

UNDERSTANDING UKRAINE'S
DECENTRALIZATION REFORM: IS IT JUST
MONEY, OR SOMETHING ELSE DRIVING
THE AMALGAMATION PROCESS?

by

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Abstract

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The decentralization reform that Ukraine adopted in 2014 allows for the creation of a new lowest-tier governmental level called Amalgamated Hromadas (AHs). Previous to this, local councils had little to none executive decision power. Since the reform was approved, AHs have been being established at a very fast pace. The aim of this work is to analyse what the main drivers behind the decision to amalgamate are. With data from the Ministry of Finance of Ukraine for the year 2014, we study how the amalgamation process looked like by 2017. By means of two logit models, we estimate the following two hypotheses: 1) wealthier communities are more propense to amalgamate, and 2) historical experiences with local self-governance drives the decision to amalgamate. Considering personal income tax per capita and total revenues per capita as proxies for wealth, we find that these two variables seem to be important factors for amalgamation. Moreover, we also find that communities in the oblasts once part of the Austro-Hungarian empire and Poland appear to be more willing to amalgamate than the rest of the Ukrainian regions.

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Chapter 1

INTRODUCTION

After the Euromaidan Revolution in 2014, the Ukrainian Parliament adopted a reform legislation that formally began with an administrative and fiscal decentralization process. The disruptive feature of this reform is that it creates a new subnational tier and grants fiscal privileges to its newly elected self-governments. This policy addresses some serious historical discretionary issues, allowing for a healthier and more efficient democracy (Åslund 2009). Economic research about decentralization is rather conclusive: a higher level of sub-national fiscal autonomy is expected to enhance the provision of public goods, the allocation of resources and governance transparency (Trasberg 2009). Additionally, when local councils have no executive rights and depend largely on a rather discretionary central authority, their incentive is to avoid taxable investments, with the intent of punishing the central ruler, but at the cost of operating less productively in the informal sector (Myerson 2015). Nevertheless, economic literature is scarce when it comes to analyzing decentralization policy and local behavior when reforms include granting new executive prerogatives. In this work, this matter is addressed in order to provide a better understanding of what is driving behavior at the subnational level in Ukraine.

By 2014, Ukraine was divided into 24 Oblasts, 490 Rayons and over 11,000 small communities, with approximately 1,500 inhabitants on average. All those communities were depending on main administrative and budgetary issues controlled by the central state administration, represented down to the district level (called Rayons). Communities had almost no resources and administrative power to provide local public services, while district administrations, who were subordinate to central government and not accountable to local citizens, were not able to provide local public services

efficiently. Additionally, even though local councils are elected, lack of executive rights hamper transparent governance and local development. In this context, the law “On Voluntary Amalgamation of Territorial Communities”¹ was adopted in 2014 to allow neighbor communities to amalgamate into a new type of municipality called Amalgamated Territorial Community, known as Amalgamated Hromadas (AHs). AHs are no longer dependent on Rayon administrations (as representatives of central state), and are entitled to 60% of Personal Income Tax, collected within their jurisdiction. Furthermore, they receive administrative autonomy on public services like garbage collection, building and maintenance of local roads, healthcare and schools. Put differently, with the new AHs, a completely new type of local self-government appeared in Ukraine where all these services can be provided more cost efficiently, while enhancing government transparency. Between 2015 and 2019, 4,619 communities amalgamated into 1009 AHs, which can be observed in figure 1. These new AHs are home to approximately 43.2% of the total territory of the country and 32.1% - approximately 11 million people. of its total population. On average, five communities amalgamated in one new AH. In figure 1, we can observe the distribution of AHs created by 2019.

¹ The complete text of the law (in Ukrainian) can be found at: <https://zakon.rada.gov.ua/laws/show/157-19/ed20150205>



Figure 1. Amalgamated hromadas in Ukraine by December 2019

Source: Monthly reporting of the Ministry of Community and Territorial Development of Ukraine

While observing the impressive speed of amalgamation, it becomes interesting to understand: what driving factors contributed to such an accelerated amalgamation process? With data from the Ministry of Finance of Ukraine for the period 2014-2017 at the community level, we will analyze what seemed to be driving the first cohorts of AHs to amalgamate. It must be highlighted that, when facing this decision, communities had little to no evidence on which to base their choice. When looking back in history, they could only see that this was not the first decentralization attempt in Ukraine after independence in 1991. When looking at the present, they had no one to follow or copy, as well as no conceptual vision on how to take over the new executive responsibilities. For those who decided to amalgamate, it meant to learn to deal with complex new tasks and issues on spot. Thus, those pioneers must have been very determined, and eager for the new statute of independence from rayon administration, notwithstanding all responsibilities and challenges this new freedom would imply.

Taking further into account that the Ukraine is in a state of war, the dynamics of the amalgamation process is impressive. Given this observation, we are interested in better understanding the main factors driving the voluntary amalgamation process, a concept that, to the best of our knowledge, has not been investigated in depth so far.

In this work, it will be argued that the first incentive for amalgamation derives from the attractive prospect of receiving a share of 60% of the Personal Income Tax as a new source of revenues, collected by central state administration within the jurisdiction of the new AH. This way, communities which amalgamated into a new AH do not have to negotiate resources with a centralized government tier and become more independent. However, anecdotal observations indicate that a substantial increase in revenues is not the only expectation that is driving the decision of communities to amalgamate. In some cases, amalgamation seems to take place even if no material gains could be expected. Therefore, the following research question becomes particularly relevant: apart from wealth, are there other background factors motivating communities to amalgamate? Previous experiences with local self-governance might be one of those factors. As remarked by Åslund (2009), regional divisions are a distinctive feature of Ukraine. From a historical perspective, we can observe that one of the most noticeable east-west differences is outlined in the territories that belonged to Poland -Volyn and Rivne-, and the Hapsburg Empire -Lviv, Ternopil, Ivano-Frankivsk, Chernivtsi (formerly Bukovyna), and Zakarpattia. Before they were integrated into the Soviet Union in 1944, these territories had a rich tradition of self-governance, in contrast to the rest of Ukraine which was exposed first to Zarist and then to Soviet centralism (Snyder, 2002). Hence people in those regions might have been eager to return to local self-governance independent from financial incentives.

To address this issue, this work will test two complementary hypotheses: 1) wealthier communities are more propense to amalgamate, and 2) historical experiences with local self-governance drives the decision to amalgamate.

The first hypothesis will be tested by means of a logit model using data for the 2014-2017 period at the community level. The proxies for wealth are personal income tax and total revenues per capita. We are interested in evaluating if these variables are significant while controlling for other factors. The second hypothesis, will be tested with a subtle re-specification of the model used for hypothesis 1. In this case, the factor variable that controls for amalgamation by oblast in model one, will be grouped in order to observe if the regions that belonged to Poland, and to the Hapsburg Empire behave significantly different than the rest of the regions.

The remainder of this work is organized as follows: section two provides a state-of-the-art overview with relevant theoretical and empirical findings; section three explains the methodology to be applied; section four provides data description; section five presents the estimation results; and section six discusses the research findings.

