

## Determining the level of efficiency of gas distribution enterprises in the western region of Ukraine

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This article analyses the current situation and processes of structural transformations in Ukraine's natural gas sector, particularly in its western region. The constant existence of violations of the market balance between supply and demand has necessitated reforms in the gas sector of Ukraine and its regions. From the standpoint of the unconditional importance of gas distribution companies in the structure formation and functioning of the gas sector of the state, the relevance of the proper functioning of natural gas distribution networks among consumers in times of war and political and economic crises will help reduce the level of potential risks, as well as ensure the integrity of the liberalized natural gas distribution system as a whole. The methods implemented in the process of analyzing the level of efficiency of regional gas distribution systems include the methodology of expert assessments, which allowed for a generalized assessment of the expected results, contributed to the unification of existing approaches that reflect the level of economic and market efficiency, innovation activity, and financial stability of gas distribution companies. During the study, it was possible to identify the level of need for comprehensive measures, including several actions-analysis of the institutional environment of the Western Ukrainian natural gas distribution market. As a result of the study, it was possible to find out that the level of supply from Western Ukrainian gas distribution companies is regularly changing; Joint stock company "Zakarpazhaz" can be considered the most promising and competitive; at the same time, Joint-stock company "Ternopilhaz" is characterized by the lowest level of its professional activity.

Table 1  
 Relative indicators of assessment of property status and efficiency of property use for the gas distribution companies in the Western Region of Ukraine, 2017-2021

Year	Regional gas distribution network operator	Fixed assets operability ratio (Rfao)	Fixed assets depreciation ratio (Rfad)	Mobility rate (Rmob)	Capital and current assets ratio (Rcca)	Capital productivity (CapProd)	Capital intensity (CapInt)	Capital-labor ratio (Rcl)
2017	AT 'Volynhaz'	0,532	0,388	0,566	0,884	1,379	0,500	191,325
2018		0,729	0,421	0,822	3,147	6,093	0,176	327,245
2019		0,554	0,341	0,635	2,267	5,779	0,206	261,763
2020		0,640	0,433	0,499	1,172	4,588	0,199	237,422
2021		0,648	0,385	0,469	1,269	3,694	0,213	307,122
2017	AT 'Zakarpazhaz'	0,586	0,418	0,580	1,751	6,139	0,143	151,978
2018		0,513	0,477	0,924	4,177	11,670	0,106	210,741
2019		0,577	0,379	0,876	2,872	1,283	0,768	179,692
2020		0,477	0,473	0,646	1,588	1,513	0,736	172,472
2021		0,439	0,459	0,672	1,758	0,997	0,779	276,081
2017	AT 'Ivano-Frankivskhaz'	0,464	0,424	0,611	2,189	5,128	0,252	100,124
2018		0,502	0,399	0,854	5,316	9,090	0,120	87,917
2019		0,583	0,549	0,401	1,119	1,800	0,741	76,128
2020		0,515	0,427	0,179	0,249	1,566	0,704	169,812
2021		0,571	0,514	0,313	0,328	1,040	0,660	173,979
2017	AT 'Lvivhaz'	0,639	0,498	0,708	1,600	3,322	0,223	178,508
2018		0,476	0,436	0,849	3,329	7,333	0,116	197,298
2019		0,507	0,000	0,878	4,354	10,163	0,099	175,144
2020		0,528	0,000	0,783	2,363	8,190	0,111	218,926
2021		0,584	0,560	0,636	2,507	6,388	0,186	264,870
2017	AT 'Rivnehaz'	0,540	0,387	0,622	1,835	3,797	0,229	175,693
2018		0,480	0,396	0,816	3,156	7,955	0,139	171,319
2019		0,626	0,462	0,893	3,309	7,439	0,109	180,403
2020		0,462	0,471	0,714	1,659	6,369	0,112	163,816
2021		0,529	0,537	0,493	1,331	4,372	0,196	271,208
2017	AT 'Ternopilhaz'	0,489	0,419	0,337	0,585	3,507	0,307	105,055
2018		0,623	0,394	0,392	0,854	1,564	0,556	138,425
2019		0,465	0,480	0,407	0,984	1,518	0,537	133,446
2020		0,634	0,548	0,273	0,516	1,444	0,622	139,865
2021		0,512	0,412	0,359	0,728	1,032	0,964	159,358
2017	AT 'Hmelnytskhaz'	0,741	0,341	0,579	1,161	2,688	0,368	167,643
2018		0,561	0,382	0,831	1,989	6,121	0,210	265,253
2019		0,763	0,419	0,298	0,503	4,732	0,195	238,960
2020		0,511	0,348	0,503	1,510	4,899	0,206	247,303
2021		0,600	0,410	0,479	0,996	3,705	0,241	282,562
2017	AT 'Chernivtsihaz'	0,531	0,430	0,606	1,487	3,972	0,305	216,668
2018		0,666	0,468	0,750	3,101	5,930	0,129	198,118
2019		0,648	0,425	0,271	0,563	6,626	0,142	223,456
2020		0,468	0,430	0,322	0,490	6,438	0,150	202,141
2021		0,586	0,558	0,379	0,452	6,445	0,186	195,678

