relative to non-amalgamated councils. The effect builds gradually: in the first year after treatment it is small, but from the second year onward the estimates become consistently positive, reaching 0.09–0.11 standard deviations by the fourth year. The illustrated pre-trends support the plausibility of the parallel trends assumption, and the gradual post-treatment increase is consistent with the cumulative nature of local economic growth. These results indicate that the reform did not trigger

an immediate one-time jump in the economic activity but rather set in motion to a gradual process of economic expansion, which is in line with the evidence documented by Ukrainian media and Egger et al. (2022).[12]

To benchmark magnitudes, I scale the coefficients by the pre-treatment mean of the outcome in the never-treated comparison group. Using this normalization, the estimated treatment effects correspond to a 7% increase in average nightlight intensity. These magnitudes are close to those reported by Egger et al. (2022), which finds that German municipal mergers increased nightlight intensity by roughly 8%. Therefore, my estimates are of a comparable order of magnitude, if anything somewhat conservative, and fall within the range of prior evidence from similar studies.

Taken together, the observed changes suggest that amalgamation led to improvements in local governance and significantly increased local economic activity. Complementing the improvements in procurement documented earlier, these results point to an improvement in local governance and resource allocation practices in amalgamated areas. While disentangling mechanisms is beyond the scope of this section, the findings indicate that consolidation and expanded autonomy jointly enhanced both the economic and fiscal performance of local governments.

5.2.3 Impact of the Reform on Civic National Identity

I analyze the reform's impact on civic national identity using a nationally representative repeated cross-sectional survey. The main outcome is a binary indicator for whether respondents identify *only as Ukrainian*.

While the survey also includes recurring questions on language use, I focus on self-declared national identity. This is important in the Ukrainian context, where many citizens before the full-scale war spoke Russian daily but identified as Ukrainian (Kulyk, 2016, 2018, 2021). A similar pattern exists in other post-Soviet states, where Russian is widely spoken but identification as Russian is much lower.[13] Since language use before the full-scale war was relatively stable over time in Ukraine (Metzger et al., 2016; Abramenko et al., 2024), self-declared identity provides a more direct measure of the nation-building effects of the reform.

Table 5 shows that amalgamation increased identification as only Ukrainian, with effects concentrated in rural areas. A 10 percentage point increase in the share of people living in hromadas corresponds to a 0.8 percentage point increase in the probability of identifying as only Ukrainian. The last three columns include a vector of controls accounting for individual characteristics (gender,

[12] Night lights show economic growth of Ukraine, decline of occupied Donbas. *Euromaidan Press,* January 29, 2022.

[13] Statistics Lithuania: 78.5% of Lithuanians speak at least one foreign language. *Statistics Lithuania,* September 27, 2013.

age, education and rurality of location) and regional factors (regional inflation and gross regional product). The estimates suggest that the reform strengthened civic identity precisely where it was most salient: in rural local councils, which were the main beneficiaries of amalgamation. By contrast, no significant effects are detected in urban areas, consistent with the more limited role of the reform there.

To assess the parallel trends assumption, I estimate event study regressions for the rural sample, transforming treatment into a discrete variable. I define a district as treated if more than 5% of its population resides in a hromada. Figure A1 illustrates the evolution of trends for rural areas, supporting the validity of the parallel trends assumption.

5.3 Robustness Checks

5.3.1 Personal Income Tax Collection

I complement the previous results with district-level personal income tax (PIT) revenues per capita. According to Ukraine's Ministry of Finance, PIT is the largest single source of local tax revenue and accounts for roughly two-thirds of local tax revenues.[14] Although data at the local council level exist, I aggregate PIT to pre-2020 district boundaries (summing over district, hromada, and council budgets and excluding cities of oblast significance) to avoid capturing mechanical changes in the intra-district allocation of tax shares induced by the reform. Changes in the circulation of PIT occurred at the local council level, but they do not mechanically affect total PIT collected within a district.

The estimates show a strong positive relationship between amalgamation and PIT revenues: a 10 percentage point increase in the share of a district's population living in hromadas is associated with an increase of about 19 hryvnias per capita, roughly 2.1 percent of the pre-reform mean. In other words, moving from no amalgamation to full amalgamation corresponds to an increase in PIT per capita of around 21 percent. This pattern is consistent with the nightlight estimates and suggests that the reform's effects extend beyond satellite-based measures to directly observed fiscal outcomes. Because the PIT series is only available from 2015 onward, I cannot construct event-study figures with a long pre-treatment period at the district level, so I view the PIT results as a complementary robustness check on local economic activity rather than as the primary basis for identifying dynamic effects.

[14] Execution of Local Budget Revenues. *The Ministry of Finance of Ukraine,* October 3, 2023.

5.3.2 General Changes in National Identity or Due to Reform?

One potential concern about the results on civic national identity might be a general shift in attitudes towards the Ukrainian national identity, regardless of the improved governance of local governments.

One straightforward way to check is to focus on the language of use, as Ukraine has had a traditionally high share of Russian speakers. As an additional falsification test, I re-estimate the same TWFE model using the probability of replying in Russian as the outcome. Consistent with the idea that civic identity is more malleable than entrenched linguistic practices, as presented in Table A2, I find no corresponding effect on respondents' reported language of use. This helps rule out the concern that my main results are driven by a broad shift in survey responses or a generalized trend in national identification. Rather, the evidence points to a targeted shift in civic self-identification.

The fact that changes are concentrated in civic national identity, rather than in broader linguistic self-descriptions, suggests that the reform specifically altered civic attachments rather than inducing a full shift of identity.

6 Mechanisms

The baseline results document that amalgamation increased procurement competition, expanded public spending at the hromada level and strengthened civic national identity. In this section, I explore two mechanisms that can help interpret these results in light of theory and the Ukrainian institutional context.

First, pooling administrative resources may have reduced barriers to entry in public tenders, making it easier and more attractive for new suppliers to participate. Second, improvements in local governance and economic conditions may have reinforced citizens' civic attachments, strengthening identification with the Ukrainian state.

6.1 Participant Entry

A first mechanism concerns the entry of new participants into public procurement. The rise in bids per tender, as documented earlier, could reflect more aggressive participation by incumbents or the entry of new suppliers. To distinguish between these possibilities, I track the total number of participants and the number of new entrants at the council–year level. New entrants are defined as participants not observed in that council in any prior year. Event-study estimates show flat pre-

trends and a sustained increase in both measures after amalgamation. Panel (b) of Figure 4 presents an increase of 0.341 additional new suppliers per council–year, corresponding to an increase of roughly 20% relative to its pre-reform mean. This evidence indicates that amalgamation expanded the pool of competitors, reducing entry barriers and making tenders more attractive to outside firms. Participant entry thus provides a proximate mechanism linking consolidation to improvements in procurement competition.

6.2 Civic Identity Reinforcement

Another mechanism is that the reform might have strengthened civic identity by improving local governance and service provision. As explained in detail in Section 5.2.3, amalgamation increased the probability of identifying only as Ukrainian, with effects concentrated in rural areas where the reform had the largest effect and most expanded local autonomy. No comparable effects are detected for language use, which remains stable over time.