Chapter 2

THEORETICAL AND EMPIRICAL OVERVIEW

2.1 Theoretical review

The importance and benefits of decentralization as a welfare enhancing policy have been extensively documented by researchers. The most meaningful discussions on the matter commenced in the second half of the 1950s. At this point, the debate concentrated on how to allocate public goods efficiently. Among relevant early work, it can be mentioned that Tiebout (1956) showed that local governments can both allocate public goods more Pareto-efficiently than central authorities, and address individual consumer-voter² preferences more accurately which allows communities to achieve higher levels of welfare.

Another major contribution was made by Musgrave (1959). This author characterizes three stages of the public household: the allocation, the distribution and the stabilization “branches”. The first deals with the allocation of resources to satisfy public wants³. The second branch deals with income redistribution, with tools like taxes and transfer payments to provide aid to households with insufficient resources. Finally, the third branch looks after aggregate demand in the search of full employment and price stability. These three stages are the key goals of the public sector. Musgrave emphasizes that the allocation branch is better addressed by subnational governments, as they are closer to citizens and have more information about their preferences. However, redistribution and stabilization should be handled by higher governmental tiers.

² Tiebout chooses to use this term when referring to households, as part of his logic is based on the median voter theorem.

³ According to Musgrave, individual preferences are characterized by social and private wants. The difference between them is that the private market is not always able to provide the desired amount and kind of certain goods. In many cases, this situation is compensated by government intervention.

In tune with these arguments, Oates (1972) stresses that decentralized local governments can account for heterogeneity of tastes and resources. Additionally, positive externalities between neighbor communities may arise from the control of taxes on a mobile basis, an effect that would be lost if revenues were controlled in a centralized fashion. Oates is one of the first leading authors on Public Finance and Decentralization. Perhaps one of his most important contributions is his Decentralization Theorem, which reads as follows:

" . . . in the absence of cost-savings from the centralized provision of a [local public] good and of interjurisdictional externalities, the level of welfare will always be at least as high (and typically higher) if Pareto-efficient levels of consumption are provided in each jurisdiction than if any single, uniform level of consumption is maintained across all jurisdictions." (Oates 1972, p. 54)

The theorem states that, from the point of view of economic efficiency, welfare levels will be higher if public goods are provided locally. Furthermore, Oates argues that the potential payoff from decentralization derived from the differences in local demand for public goods, is inversely proportional to the price elasticity of demand. Provided that there is evidence to support that local public good demand is vastly price inelastic, gains from decentralization can also expected to be high.

When reviewing relevant literature on the subject, there appears to be consensus about the effectiveness of decentralization to address public services provision more efficiently. Nevertheless, some researches argue that empowering subnational governments can yield higher levels of efficiency and welfare only if certain drawbacks are considered. For instance, Prud'homme (1995) considers that it is crucial for policy makers to have a real understanding of the real choices. This author does not reject decentralization in general, but suggests that choosing which functions to decentralize wisely is key. Complementarily to Musgrave, Prud'homme argues that there are two reasons why income redistribution should remain under a centralized

authorities' responsibility: a) to avoid unfairness, as the poor in richer regions may be in less need than the poor in worse-off regions, and b) to avoid situations in which rich and poor have incentives to move to communities with more convenient conditions, -less taxes and more benefits, respectively- destabilizing the community.

The last theoretical reference relevant to be mentioned at this point should provide a framework that allows understanding of the decision-making logic that drives communities to amalgamate. One possible approach originates from behavioral economics and it consists of the distinction between local and global public goods, and how individuals make choices depending on their perception of the environment. By means of a public good experimental game, Fellner and Lünser (2008) investigate how variations in diverging marginal returns per capita and social feedback information influence the decision to cooperate in a smaller -local- and a larger -global- group that contains the latter. It is necessary to stress that the distinctive element of a local group is that it offers information on social reaction about individual contributions. This creates a tension for individuals, as they need to decide whether to contribute at the local or the global level. Interestingly, these authors find that when both groups offer the same social return, individuals prefer to contribute at the local level, indicating a preference of human beings for public goods provided at a local level. This preference for being in a local public goods setting (of a new AH) rather than in a global one (depending on the central state administration), might drive the desire of communities to leave the umbrella of the "global public good" represented by the central state and its placeholder at local level, the rayon administration, to set up a new local self-government.

2.2 Relevant empirical findings

One interesting feature of amalgamation reforms is that it is a policy tool that can be observed in all continents, and for countries of the most varied structural backgrounds. An important aspect we can consider when studying the incentives for amalgamation is population size. Dollery, Byrnes, and Crase (2008), argue that population size is an accurate proxy for public good and services demand. For example, policy makers in Australia have historically aimed at the amalgamation of small communities into larger governmental bodies. Nevertheless, the authors stress that economies of scale in the provision of public goods and services that would arise from the existence of largely populated governmental tiers, cannot be sustained neither theoretically nor empirically.

For the purposes of this work, it is necessary to mention that financial incentives are usually found by researchers as key factors for amalgamation, regardless of the important structural differences that the case under analysis may present (Mabuchi 2001; Calciolari, Cristofoli, and Macciò 2013; Nakazawa and Miyashita 2014). Notably, Nakazawa and Miyashita (2014) argue that most studies on subnational governmental tier amalgamation concentrate on ex-post public expenditures, but pay insufficient attention to the ex-ante decision making process. By means of a time-discrete variant of the same model that is going to be used in this work, these authors find that financial incentives and amalgamation of neighbor communities are the two most important drivers for amalgamation.

2.3 Findings for Ukraine

2.3.1 Brief territorial characterization

Ukraine's territorial organization is complex and it has not changed considerably between independence in 1991 and 2014. When the reform was

introduced in 2014, the country had three subnational tiers: 24 *oblasts*, 490 *rayons* and over 11,000 local communities. The lowest governmental level was the rayon and the highly fragmented local communities depended financially on centralized governmental tiers (Swianiewicz et al. 2017). Transfers from central dependences are both unpredictable and non-transparent, leading to financially unsustainable paths for sub-national governments, and making the provision of essential goods and services difficult and inefficient. Furthermore, action towards better general living conditions at the sub-national level, can help mitigate the effects of an ageing population, tight public finances and large levels of emigration. Economic activity and population tend to concentrate in largely populated areas, and the most productive workers are the first ones to leave. Nevertheless, even though concentration in Kyiv city is the largest of the country, accounting for larger levels of growth than any other region in Ukraine, this level of concentration is relatively low, according to OECD standards (OECD, 2014). This means that the decentralization reform has the potential to generate subnational growth hubs, taking advantage of the largely disperse population pattern inherited from Soviet times. With limited internal and external investment inflows, deteriorating industrial capital stock and a shrinking labor force, it can be argued that sub-national growth depends on improving productivity.

2.3.2 Local self-governments from a historical perspective

Vovk (2018) documents the creation of local self-governments in the Ukrainian cities once part of the Hapsburg region of Galicia and Poland, starting from the second half of the XIX century. The current Ukrainian territory that belonged to the Austro-Hungarian empire includes Lviv, Ternopil, Ivano-Frankivsk, Chernivtsi (formerly Bukovyna), and Zakarpattia oblasts. Similarly, the current oblasts of Rivne and Volyn belonged to Poland. The cultural and historical heritage regarding local governance of this regions

is very different from the rest of the country, with a more centralized tradition from Zarist Russia and Soviet Union times (Snyder, 2002).

