

THE MINING INDUSTRY AND THE RESILIENCE OF THE ECONOMY OF THE REPUBLIC OF ARTSAKH

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Key words: mining industry, exploitation of open pits, economic growth, economic resilience, added value, GDP, industrial-production fixed assets, concentrate, export commodity structure

Introduction

During the period of independence, the mining industry was the engine of the development for the Artsakh economy, providing a significant share of the country's gross domestic product, state revenues, exports, foreign investments, inflow of foreign currency, and employment. Alongside the inflow of capital, the mining industry played a crucial role in promoting a better business culture and enhancing staff management practices. It is well known that in the Republic of Artsakh mining industry, every unit invested in the economy yields more than one unit of output. Regarding economic impact, the mining multiplier worldwide surpasses that of the energy, agriculture, financial services, trade, and food industries. On the other hand, external factors like wars and pandemics can lead to economic collapse. In this case, the multiplier effect negatively impacts various branches of the economy. Indeed, the 2009 international financial crisis, along with the pandemic and wars in Artsakh, affected the mining industry index in Artsakh to a significant degree. In fact, the decline in many macroeconomic indexes during this period is a result of the factors mentioned above.

The analysis of trends in the development of the mining industry sector is crucial and relevant for assessing the economic growth of the Republic of Artsakh. This article highlights the conflict between the mining industry and the economy. To achieve this goal, we focused on the following objectives: analyzing the development path of the sector, examining its connections with other economic sectors, and assessing its impact on macroeconomic indicators. The research topic is not new in the scientific sphere, but its effects on the Artsakh economy have yet to be thoroughly studied.

Methodology

The informational foundation of the article has relied on scholarly works by both local and international authors in the field, along with regulatory laws shaping the sector. Methodologies involving data collection, synthesis, and analysis have been employed.

Literature review

The mining industry, with its economic potential and impacts on the country and its inhabitants, has long been a subject of debate among economists and political, healthcare, and environmental experts. Consequently, there is abundant research on this topic, espe-

cially considering that mining is one of the earliest forms of human economic activity. On May 11, 2023, the government of the Republic of Armenia gave its approval to a comprehensive research paper titled "Development Strategy of the Mining Industry" [RA Government, 2023, N730-L]. Abdunazarova N.Ju emphasizes the importance of competent management in harnessing the industry's contributions to the sustainable development of countries [Abdunazarova & Maxkamov, 2017, 4]. In her article on the challenges of regulating the sensitive raw materials market, E. Degteriova concluded that guaranteed access to mineral resources is fundamental to enhancing the competitiveness and sustainable development of the modern EU economy [Degtereva, 2021, 47]. H. Avagyan's scientific articles reflect contemporary issues regarding the utilization of ore resources in the Republic of Armenia [Avagyan, 2011, 15]. Another expert, L. Harutyunyan discussed the mining industry's persistent developmental challenges by analyzing development trends [Harowt'yownyan, 2015, 77-88].

The emergence of economic resilience entails overcoming financial challenges, enhancing economic security, and positively impacting other areas of the economy, such as economic diversification and increased inclusivity.

Scientific novelty

Through an examination of key metrics within the mining industry of the Republic of Artsakh throughout its period of independence, this study underscores the sector's multifaceted impact on economic growth. It highlights the sector's critical role in addressing fundamental economic, social, and resource management challenges, emphasizing its resilience and capacity to swiftly respond to shocks.

Analysis

The government of the Republic of Artsakh lacked a verified strategy for the mining industry. There was no comprehensive and versatile document addressing national characteristics, necessary and available resources, and global challenges in this sphere.

During the period of independence, fundamental studies on crustal resources were not conducted, and there was a lack of consistent assessment of this national asset. However, it was not anticipated that this sector would serve as a significant catalyst not only for economic rebound but also for fundamental economic advancement. The development of the sector was not solely seen as an international concern, and the Republic of Artsakh was not recognized as an independent state on the international stage. It's no secret that countries with developed mining industries like Australia, Canada, and Chile, as well as emerging economies like China, the Democratic Republic of the Congo, and Kazakhstan, play significant roles in the international market. Therefore, analyzing economic progress requires considering global market trends, international standards, norms, and regulations. For years, Artsakh's connection with Armenia has been significant on the global stage, and this sector has not been an exception. In assessing the statement, it's important

to highlight that Artsakh's economy incurred substantial losses due to the export of concentrate, resulting in a presumed increase in added value from its processing. To be fair, it's important to acknowledge that Armenia also faces the unresolved issue of unrealized potential in further processing of mined minerals to maximize the value obtained from metal concentrates.

