

# IMPACTS OF MINING IN LOW DENSITY REGIONS: A CASE STUDY IN CASTRO VERDE

**Conceição Rego**  
mcpr@uevora.pt

**Manuel Tagaroso**  
mtagaroso@hotmail.com

**Isabel Vieira\***  
impvv@uevora.pt

Departamento de Economia – Universidade de Évora (Portugal)  
and CEFAGE-UÉ

*(This version: May 2008)*\*

## **Abstract:**

Foreign direct investments are key elements in modern economies and many governments concentrate significant efforts in the attraction of capital to implement domestic projects. Mining activities are especially dependent on the interest of a few multinational corporations, which control the extracting industry around the world. In this particular case, the usual cycles of investment and disinvestment have a wide range of potential positive and negative effects that overlap the usual economic and social considerations, also comprising impacts upon the environment and landscape viability in areas surrounding the mines. This study assesses various impacts from a mining foreign direct investment project, implemented in a low density Portuguese region. Attention is focused on the main economic, social, cultural and environmental aspects, and the preparatory measures to prevent the adverse consequences from the closure of the mine are briefly analysed.

**JEL Codes:** R11, O12, L7

**Key words:** Regional economies, Mining FDI, development

---

\* Corresponding author.

• Preliminary work. Please, do not quote.

## 1. Introduction

The impact of foreign direct investments (FDI) in host economies has been an object of interest for both academics and politicians. Although it is difficult to anticipate the liquid effects of each FDI project, the image of multinational corporations has significantly changed with time. In fact, FDI has grown from being considered an intolerable interference in the sovereignty of hosting countries, to be viewed as a source of funding for capital starved regions and also as a way of rapidly transferring modern business and management techniques to economies in transition, or to areas that are distant from the big international development centres.<sup>1</sup> This has occurred in spite of the knowledge that the activities of multinational corporations may either promote growth and development, or generate dependence links that lead to economic, social and, at times, environmental depression, once disinvestment takes place.

From the point of view of the areas aiming at attracting foreign capital, FDI may contribute to improve the competitiveness of the hosting territories, following its positive impacts upon the labour market, or in a broader perspective, upon the dynamics of local economies (Cuervo-Cazurra, 2008). Such effects, resulting directly and indirectly from the activities of the foreign firms, are usually more visible in regions lagging behind in terms of development and exhibiting growth problems resulting, inter alia, from low labour mobility, peripheral location, or deficient entrepreneurial environments.

The importance of FDI is currently recognised by most governments and its key role is acknowledged by the fact that many countries have implemented policy measures specifically designed to enhance their attractiveness in the eyes of foreign investors. Such instruments may be non-specific or be directed to attract funds to precise regions or particular economic activities.<sup>2</sup> In the last decades, the number of goods and services mainly supplied by multinational corporations has increased and the functioning of entire domestic industries is critically dependent on the interest of international entrepreneurs. In Portugal, this is clearly the case of mining, where FDI has a major role in the implementation of projects and where a lack of foreign investment often translates into a stagnation of extracting activities.

---

<sup>1</sup> See, for Dunning (1993).

<sup>2</sup> See, inter alia, Chatterjee (2002), or Naito (1998).

The dependence of the Portuguese mining sector in relation to FDI is particularly visible in the consistent cycle of expansion, following an inflow of capital, and subsequent depression after disinvestment. Such process is often accompanied by phenomena of population and income growth during expansion, and economic, social and environmental degradation once mining activities are terminated or restricted. Examples are evident in the Portuguese region of Baixo Alentejo, across the so-called Faixa Piritosa Ibérica, in the mines of São Domingos, Lousal or Aljustrel. Although solutions for some of these problems are currently being implemented, namely via recovery projects executed with the financial support of the European Union, many persist and greatly restrict the recovery of these territories.

This is the reality motivating the present analysis, aimed at assessing the main impacts of an FDI mining project, implemented in the copper and tin mine of Neves Corvo by the Sociedade Mineira de Neves Corvo (Somincor), a firm currently owned by Lundin Mining Corporation. The study is organised as follows: these introductory remarks are followed by a section presenting relevant information on Somincor and on its hosting territory. A third part contains the assessment of the main economic and social impacts and the results of an analysis based on a regional impact index. Section four concludes by briefly analysing the most probable outcomes in case of mineral exhaustion or abandonment of the extracting activities.

## **2. Somincor and the Castro Verde Region**

Somincor was founded in 1980, with the objective of assessing the viability of mineral exploitation in the site of Neves Corvo. The firm was always partly owned by foreigners, initially by French and then subsequently by British, Canadian and Swedish firms. At first, the shareholders were Empresa de Desenvolvimento Mineiro, controlling a share of 51% of the capital and owned by the Portuguese state, the Société Minière et Methallurgie de Peñarroya Portugaise, Lda and the Société d'Études de Recherches et Exploitations Minière, S.A., both holding 24,5% of the capital. The two French enterprises had a major role in the process of identifying the mineral bed of Neves Corvo, one of the worlds largest and richest in copper and tin contents. In 1985, the British Rio Tinto Zinc, one of the major international mining enterprises, bought the share of French capital. Later, in 2004, the Canadian Eurozinc Mining Corporation

acquired the totality of the capital. Finally, in 2006, following the fusion with Lundin Mining, Lundin Mining Corporation was created, and is the current owner of Somincor. This succession of mergers and acquisitions is in line with what is usual in mining FDI and is essential in a sector where access to the latest technological updates is crucial.

