The Socio-Economic Impact of Mine Closure A comparative analysis between Romania’s Jiu Valley and Germany’s Ruhr Valley

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Abstract:
This article analyses recent crises in the world about coal resources, which leads to a reconsidering of national strategies for their exploitation and utilization. Under the conditions of market risk, lack of efficiency, progressing global decarbonization, and the decline in hard coal prices, mining enterprises are on the verge of bankruptcy, unable to stop the fast increase in production costs triggered by social tension and trade unions. Research focuses on the two following issues: 1) Can coal mining still prompt economical development as it did during the previous century without interposing with what is now generally perceived as prosperity in the wider sense of the word: growth in productivity, re-silience, social development and sustainability? and 2) How did mine closure impact the socio-economic development of the regions and of the countries as a whole?

Keywords: mine closure, unemployment, economical viability, extractive industries, sustainable development.

Introduction:
These questions have been put in sharp relief by approaching two case studies, one concerning Jiu Valley, the notorious hard coal mining region of Romania, respectively Ruhr Valley, the industrial entre of Germany. The paper aims at the diagnosis of the current situation in the hard coal mining industry in both countries, accompanied by an assessment of the economical competitive potential of this industry and its determinants.

This study advances research on the nature and role of mining industry with respect to economy, which is very significant given their norm-setting potential. Conclusions and proposals provide general guidance on key factors and key considerations that may be relevant now and in the future when considering the inherent difficult issues of balancing exploitation of valuable mineral resources to long-term needs of the country. The present article rather focusses on the global politico-economic context, where the causes or solutions might root from. I established the context with special regard to Romania’s and Germany’s economic position in the European Continent and their political stance in the European Union’s approach on coal mining.

September 2015 brought on the international stage the 17 Sustainable Development Goals (SDGs), introducing the world’s common agenda for sustainable development by the year 2030, among which the mining sector ranks major importance. On this ground, this research work is extremely opportune.

Mineral resource wealth is often responsible for a large share of gross domestic product, export profit, government revenues, and job opportunities. During the industrial revolution boom of the past two centuries, hard coal was the primary energy resource in Europe. For countries like Romania and Germany, a policy shift toward the extractive industries offered the prospect of an economy more diverse than one defined by subsistence agriculture. It has helped lead the way toward a balanced budget, a reduction in foreign debt, savings, and an opportunity to develop new industries. But old ways won’t necessarily open new doors.

In the 1990s, due to the steady-increasing emission of carbon dioxide and high pollution levels, the European Union decided to limit the use of hard coal in the power industry by setting emission restrictions and pushing forward renewable energy sources. Consequently, hard coal producers in Europe felt forced to decrease mining operations, restructure them by reducing personnel or completely liquidate them. In practice this translates into higher operating costs for existing plants and even higher construction cost for establishing new ones, which leaves coal increasingly non
competitive when compared to clean energy sources. Even current subsidies for coal-related activities are targeted because in many countries they are not presented transparently, and need to go through a legal check-up according to the state aid criteria, then put at the service of energy transition. This turning point represents the beginning of the coal termination process. Simply uncompetitive against renewables, coal-fired nations might be nearing the end of the line, as mines and power plants no longer insure economical prosperity.

Carbon neutrality or low carbon intensity would offer many economic benefits to the countries in discussion. A persevering decarbonisation path could prompt economic growth, consolidate energy security, provide better paid jobs, etc. But three reasons cause a halt in the process: firstly, the dramatic drop of the cost of renewables after the economic crisis that discouraged investors. Secondly, many CESEC countries are policy followers, not first movers. Thirdly, in terms of energy the region is politically ignored and misinterpreted. All these combined with many administrative, legal, tax and other barriers, make development and investing in clean energy slow and delayed.

By using methodology available for social science scholars, I have assessed the potential negative impact of mine closure in terms of economical degradation, which further triggers a decrease in the quality of life in all respects, but also provides an insight of how these impacts were cushioned in the case of two coal mines that were closed, in Romania, respectively Germany. For this purpose, I gathered economic data related to the employment structure alterations in order to reflect the fall of the mining activity. In addition, data about the evolution of the population’s income was also collected in order to outline the influence of the mining process on this variable.

