Analysis of the evolution of foreign direct investment in the coal mining sector in Colombia from 2002 to 2013*

Análisis de la evolución de la inversión extranjera directa en el sector minero del carbón en Colombia de 2004 a 2013

Análise da evolução de investimento estrangeiro directo no setor de mineração de carvão na Colômbia a partir de 2004-2013

*Fabián Alfredo Plazas Díaz***

Research article

Date of reception: 1 July 2015
Date of approval: 9 December 2015

https://doi.org/10.19053/22565779.4146

Abstract

This article studies the evolution of foreign direct investment (FDI) flows in the mining and quarrying sector and in the extraction of coal, lignite and peat in Colombia in the period 2004-2013, using statistics from the central bank of Colombia (Banco de la República) and from the Colombian Mining Information System. An overview of the coal mining industry in Colombia and the evolution of FDI are presented for the described period. It is concluded that coal mining in Colombia has an enormous potential that has favored the entry of foreign capital during the period, but ended up being an indicator of the prioritization of FDI in the country.

Keywords: economic development, foreign direct investment, economic geography, mining.

JEL: O1, F21, L72

---

* This research article is the product of the project: "Analysis of the evolution and geographic distribution of foreign direct investment in the coal mining sector in Colombia, 2004-2012". The research is financed by the Youth Researchers and Innovators Program 2013 "Virginia Gutiérrez de Pineda" of the Colciencias Science, Technology and Innovation Administrative Department and the Universidad Pedagógica y Tecnológica de Colombia UPTC. The project is part of the Geography and Land Management research group (GEOT, by its acronym in Spanish).

** Research professor of the Bogota branch of the Universidad La Gran Colombia. Holds a Master's degree in Latin-American Studies and International Relations from the Ecuador branch of the Universidad Andina Simón Bolívar, and a Bachelor of Arts in Social Sciences from the Universidad Pedagógica y Tecnológica de Colombia UPTC. Tunja, Colombia. Postal address: 111711. Email address : fabian.plazas@ugc.edu.co, fabian.plazas@uptc.edu.co

Resumen

En este artículo se analiza la evolución de los flujos de inversión extranjera directa (IED) en el sector minas y canteras y en la extracción de carbón, lignito y turba en Colombia en el periodo de 2004 a 2013, utilizando datos estadísticos del Banco de la República y del Sistema de Información Minero Colombiano. Se presenta un panorama del sector minero del carbón en Colombia y la evolución de la IED en el periodo descrito. Se concluye que el sector minero del carbón en Colombia posee un enorme potencial que favoreció la entrada de capitales foráneos durante el periodo, pero terminó siendo un indicador de la primarización de la IED en el país en el mismo periodo.

Palabras clave: desarrollo económico, inversión extranjera directa, geografía económica, minería.

Resumo

Este artigo discute a evolução do investimento estrangeiro direto (IED) no setor de mineração e pedreiras e extracção de carvão, lignite e turfa na Colômbia é analisada no período de 2004-2013, utilizando as estatísticas do Banco da República e Sistema de Informação de mineração colombiana. Uma visão geral do setor de mineração de carvão na Colômbia é feito e da evolução do IED ocorre no período descrito. Concluiu- se que o setor de mineração de carvão na Colômbia tem um enorme potencial que favoreceu a entrada de capital estrangeiro durante o período, mas acabou sendo um indicador de primarização de IED no país durante o mesmo período.

Palavras-chave: desenvolvimento Económico, o investimento estrangeiro, geografia econômica, Mineração.

INTRODUCTION

During the 1990s, the majority of Latin-American countries began to liberalize the regimes of the regulation of foreign investment under the premise of stimulating internal economic growth with the introduction of foreign capital. Some of these policies were promoted by the United States, the World Bank and the International Monetary Fund, in the framework of the bundle of neoliberal policies for the region, which sought to apply a set of economic reforms of commercial opening and deregulation of the financial market, with the aim of reducing tariff protection, the flexibilization of the labor market and the creation of a free capital market (Unctad, 2013). In this context, the countries of Latin-America reduced their tariffs and subsidies, eliminated the barriers to foreign investment, reduced public expenditure and minimized the participation of the state in the economy. In Colombia, the greater levels of internationalization and economic opening also took place in the early

1990s and particularly consisted of the reduction of barriers to foreign trade and foreign direct investment (FDI).