Somincor located its headquarters in Castro Verde, a town in the vicinity of the Neves Corvo site, which hosts the productive infrastructures (the mine, washers and other support facilities), but also has offices in Lisbon, for the administration, commercial and financial services, and expedition services in the port of Setúbal, the destiny of extracted minerals, mainly copper and tin, carried from Neves Corvo by train.

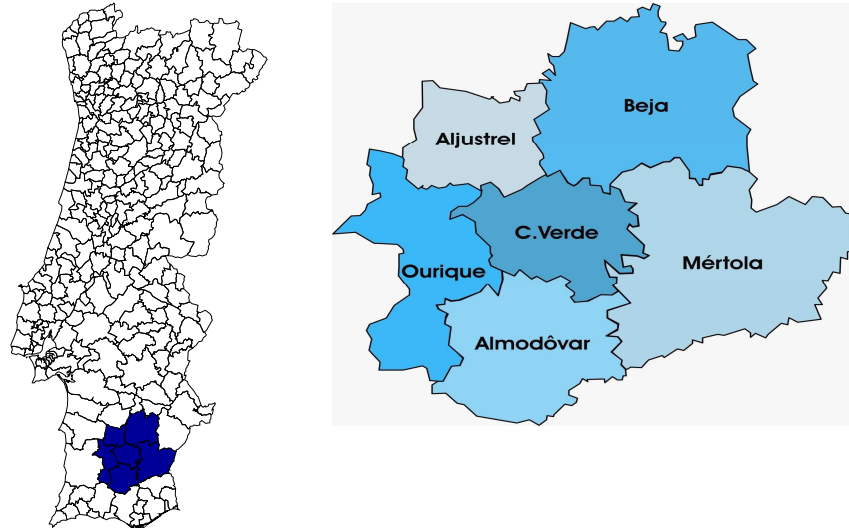
In 1989, when work on the mine began, around 1000 employees were allocated to productive activities but, by 2006, their number had decreased to 916. The majority of workers were recruited in the towns surrounding the mine and only the higher rank personnel came from more distant locations. Given the specific characteristics of mining, the level of the workers' professional qualifications is high. The opposite occurs in terms of academic background, as more than half of the workers completed very basic educational levels (four years of schooling). This figure is especially significant because it is registered within a rather young group of people. Around half of the firms' workers have up to 40 years of age.

In the first years, Somincor extracted around 1000 tons of minerals per year, having currently evolved to around 1797 tons. The amounts of extracted minerals are nevertheless a poor proxy for the returns of mining, as the mineral contents of the material extracted and the prices quoted in world markets may be quite variable (Garcia et al., 2001). In fact, although Somincor's profits reached around €50 millions/year in the first four years, in 1993 and in the end of the 90s it incurred negative results, mainly due to a decline in the quotation of copper in world markets and to a rise in operational costs. More recently, the recovery of international markets translated into positive returns. Also contributing to this upturn was the adoption of new technologies and the reduction in the number of workers, i.e. a rationalisation of the firms' modus operandi.

The site of Neves Corvo is located near the town of Castro Verde, in the Portuguese South region of Baixo Alentejo (see figure 1). Castro Verde, as the host of Somincor's headquarters, is the territory benefiting the most with its physical presence, registering an evolution that is quite distinct from that of neighbouring towns. The latter is clear in comparative analyses involving Castro Verde and its vicinity, before and after the

existence of Somincor. The enterprise appears to have been a direct promoter of a number of economic and social activities, later described in this study.

**Figure 1 – Portugal and the Baixo Alentejo Region:**



Baixo Alentejo is one of the poorest Portuguese regions, displaying very low levels for most economic and social development indicators. The area is mainly rural, and for centuries depended on agriculture and extensive cattle breeding, often developed in large farms (*latifúndios*). Recently, the primary sector lost weight in favour of tertiary activities such as petty trade, proximity services and public administration. This trend was not followed by Castro Verde where, due to Somincor, the secondary sector is dominant.

The demographic density in Castro Verde, and in Baixo Alentejo in general, is low and the average age of the population is quite high. In the past, the lack of jobs promoted migration outflows, which were clearly reduced when mining activities began. From the end of the 80s onwards, the availability of employment in activities distinct from the traditional rural ones, led to the retention of locals and, simultaneously, attracted younger and more qualified persons to Castro Verde. As a consequence, the demographic characteristics of the area have grown rather distinct from those of the surrounding territories, although the relative weight of the eldest is still dominant.