Mining towns are mostly located in areas that are economically and physically peripheral, face environmental degradation and negative health impacts, and experience high unemployment rates due to various reasons, including, for instance, the exhaustion of reserves. (Magrin, 2013: 203; Martinez-Fernandez et al., 2012b: 247–8). Economic components of these global control relations have received considerable attention in debates about the so-called ‘resource curse’ (Magrin, 2013: 103–37; Sachs and Warner, 1995). In practical terms, this means that, most of the time, mining in the goes along with political instability, forced displacement, disrupted and destroyed livelihoods, and violent conflicts on different scales (cf. Brand and Wissen, 2017; Campbell, 2009; Fischer et al., 2016).

The three technical or nonpolitical factors most commonly identified as contributing to the resource curse are:
(1) Revenue volatility;
(2) The Dutch Disease;
(3) Resource exhaustion.

**Revenue Volatility**

The volatility of petroleum and mineral prices and hence a large proportion of revenues is one of the most damaging aspects of resource dependence, and also lead to long-term uncertainty of commodity prices. This will translate into more volatile budgetary revenues for exporters of these resources. The long-term investments with high initial costs and degrees of risk demands stable and predictable operating environments. Market volatility around prices can make the benefits highly unpredictable, and their characteristic exhaustibility make any benefit time limited.

**Dutch Disease**

The phenomenon involves a significant appreciation of a state’s real exchange rate. This appreciation puts upward pressure on domestic prices, and is attributable to a sudden and major inflow of foreign exchange associated with resource exports. As a result, preexisting non resource exports and import competing industries lose their competitiveness, and domestic labor and capital shift to the resource and non tradable sectors, which diminishes the host state’s economic diversity.
Resource exhaustion

Oil, gas, and mineral resources are by their nature exhaustible, and by implication so are the exports on which the countries depend. This requires policy makers to plan in advance for resource decline and eventual exhaustion, identifying a resource horizon.

Comparison Study

The two countries have sufficient common characteristics to justify a unified assessment. The comparison is drawn by the role played. Lessons obtained from the case study allowed for a satisfactory validation of the proposed methodology. The comparison crosses the field of economics, policy making and resource management by observing mine closures in Jiu Valley, a large and relatively old mining area, parallel to the century-old Ruhr Mining Area, due to their similarities in frame and economic state.

Since Europe is one of the main actors on the world stage, its actions have the potential to propagate, influence and impact global economical order. A failure of adjusting to the new order would dissolve the EU’s international credibility and trading regime. In the current political environment, the favourable direction is to cooperate. This will enhance the position of the entire European Union worldwide. Coal’s market is disappearing because of its environmental costs and health implications, and is steadily replaced by natural gas, solar, wind, and hydropower. Since Romania joined the European Union in 2007, the use of fossil fuels has decreased dramatically, as consumers switched to either natural gas or biomass. This came as a result of the European Commission encouraging the member countries to make use of renewable sources. The fundamental relationship of the extractive industries with sustainability is clearly enunciated: since mining resources are not renewable, the conversion of nonrenewable natural capital into other forms of (renewable) capital is the fundamental objective.

As a bridge between East and West Europe, Romania can attract the attention of many major economic forces such as international interests and investments by leveraging its good geographical location on European maps. This comparison reveals the duality and sensitivity of the issue. The recommended approach is environmental awareness, reducing development disparities and supporting local communities, implementing ethical labor regulations and local procurement through labor practices, and volunteer services. Countries work together on this common task, with Germany leading the way and countries like Romania comply with the new ways, in order to assure the future economical prosperity of the entire region. The four dynamics of the new global economy—globalization, democracy, free markets, and sustainability - create an environment where economic, social, and ecological factors are increasingly interdependent.