We attempt to draw a parallel with the Islamic Republic of Iran, which, over the past forty years, has developed a self-sustaining national economy despite facing economic sanctions. This is particularly noticeable in industries such as electrical engineering and chemical manufacturing, where the primary added value comes from cathode copper. In contrast to the Republic of Armenia and Artsakh, the Republic of Iran's territory size, economic self-reliance, and population size guarantee the consumption not only of copper but also of sulfuric acid produced through smelting.

Table 1. The dependencies between mining and certain macroeconomic indicators in Artsakh from 1996 to 2022 [Arcaxi vitwakagrakan taregrqr]

	1996	2000	2005	2010	2015	2019	2020	2022
GDP mln AMD	14221	23148.6	51379.4	118187.2	209346	342463.6	270907.2	288792.8
in % to previous year	-	106.7	114.1	105.5	109.1	110.3	77.6	112.2
per capita, thsd. AMD	114.5	172.2	373.1	823.2	1443.8	2307.6	1820.1	1922.6
in % to previous year	-	109.3	119.6	113.7	108.6	109.2	77.3	111.9
Industrial output, mln. AMD	2563.9	4854.6	17773.0	42991.8	53541.3	164999.8	103203.2	104472.8
in % to previous year	115.5	116.8	99.1	105.3	102.5	140.1	63.7	136.9
Mining and quarrying, total	-	-	6397.6	19676.6	12937.5	83325.0	63985.6	60502.7
in % to previous year	-	-	-	99,3	93.9	80.2	50.5	181.2
Share of industry in GDP, in %	18.0	21.0	16.0	17.2	12.9	30.0	26.5	24.1
Share of mining and quarrying in industry %	-	-	36.0	45.8	24.2	50.5	62.0	58.0
Share of industry in employment %	7.9	8.9	12.2	11.5	15.4	11,5	10,1	10,9

In 2002, the contribution of the mining industry and open-pit exploitation to the economy of the Republic of Artsakh was assessed through the operations of the closed joint-stock company Base Metals. According to data from the National Statistical Service of the Republic of Artsakh, the industry contributed an average of 23.8 percent to the value added from 2014 to 2022, while the gross domestic product averaged 22.6 percent. Additionally, the mining industry and open-pit exploitation accounted for an average of 42.5 percent of the industrial output during this period [Arcaxi vitwakagrakan taregrqr, 2022]. Table 1 illustrates the trend of key indicators related to the sector in 1996 - 2022. For comparison, it should be noted that in Armenia, the share of industry in the added

value of GDP averaged 21.3% in 2018-2022 while the share in GDP was 19.0%. Specifically, the share of the mining industry and quarrying sector was 4.6% and 4.1%, respectively [Hayastani vitwakagrakan taregirq, 2023]. In Canada the mining share in GDP is about 6%, whereas in neighboring Georgia, it does not reach 1%¹. The index highlights the relationship between the utilization of natural resources and economic development in mining countries worldwide. Notably, in Artsakh (NKR), the average physical volume index of the mining sector was around 30% from 2014 to 2022. This played a significant role in forming the physical volume index of the industrial sector, which was 24.5%.

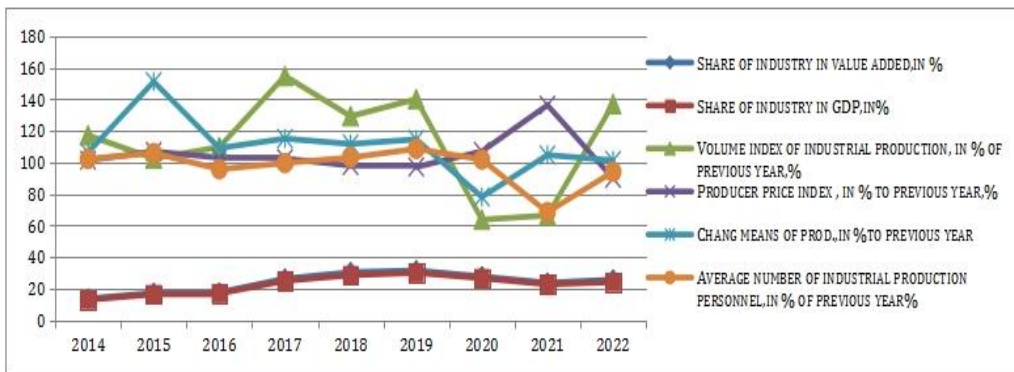


Figure 1. Volume Indices of Production by Type of Economic Activity [Arcaxi vitwakagrakan taregrqr]

From 2014 to 2022, the industrial price index remained relatively stable compared to the previous year, with the notable exception of 2021 when it surged to 136.3%.

