

## Mine Closures and Local Diversification A Post-Coal Economy's Diverse Employment Opportunities for Coal Mining Communities

Esteban Fernández-Vázquez\*

University of Oviedo, Spain

### Abstract

By examining how a collection of local economies heavily specialised in mining diversified its economy after the cessation of state subsidies that supported coal extraction, this paper attempts to shed light on the research that links mining activities to regional diversification. The case in point is the mining municipalities in Asturias, an autonomous community in northern Spain, which made up one of the nation's most significant coal basins. Although the mining of coal was one of the key factors influencing the region's economic activity, the mine pits were only dispersed among a small number of municipalities [1-15]. The most significant negative repercussions of this strategy, which was first put into place in the Recent research (see Fitjar and Timmermans, 2019) suggests that this change in public mining policy should have resulted in a better diversification of the local economies that had previously specialised in mining operations, but it can be difficult to accurately evaluate this effect. Due to the limited number of geographical units that are directly impacted by the therapy, conventional approaches such as difference-in-differences are not feasible. In order to solve this issue, the Synthetic Control Method (SCM) estimation approach from Abadie and Gardeazabal (2003) is applied in this study. A weighted average of the untreated units (non-mining municipalities) produced by the application of the SCM closely resembles the treated unit over the pre-treatment period. The expected outcomes for this artificial control are then made using the weights determined from the. The counterfactual for the treated unit is this projection. This methodology will be used in conjunction with extensive historical data on local employment that has been categorised by industry and is available for all of the region's towns for the years 1978 to 2018. The Herfindahl-Hirschman Index (HHI), which is the variable of interest, is used to quantify the degree of diversification in each region. The use of this technique demonstrates how this accelerated the diversification of the mining area, producing significant differences on the HHI with the counterfactual synthetic unit and indicating that the level of concentration of the economic activity is significantly lower than it was in the early 1990s (when public policies of support for coal extraction started to end).

### Introduction

Recent economic geography research examines how the interdependence of different industries in a region affects its economic specialization and produces effects that go in opposite directions. On the one hand, a number of beneficial effects have been found. Local businesses may profit from knowledge spillovers between industries; this effect is amplified if the workforces of the two industries are similar. Evidence from empirical investigations indicated that locations with higher levels of related variety had grown at a faster rate. In particular, Boschma and Frenken's (2009) research focused on the economic activities using technology associated to the regional areas of speciality and how industrial relatedness in one location fosters the establishment of other sectors. These concepts have provided the theoretical foundation. However, if the activities of different industries depend on a shared pool of inputs, there may be interindustry competition in the factor markets as well as knowledge spillovers between these industries (e.g., workers with some specific skills). The so-called "Dutch Disease" is anticipated to have detrimental effects in these economies' non-resource sectors. Recent resource economics literature has examined this aspect from a different perspective by examining the implications for the performance of other industries competing for factors with a powerful resource-intensive industry. There have been prior attempts in this field of literature to discover theoretical pathways that aid in establishing links between the availability of natural resources and economic diversification has focused on the specific risks that specialisation in resource industries might entail for the economic diversification in developing nations. Due to the peculiarities of this type of activity, it was discovered that only a small portion of developing nations with an abundance of natural resources had been successful in diversifying their economies. investigate the relationship between economic resource exploitation and diversification for a sample of

resource-rich countries and discover a strong inverse relationship between oil dependence and diversity. According to this body of knowledge, we should anticipate some effects on the level of economic diversity when there is only one major natural resource business.

### Subjective Heading

By relating this potential pattern to the notion of regional inter-industry relatedness for the case of the effects generated by one natural resource industry—oil extraction—which played a dominant role in the regional economy of Stavanger, which was the main oil producer within Norway, Fitjar and Timmermans (2019) investigated it. These authors base their analysis of the consequences of the oil extraction industry's expansion on a time of rising oil prices on other industries. Their findings imply that industries associated to petroleum expanded more than unrelated industries, with an increase in labour expenses being the cost of this relatively higher expansion. The loss has yet another unfavourable impact on other economic activities..