Following Vovk's argument, the creation of local self-governments can be understood as a response to the urbanization process that extended throughout the Austro-Hungarian Empire. Growing cities became an important part of social life and culture, as well as an important economic development hub. Moreover, the 1848 revolutions in Europe served as incentive for different social groups to come together and exploit the potential benefits of governmental decentralization for their communities. On the other hand, allowing local councils to decide on every-day problems was a response which aimed to restore confidence in the central government after defeat in the war with Prussia. The implementation of the local executive powers was a process that Vovk divided into stages that lasted until the end of the XIX century, and even affected "outsider" Polish cities in today's Volyn and Rivne Oblast. Considering this framework, we will distinguish between "western heritage" for the Ukrainian oblasts that belonged to the Austro-Hungarian Empire, and "Polish heritage" for the ones that belonged to Poland until their incorporation to the Soviet Union in 1944.

2.3.3 The 2014 reform

Even after the dissolution of the Soviet Union, local communities had almost no governmental rights before the 2014 reform. In order to better address bottom-up demands, the reform concentrated in empowering local communities with executive rights if they chose to amalgamate with neighbor communities. After the failure of a constitutional amendment prepared to set the framework for a decentralization reform, the law "On Voluntary Amalgamation of Territorial Communities" allowed local communities to opt to amalgamate and form a self-governmental executive unit (amalgamated hromadas). It is remarkable that these powerful reforms started on a year that

presented a sharp economic downturn and a stressful time for the national budget, as military expenditures increased due to conflict with Russia. Additionally, when considering how responsive communities were in their choice to cooperate by forming a new legal entity as an amalgamated hromada, it can be argued that the demand for local empowerment and bottom-up power relationships reshuffle is very high in Ukraine.

As mentioned in the introduction, by December 2019, 1,009 amalgamated hromadas were established. Before the reform, the lowest governmental tier was the 490 Ukrainian Rayons. By the end of 2019, 24 of these Rayons were completely covered by amalgamated hromadas -making the Rayon existence redundant, 166 Rayons were covered by AHs on more than 50% of its territory, 200 Rayons were affected in less than 50% of its territory, and only 75 Rayons do not have any amalgamated hromadas within their territory yet⁴.

After constituent elections, AHs are entitled to receive a share of 60% of personal income tax collection. Additionally, they receive a share of the State's budget directed to fund education, health, and social protection, which represents the largest share of the local government's revenues (Halhash et al. 2020).

Along with a higher level of trust in the new local government that discourages tax evasion (Myerson 2015), AHs might appear to be a virtuous vehicle to boost subnational growth. As a matter of fact, in figure 3 we can observe that local budgets at the lowest governmental tier level have been increasing steadily given this new fiscal set up.

⁴ The remaining 25 Rayons are in the occupied territories of the Luhansk and Donetsk Oblasts, as well as the Autonomous Republic of Crimea.

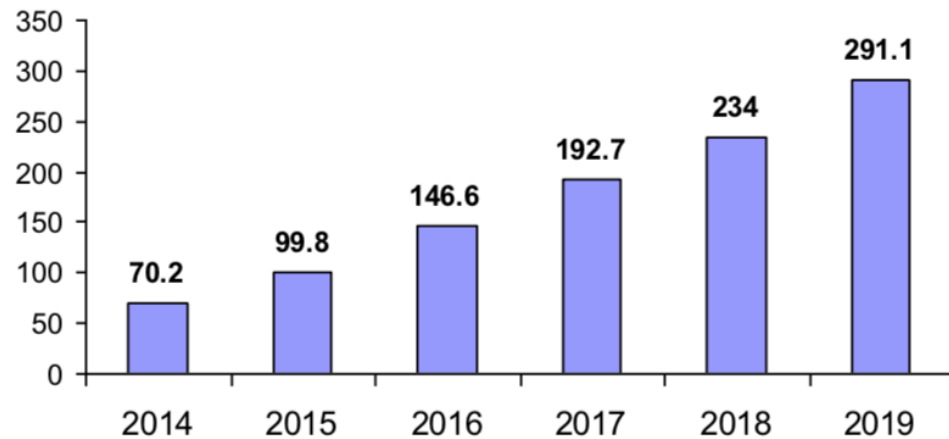


Figure 2. The evolution of local budgets 2014-2019 in billions of UAH.

Source: (Halhash et al. 2020)

According to the National Bank of Ukraine, the average y-o-y budget size increase is 33.26%, when the average level of inflation for the period 2014-2019 was roughly 18%⁵. Interestingly, Hamaniuk and Palchuk (2020) found that the optimal size for amalgamated hromadas is a tradeoff between the scale effect that allows for a more cost effective provision of social goods and services, and social trust, which seems to be easier to build in AHSs smaller than 5000 inhabitants rather than in AHs bigger than 5000 inhabitants as people can watch and control the activities of the local administration more closely in smaller AHs.

⁵ Available at: <https://bank.gov.ua/statistic/macro-indicators#1>

Chapter 3

METHODOLOGY

3.1 Model choice background

When it comes to analyzing the probability of amalgamation at individual subnational levels, there seems to exist consensus among researchers on how to address the problem methodologically. In a comprehensive study about the factors that explain inter-municipal cooperation in service delivery, Bel and Warner (2016) perform an exhaustive state-of-the-art overview to analyze what models and variables are used in scientific research. Out of the 49 papers reviewed for the time span 1988-2015, these authors find that 38 papers analyze cases for the United States, 8 for developed western European countries and 3 for Latin-American countries. More importantly, 38 of them use logistic regression to account for the probability of cooperation. In their paper, the authors underline that “Inter-municipal cooperation involves contracts or joint production with other local governments as a means to gain economies of scale, improve service quality, and promote regional service coordination across fragmented local government regions”. This definition is very consistent with what we expect to observe after Ukrainian communities amalgamate.

Another important issue that Bel and Warner address is the choice of variables for the 171 models analyzed in the 49 above mentioned studies. As for the dependent variable, the authors find that “typically, the measure is (1) a dummy variable with one for cooperative delivery and 0 otherwise in single service studies; and (2) a percentage of the services each jurisdiction provides via cooperative delivery for multiservice studies”. The dependent variable for this work is of the first type and will be explained in detail in the next section.

On the other hand, Bel and Warner find that the most common independent variables are: fiscal constraints⁶; community wealth⁷; scale economies⁸; special factors⁹; organizational factors¹⁰; racial homogeneity¹¹; service level transaction costs¹²; and political factors¹³. Following the usual methodology found in related scientific research, the hypotheses of this work will be tested using logistic regression.

3.2 Characterization of the logit model.

In general terms, a binary outcome model serves the purpose of allowing us to estimate the level of probability with which our independent variable y will present one property or not. The most common way in which this is represented is accounting for the probability that y will be equal to 1 if it presents the property under study and 0 otherwise. For example, in this study the independent variable will account for the probability that a community has amalgamated ($y = 1$) or not ($y = 0$). In general terms, the logit model can be expressed as follows:

$$L = \ln\left(\frac{p}{1-p}\right) = Z = x'\beta \quad (1)$$

⁶ Fiscal constraints are used in 70% of the reviewed models and reported as statistically significant in 57% of the cases.