In Colombia, FDI is that which comes from a natural or legal person from abroad, whose capital in invested with the intention of having a direct influence, on the long term, on the development of a firm, through involvement with other already established companies or through the establishment of a subsidiary of the investing company (Ramírez & Flórez, 2006). For the Banco de la República de Colombia

> direct [foreign] investment is a category of international investment associated with the significant degree of control which the foreigner (or national) acquires over a resident (or foreign) company. The degree of control is defined taking into account criteria such as the active participation of the foreign investor in the management of the company and the percentage of their shares in the same. (Banco de la República, 2014)

According to the economic literature (Solow, 1956; Swan, 1956; Rubini & Naranjo, 1997), FDI is considered to be a useful variable for stimulating the economic growth of a country and there are theories such as the neoclassical *theory of economic growth* and *the theory of endogenous growth* that defend and develop this importance. Nevertheless, in opposition to the arguments regarding the benefits of FDI, the *structuralist theory of the ECLAC* has questioned the extents of foreign investment, estimating that its contribution to economic growth could be minimal and its benefits will depend on the economic sector to which these investments are directed. According to official figures from the Banco de la República (2014), during the period of opening and deregulation of foreign investment from 1994 to 2013, in Colombia, FDI flows have been registered above US $118.473 billion, distributed among the different economic sectors and geographic regions of the country.

In the last ten years, in Colombia, FDI has shown a tendency of concentrating in natural resources, particularly impacting the primary sectors of oil and mining, above all in the extraction of coal, lignite and peat in this last sector. The above deserves attention if one considers that the country went through a period in which it sought to promote the oil and mining sectors as the two drivers of the economic growth of the country. According to the *Plan Nacional de Desarrollo Minero, Colombia País Minero Visión al Año* 2019 (National Plan for Mining Development, Colombia, the Vision of a Mining Country towards 2019), "In the year 2019, the Colombian mining industry will be one of the most important in Latin America and will have considerably expanded its participation in the national economy" (Upme, 2006). One of the strategies for this has been the creation of a regulatory framework that defines and incentivizes foreign investment in the sector. In this

context, it must be asked, what has been the evolution of the flows of foreign direct investment that have entered into the mining sector in Colombia and in particular in coal mining in the last ten years?

Currently in the country there exists an important discussion about the benefits, risks, threats and the environmental, social, cultural, economic and political effects of the promotion of the mining and oil industry as ways to achieve the economic growth and development of the nation (*Contraloría General de la República*, 2013 & 2013i). So as to contribute to this discussion of great national interest, the objective of the article is to analyze the evolution of FDI flows in the mining sector in Colombia, in particular in the extraction of coal, lignite and peat in the period of 2003 to 2013, taking elements of the economy and the economic geography, in order to highlight some relations between foreign investment and its possible impact on the national economy as well as aspects related to the geographic distribution of the same. With this it is hoped to demonstrate that there is a prioritization of FDI in the country, thanks to the policies that promote the mining sectors and foreign investment as important strategies for economic growth in Colombia. In the same way, the need to analyze the geographic distribution and the characterization of the modalities of foreign investment in the mining sector is proposed, so as to demonstrate the possible risks and benefits of the investment.

METHODOLOGY

The research was developed taking into account three economic theories, in order to analyze and combine the diverse factors in the evolution of direct foreign investment in the coal mining sector in Colombia. To begin with, from the specialized literature, a theoretical framework was developed along with a state of play regarding the theories of the economic and geographic sciences that defend or reject the benefits of foreign investment, making emphasis on investment directed towards natural resources. The neoclassical theory of economic growth (Solow, 1956; Swan, 1956; Rubini & Naranjo, 1997); the theory of endogenous growth (Elías et al., 1998; Borensztein, De Gregorio & Lee, 1998; De Mello, 1999; Zhang 2001), and the Latin American structuralist theory of the ECLAC (Prebish, 1949; Singer, 1950; Hirschman, 1958; Stoneman, 1975; Bornschier, 1980; O´Hearn, 1990) were studied.