Elasticity of Civic National Identity. A potential concern is the elasticity of civic national identity, as it is often considered relatively stable and slow to change. However, existing research (Kulyk, 2016, 2018, 2021; Abramenko et al., 2024) documents a shift toward a more uniform Ukrainian identity following the Euromaidan protests, the annexation of Crimea, and the conflict in Donbas. My findings add to this evidence, showing that institutional reforms can also alter civic identity within a relatively short time frame.

Implications for Institutional Resilience. While Rabinovych et al. (2023) emphasize the role of greater local autonomy and Arends et al. (2023) stress increased trust in local governments after the reform, my findings suggest that strengthened civic identity provides an additional channel in contributing to the institutional resilience amidst the full scale invasion. By fostering local development and reinforcing a sense of belonging, the reform may have increased citizens' willingness to cooperate and resist in the face of external aggression.

7 Heterogeneity

The analysis in Section 5 establishes that amalgamation improved local governance and economic activity, ultimately strengthening civic national identity. These average effects, however, may mask important differences across units. In this section, I document which types of units benefited most from the reform and along which dimensions. While the baseline results show clear gains, they do

not reveal where these gains are concentrated or why. To shed light on this, I analyze heterogeneity along three dimensions: (i) the size of the hromada in terms of the number of member councils, (ii) differences in population size between capital and non-capital councils within hromadas and (iii) pre-reform financial self-sufficiency. Together, these exercises allow me to investigate whether economies of scale, redistribution within hromadas and baseline capacity shaped the reform's impact.

Heterogeneity in Hromada Size. I begin by analyzing whether the size of a hromada influenced the effect on the local economic activity. Theoretically, consolidation could generate economies of scale by reducing inefficiency in administrative functions and pooling resources. However, when units become too large, administrative complexity may offset these gains. To test this, I classify hromadas into three bins based on the number of member councils: small (2–3 councils), medium (4–6 councils), and large (7 or more councils). Never-treated councils are coded as zero. To ensure consistency, I restrict attention to stable hromadas that did not subsequently expand after their initial formation.

Table 6 shows evidence of diminishing returns to scale. Councils in small hromadas experience the largest post-reform gains in nightlight intensity, followed by those in medium-sized units. In contrast, the effect vanishes for councils in large hromadas. The estimates imply that councils in small hromadas see an increase in nighttime lights of about 9-10 percent relative to never and not yet treated councils, compared to roughly 7-8 percent for medium-sized hromadas and a near-zero effect for large hromadas. This pattern suggests that amalgamation generated efficiency improvements up to a point, but excessive consolidation may have recreated the very coordination costs and fragmented bargaining that arise in larger jurisdictions, as emphasized by Besley and Coate (2003). While pre-reform councils were already heavily dependent on higher-level administrations, the creation of very large hromadas introduced new internal layers of complexity that may have diluted the efficiency gains from pooling resources. This non-monotonic pattern suggests that the design of jurisdictional boundaries, specifically in this case, the number of units merged, shapes the impact of reform.

Population Heterogeneity across Councils. A second mechanism concerns the relative size of councils within the new units, hromadas. To test this, I compute the absolute population difference between the capital and non-capital councils, dividing them into terciles.

The results, reported in Table 7, show that councils with greater population differences relative to the capital, i.e., the more peripheral and rural units, experience larger gains in local economic activity. Councils in the top and middle terciles of population difference see an increase in nightlight

intensity of about 10-12 percent relative to not yet and never treated councils, while councils in the lowest tercile experience a much smaller effect of around 6 percent. This result is also related to a long-standing debate in political economy. Alesina and Spolaore (1997) argue that smaller units may suffer from under-provision of public goods, while integration into larger jurisdictions can help internalize spillovers. The evidence from Ukraine supports this logic, showing that relatively more peripheral councils, which were previously constrained by limited capacity, reaped substantial economic benefits from amalgamation. On the other hand, the larger ones, e.g., capital councils, might have faced increased administrative and infrastructural burdens. As shown in 5.2.3, the largest gains in civic identity are also concentrated in rural and peripheral areas. Taken together, these indicate that amalgamation not only shifts economic activity toward previously disadvantaged councils but also strengthens their attachment to the Ukrainian state.

Financial Self-Sufficiency and Returns to Capacity. Finally, I investigate whether baseline financial capacity conditioned the effects of amalgamation. Councils with greater financial independence before the reform may have been better equipped to leverage the new autonomy granted to hromadas, while councils more dependent on transfers may have lacked the capacity to translate consolidation into growth. To investigate this, I construct a measure of predicted financial self-sufficiency. For each stable hromada, I calculate the share of own revenues, defined as all revenues excluding transfers and subsidies, over total revenues in the year prior to amalgamation and then average this across the member councils. I then divide hromadas into terciles of this baseline Own-Income measure, with the bottom tercile representing units most dependent on transfers and the top tercile those with the highest pre-reform fiscal independence.

Table A6 shows that hromadas with higher pre-reform self-sufficiency experienced significantly larger post-reform gains in nightlight intensity. Councils in the top tercile of baseline *OwnIncome* see an increase in nightlight intensity of about 10 percent relative to not yet and never treated councils, compared to roughly 6 percent in the middle tercile and no effect in the bottom tercile. This implies that local capacity was complementary to the reform: units that already demonstrated the ability to raise revenues and manage budgets were best positioned to exploit the new fiscal and administrative autonomy. Conversely, councils with low initial capacity saw weaker gains, suggesting that decentralization without adequate baseline resources may limit growth potential.

8 Conclusion

This paper documents the effects of a nationwide territorial reform in Ukraine that allowed small local councils to voluntarily merge into larger units while expanding their fiscal and administrative autonomy. The staggered rollout of the reform provides quasi-experimental variation that I exploit to study how changes in jurisdiction size and authority affect local governance, economic development and civic identity.

I document three main results. First, some of the pre-reform characteristics were influential in participation. Wealthier and units with a higher share of native Ukrainian speakers were more likely to partake in the reform. I also document that similar units were more likely to merge into the same hromada, consistent with homophily in amalgamation. Second, amalgamation improved local governance and economic outcomes. Procurement became more competitive, with an increased share of highly competitive contracts and a higher number of bidders per tender. On the fiscal side, total per-capita expenditures increased markedly after amalgamation, and this expansion was accompanied by changes in the composition of spending. It shifted toward social sectors, with education and healthcare absorbing a greater share of resources. Procurement composition moved in the same direction, with a rising share of contracts allocated to social and public services. Local economic activity rose gradually and persistently, as reflected in nightlight intensity and cross-checked by increases in district-level PIT revenues per capita, consistent with an expanding local fiscal capacity. Third, the reform affected civic identity: in rural areas, which are the main beneficiaries of the economic gains, residents became significantly more likely to identify solely as Ukrainian.