Fixed assets operability ratio (Rfao). According to Table 1, the indicator is within the optimal range (over 0.5), showing the overall satisfactory condition of fixed assets of gas distribution companies. For example, AT 'Hmelnytskhaz' had the highest coefficient in 2019 (0.621), although it decreases annually.

Fixed assets depreciation ratio (Rfad). The coefficient is in inverse proportion to the fixed assets operability ratio. The calculations show that the situation is the best for AT 'Hmelnytskhaz' (0.379)

Mobility rate (Rmob). The coefficient is rather high for AT 'Lvivhaz' against other oblast gas companies. Meanwhile, it remains low for AT 'Ivano-Frankivskhaz' (0.279).

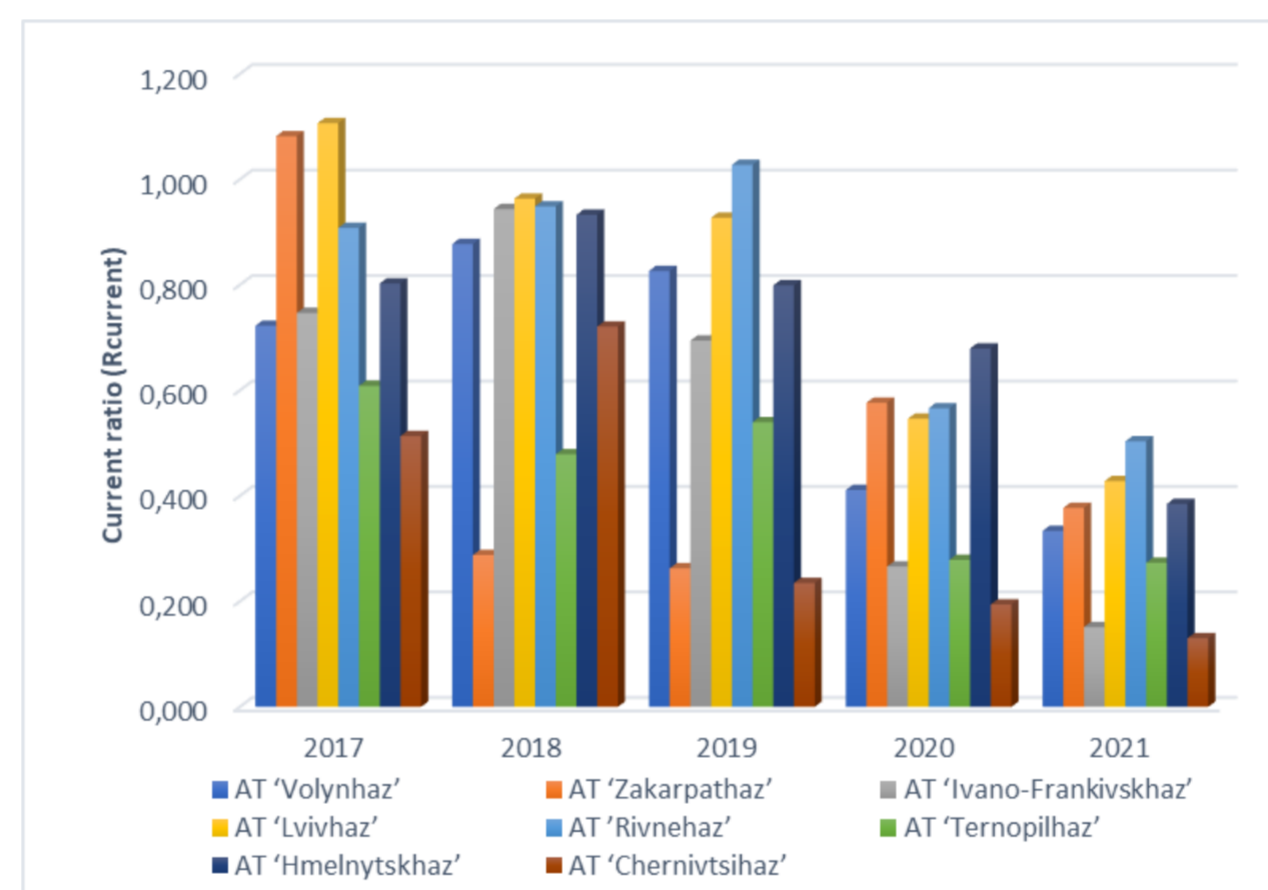


Fig. 1. Cash ratio (Rcash) in years 2017 – 2021

Cash ratio (Rcash). The coefficient within 0.1 – 0.2 is considered the standard value of the indicator. Unfortunately, none of the gas distribution companies adheres to the specified value, so we can assume that none of the companies under research is capable to cover debts on time in case of an urgent need. Changing of the cash ratio (Rcash) in years 2017 – 2021 is presented in fig. 1.

Table 2  
 Integral value and rating indicator of the gas distribution companies' performance in the Western Region of Ukraine

Years	2017		2018		2019		2020		2021	
	Integral value	Rating indicator	Integral value	Rating indicator	Integral value	Rating indicator	Integral value	Rating indicator	Integral value	Rating indicator
AT 'Volynhaz'	0,007	7	0,018	2-3	0,019	1-3	0,02	2	0,017	4
AT 'Lvivhaz'	0,009	5-6	0,017	4	0,019	1-3	0,019	3-5	0,015	8
AT 'Ivano-Frankivskhaz'	0,014	2	0,012	7	0,014	8	0,017	7-8	0,02	2