Once the theoretical framework was developed, the regulatory framework for foreign investment in the country was revised, making emphasis on the provisions afforded to the mining sector. Afterwards, the database was systematized and analyzed with statistical information of the FDI flows registered in the Banco de la República de Colombia and the Colombian Mining Information System (SIMCO, by its acronym in Spanish) of the Mining and Energy Planning Unit (UPME, by its acronym in Spanish), of the Ministry for Mines

and Energy of Colombia. After the data was analyzed, the results for the period from 2004 to 2013 were presented.

Firstly, the proven, indicated and inferred coal reserves in Colombia were investigated and analyzed, as well as their geographic distribution, in order to highlight the potential that the coal sector of the country represents. Secondly, the economic context of the coal mining sector was developed, determining the national production of coal by producing departments, as well as the production destined for export and national consumption, coming from statistical data from the National Mining Agency (2014). Also, emphasis was made on three groups of nations that import Colombian coal. Equally, the contribution of the mining sector to the country was analyzed, taking into account some economic indicators, such as the evolution of the gross domestic product (GDP) and the mining GDP, calculating the participation of the amounts at current prices the mining sector has over the total annual national GDP, using data from the World Bank (2014), Fedesarrollo (2013) and the DANE (National Administrative Department of Statistics) (2014i).

Later, an analysis was carried out of the evolution of the FDI flows by economic sector in the country for the period indicated. The percentage participation of the FDI flows in each economic sector were calculated for two time-periods of 1994 to 2004 and 2004 to 2013, in order to make clear the concentration of FDI in the natural resources of coal and oil in the second period described. In the same way, the evolution of the FDI flows in the mining and quarrying sectors was analyzed, where the FDI information was divided into the extraction of coal, lignite and peat, FDI in the extraction of metal ores and the reinvestment of profits and other mining activities. With this information, the percentage participation and variation was calculated. Finally, the evolution of FDI in the extraction of coal, lignite and peat for the period 2004 to 2013 was analyzed and its percentage participation in the total FDI flows that go into the mining and quarrying sector was calculated, as well as in the total of the FDI flows that entered the country in the period analyzed.

THEORETICAL FRAMEWORK

Foreign direct investment and economic growth

With the emergence of the doctrines regarding economic growth, it has been maintained that foreign direct investment is a factor that contributes to long term production, as it facilitates the transfer of physical goods and knowledge. Authors such as Baracaldo *et al.* (2001), consider that FDI can positively affect the demand of an economy, to the degree in which it manages to increase the size of firms in the host country, which generates increases in productivity, thanks to the diffusion of knowledge and technology among the

different firms (crowding in effect). However, it is also maintained that FDI would negatively affect demand, if it competes with national investment for production and participation in the financial markets (crowding out effect). From the point of view of supply, FDI could provoke changes in the productivity of factors and reflect growing returns within the function of production, due to the use of intermediate goods of better quality and lower cost (Baracaldo et al., 2001).

Among the benefits that are attributed to FDI, authors such as Borensztein *et al.,* (1998); Baracaldo *et al.*, (2001); De Mello (1999); Bernal (2012), Gaviria and Gutiérrez (1993) and Zhang (2001), agree in affirming that FDI leads to a better rate of economic growth and is considered to be the main vehicle for the transfer of technology and knowledge (know-how), generating positive externalities in the host economies. The authors maintain that FDI can also generate increases in employment and wages, more diversity of goods and services produced in the host country, diffusion of knowledge for improving productivity and the organizational schemes of the sectors and businesses, as well as capital injection into sectors that show comparative advantages and that have potential as regards international trade through horizontal or vertical investment. According to the Organization for Economic Co-operation and Development (OECD, 2011), FDI is a key element in the rapid evolution of international economic integration and constitutes a means of establishing direct, stable and lasting links between the economies of different countries.