These and other effects related to the activities of Somincor are the object of this study, developed following a two-step approach. Firstly, a descriptive analysis of direct impacts is performed. After that, a Regional Impact Index (RII), inspired in the United

Nations' Human Development Index, is calculated, to compare the effects of the enterprise in the different zones of the territory of interest. The sources for the utilised data are the Instituto Nacional de Estadística (INE), Somincor and a number of local institutions.

### **3. Empirical Assessments**

With the objective of identifying Somincor's impacts in economic, social and environmental terms, a comparative analysis of Castro Verde and the neighbouring towns is performed, using raw data and the information obtained with the RII. The theoretical basis for this type of analysis is provided by the divergent development theories, originating in Myrdal's Circular Causation Model (see, Aydalot, 1985). In this context, when for whatever reason an industrialisation process is started, in a specific location, such space is endowed with the capacity to develop dynamics that will have a positive impact upon the competitive potential of the region.

Therefore, the implementation of a productive activity (in this case by Somincor) in a specific area, originates the growth of local employment and of resident population. It also increments industrial know how and enhances the region's capacity to attract productive capital, motivated by the pressure of an increased demand for goods and services. This, on its term, stimulates their supply and improves the community's quality of life. The expansion of fiscal revenues, promoted by the economic growth, allows an improvement of local infrastructures, which will be able to attract more firms and more population, in a virtuous, cumulative cycle.

According to what follows, Somincor appears to have planted the seed of a virtuous development cycle in Castro Verde. What remains to be seen is whether such seed, and the plant that it has produced so far, are strong enough to keep the positive cumulative trend in motion, once the original source of strength fades away.

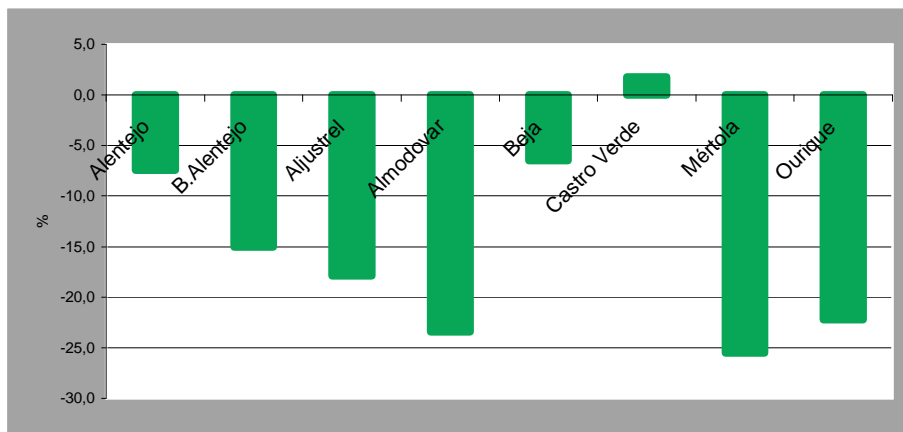
#### **3.1. Economic and Social Impacts**

The assessment of the economic and social impacts originating in Somincor is developed by focusing on the comparative behaviour of variables such as population

and employment, local income, gross added value (GAV), education, health or housing conditions. Cultural and environmental aspects are also taken into consideration.

One of the most striking differences between Castro Verde and the neighbouring towns emerges in the analysis of the resident population. In the last twenty years, Castro Verde is the only area where the resident population increased, clearly at odds with what is observable in the surrounding areas (see figure 2).

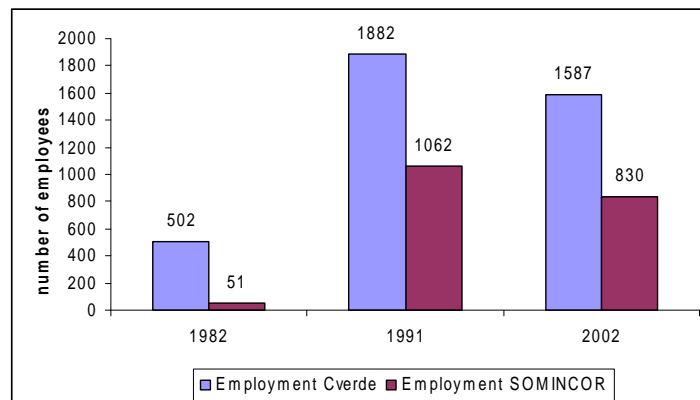
**Figure 2 – Growth of Resident Population 1981/2001**



Source: INE.

The growth of resident population is a consequence of the direct employment created by Somincor, but also of the effects of indirect job creation, usually associated to the mining activities, i.e. building and public construction or services such as those related to restaurants, trade, repairs, etc (see figure 3).

**Figure 3 – Employment in Somincor and in Castro Verde**



Source: Somincor and INE

In 1982, Somincor's employment amounted to 10% of Castro Verde's. In 1991, with the beginning of the extracting activities, that share grew to around 50%, and remained more or less stable, despite the decrease in the number of jobs, registered in 2002.