AT 'Ternopilhaz'	0,012	3	0,021	1	0,015	7	0,018	6	0,016	5-7
AT 'Lvivhaz'	0,001	8	0,002	8	0,017	5	0,017	7-8	0,018	3
AT 'Zakarpazhaz'	0,017	1	0,014	6	0,016	6	0,025	1	0,023	1
AT 'Hmelnytskhaz'	0,01	4	0,018	2-3	0,019	1-3	0,019	3-5	0,016	5-7
AT 'Chernivtsihaz'	0,009	5-6	0,015	5	0,018	4	0,019	3-5	0,016	5-7

### Conclusion

Having analyzed the data (the results of the research), the following conclusions can be made:

- The positions of the gas distribution companies in the Western Region of Ukraine change each year, in our opinion, due to different values of their general performance indicators, low innovative activity, national natural gas distribution market condition, regional features of the gas distribution companies' functioning, number of regional actors on the regional natural gas distribution market, regional tariffs at a certain moment in time, level of pressure of financial activity control authorities.
- AT 'Zakarpazhaz' can be considered the most competitive in the last two years as it held the first position in 2020 and 2021.
- The activity of Ternopilhaz remains challenging. It has severely deteriorated its positions starting since 2017.

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Gas distribution networks support economic development by enabling the use of gas for various industrial applications, power generation, and heating needs. Access to natural gas can attract businesses and industries that rely on affordable and reliable energy sources, thus driving economic growth and job creation. Overall, the purpose of gas distribution is to deliver a clean, reliable, and affordable energy source to consumers while ensuring safety, reliability, and environmental sustainability.