⁷ Community wealth is used in 52% of the reviewed models and reported as statistically significant in 35% of the cases.

⁸ Scale economies are used in 70% of the reviewed models and reported as statistically significant in 50% of the cases. In the majority of cases, the proxy used for the existence of economies of scale is population. However, as discussed in chapter 2, some authors suggest that higher levels of populations are not necessarily related to scale economies.

⁹ Spatial factors are used in 35% of the reviewed models and reported as statistically significant in 62% of the cases.

¹⁰ Organizational factors refer to the level of independence of the community at the time of deciding on cooperation. This variable is used in 36% of the reviewed models and reported as statistically significant in 50% of the cases.

¹¹ Racial homogeneity is used in 34% of the reviewed models and reported as statistically significant in 54% of the cases.

¹² Service level transaction costs are used in 18% of the reviewed models and reported as statistically significant in 61% of the cases.

¹³ Political factors are used in 18% of the reviewed models, but the way in which this variable is constructed/specified is extremely wide and not possible to generalize.

In the previous equation, $\frac{p}{1-p}$ is the probability ratio in favor of $y = 1$. This ratio has a useful straightforward interpretation: if $p = 0.8$, then the probability that $y = 1$ -or the probability that y presents the property under study- is 4 to 1. Furthermore, L represents the logarithm of the probability ratio and it is linear in both betas and independent variables. Defined this way, L is called logit, where the model takes the name from. It is important to observe that, if L is positive, it means that the dependent variable is more likely to be equal to 1 as the value of the regressors increase. Inversely, if L is negative, y is less likely to be equal to one as the value of the independent variables increase.

3.3 Testing the hypotheses

In order to test if wealth is a good predictor for the probability that a community will amalgamate, as well as if there are other factors that would seem to be driving the process, the following logit models will be estimated¹⁴:

$$L_i = \ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 \text{loginctaxpc} + \beta_2 \text{logtotexpc} + \beta_3 \text{totrentlandtaxpc} + \beta_4 \text{logpopdens} + \beta_5 \text{i.regionalheritage} + \beta_6 \text{i.logtotrevspsc}_5 + u_i \quad (2)$$

$$L_i = \ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 \text{loginctaxpc} + \beta_2 \text{logtotexpc} + \beta_3 \text{totrentlandtaxpc} + \beta_4 \text{logpopdens} + \beta_5 \text{i.incomequintile} + \beta_6 \text{i.oblast} + u_i \quad (3)$$

¹⁴ The decision on whether or not to transform certain variables was taken from observing that all continuous variables have rather skewed distributions and confirmed by using the commands `ladder`, `gladder` and `qladder` in Stata. Help on this command can be found at: <https://www.stata.com/manuals13/rladder.pdf>

The regressed variable in this model is called AH and it is equal to 1 if the observation refers to a community that has amalgamated by 2017 and 0 otherwise. The regressors are defined as follows:

- ❖ *loginctaxpc* - the natural logarithm of personal income tax¹⁵ per capita;
- ❖ *totrentlandtaxpc* - rental and land taxes per capita;¹⁶
- ❖ *logtotexpc* - the natural logarithm of total expenditures per capita¹⁷;
- ❖ *logpopdens* - the log of the ratio of population and area in squared kilometers;
- ❖ *regionalheritage* - a categorical variable -transformed into several dummies- equal to 3 if the observed community belongs to Rivne or Volyn oblasts (“Polish heritage”), 2 if the observed community belongs to Ivano-Frankivsk, Lviv, Ternopil or Chernivtsi, and 1 otherwise;
- ❖ *i.income* - a categorical variable -transformed into several dummies- accounting for the income quintile the observed community belongs to¹⁸;
- ❖ *i.oblast* - a categorical variable -transformed into several dummies- accounting for the oblast that the observed community belongs to.

The expected signs on the predictors for both income tax and total revenues -represented by income quintiles- variables is expected to be positive, indicating that wealth is one of the main amalgamation drivers. This would allow us not to reject the hypothesis that wealthier communities are more prone to amalgamate. The choice of personal income tax as the most important proxy for wealth comes from observing that for a community where a lot of this tax is generated, would see all these revenues disappearing

¹⁵ Unless specified otherwise, in this work, income tax refers to personal income tax.

¹⁶ Both at the individual and corporate levels.

¹⁷ Expenditures oriented to local public services.

¹⁸ Income quintiles were created using total revenues as wealth parameter. The first quintile is the lowest income one and the fifth quintile the highest income one. The revenues included in this variable are taxes received at the community level before the reform was implemented and other revenues, such as fines and fees.

in the Budget of the next higher government level, the Rayon, with limited possibilities to influence on how to distribute this revenue. For any such community, it must be therefore a very attractive option to amalgamate with two, three villages nearby, even if those are relatively poor. This is because, after amalgamation, 60% of local income tax would remain in the budget of the new AH, where the council and head of hromada can decide themselves how to use these revenues.

The expected sign on the variable that accounts for local expenditures, is uncertain. On the one hand, we can expect that the effect on amalgamation would be negative, as these funds are distributed by central authorities. Therefore, higher levels of these expenditures would indicate that a community is well positioned with respect to central authorities and, thus, presents no urgency for financial independence. On the other hand, these expenditures could be evidence of a good local administration, disposing of the managerial skills to manage future revenues and the community would benefit from collecting its own revenues.

As for the variable representing rental and land taxes, allegedly often evaded by agricultural business by informal side payments to district administrations (Herrmann, personal information), if significant, the correspondent predictor will allow us to determine if the economic pattern of specialization at the community level has an effect on amalgamation. It would not be surprising if this predictor is insignificant, as it would mean that whether the economy of the community is more agricultural or industrial oriented, the decision to amalgamate relies on other factors.

It will be informative to see the sign on the variable that accounts for population density, as this will allow to understand if the level of population and the size of the community have an effect on amalgamation or not. Regarding the factor variables accounting for the historical experience with

self-governance, we expect to find a statistically significant and positive difference between the oblasts with such a heritage and the rest of the country.

All the above-mentioned variables correspond to the year 2014, except the regressed one, which accounts for amalgamation in the year 2017. Hence, the idea of this work is to illustrate how the decision-making process at the community level in 2014 seemed to be affecting amalgamation by 2017. In the specified models, income tax per capita and total revenues per capita are the proxies for wealth and the interest is focused on whether or not these variables are statistically significant and positive, as well as how the other controls seem to affect the probability of amalgamation, especially the ones that consider the regional historic heritage.

In table 1, the matrix of correlation for the continuous variables used in both models is presented. In particular, it is necessary to test for the relationship between the income tax and total revenues variables per capita, as they capture similar effects. This is, both are understood as proxies for wealth. As can be observed in table 1, the level of correlation between these two variables is a non-critical 38%, and there's almost no correlation between the rest of the variables. Therefore, no multicollinearity issues arise from combining these variables in a model.