Although the level of professional qualifications of Somincor's workers is rather high, their schooling attendance is generally very low. However, even in this respect, the situation of the firms' employees is better, not only for having been in school for longer, but also for having had the opportunity to enrol in a number of courses that improve their employability (see tables 1 and 2).

**Table 1 – School attendance by local employees, 2002**

	No schooling	4 years	9 years	12 years	Higher education	Total
<b>Somincor</b>	0	622	17	141	50	830
<b>%</b>	0	75	2	17	6	100
<b>Castro Verde</b>	135	1982	10	135	338	2600
<b>%</b>	5.2	76.2	0.4	5.2	13	100
<b>% Somincor in Castro Verde</b>	<b>0</b>	<b>31.4</b>	<b>170</b>	<b>104.4</b>	<b>14.8</b>	<b>31.9</b>

Source: Own calculations with INE and Somincor's data.

From the inception, Somincor has promoted around 400 courses in distinct areas, thus contributing to improve its workers capacities and promoting their sustainability in case the mine in Neves Corvo closes.

**Table 2 – Courses promoted by Somincor up to 2002**

Total	Extraction of minerals	Mineral transformation	Administration	Geology	Other
400	72	60	88	44	136

Source: Somincor

Other than promoting the growth of general employment, Somincor has also contributed to the emergence of regional disparities, visible in the productive structure, levels of labour compensation and gender pay gaps (see table 3).

**Table 3 – Labour Market Indicators, 2002 (%)**

Region/Indicator	Employment in firms with <10 workers	Employment in firms with > 250 workers	Gender gap in monthly average gains
Portugal	24,2	23,8	12,3
Alentejo	32,1	18,7	13,2
Baixo Alentejo	42,1	18,7	8,5
Aljustrel	45,7	9,8	4,1
Almodôvar	58,4	7,3	5,6
Beja	35,6	23,0	6,9
Castro Verde	<b>25,1</b>	<b>55,0</b>	<b>12,8</b>
Mértola	55,3	3,7	1,0
Ourique	47,5	17,3	9,1

Source: Ministry of Work and Social Solidarity.

The gender pay gap in Castro Verde, though similar to that of Portugal and Alentejo, is bigger in Castro Verde than in the surrounding councils. This fact may be explained by the higher salaries paid by Somincor, who employs mainly men. Contrary to what is typical in Portugal, in Castro Verde the majority of the employment is allocated to firms with more than 250 workers. This is solely due to the employment generated by Somincor who pays around 68% of the salaries received by the residents in Castro Verde.

Beyond these impacts on the workers' income, the dynamics of other activities may have been directly and indirectly promoted by the mining project. In fact, the inflow of revenues generated by the mine, promoted the emergence of a number of firms in distinct economic sectors, namely restaurants, petty trade, building and construction (see table 4).

**Table 4 – Number of firms, per sector of activity, in Castro Verde**

NACE	1982	1992	2001
Agriculture, hunting and forestry	16	43	31
Mining and quarrying	1	1	1
Manufacturing	9	12	15
Construction	-	11	9
Wholesale and retail trade, hotels and restaurants	18	46	53
Transport, storage and communication	-	1	8
Financial intermediation, real estate, renting and business activities	-	1	2
Other community, social and personal service activities	6	13	5
Total	50	128	124

Source: MWSS, 1982 and 1992; INE 2001.

In spite of the enhancement of local economic activities, it appears that the maximum impact has already been attained. Not only the total number of firms in Castro Verde is currently lower than in 1992 but, as shown in table 5, the number of jobs has also diminished.

**Table 5 – Number of Employees, per activity sector, in Castro Verde**

NACE	1982	1992	2001
Agriculture, hunting and forestry	137	158	79
Mining and quarrying	51	959	816
Manufacturing	66	57	49
Construction	55	233	81
Wholesale and retail trade, hotels and restaurants	91	297	243
Transport, storage and communication	36	46	28
Financial intermediation, real estate, renting and business activities	15	61	52
Other community, social and personal service activities	51	71	62
Total	502	1882	1410

Source: MWSS, 1982 and 1992; INE, 2001.

The development promoted by Somincor is also visible in the data relative to energetic consumption and local firms' sales. The figures displayed in table 6, confirm that the economic activity in the town is more significant than that of the surrounding territories, with the exception of Beja, the capital of Baixo Alentejo, and much larger than any of the other towns.