Figure 1: European Energy Community Map Source: Euracoal
Mine closure is an area of high concern associated with generation of adverse impacts such as unemployment, the loss of community services and pollution, all of which threaten the fulfilment of the sustainable development goals that need to be fulfilled in order for the economy to prosper. Within this article, there is nonetheless a broad consensus about the fact that many negative consequences of mine closure could only be avoided by differently planning. This involves the establishment of closure funds, the stimulation of diversification, as well as infrastructural considerations. Successful environmental and social policies, for example, underwrite positive and sustainable impacts on the economy.

Some of the appropriate remedies that policy makers must take in order to address the negative economic outcomes include:

1. policies to smooth the expenditure of volatile revenues
2. introduction of resource funds for savings and stabilization
3. improvements in macroeconomic planning, and
4. forecasting and expenditure policies that improve the framework for investment and promotion of economic diversification.

Profound changes, political, social and cultural mutations that took place in the Romanian economy in the last two and a half decades have led to a radical change of its statute, transforming it from a centralised economy to a free market and functional economy, that needs to ensure its competitiveness both in Europe and worldwide. Romania’s coal production has almost halved during the last twenty years, mainly due to the restructuring process. These items underlying the shifting energy policies of all countries depend to a greater or lesser share of imported energy. Romania has a wide range of primary energy resources, but quantitatively reduced, so that indigenous coal has a decisive role in the national energy balance.

Today, Germany is by far the wealthiest country in Europe, and also the 4th largest economy in the world. Hard coal is the fossil fuel that helped Germany step out of the Industrial Revolution as an industrial giant and fuelled its prosperous economy after the Second World War. For 200 years, miners have been extracting coal from mines in Germany’s Ruhr valley, and used it to power steel mills and produce electricity to make the industrialisation possible. At their peak, in the 1950s the mines employed almost more than half a million workers, enshrining the region’s identity with coal. But coal has been on the verge of dissolving for a long time, needing money from subsidies in order to survive and polluting the environment. In the 1970s, as coal imports from other countries caused a steep increase in the price of German coal, it became unprofitable for the government to continue subsidizing the mines. The reserves are also located deep and in complicated geological areas, constituting a disadvantage in competing on the international market. With imported coal proving to be more economically profitable than the local coal, the Ruhr’s mines shut down one by one. Germany doesn’t end the use of coal as a fuel for its power plants for years to come, and the coal will have to be shipped from Russia, The United States, Australia, Columbia, Poland, Canada and South Africa, an alternative which does not support the local communities in the Ruhr Valley.

Thus, in Ruhr and the Jiu Valley, regional transformations show a few important parallels, but some key differences. Commonalities include demographic decline, persisting coal nostalgia, and continued disparagement in views over coal’s future. But the key characteristics and variations in the two regions discussed above, the nature and degree of state involvement, organizational life, show very different ways forward. Though the circumstances that shaped key regional differences continue to operate, contemporary global energy politics and market and environmental threats to coal profits have greatly transformed the general outlook.

Results of the comparison

This article reports on a comparison between the economical disjuncture of coal’s decline in Romania’s Jiu Valley and Ruhr Valley in Germany. The two areas are very similar in their background and present spirit, as coal’s decline produces generic consequences in former coal regions. Both of them have witnessed huge declines in industry and population drops during the last two decades, which has severely impacted their economy. Some of the post-industrial towns are recovering better
and faster than others, due to the factors that influence regional variation, such as political economy and state control over mining. Jiu Valley is characterised by a weakening of organization, while Ruhr Valley benefits more from an active organizational environment. This feature shapes the regions’ future. The population in Jiu Valley is protected by state intervention, but this weakens the role that the locals themselves might have in managing the economic challenge posed by mine closure. In Germany the tensioned social activism hosts conflict between coal supporters and coal detractors but also creates an intensity toward future changes.