The effects are heterogeneous. Gains are largest in small hromadas of two to three councils and in smaller councils within merged units, which suggests an optimal level of administrative complexity and redistribution of development toward previously disadvantaged areas. At the same time, hromadas with greater pre-reform financial self-sufficiency benefited more, representing complementarities between baseline capacity and the autonomy granted by the reform. In contrast, very large hromadas and units with low initial capacity saw weaker gains.

The pattern of evidence is consistent with two proximate channels. First, amalgamated councils attracted new suppliers into public procurement, expanding the pool of participants and increasing competition. Second, budgets were reoriented toward social services, and this shift is mirrored in procurement composition. A third reinforcing factor is civic identity: improved local governance and rising economic activity are associated with a stronger sense of identification as Ukrainian in rural areas, where the economic effects are strongest.

The findings relate to broader debates on the optimal scale of government. A long tradition in public economics emphasizes the trade-off between economies of scale and preference alignment.

My results suggest that when consolidation is paired with genuine autonomy, these trade-offs are attenuated. Consolidation reduces the inefficient red tape and improves local governance, while autonomy strengthens incentives and accountability. The reform also shows that institutional improvements at the local level can have spillovers into nation-building, as better governance and consequent economic stimulation reinforced civic identity in rural areas.

In terms of policy implications, there are clear messages. Consolidation delivers benefits up to a point but becomes less effective in very large jurisdictions. Fiscal devolution is most effective when paired with baseline capacity, underscoring the importance of capacity-building alongside decentralization. More broadly, the evidence suggests that "remaking the state from below" by right-sizing jurisdictions and granting them real autonomy can improve governance, stimulate development and foster civic attachments in settings where fragmentation and weak local capacity remain central challenges.

The Ukrainian case thus provides broader insights for countries considering similar reforms. The combination of consolidation and genuine fiscal autonomy can strengthen local governance, stimulate development, and reinforce civic identity, but future work should investigate the long-term impacts of such reforms. Furthermore, they should assess their effects on other core services such as education and healthcare. A comparative perspective, contrasting voluntary and mandatory amalgamation experiences across countries, would further clarify the conditions under which territorial consolidation translates into durable improvements in state capacity.

References

Abramenko, S., V. Korovkin, and A. Makarin (2024). Social media as an identity barometer: Evidence from the russia-ukraine war. *Available at SSRN*.

Alesina, A., R. Baqir, and C. Hoxby (2004). Political jurisdictions in heterogeneous communities. *Journal of political Economy 112*(2), 348–396.

Alesina, A., B. Reich, and A. Riboni (2020). Nation-building, nationalism, and wars. *Journal of Economic Growth 25*(4), 381–430.

Alesina, A. and E. Spolaore (1997). On the number and size of nations. *The Quarterly Journal of Economics 112*(4), 1027–1056.

Arends, H., T. Brik, B. Herrmann, and F. Roesel (2023). Decentralization and trust in government: Quasi-experimental evidence from ukraine. *Journal of Comparative Economics 51*(4), 1356–1365.

Bandiera, O., A. Prat, and T. Valletti (2009). Active and passive waste in government spending: evidence from a policy experiment. *American Economic Review 99*(4), 1278–1308.

Banerjee, A., E. Duflo, C. Imbert, S. Mathew, and R. Pande (2020). E-governance, accountability, and leakage in public programs: Experimental evidence from a financial management reform in india. *American Economic Journal: Applied Economics 12*(4), 39–72.

Bardhan, P. and D. Mookherjee (2000). Capture and governance at local and national levels. *American economic review 90*(2), 135–139.

Bel, G. and M. E. Warner (2016). Factors explaining inter-municipal cooperation in service delivery: a meta-regression analysis. *Journal of Economic Policy Reform 19*(2), 91–115.

Bergholz, C. and I. Bischoff (2018). Local council members' view on intermunicipal cooperation: does office-related self-interest matter? *Regional Studies 52*(12), 1624–1635.

Besley, T. and S. Coate (2003). Centralized versus decentralized provision of local public goods: a political economy approach. *Journal of public economics 87*(12), 2611–2637.

Bianchi, N., M. Giorcelli, and E. M. Martino (2023). The effects of fiscal decentralisation on publicly provided services and labour markets. *The Economic Journal 133*(653), 1738–1772.

Blom-Hansen, J., K. Houlberg, S. Serritzlew, and D. Treisman (2016). Jurisdiction size and local government policy expenditure: Assessing the effect of municipal amalgamation. *American Political Science Review 110*(4), 812–831.

Boffa, F., A. Piolatto, and G. A. Ponzetto (2016). Political centralization and government accountability. *The Quarterly Journal of Economics 131*(1), 381–422.

Brollo, F., T. Nannicini, R. Perotti, and G. Tabellini (2013). The political resource curse. *American Economic Review 103*(5), 1759–1796.

Callaway, B. and P. H. Sant'Anna (2021). Difference-in-differences with multiple time periods. *Journal of econometrics 225*(2), 200–230.

Caprettini, B. and H.-J. Voth (2023). New deal, new patriots: How 1930s government spending boosted patriotism during world war ii. *The Quarterly Journal of Economics 138*(1), 465–513.

Cassidy, T. and T. Velayudhan (2024). Government fragmentation and economic growth. *Review of Economics and Statistics*, 1–46.

Cohen, I. (2024). Documenting decentralization: Empirical evidence on administrative unit proliferation from uganda. *The World Bank Economic Review*, lhae008.

Dahis, R. and C. Szerman (2023). Decentralizing development: Evidence from government splits. Technical report, Working Paper.

Di Porto, E. and S. Paty (2018). Cooperation among local governments to deliver public services. *Politics & Policy 46*(5), 790–820.

Egger, P. H., M. Koethenbuerger, and G. Loumeau (2022). Local border reforms and economic activity. *Journal of Economic Geography 22*(1), 81–102.

Gerardino, M. P., S. Litschig, and D. Pomeranz (2024). Distortion by audit: Evidence from public procurement. *American Economic Journal: Applied Economics 16*(4), 71–108.

Gibson, J., S. Olivia, and G. Boe-Gibson (2020). Night lights in economics: Sources and uses 1. *Journal of Economic Surveys 34*(5), 955–980.

Gordon, N. and B. Knight (2009). A spatial merger estimator with an application to school district consolidation. *Journal of Public Economics 93*(5-6), 752–765.

Hamaniuk, O., B. Herrmann, and F. Rosel. Go local – get tax compliance and local growth? work-in-progress.

Korczak, M. Loss of capital status: does it matter for a city's development? work-in-progress.

Korovkin, V. and A. Makarin (2023). Conflict and intergroup trade: Evidence from the 2014 russia-ukraine crisis. *American economic review 113*(1), 34–70.

Kulyk, V. (2016). National identity in ukraine: Impact of euromaidan and the war. *Europe-Asia Studies 68*(4), 588–608.

Kulyk, V. (2018). Shedding russianness, recasting ukrainianness: The post-euromaidan dynamics of ethnonational identifications in ukraine. *Post-Soviet Affairs 34*(2-3), 119–138.

Kulyk, V. (2021). Identity in transformation: Russian-speakers in post-soviet ukraine. In *The Russian-speaking Populations in the Post-Soviet Space*, pp. 156–178. Routledge.

