Benchmarking the efforts of local governments in Ukraine to respond to the wartime challenges

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Motivation 1

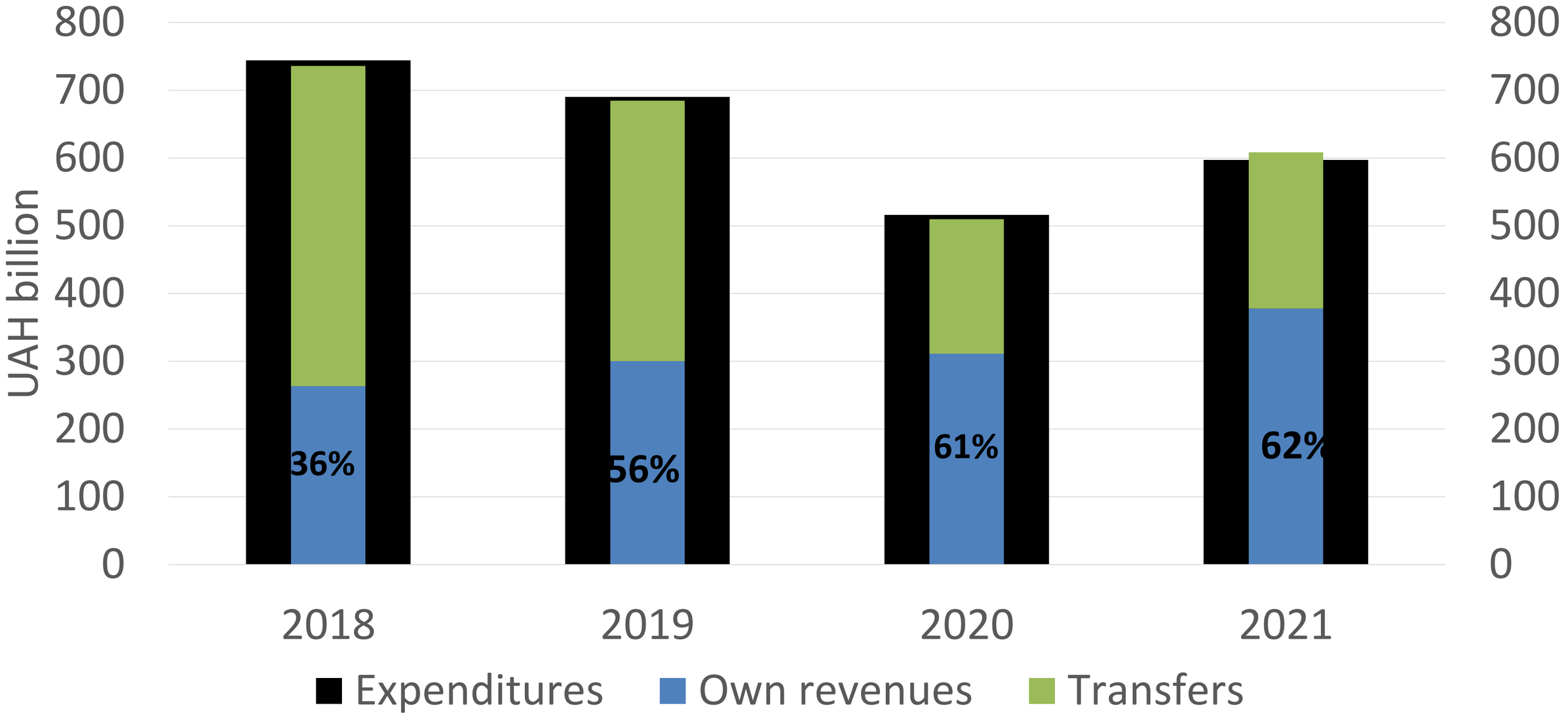
- Decentralization and territorial amalgamation reform in Ukraine since 2014
  - **Over 10,000 small local councils** were consolidated **into 1,469** amalgamated territorial communities (*hromadas*) by 2020, each endowed with fiscal and administrative autonomy, land ownership, and service delivery mandates
- Under exceptional stress of political upheaval and threat from russia:
  - Crimea annexation and Donbass invasion in 2014 that culminated in a full-scale military invasion in 2022
- Empirical evidence on the reform begins to accumulate
- Country resilience
- A big hope for local governments in a post-war rebuilding and development of Ukraine
  - decentralize foreign assistance so that at least one-third of this assistance should be channels via local authorities (Meyerson 2023)