\*Corresponding author: Esteban Fernández-Vázquez, University of Oviedo, Spain, E-mail: evazz@uniovi.es

Received: 04-Jul-2022, Manuscript No: jpm-22-69673, Editor assigned: 06-Jul-2022, PreQC No: jpm-22-69673 (PQ), Reviewed: 20-Jul-2022, QC No: jpm-22-69673, Revised: 22-Jul-2022, Manuscript No: jpm-22-69673 (R), Published: 29-Jul-2022, DOI: 10.4172/2168-9806.1000316

Citation: Fernández-Vázquez E (2022) Mine Closures and Local Diversification A Post-Coal Economy's Diverse Employment Opportunities for Coal Mining Communities. J Powder Metall Min 6: 316.

Copyright: © 2022 Fernández-Vázquez E. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Fitjar and Timmermans (2019) looked into the relationship between this potential pattern and the idea of regional inter-industry relatedness for the case of the effects produced by one natural resource industry oil extraction which played a dominant role in the regional economy of Stavanger, which was the main oil producer within Norway. These writers use a period of rising oil prices to frame their research of the effects of the oil extraction industry's expansion on other industries. According to their findings, petroleum-related industries expanded more than unrelated ones, and the price of this comparatively larger expansion was a rise in labour costs. Another negative effect of the loss is that it has on other economic activities.

## Discussion

Asturias, a territory in the northwest of Spain, is structured similarly to the other NUTS-2 regions in Spain as an autonomous community. Although the region has a long history of mining, including the centuries-old exploitation of gold and silver mines, coal mining only began in the middle of the 19th century. Since then, the Asturian coal pits have been one of the main producers of fossil fuels for the Spanish economy, providing fuel for both final consumption as well as intermediate input to other industries. Asturian coal mining went through numerous stages in the twentieth century, from extreme protectionism in the 1940s and 1950s during Franco's dictatorship to industrial modernization and nationalisation of mining. Private coal mine owners asked the government to nationalise their businesses in the middle of the 1960s because they were unable to bear the financial losses. The National Institute of Industry (INI) entered the coal industry as a result by founding the public company Hulleras del Norte Sociedad Anónima in 1967. (HUNOSA). Aside from this shift in ownership of the mines from private to public, the structural and technological changes in the Spanish economy led to the widespread substitution of oil for coal as the country's primary fuel by 1970. Additionally, important adjustments to the policies intended to assist coal mining as a sector resulted from Spain's accession into the European Economic Community in the middle of the 1980s. 91/3/EEC of the European Commission.<sup>2</sup> With this decision, the public subsidies received by the Spanish mining companies to cover operating losses were effectively put to an end. As a consequence of this change in the policy, the generally unprofitable Asturian coal mines decreased rapidly their activity and their weight in the regional economy dropped.

The effects of this change were not evenly distributed across the regions, rather they were mostly concentrated in a few specific places. Coal is extracted in Asturias in the area's south-central region and, to a lesser extent, in the southwest. The majority of Asturias' coal production historically has come from the mining municipalities found in the region's centre, known as the Central Coal Basin (CCB), with the Southwest Basin also having some coal mining activity, albeit on a much smaller scale. A cluster of six municipalities make up the central portion of the CCB's territories (Langreo, Mieres, Aller, San Martín del Rey Aurelio, Laviana and Morcín). Map depicts the general area of the

The municipalities in this region displayed a unique trend within the broad regional economic contraction or decline throughout the past few decades. In the late 1970s, there were 180,000 people living in the CCB area, making up more than 16% of the total population at the time. By 2018, that number had dropped to just over 120,000, making up less than 12% of the total population. In conclusion, it is possible to distinguish between two concurrent declining processes that began several decades ago in the Asturian region as a whole, as a result of several structural changes, which include the progressive mining closures; and a specific trend of the economies located in the region.