Romania’s Jiu Valley and Germany’s Ruhr Valley were mono-industrial areas whose experience in coal’s decline is largely similar. When coal employment fell, hardship inevitably followed. In the Jiu Valley, the mining industry that once employed 50,000 people in the nineties, today employs about 4,000 workers, while in Ruhr Valley, the number of active coal miners fell from 500,000 in 1970 to by 2015. This was a consequence of multiple factors such as technological advancement, industry automation, global economic crisis in 2008, low cost natural gas, and renewable energy implementation.

Social issues also affect both regions. Nonetheless, significant differences define the zones, such as the differential abilities to continue to earn a living. The Romanian state provides safety-net protections for former miners, but other economic options in Jiu Valley are scarce. Underneath the conflict over coal, one sees intense challenge to the region’s coal dependency. These variations need explanation via policies of the European Union.

In both countries I was able to confirm the hypothesis of van Vliet (1998) and Magrin (2013: 205), that closure usually marks the most conflictual moment of mining town histories.

However, those areas with greater wealth and more diversified economies were able to absorb the shock of mine closure more effectively than poorer areas and those with less diversified economies.

Romania's continued efforts to adapt to a market economy within the environmental and economic constraints of the EU make this collection of data valuable as the eventual fate of the other mines in Jiu Valley is uncertain.

Survey Analysis

The aim of this survey is to provide governmental institutions and mining companies with an organised body of opinion on the side of the local population, that could be taken into account when dealing with mitigation of social impacts of future underground coal mine closures. It makes heard the voice of the population, the citizens’ take on the issue and their right to the city. In the already existing studies one will, more often than not, notice that conclusions are being drawn by people who have never visited the area, based on scientific research, but without any practical proof. Most of the times, only locals can truly understand the multi-faceted aspects of it and give a realistic insight which can have higher chances of developing a mechanism of adjustment in the case of mine closure that will match the reality of people who are living it, not only reading it from theoretical analysis.

The author realized a campaign field in 2018 in order to provide detailed field observations regarding the social and economic impacts of mining in Jiu Valley. Research consisted of altogether five months of participant observation and interviews. In 2018 the author did about 100 interviews in the city of Petrosani as part of a Master thesis on the socio-economical impact of coal mining in Jiu Valley. In 2019, another 50 semi-structured interviews were conducted with stakeholders (miners, managers and locals; local administrators, politicians, and activists). The investigation was formulated by the author in consultancy with experts from universities, research institutions and coal mining companies from Romania and conducted with the local population in the first place, as well as with inhabitants of other cities and regions in Romania, in order to get an objective result. Limitations of the present study mainly hold to language barrier, reluctance of answering and time constriction. The first part of the survey focusses on the miners themselves and their outlook on the current situation and proves that there exists an alteration in the quality of their life after the mines closed. The second part reflects outsiders’s view on the micro-region, on the mining industry there and on the miners as a whole class. Here, the author insisted upon the population dynamics that has been strongly influenced
over the time by the mining activity.

Even though the population of Jiu Valley enjoyed an ascending evolution during the peak exploitation period, the restructuring of the mining sector after 1990 triggered a series of demographic consequences, the most severe being the decrease of the birth rate and the increase of emigration.

In the collective perception at national level, Jiu Valley is associated to the coal-bearing mining. Hid- ing in subsoil the most important pit coal deposit from Romania, the area became interesting from an economic point of view 165 years ago. The heaviest burden the localities seem to face is the shortage of jobs. For many decades the coal mining industry was the biggest job provider in the area, but once the mines started closing, the workers have been gradually reduced as demand decreased. Therefore, a large number of people were left not only without an occupation, but without an alternative. When it comes to finding an alternative, a new job opportunity, the population is faced with another kind of disadvantage, besides the inherent disadvantage of the mono-industrial area and single professional qualification, and that is age. Moreover, there is a lack of implementation of employment policies through special programs by the local or regional public administration.

In general, interviewees complained that everything is going down and that the area would soon become a ghost town, if mining did not come back. The changing economic situation led to the questioning of political, social, cultural, and economic institutions. The most outspoken advocates for change are the groups that experienced the most pronounced ups and downs in economic and social terms, i.e. the workers. They are requesting for renewed mining, which means either a comeback of the former companies or the takeover of the same mines by another company, since they want their jobs back. Some locals think the actions should be focused on diversification and entrepreneurialism, and pose themselves against the return of mining.