Motivation 2

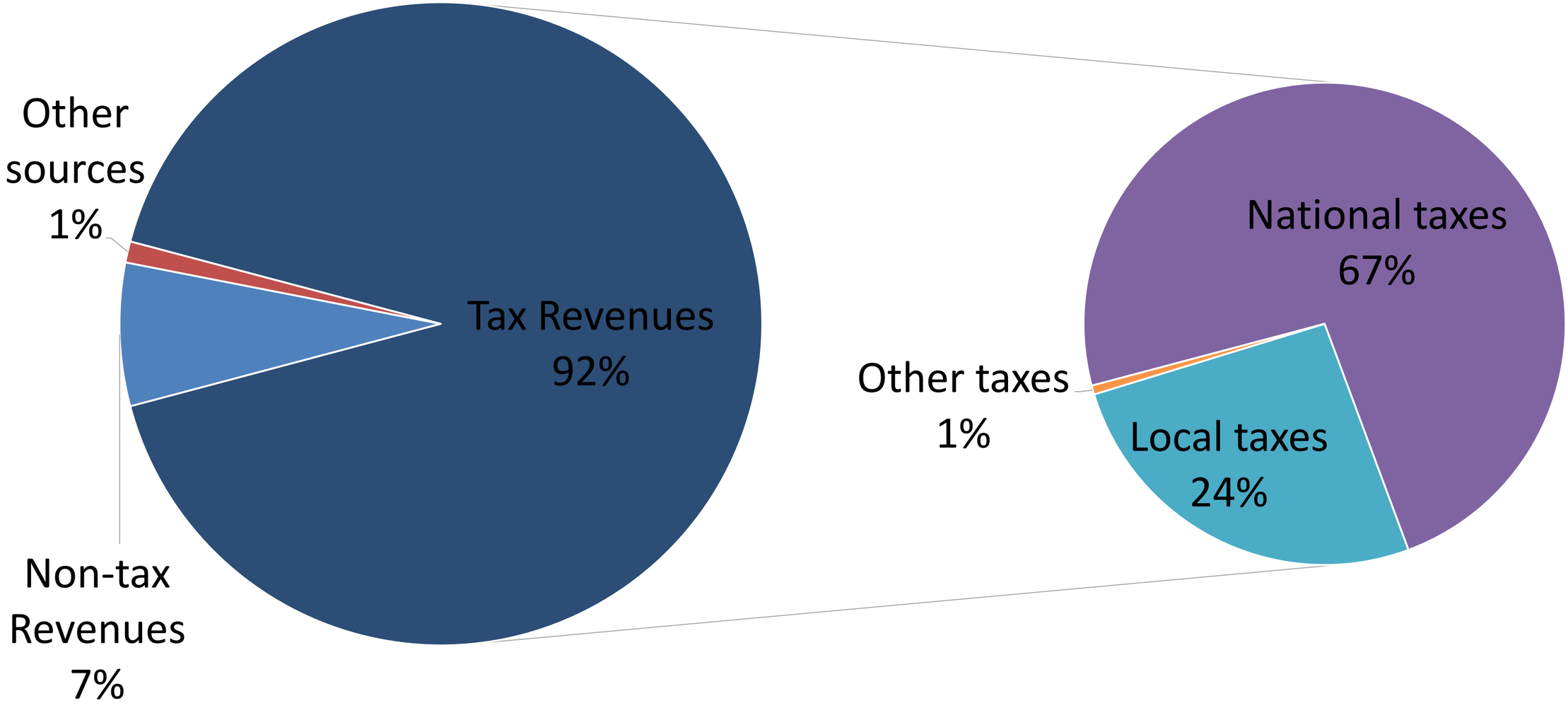
- Local government performance and development disparities across and within *hromadas, s*uccess benchmarks
- Reconstruction and recovery: how to prevent abuse of assistance funds at local level?
  - monitoring and evaluation infrastructure that would trace the funds and effectiveness of their use (Meyerson, 2023)
- Existing benchmarking and performance frameworks for Ukraine's *hromadas*
  - either by government or expert groups
  - based on simple aggregation of indicators without a theoretical foundation
  - yield inconsistent results (Kazuik, 2023a, 2023b).