Lapointe, S. (2018). "love thy neighbour"? the effect of income and language differences on votes for municipal secessions. *Regional Science and Urban Economics 70*, 229–245.

Lassen, D. D. and S. Serritzlew (2011). Jurisdiction size and local democracy: Evidence on internal political efficacy from large-scale municipal reform. *American Political Science Review 105*(2), 238–258.

Lewis-Faupel, S., Y. Neggers, B. A. Olken, and R. Pande (2016). Can electronic procurement improve infrastructure provision? evidence from public works in india and indonesia. *American Economic Journal: Economic Policy 8*(3), 258–283.

Martinez-Bravo, M. (2014). The role of local officials in new democracies: Evidence from indonesia. *American Economic Review 104*(4), 1244–1287.

Martinez-Bravo, M., G. Padró i Miquel, N. Qian, and Y. Yao (2022). The rise and fall of local elections in china. *American Economic Review 112*(9), 2921–2958.

Metzger, M. M., R. Bonneau, J. Nagler, and J. A. Tucker (2016). Tweeting identity? ukrainian, russian, and# euromaidan. *Journal of Comparative Economics 44*(1), 16–40.

Oates, W. E. (1972). Fiscal federalism. *Books*.

Olken, B. A. (2010). Direct democracy and local public goods: Evidence from a field experiment in indonesia. *American political science review 104*(2), 243–267.

Pierskalla, J. H. (2016). Splitting the difference? the politics of district creation in indonesia. *Comparative Politics 48*(2), 249–268.

Rabinovych, M., T. Brik, A. Darkovich, M. Savisko, V. Hatsko, S. Tytiuk, and I. Piddubnyi (2023). Explaining ukraine's resilience to russia's invasion: The role of local governance. *Governance*.

Sørensen, R. J. (2006). Local government consolidations: The impact of political transaction costs. *Public choice 127*(1), 75–95.

Tiebout, C. M. (1956). A pure theory of local expenditures. *Journal of political economy 64*(5), 416–424.

Tricaud, C. (2021). Better alone? evidence on the costs of intermunicipal cooperation.

Vlasenko, A. (2022). *Electoral Effects of Institutional Reforms: Evidence from Ukraine and Russia*. The Florida State University.

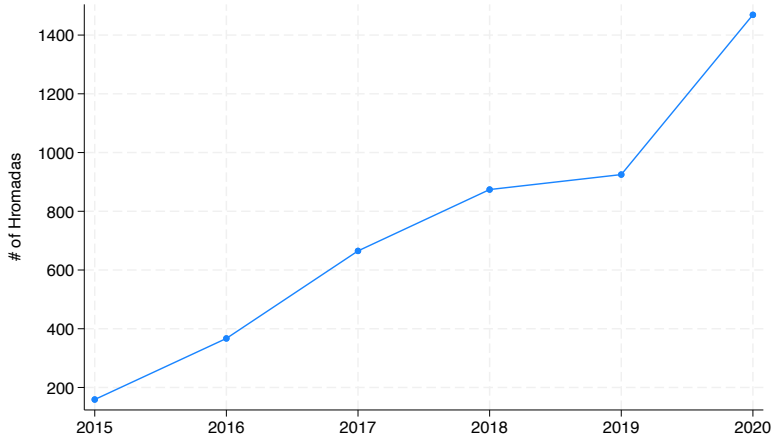
Weese, E. (2015). Political mergers as coalition formation: An analysis of the heisei municipal amalgamations. *Quantitative Economics 6*(2), 257–307.

Wooldridge, J. M. (2021). Two-way fixed effects, the two-way mundlak regression, and difference-in-differences estimators. *Available at SSRN 3906345*.

Figure 1: Map of Ukraine's Territorial Reform in 2019

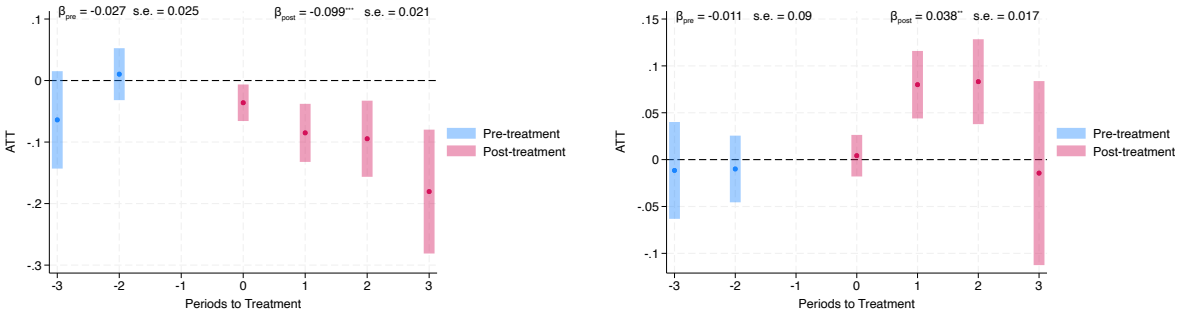
Notes: This figure presents the total number of councils as a part of hromadas (all colored areas) in December 2019. The white areas represent the non-amalgamated councils.

Figure 2: The Number of Amalgamated Hromadas Over Time



Notes: This figure presents the evolution of the number of new hromadas throughout the years. The numbers for each year represent the end-of-year number of hromadas.

Figure 3: Effect of Amalgamation on Procurement Type

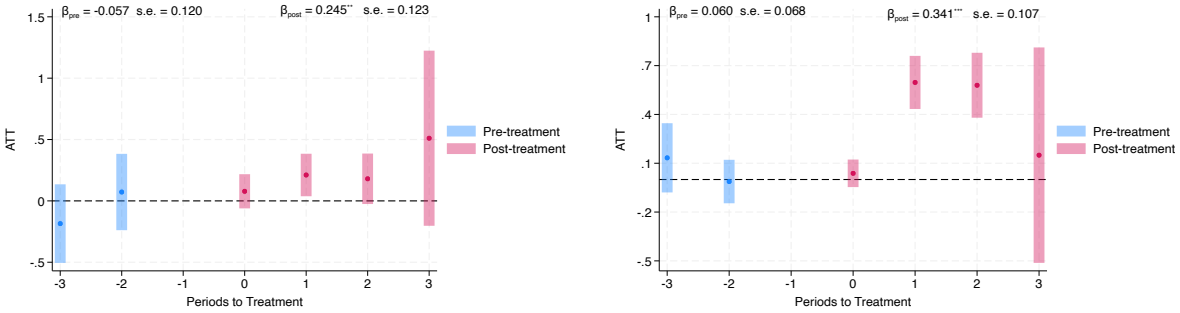


(a) Direct Procurement

(b) Highly Competitive Procurement

Notes: These event-study figures present the coefficients for being amalgamated (aggregated with respect to the years of exposure) using Equation 1. They illustrate the evolution of procurement contracts of amalgamated councils relative to their non-amalgamated counterparts for different years of exposure. The outcomes are the value share of direct and highly competitive contracts in a given council-year pair. The regressions do not include controls other than local council and year fixed effects. I present the point estimates as well as the 95% confidence interval. The standard errors are clustered at the local council level.