Romania is an integrant part of the European Union and is enjoying a series of instruments for reducing the development disparities. The general objective of the micro-region represents the transformation of the cities located in the coal-bearing area in regions favorable to the economic development by replacing their dependence of the mining industry.

For this goal to be achieved, specific conditions must be fulfilled:
- The increase of the occupation degree of the population;
- The diversifying of the economic activities and the involvement of new investment companies;
- The involvement of investments in order to build/ modernise and rehabilitation of the infrastructure in the micro-region;
- The promoting and presentation of Jiu Valley as a touristic destination, attractive and accessible;
- The protection of the environment by acting against the main sources of pollution.

The rise in unemployment and the lack of alternative jobs for workers in the mining sector have been the causes of tensions and social conflicts that have in the past created a negative image of the area and a generalised misconception toward the inhabitants of Jiu Valley. These premises keep investors away, so the economic recovery of the region is rather slow. In order to reduce the negative effects, a program of social protection measures could alleviate the burden.

The profound significance of coal in the Jiu Valley leads to a worship of the natural resource. But its collapse represents the culprit of fear, uncertainty, and economic, social, political conflicts. As the main economical pillar dissolves, it splits community relationships into coal supporters and coal detractors and social organization between those owning the resource and the workers faced with job loss. Ever since its beginnings, mining in the Jiu Valley has shaped every aspect of life and was the force that pushed actions forward, from forming the Valley to its collapse. Although meant to create wealth and wellbeing, the coal industry in decline generates loss and violence.

Conclusions

This article does not pursue finding solutions for a sustainable development of Jiu Valley and Ruhr Valley, but only proves that mining decommissioning has generated an imbalance of all the
pillars of sustainability in the area, both qualitative and quantitative and that the responsible authority should take this into consideration. The study advances research on the nature and role of mining industry with respect to economy, which is very significant given their norm-setting potential. Moreover, many official reports have a classified status, so this study is important because it makes the understanding of the problem more accessible to the large public. This work also makes visible the citizens’ attitude toward the issue and their right to the city.

The future of the coal mining industry in Romania and Germany and the real possibility of getting coal in terms of profitability is based on reengineering competitive and fundamental redesign of the whole process of coal mining extraction that aims to report the significant improvement of the critical indicators of performance evaluation, starting with the quality and the volume of geological reserves to the cost and quality of the finished product.

There is a range of social risks and benefit-sharing principles that require coordinated engagement among the investor, the government, and the entire community (leaders, elites, mass, vulnerable groups). Well-designed social mitigation measures will undertake initiatives to reduce the dependency of the community on the mineral operation in order to avoid the collapse of it when production ceases. Good practice suggests a number of generic indications to be followed by investors and governments alike in responding to economical issues posed by mine closure.

It is crucial that any government learns lessons from its neighbours and identifies policies that have delivered positive outcomes, while avoiding the others. The capacity to form an integrated view, to extract lessons appropriate to one’s circumstances, and to apply knowledge accordingly is what differentiates winners from losers. No single approach will suit all country contexts. The adjustment process remains in the hand of the governments, which will need to tailor good practice to a specific national context, and assure it is up-dated over time if circumstances change.

**Future research recommendation**

Since this study proves that mining can no longer be a source of prosperity in the sense of socio-economical development, any further research should be directed toward alternative options, making use of the natural beauty of the region and also the existing pool of talent. The case of coal is a double edged sword, with climate action policies on one side and economic forces on the other leading to closing coal power plants in some countries, while coal continues to play an important part in securing access to affordable energy in countries where it is abundant and affordable. Risks associated with climate policy, potentially stranded assets, local opposition and the memories of the last downturn have cooled investor appetite to invest in new production, but the increased speed of productive and economic movement for the mining area towards the informational technology might dominate the economic and social field of the future society.

**References**