- !!! Need for a robust, evidence-based framework for measuring local government performance

Ukraine’s local budgets in a nutshell

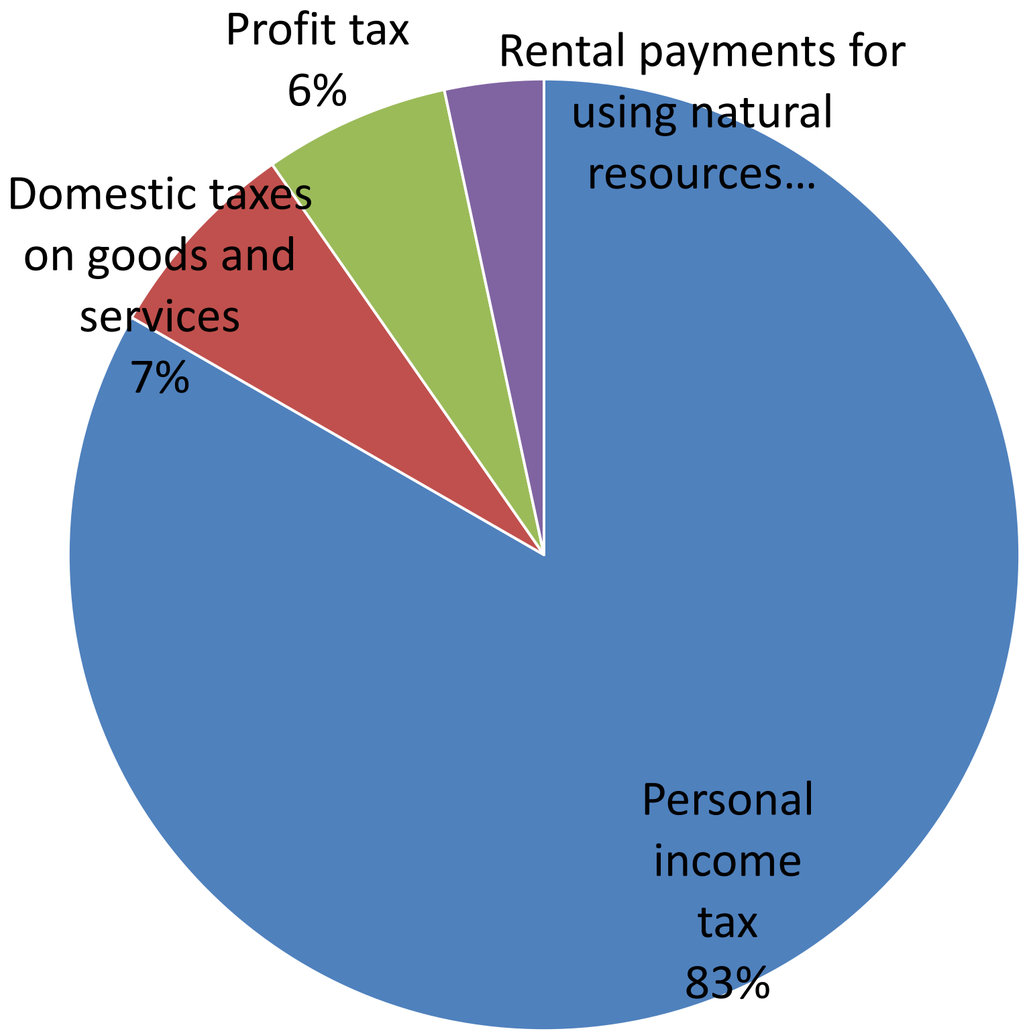


Own Local Budgets Revenues

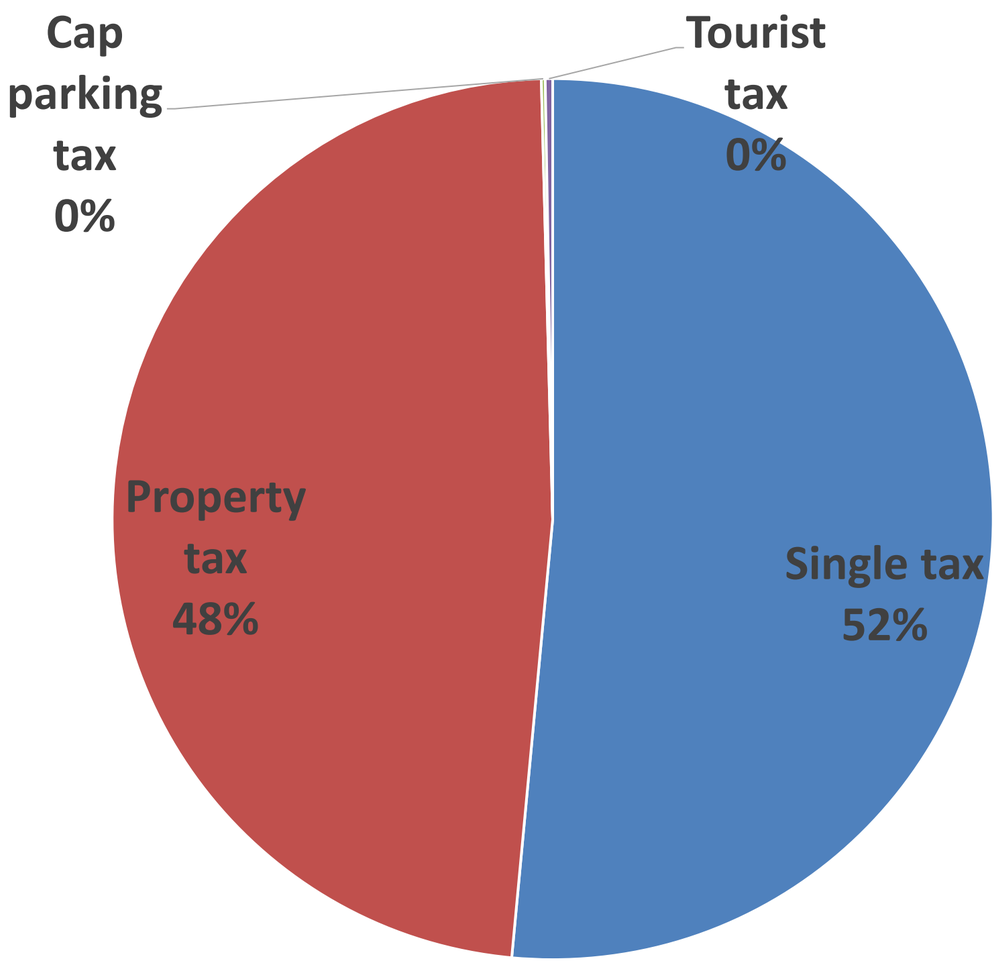


Revenues of hromadas from:

National taxes

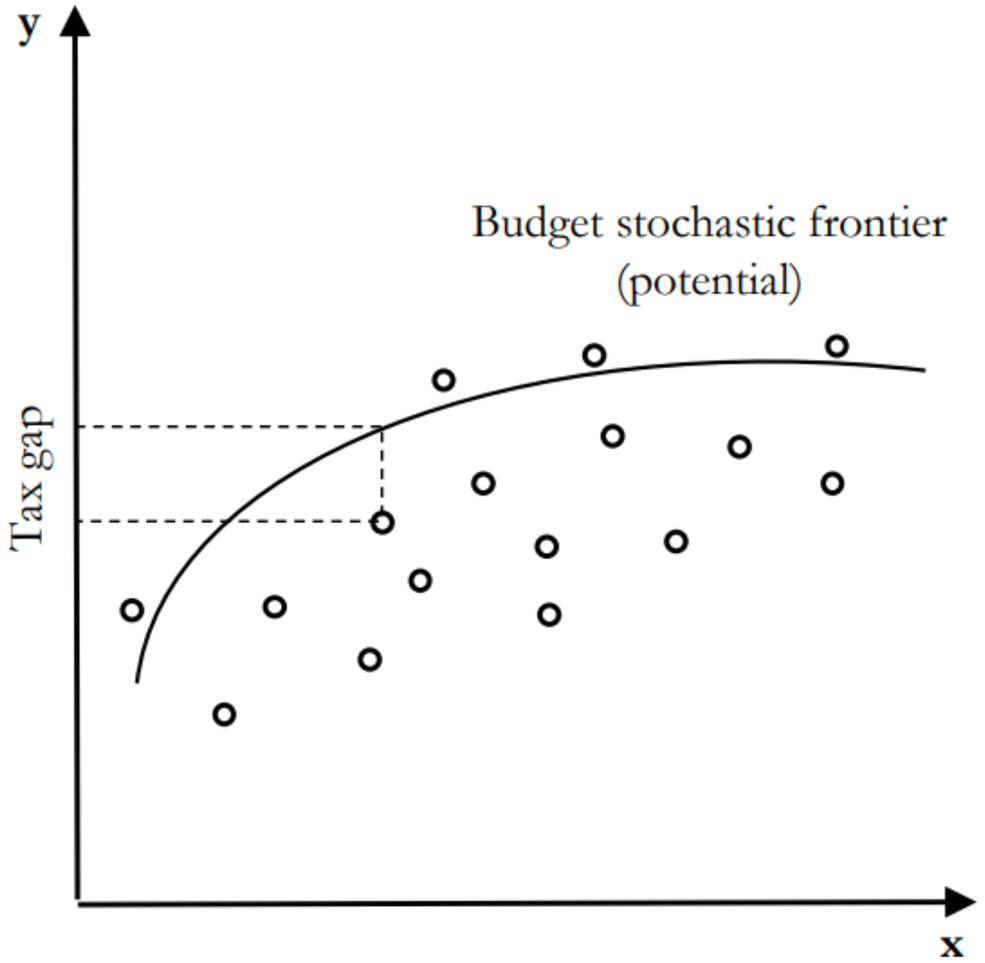


Local taxes



Methodology

Graphic representation of a (Stochastic) Frontier Model



Source: adopted from Bogetoft and Otto (2011)

- **Tax potential:** estimated through SFM. Maximum amount of money an ATC could raise given its current characteristics.
- **Tax effort:** Actual own-sourced revenue / Potential (varies from 0 to 1). Measure of efficiency as a relation between the current own-sourced budget revenue of the ATC and its tax potential..
- **Tax gap:** Potential own revenue – Actual

Methodology

Formal representation of SFM

$$y_i = f(x_i; \alpha) - u_i + v_i, \qquad u_i = z_0 + z_i\delta + w_i \geq 0$$

y_i – own-sourced budget revenue of hromada i (in logs)

x_i – set of hromada characteristics (in logs)

α – vector of estimated parameters

v – statistical noise, follows a truncated half normal distribution

u_i – hromada's budget (technical) inefficiency: how far it is located from a frontier

δ is a vector of estimated parameters for budget inefficiency

w accounts for error term in inefficiency estimation

- **Dependent Variable**:
  - own-sourced budget revenues
- **Independent Variables**:
  - population
  - area
  - number of FOPs
  - number of companies
  - total corporate entities' revenue
  - administrative expenditures
  - capital expenditures
- **Z-Variables**:
  - number of settlements in ATC
  - urban ATC dummy
  - regional center dummy
  - region dummy

Data description

ATC–level data as of 2021

1,437 observations

Inputs

“Decentralization portal”

State Tax Service

State Register of Legal Entities, Individual Entrepreneurs and Public Associations