Due to the limited number of geographical units that are directly impacted by the therapy, conventional approaches such as difference-in-differences are not feasible. In order to solve this issue, the Synthetic Control Method (SCM) estimation approach from Abadie and Gardeazabal (2003) is applied in this study. A weighted average of the untreated units (non-mining municipalities) produced by the application of the SCM closely resembles the treated unit over the pre-treatment period. The expected outcomes for this artificial control are then made using the weights determined from the. The counterfactual for the treated unit is this projection. This methodology will be used in conjunction with extensive historical data on local employment that has been categorised by industry and is available for all of the region's towns for the years 1978 to 2018. The Herfindahl-Hirschman Index (HHI), which is the variable of interest, is used to quantify the degree of diversification in each region. The use of this technique demonstrates how this accelerated the diversification of the mining area, producing significant differences on the HHI with the counterfactual synthetic unit and indicating that the level of concentration of the economic activity is significantly lower than it was in the early 1990s (when public policies of support for coal extraction started to end).

## Conclusion

Comparing the CCB area to other areas in the region in terms of economic specialization also gives a more comprehensive picture of the significant transformation during the forty years under study. The percentages of employment in the CCB and the rest of Asturias are shown in Table 1 for the sectors of manufacturing, mining, and agriculture. These percentages demonstrate that, even in the 1980s and 1990s, the agricultural industry continued to play a significant role in the Asturian economy percentages greater than 10%, although it was significantly lower in the CCB than it was in the rest of the region. Furthermore, these data show that the CCB economy was predominantly dominated by coal extraction, with the number of jobs directly associated with this activity exceeding all others until 1990 before gradually declining thereafter. In conclusion, there were considerable discrepancies between the CCB and the rest of the region in terms of economic specialisation, but these gaps gradually vanished to lead to roughly similar economic structures in 2018.

## Acknowledgement

I would like to thank my Professor for his support and encouragement.

## Conflict of Interest

The authors declare that they are no conflict of interest.

## References

1. Amuda OS, Amoo IA (2007) Coagulation/flocculation process and sludge conditioning in beverage industrial wastewater treatment. *J Hazard Mater* 778-783.
2. Binnemans K, Jones PT, Manjón A (2020) Masaguer Torres Hydrometallurgical processes for the recovery of metals from steel industry by products a critical review. *J Sustain Metall* 505-540.
3. Cappuyns V, Swennen R (2008) The application of pHstat leaching tests to assess the pH-dependent release of trace metals from soils sediments and waste materials. *J Hazard Mater* 158: 185-195.
4. Chang JT, Lin JJ, Huang JS, Chang YM (2009) Recycling oil and steel from grinding swarf. *Resour Conserv Recycl* 49: 191-201.
5. Baradie MA (1996) Cutting fluids part II Recycling and clean machining. *Mater Process Technol* 56: 798-806.
6. Krauss G (2015) Steels Processing Structure and Performance. ASM International.

7. Lee CM, Choi YH , Ha JH (2017) Eco-friendly technology for recycling of cutting fluids and metal chips a review. *Int J Precis Eng Manuf Green Technol* 4: 457-468.
8. Lee H, Jung M, Bae M, Lee E (2020) Mishra B Removal of oil from ferrous grinding swarf of automobile industry by aqueous washing process. *Waste Manag* 111: 51-57.
9. Paul EL, Atiemo VA, Kresta SM (2003) *Handbook of Industrial Mixing Science and Practice*. John Wiley & Sons.
10. Ruffino BM, Zanetti MC (2008) Recycling of steel from grinding scraps: reclamation plant design and cost analysis. *Resour Conserv Recycl* 52: 1315-1321.
11. Song Z, Williams CJ, Edyvean RGJ (2009) Treatment of tannery wastewater by chemical coagulation. *Desalination* 164: 249-259.
12. Tunsu S, Petranikova M, Gergorić M, Ekberg C (2015) Retegan Reclaiming rare earth elements from end of life products a review of the perspectives for urban mining using hydrometallurgical unit operations. *Hydrometallurgy* 156: 239-258.
13. Virolainen S, Salmimies R, Hasan M, Häkkinen A (2019) Recovery of valuable metals from argon oxygen decarburization (AOD) dusts by leaching filtration and solvent extraction. *Hydrometallurgy* 140: 181-189.
14. WuX, Li Z (2021) Sharma Circulating purification of cutting fluid an overview. *Int J Adv Manuf Technol* 117: 2565-2600.
15. Lee CM, Choi YH , Ha JH (2017) Eco-friendly technology for recycling of cutting fluids and metal chips a review. *Int J Precis Eng Manuf Green Technol* 4: 457-468.