However, authors such as Elías *et al.* (1998), Carkovic and Levine (2002), Alfaro (2003), Loja and Torres (2013), argue the mentioned benefits of FDI, affirming that the contribution to economic growth is minimal or negative and essentially depends on the economic sector to which the investment is directed. In this sense, Alfaro (2003) considers that the FDI flows directed towards the primary sector, such as for example, the investment in mines, quarries or oil, or all three, tend to show a negative effect on the growth of an economy, as the profits from the investment are obtained on the short or medium term, while on the long term the investment causes a significant environmental footprint in the host country and a loss of natural resources that can overtake the costs and profits obtained initially.

For their part, Elías *et al.* (1998) maintain that FDI can constitute a threat to national economies, taking into account the impact had on the environment, the increase in transnational corporations displacing domestic companies (crowding out), the privatization of public companies and the overexploitation of natural resources. At the same time, Bernal (2012) asserts that FDI can promote an ideology of mass consumption within the society, as well as warning about the risks associated with corruption on the part of multinational companies in order to influence decision making on the part of the state and governments,

prioritizing personal benefit over the social, cultural, economic and environmental goods of a nation.

From the point of view of the *neoclassical theory of economic growth*, FDI only has effects on the short term, as economic output can only be affected by technological advances and growth in the work force. The neoclassical theory results from the contributions of Solow (1956) and Swan (1956), who attempted to guide in an analytical way the economic growth of a country on the long term, from the accumulation factors of physical capital, work and technological progress, these being the driving forces of economic growth. With relation to foreign investment, the neoclassic view indicates that it is a factor that contributes to the increase of capital stock and thus to economic growth, where the flow of foreign capital is a resource that contributes to the function of production, given that it is a market mechanism for the transfer of technology and capital from the global economy towards less developed regions (Rubini & Naranjo, 1997).

According to the neoclassical production function, FDI can contribute to the increase of physical capital stock, the workforce and the state of technology, provided that some of the following assumptions are considered. Given the state of technology, it is probable that FDI generates a doubling of the amount of capital as well as the amount of work and thus of production. In this sense, it is considered that the presence of a closed economy and no intervention from the state, is a stimulus of economic growth, as that implies that the public expenditure is zero and therefore production is equal to revenue. Nevertheless, according to Loja and Torres (2013), the neoclassical models present overly restrictive assumptions, such as markets with perfect competition, constant returns to scale and diminishing marginal productivity, for which it could be concluded that this model does not adequately explain the effects of FDI on the economic growth of a country.

From the point of view of the theory of endogenous growth, FDI is considered as a combination of capital stock, technology and knowledge. The theory considers that FDI contributes to increasing the stock of experience or knowledge of an economy (know-how) and maintains that the determinants of economic growth are seen as endogenous fundaments (Elías et al., 1998). From this point of view, FDI is an important link for the transfer of technology and contributes relatively to the growth of national investment. However, it is also clarified that FDI contributes to economic growth only when there is a sufficient absorption capacity for advanced technologies in the host country, for which the host country should have a minimum threshold of human capital (Borensztein, De Gregorio & Lee, 1998).

According to the endogenous theory, an increase in the number of capital variables requires the adaptation of the available technology in the more advanced countries, so as to allow

the introduction of new types of capital goods. According to this theory, FDI is the main channel of technological progress, assuming the existence of a "catchup" effect and considering that it is cheaper to imitate products that already exist than to create new products, under the assumption that the cost of installation depends on the number of varieties of capital that are produced in the country in comparison with those that are produced in more advanced countries (Borja, 1958). Additionally, Borensztein, De Gregorio and Lee (1998), De Mello (1999), and Zhang (2001), suggested that FDI contributes substantially to economic growth, as long as the host country takes advantage of the externalities that the entrance of FDI flows provides. Finally, from the theory of endogenous growth, authors such as Romer (1986 and 1990), Sala-I-Martin (1994), Mankiw, and Romery Wheil (1992), have included new factors and concepts for the analysis on the relation between foreign investment and economic growth, such as: the endogeneity of technical progress, the importance of the accumulation of human capital, the relevance of investment in research and development (R & D), imperfect competition, the externalities produced by the diffusion of knowledge, the importance of institutions and the management of economic policy.