Outputs

Open Budget boost data

Descriptive statistics

	Mean	St. Dev.	Min	Max
Own revenue, thsd. UAH	176,283	736,858	48,985.00	14,504,241
Tax revenue, thsd. UAH	162,954	687,784	48,985.00	13,750,372
Non-tax revenue, thsd. UAH	11,166	41,427	0	718,956
Sales of capital, thsd. UAH	1,909	13,759	-169.18	413,222
General administrative expenditures, thsd. UAH	37,940	122,620	2,950.23	2,212,150
Capital expenditures, thsd. UAH	43,213	259,805	0	5,891,306
Population, persons	24,259	71,051	1,814	1,433,886
Area, ha	385	299	2	2,497
Number of settlements in ATC, units	19	15.75	1	125
Number of individual entrepreneurs, persons	1,056	4,942	0	117,724
Number of legal entities, units	402	2,382	0	44,457
Total revenue of legal entities, thsd. UAH	3,199	36,239	0	1,232,570
Urban ATC dummy	0.278	0.448	0	1
Regional center dummy	0.014	0.119	0	1

Estimation results

SFM (Truncated normal distribution of the inefficiency term and z-variables included)

	Log(own revenue)		
Variable	**Estimate**	**St.dev**	**Significance**
Intercept	2.907	0.220	***
Log(area)	-0.002	0.10	
Log(population)	0.155	0.023	***
Log(number of companies)	0.114	0.016	***
Log(number of FOPs)	-0.016	0.019	
Log(corporate revenue)	0.012	0.002	***
Log(general admin. expenditures)	0.685	0.018	***
Log(capital expenditures)	0.117	0.001	***
Z-variables			
Z-intercept	0.336	0.059	***
Number of settlements	-0.013	0.003	***
Urban ATC dummy	-0.480	0.096	***
Regional center dummy	-0.230	0.364	
West	0.312	0.047	***
East	0.054	0.054	
South	0.037	0.047	***

Significance: *p<0.1; **p<0.05; ***p<0.01

Comments

- Mean tax effort is 78%.
- Hromadas could increase their own revenues almost by a quarter (>$1.5 bn).
- Grants from the central government could be cut to nearly 24% (from 35%) of total revenues.
- Urban hromadas tend to be more efficient in generating budget revenues.
- Administrative and capital expenditures are positively associated with revenues.

Oblast ranking

Region (oblast)	Mean own revenue effort	Aggregated own revenue effort	Aggregated own revenue in 2021, *mln UAH*	Aggregated potential own revenue, *mln UAH*
Chernihivska	85,3%	90,8%	6 975	7 686
Poltavska	86,7%	90,7%	12 834	14 149
Sumska	86,7%	90,0%	7 250	8 051
Khmelnytska	83,0%	89,8%	8 056	8 970
Donetska	82,2%	88,6%	13 607	15 366
Zhytomyrska	80,9%	88,4%	8 058	9 120
Vinnytska	83,2%	87,8%	10 346	11 790
Cherkaska	82,2%	87,7%	8 424	9 600
Kharvkiska	84,8%	86,7%	22 590	26 046
Mykolaiivska	79,1%	86,0%	7 712	8 967
Kirovogradska	83,5%	85,8%	6 489	7 565
Khersonska	77,7%	85,6%	6 014	7 025
Kyivska	82,8%	85,1%	18 801	22 097
Zaporizka	77,7%	85,1%	13 403	15 757
Volynska	74,8%	84,9%	5 766	6 788
Dnipropetrovska	80,2%	84,7%	31 017	36 617
Odeska	77,1%	83,9%	19 156	22 825
Lvivska	77,9%	83,2%	18 860	22 666
Luhanska	76,3%	81,5%	4 104	5 038
Ternopilska	72,9%	81,4%	5 543	6 807
Rivnenska	68,7%	80,4%	6 408	7 970
Ivano-Frankivska	63,2%	79,0%	7 067	8 945
Zakarpatska	68,1%	78,8%	5 897	7 483
Chernivetska	59,4%	76,1%	4 055	5 326