**Table 6 – Sales and industrial consumption of energy, 2001.**

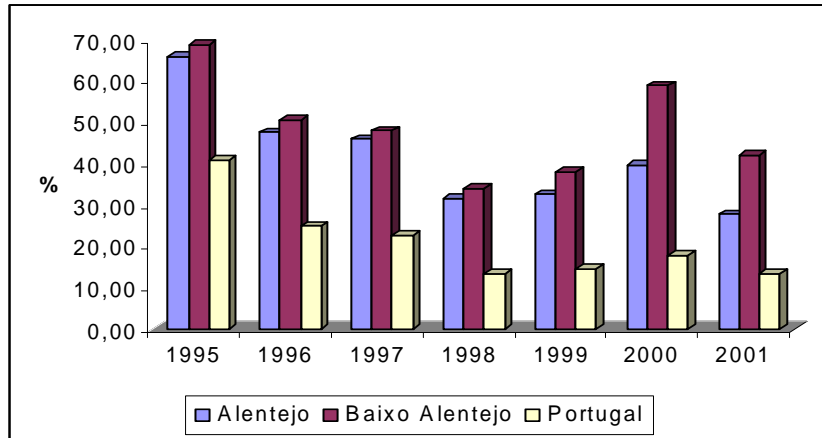
	Volume of sales (millions of euros)	Industrial consumption of energy (KWh per capita)
<b>Aljustrel</b>	42	61.4
<b>Almodôvar</b>	14	14.7
<b>Beja</b>	395	21.3
<b>Castro Verde</b>	<b>134</b>	<b>918.6</b>
<b>Mértola</b>	18	3.3
<b>Ourique</b>	22	31.3

Source: Own calculations, Ine data.

The impact upon the product is analysed using data on the firms' gross added value (GAV) at constant prices, and is assessed at the local, regional and national levels. In this respect, and according to figure 4, by 1995 the Somincor's contribution is quite

high for Portugal, amounting to around 40% of the GAV in the sector of extractive industries. With time, such trend is declining, but remains significant in Baixo Alentejo.

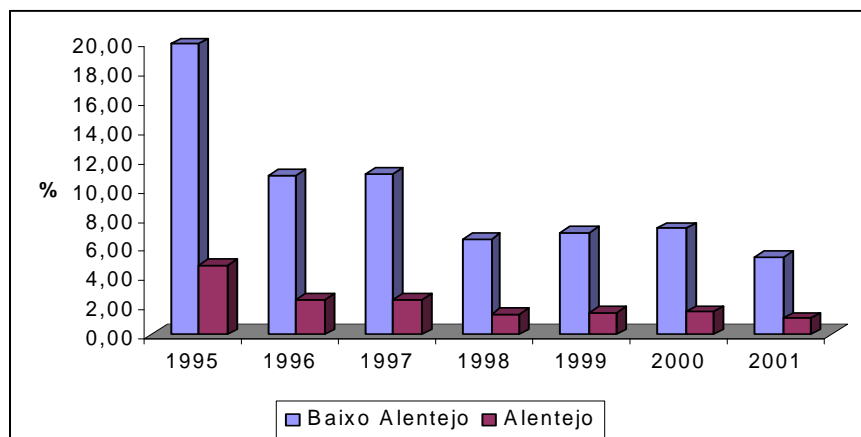
**Figure 4 – % of Somincor’s GAV in the extractive industries**



Source: INE and Somincor data, own calculation.

The weigh of Somincor in the Alentejo’s product is relatively less significant and the decreasing trend is also clear. In six years, the share has declined from 20% to around 5%. The fall is less dramatic, but stilt important, for the sub-region of Baixo Alentejo (see figure 5).

**Figure 5 – % of Somincor’s GAV in Alentejo and Baixo Alentejo**



Source: INE and Somincor data, own calculation.

Apart form the economic impacts, a number of social, cultural and environmental effects are also registered and may be associated with the presence of Somincor in Castro Verde. Table 7 presents some data on education, health and cultural/sportive activities.

**Table 7 –Indicators for Castro Verde: education health and culture**

<b>Education</b>	<b>1980/1981</b>	<b>1993/1994</b>	<b>2001/2002</b>
Number of schools	25	26	27
Number of enrolled students	1066	1531	1050
Teachers and Educators	79	105	116
<b>Health</b>	<b>1981</b>	<b>1991</b>	<b>2001</b>
Health Centres	1	1	1
Medical Centres	5	5	5
Pharmacies	1	1	1
Medics	4	7	8
Nurses	6	9	11
Other human resources	15	16	18
<b>Culture and Sport</b>	<b>1981</b>	<b>1991</b>	<b>2001</b>
Of sportive nature	3	4	4
Corals	3	7	8
Recreational Societies	2	3	3
Press and radio	0	2	2
Cinema, art galleries, museums.	3	11	12
Archives and Libraries	2	3	3
<b>Total</b>	<b>13</b>	<b>30</b>	<b>32</b>

Source: Local Development Agencies, Castro Verde Council, Association CORTIÇOL, Castro Verde Health Centre, Schooling Delegation of Castro Verde, INE, Somincor.

Castro Verde was the only town in Baixo Alentejo registering an increase in resident population in the last twenty years. This fact is reflected in the growth of its educational, health and cultural infrastructures. In this respect, the role of Somincor draws from the fact that the firm is the main employer and has also contributed, via the local taxes paid and the direct subsidies conceded, to many local cultural and sportive institutions. According to Somincor's data, from 1989 to 2001, around € 3.500000,00 were paid in subsidies and €6.700.000,00 in local taxes.