Figure 4: Effect of Amalgamation on Procurement Competition

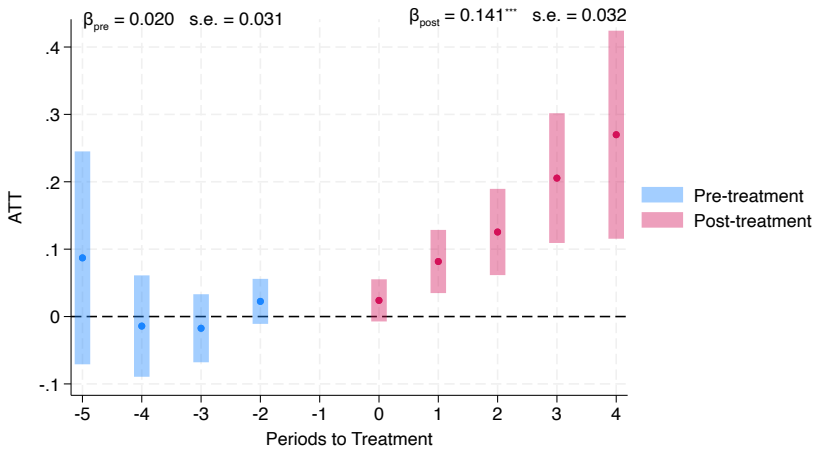


(a) Number of Bids per Tender

(b) Number of New Entrants

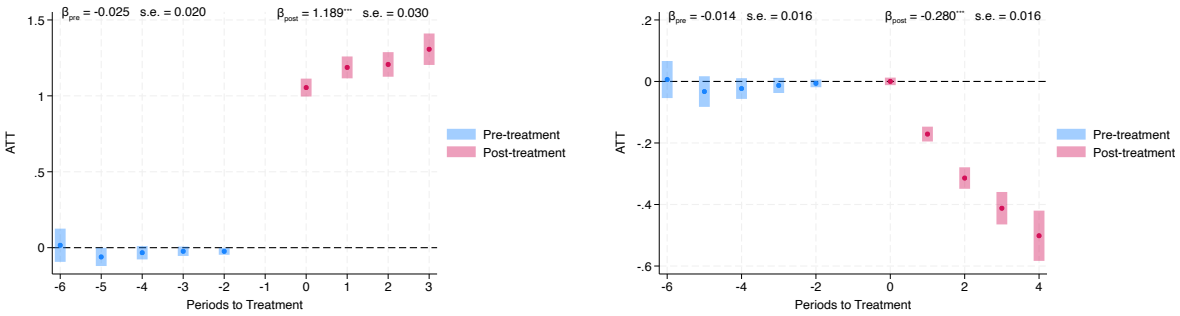
Notes: These event-study figures present the coefficients for being amalgamated (aggregated with respect to the years of exposure) using Equation 1. They illustrate the evolution of procurement contracts of amalgamated councils relative to their non-amalgamated counterparts for different years of exposure. The outcomes are the average number of bids per tender in competitive tenders and the log number of new entrants in a council year pair. The regressions do not include controls other than local council and year fixed effects. I present the point estimates as well as the 95% confidence interval. The standard errors are clustered at the local council level.

Figure 5: Effect of Amalgamation on Nightlight Intensity



Notes: This event-study figure presents the coefficients for being amalgamated (aggregated with respect to the years of exposure) estimated using Equation 1. It illustrates the evolution of nightlight intensity of amalgamated councils relative to their non-amalgamated counterparts for different years of exposure. The outcome is the total luminosity per capita, normalized by each council's population and scaled by 100, for a given council-year pair. The regression do not include controls other than local council and year fixed effects. I present the point estimates as well as the 95% confidence interval. The standard errors are clustered at the local council level.

Figure 6: Effect of Amalgamation on Total Expenditures



(a) Hromadas

(b) Districts (≥15%, treated)

Notes: These event-study figures present the coefficients for being amalgamated (aggregated with respect to the years of exposure) using Equation 1. They illustrate the evolution of total per capita spending of amalgamated councils relative to their non-amalgamated counterparts for different years of exposure. The outcome is log total expenditures per capita for hromadas (with pre-reform councils aggregated to future hromada borders) and districts. The regressions do not include controls other than local council and year fixed effects. I present the point estimates as well as the 95% confidence interval. The standard errors are clustered at the hromada or district level.

Table 1: Summary Statistics

	Treated Councils	Control Councils
	(1)	(2)
Panel A: Baseline Characteristics		
Population	2013	1975
	(2592)	(2673)
Native UkrSpeakers% (*Population weighted*)	91.040	86.678
	(17.408)	(24.295)
Native RusSpeakers% (*Population weighted*)	6.659	9.495
	(13.543)	(18.858)
Poroshenko Vote%	20.810	22.428
	(7.424)	(8.389)
Panel B: Outcomes		
Nightlight Intensity	2.180	2.119
	(2.351)	(2.536)
Share of Direct Procurement	0.691	0.750
	(0.382)	(0.351)
Number of Bids Per Tender	2.269	2.347
	(0.895)	(0.939)
Number of New Entrants	1.756	1.611
	(1.552)	(1.404)

Notes: This table presents summary statistics for the analytical sample. Nightlight intensity is measured as total luminosity per capita, in which observations with zero luminosity and the top 2.5 percent of the distribution are dropped, normalized by each local council's population and scaled by a factor of 100. The average luminosity per capita of 2013 and 2014 is calculated for each council. For nightlights and baseline covariates, pre-treatment is defined as years $\leq$ 2015. For procurement outcomes, "pre-treatment" for treated councils refers to lots announced before a council joins a hromada, while for control councils it refers to all lots in 2015–2019. The population and language variables are from the Ukrainian Census in 2001 and are time-invariant.

Table 2: Pre-Reform Characteristics and Amalgamation Probability

	Amalgamation Probability	
	(1)	(2)
Nightlight Intensity	0.025***	0.029***
	(0.008)	(0.008)
Poroshenko Vote	-0.005	-0.014*
	(0.006)	(0.008)
Ukrainian Language	0.016**	0.035***
	(0.008)	(0.007)
FE	District	Region
Obs.	8,143	8,157
Mean of dep. var.	0.417	0.417
SD of dep. var.	0.493	0.493

Notes: This table explores the effect of nightlight intensity, vote share for Petro Poroshenko (Ukraine's president during the reform) and the share of native Ukrainian speakers on the probability of voluntary amalgamation. Nightlight intensity is the pre-reform average (2013–2014) of total nightlight intensity per capita, scaled by a factor of 100. The Ukrainian language variable is based on respondents' native language and is not mutually exclusive. Both nightlight intensity and the Ukrainian language variables are normalized by population, and the regressions are weighted by LC population size. For comparability, all regressors are standardized by subtracting the mean and dividing by the standard deviation. Column 1 includes district fixed effects and Column 2 includes region fixed effects. Standard errors in parentheses are clustered at the LC level. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 3: Procurement at Council and District Level