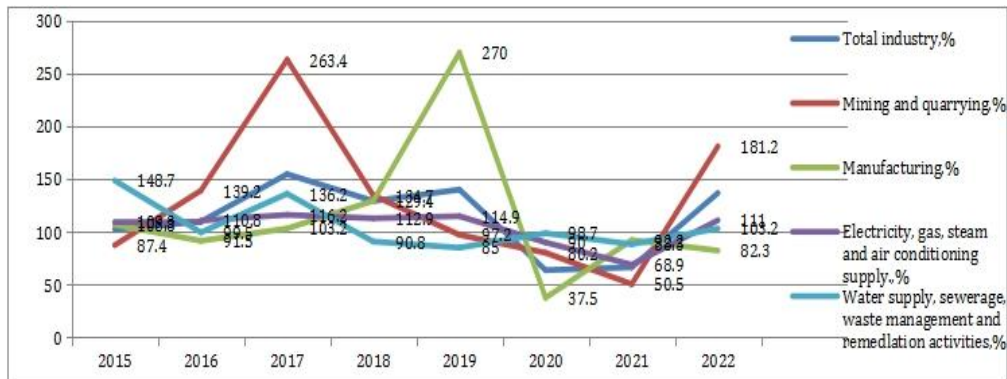


Figure 2. Indices of key industrial indicators [Arcaxi vitwakagrakan taregrqr]

The dynamic development of the sector is further demonstrated by consistent positive changes in production means year-over-year, except for 2020, which was impacted by the 44-day war. On average, the index increased by 10.2% annually during this period. The average number of industrial production personnel remained fairly stable, though Figure

¹ <https://orbli.am/hy/post/318/2019-11-22/>

1 shows declines in 2016-2017 and 2021-2022. The change in the structure of industrial production by economic activity reveals a significant increase in the contribution of the mining and quarrying sectors to industrial output since 2017. Despite active efforts in recent years to achieve energy independence in Artsakh, growth in this sector has been more moderate. Prior to the resource losses caused by the war, the average annual growth from 2014 to 2019 was 13.9%, and over the past nine years, the average annual growth has been 5.9%. Since independence, industrial production has increased more than 64 times, primarily driven by the mining and energy sectors. However, the share of the manufacturing industry has remained below acceptable levels, fluctuating between 21.5% and 43.0%. In 2019, most of the growth in the manufacturing sector was due to the activities of a single company specializing in the processing of precious metals.

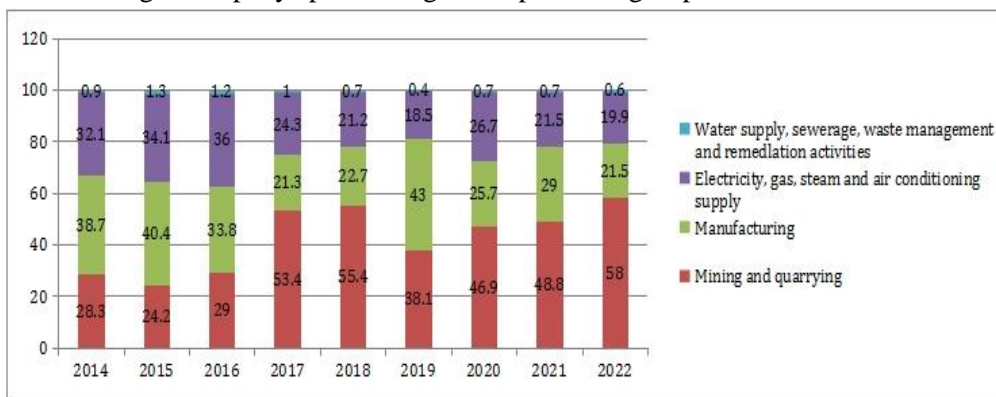


Figure 3. Industrial production structure by economic activity types [Arcaxi vitwakagrakan taregrqer]