Table 1. Matrix of correlations (In per capita terms)

Variable*	Income Tax	Total revenues	Pop. density	Tot. expenditures	Land/rental tax
Pers. Income tax	1.00				
Tot. revenues	0.38	1.00			
Pop. density	-0.01	-0.02	1.00		
Tot. expenditures	0.00	0.00	0.02	1.00	
Land/rental tax	0.00	0.04	-0.07	0.00	1.00

Another potential econometric issue that we could face, is the omitted variable bias. In reality, we do not know what are the true drivers that explain the creation of AHs. Therefore, our chosen regressors are a combination of what we have available in the data at the community level, what we can observe in practice, and economic theory. Hence, our models are subject to potentially be missing one or more important explanatory factors. In order to deal with this issue, the `linktest` Stata command will be used to test for correct model specification. The idea behind this test is that, given a correctly specified model, additional statistically significant predictors should be found only by chance. Consequently, this test is performed by rerunning the model with the linear predicted value and the same variable squared as predictors. The former should be statistically significant, unless our model is severely misspecified, and the latter should not be insignificant. Otherwise, it would mean that we have omitted one or more relevant variable(s), or that the link function of our model is not correctly specified.

Chapter 4

DATA DESCRIPTION

4.1 The dataset

The dataset was constructed from data collected and published by the Ministry of finance of Ukraine¹⁹ for the period 2014-2017 at the community level. The amount of observations is 8,511, but it is important to stress that communities that have amalgamated by the time when the data were collected in 2017, are reported as grouped, even for previous periods. Therefore, all variables have been normalized in per capita terms, in order to keep the study of all independent variables at the community -pre-amalgamation- level. This way, before cleaning the data, we are considering nearly 11,000 communities, almost the total number in the country.

At this point, it is necessary to highlight the context of the analysis. As mentioned in the previous chapter, we are considering the situation that communities were facing in 2014, when the possibility to amalgamate became an option, and study the amalgamation outcomes that could be observed by 2017. Essentially, we are evaluating the creation process of the first two cohorts of AHs: 159 AHs in 2015 and 207 in 2016, 366 in total²⁰. In the introduction, it was mentioned that we intend to understand the logic of those 366 “first movers”, referring to the first communities that decided to amalgamate. Therefore, some considerations about this group must be stressed. Firstly, they did not know exactly what they were moving into. This is, nobody could know with certainty what the new AHs would look like.

¹⁹ Except for the land and rental taxes variables, obtained from the World Bank BOOST-portal, available at: <http://boost.worldbank.org/boost-initiative>

²⁰ During 2015, the first cohort of AHs was created through constituent first elections, and they would start receiving their 60% personal income tax share from January 1 2016. The second cohort, underwent constituent elections in 2016 and would start administrating their own budget from the first day of 2017.

Issues like managing new administrative tasks or making budgetary decisions would have to be learned on spot. Secondly, this is not the first decentralization attempt in Ukraine. As a result, there was no certainty that this new attempt would last in time. Finally, in 2015 and 2016 the huge support by international donors was not yet in place. This only started to occur during the course of 2016, and mobilized a huge amount of funds to support the reform, investing heavily into capacity building programs, like DOBRE²¹, or ULEAD²². Those support programs of international partners got implemented effectively from 2017. Consequently, these pioneering communities needed real and strong motivations for choosing the amalgamation path. Given this set-up, it can be argued that we are observing the amalgamation process at its most fundamental essence.

One of the main drawbacks of the dataset is that the income tax variable is only reported for the first eleven months of 2014. This is a piece of data that is not consistently reported and is the main proxy for wealth considered in this work. Nevertheless, the total revenues variable is also taken into account and can be understood as another approximation for wealth at the community level. Because of this, almost all the information that will be used from the dataset is for 2014. The main concern that arises in this regard, is that this year may not be the best possible choice to get a sense of the Ukrainian situation, especially in terms of income. In 2014, the country experienced a deep recession, with a sharp output decrease of -6.6%²³ due to the Euromaidan revolution. Nevertheless, it can be argued that this is the year

²¹ The Decentralization Offering Better Results and Efficiency (DOBRE) Program is USAID financed and works helping seven target oblasts - Dnipropetrovsk, Ivano-Frankivsk, Kharkiv, Kherson, Kirovograd, Mykolayiv, and Ternopil- in managing their new executive responsibilities.

²² The Ukraine Local Empowerment, Accountability and Development Programme (ULEAD) is a multi-donor initiative of the European Union and its Member States Denmark, Estonia, Germany, Poland and Sweden. With roughly 102M Euros, it is one of the biggest cooperation programmes worldwide, and it helps both in assessing the central government on the reform, as well as the AHs in their executive responsibilities.

²³ According to the World Bank, checked on April 1st 2020 at <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=UA>

when the most important laws on the decentralization reforms relevant to this work were approved, and they can be understood as one of the consequences of the experienced social turmoil. Therefore, to some extent, 2014 represents the situation in which local elites started to think about whether or not to amalgamate. As previously stated, the main idea behind the construction of this dataset is to study how communities responded to the reform given their initial situation in 2014.

When analyzing the dataset, many indications of potential systematic measurement error and inaccuracies were found. The most relevant one is that many zero values for the income tax, total revenues and total land and rental taxes variables were recorded, and these were not independently distributed across rayons. It has not been possible to confirm whether this represents the true situation at the time of collection or if it was a problem when collecting or publishing the sample. Therefore, observations for communities with zero values recorded for any of these variables were dropped. The remaining sample has 6,345 observations, accounting for approximately 7,400 communities²⁴.

4.2 Presentation of the main variables

In this section, the main characteristics of the data are presented. In table 2, the distribution of the dependent variable is presented. This is a binary outcome variable equal to 1 if the community has amalgamated by 2017 and equal to 0 otherwise. We can observe that there are 262 AHs in the sample²⁵. Apart from some dropped observations due to presumed missing values, the

²⁴ It is not possible to determine exactly, as the 262 AHs are different combinations of individual communities. This estimate is given by the fact that, before cleaning, the data included 313 AHs in total formed by 5 communities on average. Then we add 262 times 4 to the 6,350 remaining observations.

²⁵ According to the official monthly decentralization report, by December 2017 there were 692 amalgamated hromadas formed. Checked on April 15th 2020 at: https://decentralization.gov.ua/mainmonitoring#main_info

difference with the real officially reported number of established AHs by 2017 might be because they may have not yet received executive attributions yet.

Table 2. Amalgamated Hromadas (AH)

AHs	Freq.	Percent	Cum.
0	6,083	95.87	95.87
1	265	4.13	100.00

In table 3, we can observe the distribution of established AHs by oblast. For this sample, the oblast with the most AHs are Dnipropetrovsk, Khmelnytskyi and Ternopil. On the other hand, the oblasts of Donetsk, Kharkiv, Kyiv, Luhansk and Zakarpattia are the ones with the smaller number of AHs. It is remarkable that two of the richest oblasts in the country -Kyiv and Kharkiv- are among the ones with less AHs. It will be interesting for future research to investigate if this tendency remains. Additionally, it will be important to study the sign and significance of the variable that accounts for land and rental taxes, in order to see if it supports these findings. On this table, we can also see a first hint towards analyzing whether the seven oblasts previously characterized with a different historical background -Chernivtsi, Ivano-Frankivsk, Lviv, Rivne, Ternopil, Volyn and Zakarpattia- seem to perform differently than the rest. Considering that for our clean dataset the average number of AHs by oblast is nearly 11, we can observe that 5 of the previously mentioned oblasts present an above average number of AHs.