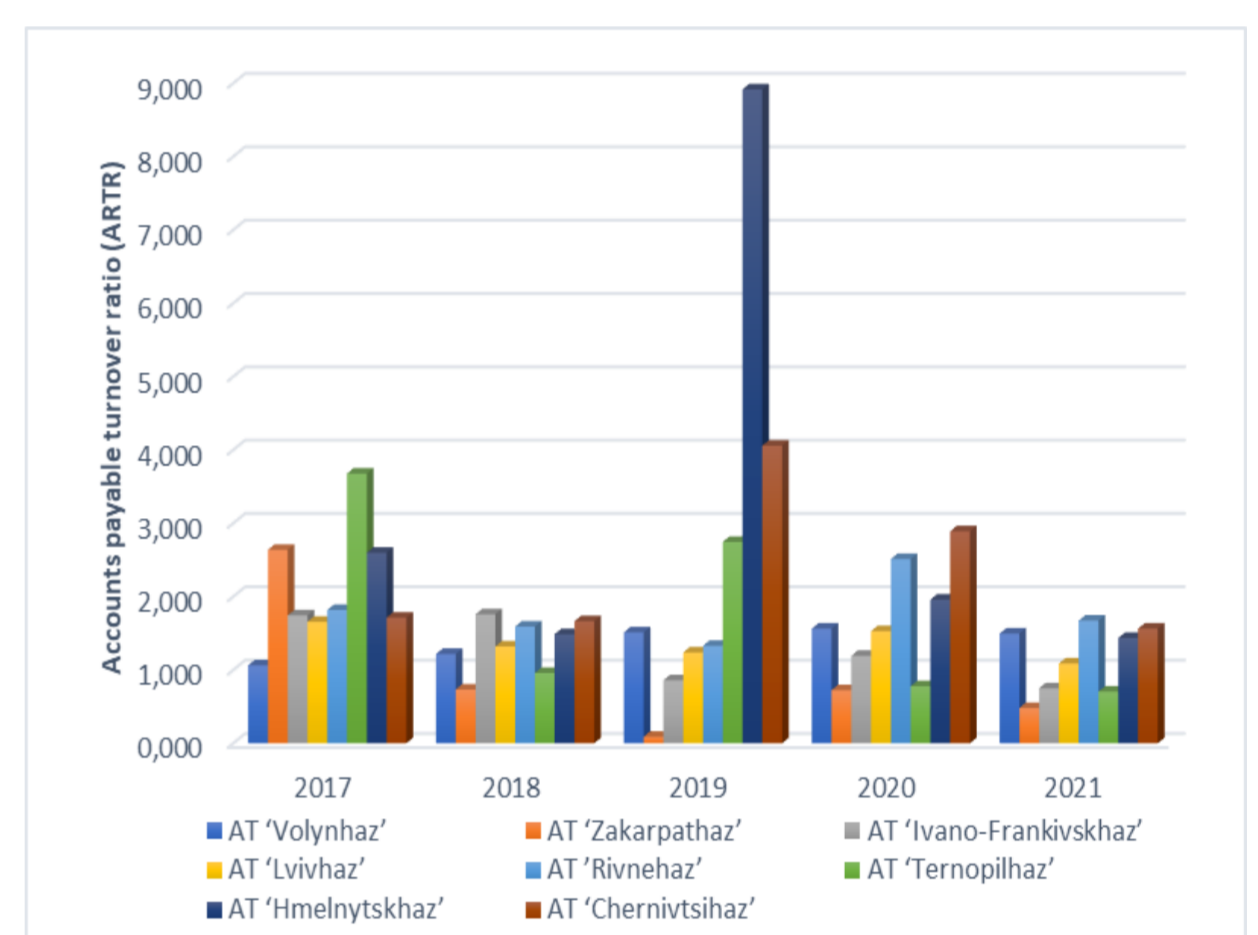


Fig. 2. Accounts payable turnover ratio (ARTR) in years 2017 – 2021

The current assets turnover ratio shows the maximum number of current assets turnovers in a certain period and the maximum revenues per 1 hryvnya of current assets for such gas distribution companies as AT 'Hmelnytskhaz', AT 'Rivnehaz', and AT 'Chernivtsihaz'. The coefficient values are 3.481, 3.762, and 9.035, respectively. Meanwhile, the value of the coefficient for Zakarpazhaz in 2021 was very low – 0.535, and a received hryvnya of revenues didn't cover the hryvnya of current resources is presented in fig. 2.