Meanwhile, from the point of view of the *Latin American structuralist theory*, which arose with the Economic Commission for Latin America and the Caribbean (ECLAC) with authors such as Prebish (1949), Singer (1950) and Hirschman (1958), FDI generates negative effects on economic growth, given the relationship of dependence under the center-periphery approach. From this critical approach of ECLAC, foreign investment can positively influence economic growth on the short term, while on the long term it produces the opposite effect. On the short term, the increase in the investment will result in an increase in production and consumption, which causes a rise in the rate of economic growth in the country. However, as time passes and projects are completed, the adverse effects of the foreign investment can be seen, thanks to the "decapitalization" and "dismantling" of the projects, once the benefits are obtained (Stoneman, 1975; Bornschier, 1980; O´Hearn, 1990).

According to the thinking of the ECLAC, foreign trade and especially FDI could cause underdevelopment, because the profits repatriated by foreign companies exceed the value of the original investment, in this way deteriorating the terms of exchange. Additionally, it is maintained that FDI does not generate demand for domestically produced goods and does not give room for the emergence of new national enterprises, as the wages of the workers of companies of foreign origin do not increase and thus it does not have profound effects on the internal market. In the same way, FDI does not produce a transfer of cutting-edge technology and does not influence the growth of new types of industries that use new technological processes (Haber, 1997, p. 164).

In this context, Borja (1958) groups the negative effects of foreign investment into five categories: a) the displacement of local producers on account of FDI; b) the flows of trade and capital generated by FDI are assumed to be negative for the host economy on the long term, due to that the foreign companies tend to import more than they export and to send more capital abroad than they what bring in as original investment; c) the technology that the companies introduce is obsolete for the developing countries, they do not carry out research in the local economy and their technologies are not appropriate for the social needs of the host countries; d) as regards distributive effects, the argument is that due to the higher salaries paid by foreign businesses, as well as the consumption models that they promote, they have a negative effect on the regressive income distribution patterns in underdeveloped countries; e) the foreign companies develop alliances with the local bourgeoisie, which result in an aggravation of the historical tendency of political exclusion and economic marginalization of the majority of the population.

In summary, according to the theories presented, foreign investment has an effect that is measurable through the increase in capital stock and the benefits that are derived from the transfer of knowledge and technology, so as to improve and encourage the innovation of production systems and, in this way, contribute to economic growth. For the neoclassical theory, the effects of FDI are short term and the benefits can be measured by the amount of capital invested, the generation of employment and the transfer of technology. For the endogenous theory, the benefits can be seen according to the qualification of the human factor and by the strategies the host country uses in order to absorb and take advantage of the transfers of capital, knowledge and technology that come in from abroad and can be used in the development of production chains in sectors of the local economy. Latin American structuralism offers criticism of the effects of foreign investment and considers that it does not demonstrate much benefit for the host country, due mainly to the factors of dependence which end up deteriorating the terms of exchange, as well as the negative impacts produced by decapitalization and dismantling of projects. For the research, the theories of endogenous growth and that of the ECLAC are considered, as two explanatory theories adequate for the analysis of the evolution of FDI in coal mining in Colombia.

RESULTS

The results give an account of the evolution of FDI in the mining and quarrying sector and in coal, lignite, and peat extraction in Colombia in the period from 2004 to 2013. A panorama of the coal mining sector in Colombia is presented, taking into account aspects such as the reserves, production and exportation of coal, the evolution of FDI in the described period is indicated.

Generalities of the regulation of foreign direct investment in Colombia

In Colombia, the legal regime for foreign investment was transformed as a result of the transition from an economy with restrictions on foreign capital to an open economy with an active policy of attracting foreign investment, where three stages can be distinguished (Fedesarrollo, 2007). Firstly, from the late 1960s until the early 1990s, the regulation of foreign investment was restricted, because of the import substitution industrialization (ISI) model, which would promote the development of domestic production from internal resources. In this first stage, the legislation would restrict all the sectors that could receive foreign investment flows and the free transfer of capital and profits in line with the exchange control regime that operated in the country (Fedesarrollo, 2007).