Table 3. Distribution of AHs by oblast

Oblast	Observed communities	AHs by 2017
Cherkasy	444	6
Chernihiv	167	10
Chernivtsi	208	14
Dnipropetrovsk	193	23
Donetsk	162	3
Ivano-Frankivsk	401	10
Kharkiv	339	3
Kherson	182	6
Khmelnyskyi	289	22
Kirovohrad	341	5
Kyiv	506	1
Luhansk	15	0
Lviv	296	17
Mykolaiv	202	15
Odessa	349	8
Poltava	357	15
Rivne	256	15
Sumy	187	6
Ternopil	79	20
Vinnytsia	605	19
Volyn	270	12
Zakarpattia	244	3
Zaporizhia	191	14
Zhytomyr	62	15
Total	6345	262

Up next, the main continuous variables will be discussed. The main descriptive statistics for these variables are presented in table 4. All financial variables are presented per capita and in thousands of UAH. Income tax and total revenues present minimum values that have been rounded to zero, as they are a marginal value -less than 10 UAH per capita per year. At this point, it is important to observe that the differences between regions can be

humongous. From communities that report almost insignificant levels of income tax per capita, we also have that the maximum observed value is 398 million UAH per capita. One possible explanation is the nature of the tax: contrary to the way that it is legislated in many other countries, income tax in Ukraine is paid to the jurisdiction where the business is inscribed.

The total land and rental tax variable include both the individual and corporate level. In this work, it will be argued that the higher the revenue from these taxes is, the more agriculture-oriented the economy of the community is. Even though the industrial and service sector businesses also pay for this taxes, Ukraine's economy specializes in the export of commodities and agriculture requires land in a much more extensive fashion.

Table 4. Descriptive statistics for the main regressors

Variable*	Obs.	Mean	p50	Std. Dev.	Min	Max
Pers. Income tax	6,344	421.76	.17	7,832.32	0	398,367
Tot. revenues	6,344	279.67	.06	1,954.92	0	90,495
Tot. expenditures	6,344	.17	.023	2.91	0	6,218.27
Land/rental tax	6,344	291.92	185.96	368.04	.98	6,218.27
Population density	6,344	98.91	24.83	485.12	1	1,362.6

*all financial variables are expressed in thousands of UAH per capita per year.

Regional disparities are also manifested in Figure 3, as it was necessary to represent these variables in log form in order for the distribution to be observable.

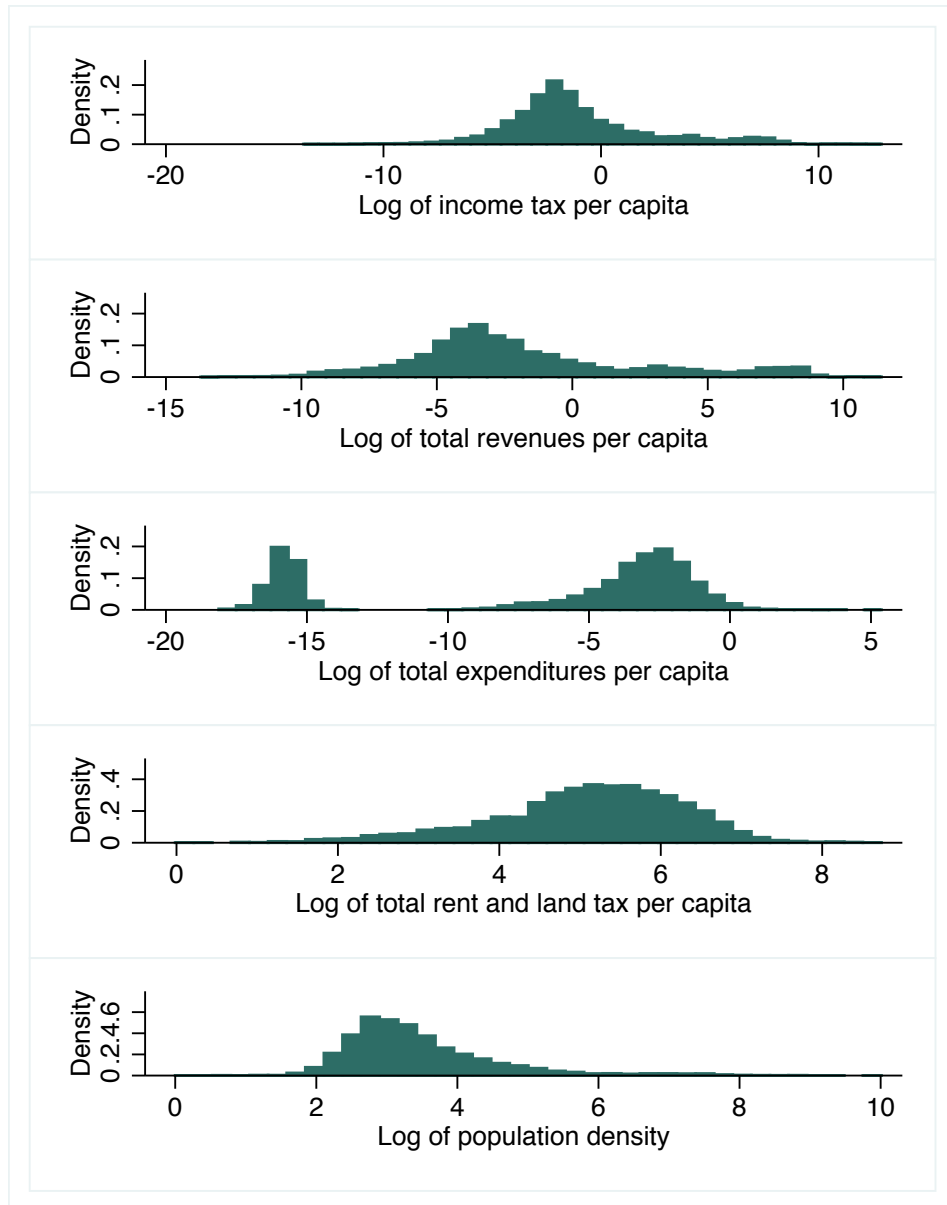


Figure 3. Income tax, total revenues, total expenditures, total land/rental tax per capita and population density (in logs).

ESTIMATION RESULTS

5.1 Output results

In this subsection, the regression results will be discussed. In table 6, the regression coefficients and standard errors are presented for four different models. Apart from the two models mentioned on Chapter 3, we add a partial regression of the AH variable on income tax per capita -model A- and on all financial variables -model B- to show how their significance varies as we add more regressors to the model. The main interested must be focused in models 1 and 2. Since this table is very long, it has been included in the appendix.