	(1) Direct Procurement	(2) Highly Comp Procurement	(3) Bids per Tender
Panel A: Local Council			
Post Average	-0.099***	0.038**	0.245**
	(0.021)	(0.018)	(0.123)
FE	X	X	X
Obs	8,446	8,446	3,717
Mean of dep. var.	0.750	0.098	2.347
SD of dep. var	0.351	0.214	0.939
Panel B: Districts			
Post Average	-0.054**	0.044**	0.250*
	(0.026)	(0.021)	(0.130)
FE	X	X	X
Obs	1,683	1,632	1,635
Mean of dep. var.	0.451	0.244	2.348
SD of dep. var	0.248	0.185	0.632

Notes: This table reports the estimated effects of amalgamation on procurement performance. Outcomes are (i) the value share of direct-award contracts, (ii) the value share of highly competitive contracts, and (iii) the average number of bids per competitive tender, measured at the local council and district levels. All regressions include unit (council or district) and year fixed effects. Standard errors in parentheses are clustered at the council or district level. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table 4: Public Expenditures Composition

	(1) Expenditures Per Capita	(2) Administrative& Security	(3) Social Sectors	(4) Municipal& Environmental	(5) Economic Activity
Panel A: Hromadas					
Post Average	1.189***	0.725***	1.783***	0.439***	0.814***
	(0.030)	(0.031)	(0.080)	(0.053)	(0.094)
FE	X	X	X	X	X
Obs	6,846	6,548	6,306	6,530	5,854
Mean of dep. var.	7.457	6.262	6.084	5.408	4.820
SD of dep. var	1.447	0.920	1.680	1.000	1.453
Panel B: Districts					
Post Average	-0.280***	-0.617***	-0.239***	-0.576***	-0.732***
	(0.016)	(0.063)	(0.016)	(0.052)	(0.133)
FE	X	X	X	X	X
Obs	2,793	2,793	2,793	2,793	2,793
Mean of dep. var.	8.524	5.653	8.413	4.845	3.233
SD of dep. var	0.388	0.718	0.390	0.639	1.822

Notes: This table presents the estimates of the impact of amalgamation on the composition of local public expenditures. The dependent variables are log per capita expenditures in four broad categories: Administrative & Security, Social Sectors, Municipal & Environmental, and Economic Activity–related spending. Panel A reports results at the hromada level, where pre-reform local councils are aggregated to their future hromada borders; Panel B reports the corresponding estimates at the district level. All regressions include hromada or district and year fixed effects, with no additional controls. Standard errors in parentheses are clustered at the hromada or district level. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 5: Self-Declared National Identity

	Do you identify yourself as more Russian or Ukrainian? (1=Only Ukrainian; 0=Only Russian, More Russian, In Between, More Ukrainian)					
	(1) Only Ukrainian	(2) Only Ukrainian (Urban)	(3) Only Ukrainian (Rural)	(4) Only Ukrainian	(5) Only Ukrainian (Urban)	(6) Only Ukrainian (Rural)
Pop_{dt}	0.032	-0.028	0.076**	0.044*	-0.010	0.083***
	(0.025)	(0.044)	(0.027)	(0.023)	(0.043)	(0.026)
District FE	X	X	X	X	X	X
Survey FE	X	X	X	X	X	X
Has Controls				X	X	X
Obs.	42,579	13,195	29,355	42,370	13,135	29,206
Mean of dep. var.	0.869	0.816	0.893	0.869	0.816	0.893
SD of dep. var.	0.338	0.388	0.310	0.338	0.388	0.310

Notes: This table presents the estimates of the impact of amalgamation on self-declared national identity. The outcome is a binary variable that indicates whether the respondent identifies as Ukrainian only. Columns 3 and 6 only include rural areas in their sample size, and columns 2 and 4 only include urban areas in the sample. Columns 1 and 3 include the whole sample. All columns include district and survey wave fixed effects. Columns 1, 2 and 3 do not contain any controls. Columns 3 and 4 include controls, which consist of respondents' gender, age, education, rurality, the respective region's inflation and gross regional product, and each region's share of refugees (from Crimea and Donbas between 2014 to 2020) over the total population. The population data is from the 2001 Ukrainian Census. * p<0.1, ** p<0.05, *** p<0.01.

Table 6: Heterogeneity in Number of Local Councils

	Small	Medium	Large
$Amalgamated_{ct} \times HromadaBin$	0.202***	0.170***	0.033
	(0.045)	(0.052)	(0.064)
FE	X	X	X
Obs	62,833	62,833	62,833
Mean dep. var.	2.173	2.173	2.173
SD dep. var.	2.373	2.373	2.373

Notes: This table reports heterogeneous effects of amalgamation on local economic activity by the number of local councils in a hromada. Each column reports the coefficient on the interaction between the amalgamation indicator and an indicator for councils belonging to hromadas in the corresponding size bin. "Small", "Medium", and "Large" correspond to hromadas with two-three, four-six, and more than six councils, respectively. The dependent variable is total nightlight intensity per capita, normalized by population and scaled by 100, for each council-year pair. Councils that are never amalgamated contribute only pre-reform observations with an amalgamation value of zero. All specifications include council and year fixed effects. Standard errors in parentheses are clustered at the local council level. * p<0.1, ** p<0.05, *** p<0.01.

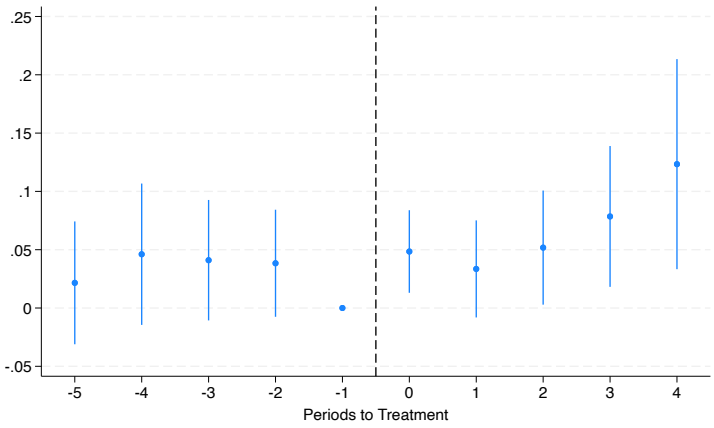
Table 7: Heterogeneity in the Population of Local Councils

	SmallDiff	MediumDiff	LargeDiff
$Amalgamated_{ct} \times PopDiff$	0.144**	0.267***	0.287***
	(0.054)	(0.052)	(0.051)
FE	X	X	X
Obs	59,786	59,786	59,786
Mean dep. var.	2.132	2.132	2.132
SD dep. var.	2.367	2.367	2.367

Notes: This table reports heterogeneous effects of amalgamation on local economic activity by the population difference between a local council and the capital of its hromada. Each column reports the coefficient on the interaction between the amalgamation indicator and an indicator for councils in the corresponding bin of the pre-reform population difference. "SmallDiff", "MediumDiff", and "LargeDiff" refer to increasing ranges of this difference. The dependent variable is total nightlight intensity per capita, normalized by population and scaled by 100, for each council–year pair. Councils that are never amalgamated contribute only pre-reform observations with an amalgamation value of zero. All specifications include council and year fixed effects. * p<0.1, ** p<0.05, *** p<0.01.