Hromadas ranking

Rank	Hromada	Region (oblast)	Type	2021 Revenue, *mln UAH*	Tax effort	Tax Potential, *mln UAH*	*Rayon-level benchmark*
1	Lebedynska	Sumska	Urban	213.4	96.5%	221.0	96.5%
2	Starovirska	Kharkivska	Rural	200.4	96.5%	207.6	96.5%
3	Apostolivska	Dnipropetrovska	Urban	301.7	96.5%	312.7	96.1%
4	Romenska	Sumska	Urban	400.1	96.1%	416.2	96.1%
5	Sokalska	Lvivska	Urban	248.3	95.9%	258.8	95.9%
6	Krolevetska	Sumska	Urban	209.8	95.7%	219.1	95.7%
7	Khrystynivska	Cherkaska	Urban	183.5	95.7%	191.8	95.7%
8	Zinkivska	Poltavska	Urban	199.3	95.6%	208.4	95.6%
9	Lozivska	Kharkivska	Urban	513.4	95.6%	537.0	95.6%
10	Yavorivska	Lvivska	Urban	301.6	95.6%	315.5	95.6%
…	…	…	…	…	…	…	…
1428	Kolochakivska	Zakarpatska	Rural	12.1	40.7%	29.6	92.2%
1429	Krasnoiilska	Chernivetska	Rural	16.8	39.7%	42.4	92.1%
1430	Kosmatska	Ivano-Frankivska	Rural	11.2	39.6%	28.2	78.1%
1431	Stepnenska	Zaporizka	Rural	13.0	38.8%	33.6	95.1%
1432	Dubivska	Volynska	Rural	26.9	38.7%	69.4	94.2%
1433	Vytvytska	Ivano-Frankivska	Rural	8.1	38.3%	21.2	91.7%
1434	Sartanska	Donetska	Rural	73.9	37.6%	196.9	94.9%
1435	Lanchynska	Ivano-Frankivska	Rural	13.4	36.4%	36.7	86.2%
1436	Lymanska	Odeska	Rural	37.3	35.7%	104.6	91.9%
1437	Toporivska	Chernivetska	Rural	19.3	32.8%	58.9	92.1%

Conclusions and implications

- There are substantial reserves to be utilized by local government in raising the budget revenues.
- Governmental transfers for financing local communities spendings may be substituted by increased revenues.
- There is a significant gap between urban and rural local communities, and it’s a challenge to cut it.
- **Institutional capacity to be improved**: payment increase and staffing, especially in rural areas. Special educational and training programs for local authorities to increase governance competence.
- Consider different **personal income tax distribution** for rural hromadas or make the tax to be **paid based on the individual residence** rather than on the company residence.
- **External financing** for capital expenditures among rural hromadas and poor-efforts performers.
- Improve **data-availability tools** to provide hromadas and other stakeholders with better inputs for policy analysis to reach better hromadas’ financial self-reliance.

Distance function model

Estimation results

-Log(tax revenue)			
Variable	**Estimate**	**St.dev**	**Significance**
Intercept	-2.600	0.222	***
Log(area)	0.006	0.010	
Log(population)	-0.212	0.020	***
Log(number of companies)	-0.115	0.016	***
Log(number of FOPs)	0.018	0.018	
Log(corporate revenue)	-0.012	0.001	***
Log(general admin. expenditures)	-0.655	0.018	***
Log(capital expenidtures)	-0.113	0.001	***
Log(nontax/tax)	0.125	0.009	***
Log(cap.proc/tax)	0.003	0.001	**
Z-variables			
Z-intercept	0.360	0.056	***
Number of settlements	-0.012	0.002	***
Urban ATC dummy	-0.445	0.083	***
Regional center dummy	-0.103	0.253	
West	0.296	0.041	***
East	0.072	0.048	
South	0.042	0.044	
sigmaSq	0.096	0.010	***
Gamma	0.740	0.043	***
Loglikelihood	16.34		
Min. revenue effort	0.317		
Mean revenue effort	0.765		
Max revenue effort	0.962		
Significance: *p<0.1; **p<0.05; ***p<0.01			

Comments

- Distance function model estimation is aligned with results of the SFM model.

Impact of war on hromadas budgets

- **Own-sourced revenues change during May 22 - Feb 23**
  (YoY, excluding subsidies and PIT of military personnel)