The second stage began with the economic opening and neoliberal reforms of the 1990s, when the foreign investment regime was modified with Law 9 of 1991, which promoted the internationalization and modernization of the Colombian economy. This law granted the same treatment to foreign investors as nationals and based on the principles of equality, universality and automaticity, the restrictions on foreign investment were eliminated in most sectors and the free transfer of capital and profits was authorized, except for in the sectors of telecommunications, air and sea transport, and continued to be completely banned in relation to toxic, dangerous and radioactive waste, in the property sector and in national defense (Resolution 9 of 1991).

The third stage began with what was stipulated in Decree 2080 of 2000 and continues into the present. It is characterized by the deepening of the reforms to the FDI regime adopted at the beginning of the nineties and from the mechanisms of simplicity, automatic authorization, equal treatment and stability for the investor, it has sought to improve and promote the attraction of foreign capital to the country. Currently, the legislation authorizes the investment of foreign capital in all sectors of the economy, except for in activities of defense and national security and in the processing and disposal of toxic, dangerous and radioactive wastes not produced in the country. In Decree 2080 it is also possible to distinguish two modalities of foreign investment: direct foreign investment (FDI) and portfolio investment[1].

In Colombia, FDI flows have become the main source of financing for the current balance of payments deficit and are registered before the Banco de la República of Colombia, which publishes statistical reports of the FDI flows that enter the country and releases

[1] It is important to clarify that in order to develop the objective that is proposed in the research article, portfolio investment was not part of the object of study, as it responds to different motivations and implications that are outside the central analysis of the study.

reports directed to the Ministry of Mines and Energy and to the Mining and Energy Planning Unit (UPME, by its acronym in Spanish) of this Ministry, on topics related to mining and oil. The principal norms that govern the registration of FDI are the Colombian Exchange Statute (Law 9 of 1991) and the General Regime for Foreign Investment in Colombia, recorded in Decree 2080 of 2000. Decree 2080 contains six definitions in which a natural or legal person can participate in the process of capital transfer in the country (art. 3 Decree 2080), as well as the modalities of investment where tangible and intangible goods are highlighted as well as the different modalities of contributions that a non-national can carry out in the country (art.5 Decree 2080).

With relation to foreign investment in the mining and oil sectors, Law 9 of 1991 in its article 15, "Investment Regimes," stipulates that through general norms exceptional regimes could be established between the investor and those sectors. In this respect, in Decree 2080 of 2000 (Title III Section II), it is stipulated that capital investments from abroad for oil and natural gas exploration and exploitation, mineral extraction and processing, were subject to the compliance with norms that regulate these activities. In those cases, the exchange regime of the sectors of hydrocarbons and mining, including the activities of oil, natural gas, coal, ferronickel or uranium exploration and exploitation, will be subject to the regulations of the governing board of the Banco de la República, in accordance with their respective powers. Additionally, companies that have foreign investments in their capital and that carry out activities of the exploration or exploitation of oil, natural gas, or coal, or that are dedicated exclusively to providing technical services for the exploration or exploitation of said resources, are not obliged to reinvest in the host country (art. 16 of Law 9 of 1991; art. 23 of Decree 2080 of 2000; Decree 1844 of 2003).

In the same way, in Law 658 of 2001, Mining Code, that which is pertinent to mining is defined, as regards exploration and exploitation rights, the reserved, excluded and restricted zones, that which corresponds to prospecting and concession contracts, among others, where, based on the criteria of equal treatment, the foreign investor may invest without any discrimination. Finally, through Law 963 of July 8, 2005, contracts of legal stability were established, regulated by Decree 2950 of 2005 and Decree 1474 of 2008, which became incentives in order to protect investors from unfavorable changes in the laws or regulations detailed in the contracts between the government and companies (foreign as well as national) and in this way guarantee the investors more than US$1.49 trillion that if the norms or interpretations that are specifically identified in the contracts as determinants of the investment change, the investment will not be affected.