Online Appendix

Figure A1: Effect of Amalgamation on Self-Declared National Identity (Rural Areas Only)



Notes: The event-study figure plots the coefficients for the amalgamation (1 if the share of people living in hromadas being greater than 5% in a given district) interacted with time since or before the treatment. The outcome is the probability of identifying only Ukrainian, and the sample includes only rural areas. Standard errors are clustered at the district level.

Table A1: Pre-Reform Characteristics and Year of Amalgamation

	Amalgamation Probability				
	2015	2016	2017	2018	2019
Nightlight Intensity	0.001	-0.011	-0.003	0.009	0.003
	(0.006)	(0.010)	(0.009)	(0.009)	(0.009)
Poroshenko Vote	-0.004	0.009	-0.002	-0.014	0.011
	(0.009)	(0.012)	(0.013)	(0.010)	(0.012)
Ukrainian Language	0.020	-0.010	0.014	0.018	-0.042***
	(0.013)	(0.010)	(0.014)	(0.012)	(0.012)
District FE	X	X	X	X	X
Obs.	3,273	3,273	3,273	3,273	3,273
Mean of dep. var	0.168	0.222	0.320	0.131	0.159
SD of dep. var	0.373	0.416	0.466	0.338	0.366

Notes: This table explores the effect of nightlight intensity, vote share for Petro Poroshenko (the former president of Ukraine during the reform) and the share of native Ukrainian speakers on the probability of amalgamation across different years, conditional on being treated. Nightlight intensity is the pre-reform average (2013–2014) of total nightlight intensity per capita, scaled by a factor of 100. The Ukrainian language variable is based on respondents' native language and is not mutually exclusive. Both nightlight intensity and the Ukrainian language variables are normalized by population, and the regressions are weighted by council population size. For comparability, all regressors are standardized by subtracting the mean and dividing by the standard deviation. All columns include district fixed effects. Standard errors in parentheses are clustered at the local council level. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table A2: Language of Reply

	(1) Russian	(2) Russian (Urban)	(3) Russian (Rural)	(4) Russian	(5) Russian (Urban)	(6) Russian (Rural)
Pop_{dt}	0.002	-0.043	0.011	-0.006	-0.069	0.009
	(0.026)	(0.057)	(0.028)	(0.026)	(0.056)	(0.027)
District FE	X	X	X	X	X	X
Survey FE	X	X	X	X	X	X
Has Controls				X	X	X
Obs.	44,794	13,901	30,863	44,558	13,829	30,699
Mean of dep. var.	0.222	0.340	0.167	0.222	0.340	0.167
SD of dep. var.	0.415	0.474	0.374	0.415	0.474	0.374

Notes: This table presents the estimates of the impact of amalgamation on the respondents' language of reply. The outcome is a binary variable that indicates whether the respondent replies to the questionnaire in Russian. Columns 3 and 6 only include rural areas in their sample size, and columns 2 and 4 only include urban areas in the sample. Columns 1 and 3 include the whole sample. All columns include district and survey wave fixed effects. Columns 1, 2 and 3 do not contain any controls. Columns 3 and 4 include controls, which consist of respondents' gender, age, education, rurality, the respective region's inflation and gross regional product, and each region's share of refugees (from Crimea and Donbas between 2014 to 2020) over the total population. The survey data is provided by the Kyiv International Institute of Sociology (KIIS) and contains information on self-reported national identity at the district level from 2010 to 2020. The population data is from the 2001 Ukrainian Census. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table A3: Differences of Pre-Reform Characteristics between Neighbors and within Hromadas

				Outcome: Amalgamation Probability
	(1)	(2)	(3)	(4)
	Council − Neighbor	Council − Neighbor of Neighbor	Within Hromadas	Same Hromada
Nightlight Intensity	0.017	0.018	0.011	-0.012***
	(0.020)	(0.020)	(0.012)	(0.003)
Population	0.825	0.817	0.512	0.007**
	(0.795)	(0.791)	(0.477)	(0.003)
Ukrainian Language	0.060	0.066	0.030	-0.018***
	(0.146)	(0.159)	(0.072)	(0.004)
Obs	165,327	165,327	3,526	159,622
Mean of dep. var.				0.601
SD of dep. var				0.490

Notes: This table presents the differences in several pre-reform characteristics between councils and their neighbors. The first two columns report the absolute differences in pre-reform variables between councils and their immediate neighbors (Column 1) and councils and the neighbors of their neighbors (Column 2). The third column shows the absolute difference between a local council and the pre-reform average of councils within the same hromada. The last column estimates the effect of absolute differences in these variables on the probability of being treated, including local council fixed effects. Nightlight intensity is the pre-reform average (2013–2014) of total nightlight intensity per capita, scaled by a factor of 100. The Ukrainian language variable is based on respondents' native language and is not mutually exclusive. Both nightlight intensity and the Ukrainian language variables are normalized by the population. For comparability, all regressors in Column 4 are standardized by subtracting the mean and dividing by the standard deviation. Standard errors in parentheses are clustered at the local council level. * p<0.1, ** p<0.05, *** p<0.01.

Table A4: Procurement Composition

	(1)	(2)	(3)	(4)
	Infrastructure& Construction	Energy& Industry	Social& Public Services	Food& Agriculture
Post Average	-0.048	0.020	0.054*	-0.025
	(0.035)	(0.038)	(0.028)	(0.033)
FE	X	X	X	X
Obs	5,662	5,662	5,662	5,662
Mean of dep. var.	0.440	0.315	0.151	0.094
SD of dep. var	0.273	0.224	0.172	0.144

Notes: This table presents the estimates of the impact of amalgamation on the composition of public procurement at the local council level. The dependent variable in each column is the share of total procurement value in a council-year accounted for contracts in one of four CPV-based categories: Infrastructure & Construction, Energy & Industry, Social & Public Services, and Food & Agriculture. The sample includes all tenders (competitive and non-competitive) organized by procurers subordinated to the council. All regressions include local council and year fixed effects, with no additional controls. Standard errors in parentheses are clustered at the council level. * p<0.1, ** p<0.05, *** p<0.01.

Table A5: Personal Income Tax Collection (District-Level)

	(1)	(2)
	PIT per capita	PIT per capita
Pop_{dt}	185.406***	194.498***
	(56.360)	(65.442)
FE	Region & Time	District & Time
Obs.	1,419	1,403
Mean of dep. var.	1054	1054
SD of dep. var.	588.693	588.693

Notes: This table presents the estimates of the impact of amalgamation on the personal income tax (PIT) collection. The outcome is the PIT per capita (in Ukrainian Hryvnias) in a given district-year. Column 1 does not include any fixed effects; Columns 2 and 3 have region & year and region & year effects, respectively. The regressions do not include any controls and the top 2.5% and bottom 2.5% of the distribution are trimmed. Standard errors in parentheses are clustered at the district level. * p<0.1, ** p<0.05, *** p<0.01.