The interpretation of the logit model coefficients is not straightforward, and even more so when some variables have been transformed. Firstly, we need to notice that the income tax variable is significant across all model specifications. Even though these coefficients can't be directly interpreted in magnitude, it is possible not to reject that the higher the personal income tax per capita is in Ukrainian communities, the more likely to amalgamate they are. In model 1, we consider regional historical factors to study if communities from oblasts once part of the Austro-Hungarian Empire and Poland appear to perform differently than the rest. As previously explained, the regional heritage variable is a factor variable that divides communities by oblast in three different groups, depending if the community belongs to the Ivano-Frankivsk, Lviv, Ternopil, Zakarpattia or Chernivtsi Oblasts, to the Volyn or Rivne oblasts, or any of the rest. With the rest of the country as a guideline, the other two groups are statistically significant. The former Austro-Hungarian group is significant at the 1% level and the former Polish group is significant at the 5% level. With these preliminary results, we have found no evidence against any of our two hypotheses.

Additionally, it can be observed that population density appears not to have an effect on amalgamation. This can lead to interpret that population as a measure of economies of scale may not be a pressing factor when making the decision to amalgamate. On the other hand, both the expenditures and land tax related variables appear to have a positive effect on amalgamation. None of these results were intuitive. The first one means that the more development related expenditures there are in a community, the more propensity for amalgamation there is. Since these expenditures depend on discretionary funding from central authorities, the expected sign was negative. As for the land and rental tax variable, it is also interesting that communities more specialized in agriculture would seem to be more propense to amalgamate. However, one should recall that the observation of a community collecting substantial amounts land rental tax might not only be an indication of a lot of agricultural business in place, but also of a relative high level of tax compliance. Reportedly the payment of land rental tax has been often evaded by all kind of agricultural business replaced by an informal side-payment to district administration. Insofar the land rental tax related variable might be also be an indicator for a high local commitment to act according to the rules.

Another piece of evidence that allows us not to reject that wealth is an important factor when considering amalgamation are the results obtained for the income quintiles. As we can observe in table 6, in both models, the results suggest that, with the poorest income quintile as reference, the following quintiles present an increasing effect on amalgamation. The exception for this observation is the second quintile, which is not statistically significant.

5.2 Marginal effects

Another way to present the logistic regression coefficients would be to exponentiate the obtained betas, obtaining the odds ratio as a result. Nevertheless, this would not make interpretation substantially clearer, as we

have some transformed variables. Therefore, in order to evaluate the magnitude of the obtained effects, the marginal effects are presented in table 5. To avoid confusion, a selection from the complete marginal effects output is presented in this table. The complete results are shown in table 7, included in Appendix B.

Table 5. Selection of main average marginal effects.

VARIABLES	Marginal effects Model 1	Marginal effects Model 2
Financial variables		
Log Income tax (pc)	0.00267*** (0.000701)	0.00238*** (0.000679)
Log Tot. Expen (pc)	0.00699*** (0.000848)	0.00689*** (0.000799)
Rent-Land Tax	1.83e-05*** (4.53e-06)	2.40e-05*** (4.40e-06)
Population density		
Log Population density	-0.00236 (0.00256)	-0.00122 (0.00241)
Regional heritage		
Western Heritage	0.0278*** (0.00841)	
Polish Heritage	0.0199* (0.0103)	

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Base for (1): All oblasts, except those defined with “western” or Polish heritage

As discussed in chapter 4, the means of the continuous variables used as regressors in these models are not at all representative of the median community. Therefore, the average marginal effects are presented instead of the marginal effects at the mean of each variable. With respect to the log of income tax per capita, we can say that a 10% increase in this revenue increases

the probability of amalgamation is approximately 0.03%. At a first glance, it would seem like a very small effect. Nevertheless, if we consider that the median value for this variable (before log transformation) is roughly 174 UAH per capita, but the mean is 421,758 (potentially, due to particular cases of very small and rich communities), huge variations in income tax per capita can be observed.

The other particular cases that are necessary to be discussed are the marginal effects for regional historical heritage. In our first model, we can observe that that, on the one hand, Ivano-Frankivsk, Lviv, Ternopil, Zakarpattia and Chernivtsi Oblasts, and, on the other hand, Volyn or Rivne oblasts, are respectively 2.78% and 1.99% more propense to amalgamate than the rest of the country. Therefore, the obtained results suggest that historical factors may have a positive impact on the decision to amalgamate.

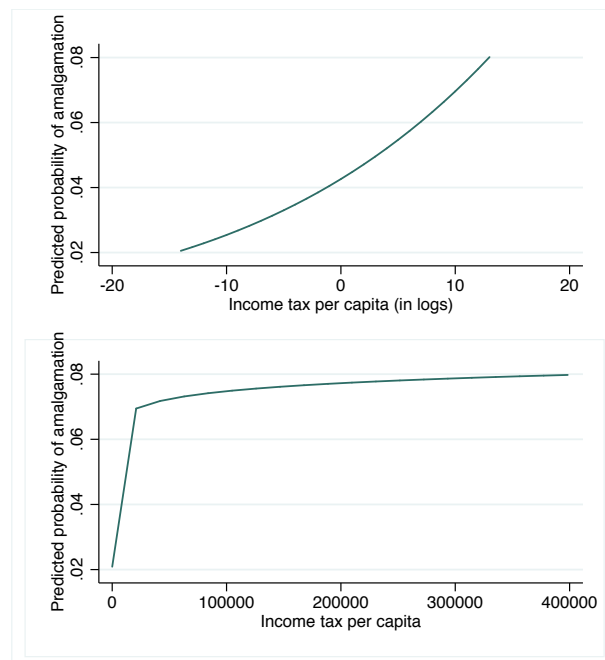


Figure 4. Predicted probability of amalgamation by level of Income tax per capita

5.3 Post estimation tests

To test for goodness of fit, we look at the McFadden pseudo- R^2 and use the `estat classification` Stata command to check both our models for accuracy of prediction. The pseudo- R^2 for model 1 is .1292, and for model 2 is .2218. Model 2 appears to explain better the variability in our independent variable, but both measures are satisfactory. As for the second indicator, we can observe that in the first model, 95.85% of the cases are correctly classified and, in the second model, 96% of the cases are correctly classified. Therefore, both our models appear to have satisfactorily fit out data.

On the other hand, in order to test our variable choice, the `linktest` Stata command is used. This test is meant to indicate if there are reasons to think that any of our models are not correctly specified. For both models, we obtain an insignificant test, meaning that when the model is rebuilt with predicted values and squared predicted values, the former result statistically significant and the latter results statistically insignificant. From here, we can conclude that there is no evidence to think that we have not considered meaningful predictors, and additional ones could only be found by chance.

Chapter 6

CONCLUSION

In this work, the decentralization reform implemented in Ukraine in 2014 has been analyzed. This policy entitles local communities with the possibility to choose to amalgamate into a new type of municipality and new lowest governmental tier called Amalgamated Hromada. In particular, the attention was fixed on studying what seemed to be the incentives that drove local communities to amalgamate. To analyze this phenomenon, we have tested the following two hypotheses: 1) wealthier communities are more propense to amalgamate, and 2) historical experiences with local self-governance drives the decision to amalgamate.