In the context of creating an investment-attractive environment, international studies show that countries generally prefer to use their taxation systems to create favorable conditions for companies specialized in mining and resource extraction. Initially, the tax load in the mining sector and open-pit operations in Artsakh was fairly light. The 5 percent rate for profit tax, income tax, land tax, state duty, and mandatory fees, which were comparatively low compared to those in the Republic of Armenia, served as a major incentive for expanding operations. Based on statistical data, in 2007, the tax burden in the industry stood at 15.9 percent, which was second only to the tax burden in trade and construction, averaging 10.5 percent. However, due to changes in tax laws, by 2019, the tax burden in mining and open-pit operations rose significantly to 29.3percent, compared to the average of 13.9percent [Finansneri vitwakagrowth'yown, AH AVC]. When analyzing state revenue planning and its execution, the significance of Base Metals, typically averaging about 35 percent, was consistently emphasized. Generally, deviations from forecasts were primarily attributed to the largest taxpayer, consistently listed prominently among published taxpayers. Consequently, given the nature of the sector, over half of the fixed assets in the industry are concentrated in mining and open-pit operations.

Table 2. The structure of industrial-production fixed assets according to the types of economic activity in the Artsakh in 2016-2022,% [Arcaxi vitwakagrakan taregrqr]

	2016	2017	2018	2019	2020	2021	2022
Total industry	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mining and quarrying, total	52.1	51.0	53.6	50.5	62.0	64.9	65.2
Manufacturing, total	14.8	13.1	8.7	8.7	10.6	9.6	8.3
Electricity, gas, steam and air conditioning supply	29.4	31.7	34.2	37.9	23.8	22.4	23.4
Water supply, sewerage, waste management, remediation activities	3.7	4.2	3.5	2.9	3.6	3.1	3.1

The mining industry and open-pit operations play a crucial role in diversifying the territorial distribution of industrial output. Historically, much of Artsakh's industrial capacity was centered in Stepanakert since the Soviet era. However, from 2014 to 2022, mining activities led to a substantial shift, with 26.6% to 58.4% of industrial output being attributed to the Martakert region.

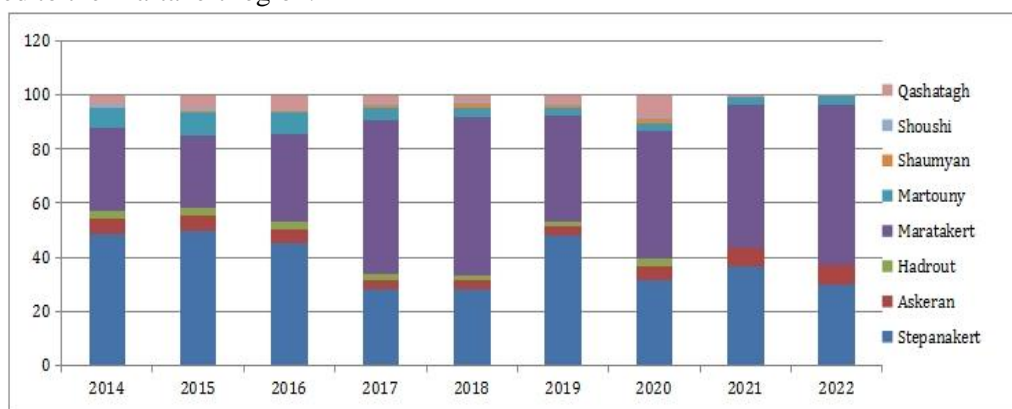


Figure 4. Structure of industrial output by region [Arcaxi vitwakagrakan taregrqr]

Throughout its period of independence, the Republic of Artsakh consistently faced a negative balance of foreign trade, with imports typically exceeding exports by 3-5 times.

Table 3. Export structure of the Republic of Artsakh by main product groups 2014-2022 [Arcaxi vitwakagrakan taregrqr]

	2014	2015	2016	2017	2018	2019	2020	2021	2022
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Products of prepared food	8.7	7.6	5.4	2.9	2.3	2.1	3.5	7.8	5.1
Mineral production	52.3	40.7	43.8	66.8	70.7	45.8	78.0	82.0	39.0
Precious stones and metals	8.6	15.6	14.5	11.8	15.1	39.8	4.8	-	50.2
Machinery and equipments	4.3	7.7	3.8	1.4	1.5	2.4	1.0	0.6	1.3
Transport means	1.6	2.4	1.6	0.5	0.3	1.2	2.0	2.9	1.1
Other	24.5	26.0	30.9	16.6	10.1	8.7	10.7	6.7	3.3

However, the mining industry and open-pit operations sector played a crucial role in boosting export volumes. In 2014-2022, mineral products accounted for an average of 57.7% of total exports, reaching as high as 82.0 percent in 2021. Table 3 highlights how significantly export volumes would decrease without mineral products, though it's worth noting that such a heavy reliance on one export product is not ideal for any economy.