On the environmental front, the implementation of the mining project has awakened the local consciences for ecological problems. A number of institutions are currently involved in projects of environmental impacts' valuation and of ecosystems' preservation, promoted both by the local government and by Somincor, which are in place almost from the beginning of the mining activities, in the early 80s.

Mining has important impacts upon the environment and the landscape, as it is a source of constant noise and dramatically changes the countryside, with the emergence of

buildings, roads and tunnels to get access to the underground. Important implications for the quality of the water and of the air may also arise, resulting from the suspended particles with high contents of heavy metals. If such industrial residues are not treated, they may be a cause non-negligible damage for the human and animal life.

Probably as a result of the implementation in Portugal of laws to prevent the environmental degradation associated to mining, but also due to the firm's attitude in this respect, Castro Verde currently displays relatively better environmental indicators than the rest of the whole country. For instance, it registers the highest levels of waste recycling per capita. Another example is the international prize awarded to a Castro Verde's program of environmental sustainability, denominated 'Sustainable Castro Verde', at the 2005 universal exposition, in Aichi (Japan), in the context of the 'Global 100 Eco-Tech Awards'. These prizes distinguish outstanding projects aimed at solving environmental problems and promoting the sustainability of environmental resources.

### **3.2 – A Regional Impact Index**

In spite of the criticism surrounding the use of indices to measure development, they are often used, among others by institutions such as the World Bank or the United Nations.<sup>3</sup> The latter is pioneer in the use of composite indices, an example of which is the Human Development Index, utilised to rank countries in terms of relative development levels. This United Nation's index is the basis for the RII used in this study, a synthetic index obtained by aggregating a set of indicators that are central in the analysis performed so far. The RII is calculated for three domains: population and social conditions, economic dynamics and public health and environment. Table 8 synthesises the information used in the construction of the RII.

---

<sup>3</sup> See, for instance, Ames and Carlson (1968).

**Table 8 – Domains of the Regional Impact Index**

Domain	Variables	Unit	Minim ,value	Maxim. value	(+) or (-) link with development
<b>Population and Social Conditions</b>	- Population Growth Rate (1981/2001)	%	-25,5 (Mértola)	5,3 (Portugal)	+
	- Illiteracy Rate	%	9 (Portugal)	26,2 (Ourique)	-
	- Medics per 1000 inhabitants	N.º	0,6 (Mértola)	12,4 (Lisboa)	+
	- Local Council expenses with cultural activities per capita	€	27 (Ourique)	261 (Alcoutim)	+
<b>Economic Dynamics</b>	- Activity Rate	%	35,9 (Mértola)	48,2 (Portugal)	+
	- Unemployment Rate	%	6,8 (Portugal)	12,7 (Aljustrel)	-
	- Energy Consumption per capita	Khw	1,6 (Mértola)	53,3 (Sines)	+
	- Enterprises' revenues per capita	€	1719,1 (Almodôvar)	26758,4 (Portugal)	+
<b>Public Health and Environment</b>	- Recycling per capita	Kg	2,5 (Mértola)	315,8 (C. Verde)	+
	- Population served by municipal residual waters treatment services	%	21,3 (Mértola)	100 (Máximo)	+
	- Municipal expenses in Health/Environment	€	11 (Ourique)	118,6 (C. de Vide)	+
	- Population served by solid waste recovery services	%	85 (Almodôvar)	100 (Máximo)	+

Source: Own calculations, INE data.

The maximum and minimum values registered for the distinct variables are used to limit their values between the extreme limits (worst situation = minimum, and best situation = maximum), for those cases where a direct relationship between the variable and development exists. There are only two situations where such link is negative, i.e. the unemployment and illiteracy rates, and in these cases the opposite occurs (the worst situation is associated with a maximum and the best with a minimum).

In line with the methodology adopted by Lopes (2001), the variables are normalised as follows:

- If the relationship with development is positive:

$$(\text{current value} - \text{minimum value}) / (\text{maximum value} - \text{minimum value});$$

- If the relationship with development is negative:

$$(\text{maximum value} - \text{current value}) / (\text{maximum value} - \text{minimum value}).$$

All normalised variables assume values between 0 and 1, which represent their weight on the domain and on the RII. In this case, the obtained values are identical for all variables: the share of each variable in the respective domain is 0,25 and its share in the IIR is 0.083(3). Therefore, in the calculation of the index, all variables are assumed to have identical weight.<sup>4</sup>

The results obtained for the first domain, population and social conditions, are displayed in table 9.