Both hypotheses were tested by estimating two logistic regressions. The first one, accounted for several financial variables of interest, including our main proxy for wealth, personal income tax per capita, as well as a factor variable controlling for the Ukrainian regions that once formed part of the Austro-Hungarian Empire or Poland.

The amalgamation decision that communities faced in 2014 was unique and complex, as this is not the first decentralization attempt in Ukraine, there was no other players to copy or follow, there was no guarantee that the reform would last in time, handling new administrative tasks and budgetary decisions would be complex, and there were little certainties about how would an AH actually be. The dataset used for this analysis was constructed from data collected and published by the Ministry of finance of Ukraine for the period 2014-2017 at the community level. All variables of choice were for the year 2014, except our regressed variable, a dummy accounting for amalgamation equal to 1 if the observed community amalgamated by 2017 and zero otherwise. This way, we analyzed the situation faced by the communities in

2014 when they could start deciding to amalgamate and studied the singularities of this process by 2017. It needs to be highlighted that we concentrated in analyzing the communities that were “first movers” in this process.

Our results allowed us not to reject any of our hypotheses. In both models, the income tax variable seemed resulted statistically significant. Furthermore, in our regression we have included a factor variable accounting for income quintiles formed by the level of total revenues at the community level. With the poorest quintile as base, we could observe that all the others were increasingly statistically significant, except for the second poorest one. With these results, it seems to be possible to state that wealth is a strong incentive for amalgamation.

Finally, we have also found that historical factors appear to have an effect on the decision to amalgamate. In our first model, we have found that, on the one hand, Ivano-Frankivsk, Lviv, Ternopil, Zakarpattia and Chernivtsi Oblasts, and, on the other hand, Volyn or Rivne oblasts, are respectively 2.78% and 1.99% more propense to amalgamate than the rest of the country. It seems that the experience with local self-governance, even if almost two generations earlier, triggered an appetite for local self-government in the Western part of Ukraine that would go beyond the consideration of a financial benefit from amalgamation. This historic experience might also be complemented by the closeness to Europe, leading to frequent traveling of Ukrainians from those regions to EU Member States where they could watch the realities of functioning systems of local self-governance.

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APPENDIX A

ESTIMATION OUTPUT

Table 6. Complete estimation output for models A, B, 1 and 2

VARIABLES	Model A	Model B	Model 1	Model 2
Financial variables				
Log Income tax (pc)	0.0792*** (0.0171)	0.0685*** (0.0185)	0.0717*** (0.0186)	0.0690*** (0.0196)
Log Tot. Expen (pc)		0.192*** (0.0204)	0.188*** (0.0211)	0.200*** (0.0219)
Rent-Land Tax		0.000377*** (0.000111)	0.000491*** (0.000121)	0.000698*** (0.000127)
Log total revs (pc)		0.119*** (0.0145)		
Population density				
Log of Pop. density			-0.0634 (0.0686)	-0.0353 (0.0700)
Regional heritage (1)				
Western Heritage			0.656*** (0.173)	
Polish Heritage			0.502** (0.224)	
Income groups by local revenues (2)				
Quintile 2			0.431 (0.291)	0.472 (0.301)
Quintile 3			0.753*** (0.272)	0.788*** (0.288)
Quintile 4			0.956*** (0.261)	1.132*** (0.271)
Quintile 5			1.707*** (0.248)	1.628*** (0.257)
Oblast (3)				
Cherkasy				-0.912* (0.533)

Table 6. (continued) Complete estimation output for models A, B, 1 and 2

VARIABLES	Model A	Model B	Model 1	Model 2
Chernihiv				1.052** (0.495)
Chernivtsi				1.175*** (0.432)
Dnipropetrovsk				1.401*** (0.413)
Donetsk				-0.316 (0.679)
Kharkiv				-1.171 (0.712)
Kherson				-0.0433 (0.544)
Khmelnyskyi				0.965** (0.405)
Kirovohrad				-1.201** (0.591)
Kyiv				-3.086*** (1.091)
Lviv				0.906** (0.415)
Mykolaiv				1.288*** (0.441)
Odessa				-0.439 (0.506)
Poltava				-0.00393 (0.438)
Rivne				0.980** (0.429)
Sumy				-0.480 (0.547)
Ternopil				2.997*** (0.446)
Vinnitsia				0.272 (0.408)
Volyn				0.457 (0.448)
Zakarpattia				-0.593 (0.668)
Zaporizhia				0.855* (0.453)
Observations	6,344	6,344	6,344	6,329
Pseudo R ²	.0092	.1176	.1292	.2218

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

Base for (1): All oblasts, except those defined with “western” or Polish heritage

Base for (2): First quintile of income (the poorest one)

Base for (3): Ivano-Frankivsk Oblast.

APPENDIX B

MARGINAL EFFECTS

Table 7. Complete average marginal effects for models 1 and 2

VARIABLES	Marginal effects Model 1	Marginal effects Model 2
Financial variables		
Log Income tax (pc)	0.00267*** (0.000701)	0.00238*** (0.000679)
Log Tot. Expen (pc)	0.00699*** (0.000848)	0.00689*** (0.000799)
Rent-Land Tax	1.83e-05*** (4.53e-06)	2.40e-05*** (4.40e-06)
Population density		
logpopdens	-0.00236 (0.00256)	-0.00122 (0.00241)
Regional heritage (1)		
Western Heritage	0.0278*** (0.00841)	
Polish Heritage	0.0199* (0.0103)	
Income groups by total revenues (2)		
Quintile 2	0.00876 (0.00591)	0.00942 (0.00597)
Quintile 3	0.0180*** (0.00634)	0.0181*** (0.00647)
Quintile 4	0.0253*** (0.00651)	0.0305*** (0.00691)
Quintile 5	0.0661*** (0.00858)	0.0549*** (0.00773)
Oblast (3)		
		-0.0174* (0.0106)
Cherkasy		0.0461* (0.0249)
Chernihiv		0.0543**
Chernivtsi		(0.0219) -0.0174*

Table 7. (continued). Complete average marginal effects for models 1 and 2

	Marginal effects Model 1	Marginal effects Model 2
Dnipropetrovsk		0.0713*** (0.0220)
Donetsk		-0.00768 (0.0155)
Kharkiv		-0.0203* (0.0111)
Kherson		-0.00118 (0.0148)
Khmelnyskyi		0.0407** (0.0168)
Kirovohrad		-0.0206** (0.0104)
Kyiv		-0.0289*** (0.00937)
Lviv		0.0373** (0.0173)
Mykolaiv		0.0625*** (0.0235)
Odessa		-0.0101 (0.0117)
Poltava		-0.000109 (0.0121)
Rivne		0.0416** (0.0191)
Sumy		-0.0109 (0.0122)
Ternopil		0.270*** (0.0502)
Vinnysia		0.00849 (0.0124)
Volyn		0.0155 (0.0154)
Zakarpattia		-0.0129 (0.0132)
Zaporizhia		0.0344* (0.0192)
Constant	-3.092*** (0.0633)	-2.239*** (0.105)

Standard errors in parentheses

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

Base for (1): All oblasts, except those defined with “western” or Polish heritage

Base for (2): First quintile of income (the poorest one)

Base for (3): Ivano-Frankivsk Oblast.