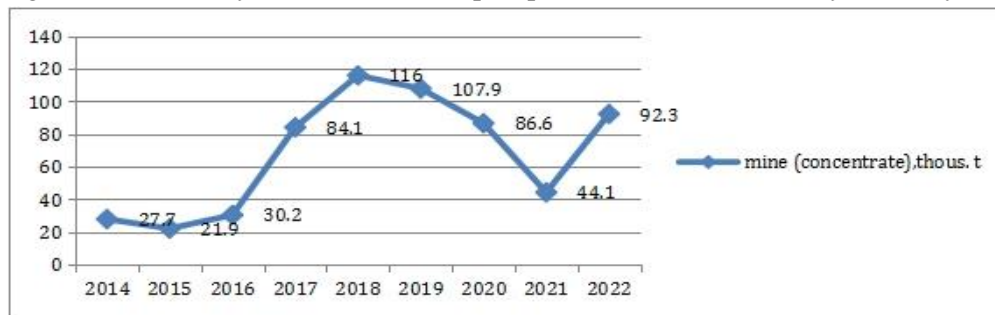


Figure 5. Extracted Concentrate Volume 2014-2022 [Arcaxi vitwakagrakan taregrqr]

Figure 4 illustrates a significant surge in concentrate production volume in 2017, marking a 2.8-fold increase. This spike contributed to the highest economic growth rate in the past decade, exceeding 15 percent. Baudrillard wrote "We need to acknowledge that true poverty serves as the core myth upon which the myth of growth thrives. The illusion of growth suggests that it combats poverty through rigorous measures, yet simultaneously perpetuates it in line with its concealed objectives" [Baudrillard, Jean.M., 2006]. Despite the notable achievements in mining and economic growth in Artsakh, there were no significant alterations observed in the poverty levels.

Conclusion

Mining is often viewed as a sector capable of fostering economic development, employment, and livelihoods, particularly in regions where opportunities in other sectors are scarce. However, it is inherently linked to social inequality, failing to distribute benefits and costs equitably. Empirical evidence suggests that mining exacerbates poverty rather than alleviating it. Double-digit economic growth and increasing GDP per capita, while significant, do not necessarily reflect the inclusiveness of GDP or address the multifaceted nature of poverty. Historically, the World Bank primarily relied on these indicators to measure poverty. However, it wasn't until 2001 that the World Bank adopted a more comprehensive definition of poverty, which includes material deprivation, low education and health levels, vulnerability to risks, and lack of voice and power. Considering all the presented criteria, mining exhibits negative effects. While the mining industry undeniably contributed significantly to the economy of Artsakh—accounting for 9.0% of the 12.2% economic growth in 2022, it is our perspective that it did not substantially enhance the economy's resilience. Any upheaval in the mining sector carries a steep cost for the entire economy. For instance, in the 12.7% economic decline of 2021, the mining industry and

open-pit exploitation sector comprised 9.1% of the decline. During the global financial and economic crisis in 2009, while the Republic of Artsakh experienced a double-digit economic decline, the United States ended the year with a 13.1% growth. However, it wasn't until 2010 that the ripple effects of global economic shifts reached Artsakh, largely due to the influence of the studied sector. This resulted in a significant reduction in the rate of economic growth (5.5%) and a decrease in domestic incomes.

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During the period of independence, the mining industry has been the driving force behind the development of the Artsakh economy. It has contributed significantly to the country's gross domestic product, state revenues, exports, foreign investments, foreign currency inflow, and employment. The analysis of development trends in the mining industry is crucial for assessing the economic growth. It is well-known that the multiplier effect of the mining industry globally surpasses that of agriculture, energy, financial services, trade, and public catering sectors. However, external influences such as wars and epidemics can disrupt this sector, with the negative multiplier effect spreading to other branches of the economy. This article aims to uncover the connections between the mining industry and the overall economic resilience of Artsakh. To achieve this, we studied the development trajectory of the mining sector, its interactions with other economic sectors, and its effects on macroeconomic indicators. Fundamental research on the subsurface resources of Artsakh was not carried out, resulting in a lack of accurate assessment of this component of the national wealth. Nevertheless, the mining industry provides significant impetus for the economy, becoming the main engine of economic growth. Armenia's economy would certainly benefit more if existing resources were used efficiently and if the republic advanced through the stages of processing these resources.