Table A6: Heterogeneity in the Own Income of Hromadas

	Small	Medium	Large
$Amalgamated_{ct} \times OwnIncome$	-0.004	0.165***	0.232***
	(0.046)	(0.043)	(0.059)
FE	X	X	X
Obs	59,833	59,833	59,833
Mean dep. var.	2.157	2.157	2.157
SD dep. var.	2.370	2.370	2.370

Notes: This table reports heterogeneous effects of amalgamation on local economic activity by the financial self-sufficiency of hromadas. Small, medium, and large own income bins correspond to below 44, below 57 and above 57% of income generated within hromada, respectively. Units that are never treated have a value of 0. The dependent variable is total luminosity per capita, normalized by population and scaled by 100, for each council-year pair. All specifications include local council and time fixed effects. * p<0.1, ** p<0.05, *** p<0.01.

Table A7: Event Study: Heterogeneity in Number of Local Councils

	(1)	(2)	(3)
	Small	Medium	Large
-4	0.028	-0.032	-0.036
	(0.041)	(0.059)	(0.065)
-3	-0.010	-0.068*	0.042
	(0.032)	(0.035)	(0.047)
-2	-0.037*	0.049	0.076***
	(0.020)	(0.032)	(0.028)
0	0.070***	-0.047*	0.060*
	(0.023)	(0.027)	(0.031)
1	0.138***	0.023	0.106***
	(0.030)	(0.036)	(0.040)
2	0.271***	0.060	0.044
	(0.043)	(0.049)	(0.048)

Notes: This table reports the dynamics for the heterogeneous effects of amalgamation on local economic activity by the number of local councils in a hromada. Small, medium, and large bins correspond to two–three, four–six, and more than six LCs, respectively. Units that are never treated have a value of 0. The dependent variable is total luminosity per capita, normalized by population and scaled by 100, for each council-year pair. All specifications include local council and time fixed effects. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table A8: Event Study: Heterogeneity in the Population of Local Councils

	(1)	(2)	(3)
	SmallDiff	MediumDiff	LargeDiff
-4	-0.040	-0.057	0.94*
	(0.063)	(0.068)	(0.055)
-3	0.003	-0.021	0.007
	(0.045)	(0.051)	(0.037)
-2	0.037	-0.012	0.072***
	(0.033)	(0.034)	(0.026)
0	0.045	0.047	0.060*
	(0.038)	(0.029)	(0.033)
1	0.130***	0.140***	0.103***
	(0.045)	(0.045)	(0.039)
2	0.229***	0.230***	0.155***
	(0.061)	(0.055)	(0.057)
3	0.295***	0.322***	0.245***
	(0.079)	(0.068)	(0.068)

Notes: This table reports the dynamics for heterogeneous effects of amalgamation on local economic activity by the population difference between a local council and the capital of a hromada. Small, medium, and large bins correspond to two–three, four–six, and more than six councils, respectively. Units that are never treated have a value of 0. The dependent variable is total luminosity per capita, normalized by population and scaled by 100, for each council-year pair. All specifications include local council and time fixed effects. * p<0.1, ** p<0.05, *** p<0.01.

Table A9: Event Study: Heterogeneity in the Financial Self-Sufficiency of Hromadas

	(1)	(2)	(3)
	Small	Medium	Large
-4	0.066	-0.002	-0.011
	(0.061)	(0.056)	(0.065)
-3	0.022	-0.073**	0.042
	(0.041)	(0.037)	(0.053)
-2	0.034	0.062**	0.048
	(0.028)	(0.030)	(0.033)
0	-0.025	0.014	0.082**
	(0.024)	(0.027)	(0.035)
1	-0.051	0.112***	0.176***
	(0.035)	(0.037)	(0.043)
2	-0.054	0.131***	0.226***
	(0.041)	(0.051)	(0.059)
3	-0.078	0.258***	0.396***
	(0.053)	(0.062)	(0.076)

Notes: This table reports heterogeneous effects of amalgamation on local economic activity by the financial self-sufficiency of hromadas. Small, medium, and large own income bins correspond to below 44, below 57 and above 57% of income generated within hromada, respectively. Units that are never treated have a value of 0. The dependent variable is total luminosity per capita, normalized by population and scaled by 100, for each council-year pair. All specifications include local council and time fixed effects. * p<0.1, ** p<0.05, ***p<0.01.

Table A10: Institutional Roles of Administrative Units

	Pre-reform local councils	**Post-reform hromadas**	**Districts**
Tier and Legal Status	Small municipalities with limited own competences; de facto subordinated to district administrations	Basic tier of local self-government with elected council and head; broad municipal competences	Pre: key intermediate tier between councils and regions; Post: intermediate tier with a narrower, more coordinative role.
Relationship to higher tiers	Indirect access to the region and central authorities, largely mediated through districts.	Direct fiscal and administrative relations with the district and central government; eligible for state development and infrastructure funds.	Pre: key intermediary between councils and oblast/center; Post: thinner coordination layer and implementing agent for selected state policies.
Elected Bodies & Executives	Village/town council and head; small staff and limited mandate	Directly elected council and hromada head with executive powers and professional staff	Pre: district council plus state-appointed district administration with wide delegated powers; post: same bodies but with a reduced mandate focused on coordination and state programs.
Main Revenue Instruments	Low PIT and land-tax shares; minor local fees; high reliance on transfers.	Higher PIT and land-tax shares; unified local taxes; equalization grants and sectoral subventions.	Pre: sizable shared taxes and transfers financing schools and hospitals; Post: shrinking own base, mainly shared taxes and transfers for remaining district institutions.
Budget Autonomy	Line-item budgets; limited discretion; tight oversight from higher tiers.	Program budgeting with greater discretion and own development strategies.	Pre: managed a large share of local service budgets within central rules; Post: constrained autonomy with budgets tied mainly to delegated functions and intergovernmental programs.

Notes: This table presents the organizational duties and institutional differences before and after the territorial reform.

Table A11: Institutional Roles of Administrative Units (cont.)

Feature	**Pre-reform local councils**	**Post-reform hromadas**	**Districts**
Public Service Responsibilities	Basic communal services, minor local roads, culture; most education and health services organized at the district level.	Primary and lower-secondary education, primary health care, local roads, utilities, local social assistance and community services.	Pre: general education, hospitals, inter-settlement roads, and many local institutions; post: mainly upper-secondary and specialized education, some hospitals and inter-settlement roads, with responsibilities scaled down as hromadas took over.
Procurement role	Many small, fragmented tenders; frequent use of contracts below e-procurement thresholds; limited bargaining power.	Main organizer of local tenders for schools, clinics, utilities and local infrastructure within the Prozorro system.	Pre: important organizer of education/health tenders and larger projects; post: procurement only for remaining district-level institutions and programs, with shrinking contract volume.

Notes: This table presents the organizational duties and institutional differences before and after the territorial reform.