**Table 9 – RII (1): Population and Social Conditions**

	<b>Population Growth Rate</b>	<b>Illiteracy Rate</b>	<b>Medics per 1000 inhabitants</b>	<b>Cultural Expenses of Council Authorities</b>	<b>RII(1)</b>
Portugal	1,00	1,00	0,22	0,16	0,60
Alentejo	0,59	0,60	0,09	0,27	0,39
Baixo Alentejo	0,34	0,47	0,08	0,37	0,31
Aljustrel	0,25	0,52	0,01	0,52	0,32
Almodôvar	0,07	0,19	0,03	0,37	0,16
Beja	0,62	0,77	0,25	0,26	0,48
<b>Castro Verde</b>	<b>0,89</b>	<b>0,61</b>	<b>0,01</b>	<b>0,62</b>	<b>0,53</b>
Mértola	0,00	0,37	0,00	0,42	0,20
Ourique	0,11	0,00	0,02	0,00	0,03

Source: Own calculations, INE data.

The information provided by the RII allows the ranking of the different regions and towns, in the same way the Human Development Index, calculated by the United Nations, classifies countries in terms of development levels. Considering the neighbouring towns with comparable dimension (and thus excluding Beja), Castro Verde ranks first for this domain, and comes second only to Portugal. Although with a relatively worst performance for illiteracy rates and number of medics, the town still ranks higher than most similar ones.

Given that the population base and its social characteristics are key elements for development, and taking into account the role played by Somincor in the progress registered by Castro Verde for most variables in this domain, it may be concluded that the RII analysis confirms the assessments performed before.

<sup>4</sup> For the sake of brevity, the actual calculus of the RII is not shown, but is available upon request.

The RII values for the economic dynamics are presented in table 10.

**Table 10 – RII (2): Economic Dynamics**

	<b>Activity Rate</b>	<b>Unemployment Rate</b>	<b>Energy Consumption p. cap.</b>	<b>Enterprises' revenues p. cap.</b>	<b>RII(2)</b>
Portugal	1,00	1,00	0,05	1,00	0,76
Alentejo	0,74	0,73	0,03	0,44	0,48
Baixo Alentejo	0,54	0,20	0,04	0,18	0,24
Aljustrel	0,28	0,00	0,02	0,09	0,10
Almodôvar	0,29	0,88	0,00	0,00	0,29
Beja	0,88	0,61	0,02	0,37	0,47
<b>Castro Verde</b>	<b>0,69</b>	<b>0,19</b>	<b>0,39</b>	<b>0,64</b>	<b>0,48</b>
Mértola	0,00	0,07	0,00	0,02	0,02
Ourique	0,44	0,37	0,01	0,08	0,23

Source: Own calculations, INE data.

The relative position of Castro Verde in terms of economic indicators is also relatively good. It comes in the second position, losing only for Portugal and displaying a figure equal to Alentejo. Although the performance in terms of unemployment is relatively worth, the town is in a much better condition than the surrounding towns of similar dimension.

The RII values for the third domain considered in this study, public health and environment, are contained in table 11.

**Table 11 – RII(3): Public Health and Environment**

	<b>Recycling p. cap.</b>	<b>Pop served by municipal residual waters treatment</b>	<b>Municipal expenses in Health/Environment</b>	<b>Pop served by solid waste recovery</b>	<b>RII (3)</b>
<b>Portugal</b>	0,07	0,43	0,37	0,91	0,44
<b>Alentejo</b>	0,04	0,62	0,23	0,73	0,40
<b>Baixo Alentejo</b>	0,12	0,77	0,28	0,78	0,49
<b>Aljustrel</b>	0,00	1,00	0,09	1,00	0,52
<b>Almodôvar</b>	0,00	0,44	0,54	0,00	0,24
<b>Beja</b>	0,06	1,00	0,16	0,95	0,54
<b>Castro Verde</b>	<b>1,00</b>	<b>0,90</b>	<b>0,11</b>	<b>0,60</b>	<b>0,65</b>
<b>Mértola</b>	0,00	0,00	0,59	1,00	0,40
<b>Ourique</b>	0,00	0,48	0,00	0,27	0,19

Source: Own calculations, INE data.

In this third domain the privileged position of Castro Verde is evident. The town is first in the ranking, gaining even when the whole country is considered. The biggest contribution is provided by recycling per capita, an aspect that highlights the environmental concerns of the local population. These, as previously referred, were

greatly enhanced by the behaviour of Somincor aimed at preventing and solving the environmental problems associated with mining.

**Table 12 – RII Summary**

	<b>IIR (1)</b>	<b>IIR (2)</b>	<b>IIR (3)</b>	<b>IIR 2001</b>
<b>Portugal</b>	0,60	0,76	0,44	0,60
<b>Alentejo</b>	0,39	0,48	0,40	0,43
<b>Baixo Alentejo</b>	0,31	0,24	0,49	0,35
<b>Aljustrel</b>	0,32	0,10	0,52	0,32
<b>Almodôvar</b>	0,16	0,29	0,24	0,23
<b>Beja</b>	0,48	0,47	0,54	0,50
<b>Castro Verde</b>	<b>0,53</b>	<b>0,48</b>	<b>0,65</b>	<b>0,55</b>
<b>Mértola</b>	0,20	0,02	0,40	0,21
<b>Ourique</b>	0,03	0,23	0,19	0,15

Source: Own calculations

The summary of the results obtained for the RII (in table 12) suggests that the Castro Verde town is distinct from those of similar dimension in the Baixo Alentejo region: Aljustrel, Almodôvar, Mértola and Ourique. The differences are evident in the social, economic, cultural and environmental contexts and may be related to the presence of Somincor in Castro Verde. The fact that, for the last thirty years, the town has benefited from domestic, but mainly from foreign capital, directed to the exploitation of the mineral bed of Neves Corvo, has visibly transformed its physical, human and financial endowments.

#### **4. Concluding Remarks**

The existence of foreign entrepreneurs interested in the exploitation of local mineral resources is fundamental for the development of regions endowed with such natural assets. Globally, mining is controlled by a few multinational corporations and most countries do not have the means or the know how to take advantage of their resources. Therefore, in spite of the fact that FDI may have both positive and negative liquid impacts in the hosting territories and of the tradition of large economic, social and environmental costs following disinvestment in the case of mining, governments are eager to attract such funds.

In the case of the mining project assessed in this study, that of Somincor in the site of Neves Corvo, the benefits appear to be compensating costs, at least up to the moment.

Somincor has been contributing to positively differentiate the town of Castro Verde and its surroundings. Although Castro Verde is located in one of the most economically depressed regions in Portugal, in the last decades, it was able to attract population, improve social, cultural and physical infrastructures and currently displays better development indicators than those of the similar towns in the vicinity. Somincor may be considered as the main promoter of such development, for its presence is the main distinctive characteristic in the analysed territory.

It was due to the implementation of this FDI project that Castro Verde was able to attract outside population, now living and working in the town. Following the growth of resident population and of the activities associated to mining, demand increased and so did the supply of goods and services and the entrepreneurial activity, in a virtuous cycle that appears to be in motion in Castro Verde, despite the low qualifications of the local work force.

At the same time, the past outflows of youngsters have been substantially reduced. People that used to migrate, searching for a better life and escaping the rural, poorly paid, available occupations, are now staying and raising families in Castro Verde. The higher salaries paid by Somincor are a source of much needed resources and have contributed to improve life standards in the region. By not being financially penalised for staying in Castro Verde, local families are able to take care of the elder and provide for a better education of the younger while, simultaneously, enjoying a quality of life unavailable in the neighbouring towns.

It is almost impossible, with the available data, not to link Somincor to the improved development indicators displayed by Castro Verde. However, one of the currently most pressing questions concerns the sustainability of this virtuous cycle. It is well known that mining is transitory and mining FDI usually change location following the exhaustion of local resources and/or the trends of international markets.

In this case, the main objective of local authorities is to prevent a collapse of the local economic dynamics when Somincor leaves. A number of measures have already been implemented and others are being prepared for future execution. Efforts have been directed to endow the region with the physical infrastructures needed to attract entrepreneurs. So far, it appears that the major problem is demographic. In fact, although Castro Verde has registered a remarkable increase of resident population, it was not enough to invert the demographic pyramid and the share of elders is still

dominant. This is a key restriction that may endanger the process of economic renewal, necessary to generate viable alternatives to mining.

On the part of the national government, the environmental problems appear to be the main source of concern and attention is focused on guaranteeing that the Neves Corvo site is left as undamaged as possible. Taking into account the country experience and the examples available worldwide, this is an important aspect to consider. However, the past also suggests that, if the landscape and environmental recuperation of regions with abandoned mines is difficult, their economic and social recovery is always harder. Consequently, anticipation is vital to guarantee the means indispensable to support the current development process.

### **References:**

AMES, E. and CARLSON, J. (1968), Production Index Bias as a Measure of Economic Development, Oxford Economic Papers, N 20, P.p. 24-37.

AYDALOT, P. (1985), Économie Régionale et Urbaine, Economica, Paris.

CHATTERJEE, K. (2002), Imperatives for attracting investment and technology in the Indian mining sector, Resource Policy, Volume 28, Issues 3-4, pp. 105-115.

CUERVO-CAZURRA, A. (2008) The multinationalization of developing country MNEs: The case of multinationals, Journal of International Management, doi:10.1016/j.intman.2007.09.001

DUNNING, J. (1993), Multinational Enterprises and the Global Economy, Addison-Wesley Publishing Company.

GARCIA, P., KNIGHTS, P. and TILTON, J. (2001), Labour productivity and comparative advantage in mining: the copper industry in Chile, Resource Policy, Volume 27, Issue 2, pp. 97-105.

LOPES, A. (1987), Desenvolvimento Regional: Problemática, Teoria, Modelos. 3ª Edição, Fundação Calouste Gulbenkian, Lisboa.

NAITO, A. (1998), Risks and opportunities for foreign investment and mineral sectors of the Central Asian Republics: Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan, Resource Policy, Volume 24, Issue 2, pp. 105-114.