A brief context of the coal mining sector in Colombia from 2004 to 2013

Colombia is characterized for having the largest coal reserves in Latin America and is one of the top ten producers of the resource in the world, which makes this sector attractive for foreign investors. The country has a potential yield of 16.436 billon tons (Mt) of coal, of which 6.419 Mt are measured and distributed in the western, central and eastern mountain range of the country. Within this potential, 4.571 Mt are indicated, 4.237 Mt are inferred and 1.209 Mt are hypothetical resources (Ministry for Mines and Energy, 2012). The country has anthracite and bituminous coals, characterized by their high carbon content and calorific value, which can be used in the thermal and steel industry and in the generation of energy. There are also subbituminous coals and lignite coals that contain a lower degree of calorific power and higher levels of volatile material, moisture and ash, but can also be used in electric power generation, steam generation and in some industrial processes (Upme, 2005, 2012).

The region of Colombia where the reserves, production and exportation of coal is concentrated is the Atlantic, in the departments of La Guajira, Cesar and Córdoba, and in the interior of the country in the departments of Antioquia, Valle del Cauca, Cauca, Boyacá, Cundinamarca, Santander and Norte de Santander (Figure 1). The zone of La Guajira leads with 57% of the total national coal reserves, distributed in the areas of Cerrejón Norte, Cerrejón Central and Cerrejón Sur. The Atlantic region with the departments of La Guajira, Cesar and Córdoba register 89% of the total reserves in the country and is a favorable region for exportation as it lies on the coast. The other 10% of the reserves are found in the departments of Antioquia, Valle del Cauca, Cundinamarca, Boyacá, Santander and Norte de Santander (UPME, 2012).

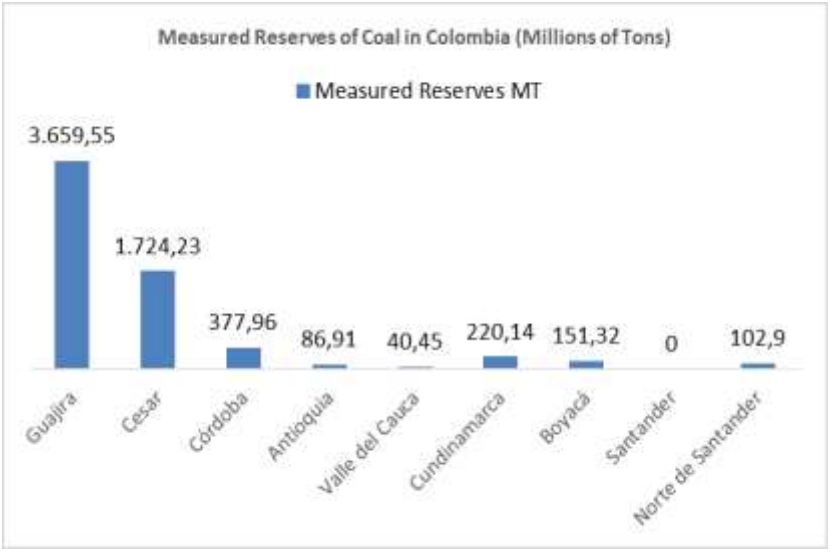

Figure 1. Measured coal reserves in Colombia by department
Source: elaborated by the author, based on data from the National Mining Agency, 2014.

In Colombia, in the period of 2004 to 2013, National coal production maintained an average annual growth of 2.4 %. National production during the period was 735,129,279 tons (t), with the departments of Cesar and la Guajira totaling nearly 90% of the production, followed by Norte de Santander (3 %), Boyacá (2 %), Cundinamarca (2 %), Córdoba (1 %), Antioquia (1 %) and Santander (1 %) (Figure 2) (National Mining Agency, 2014). Additionally, 91% of the national coal production for the period was destined for exportation (Upme, 2010). In relation to the departments of Cesar and la Guajira, it is worth highlighting that their proximity to the sea facilitates exportation, at the same time that they have the largest proved and probable coal reserves in the country.

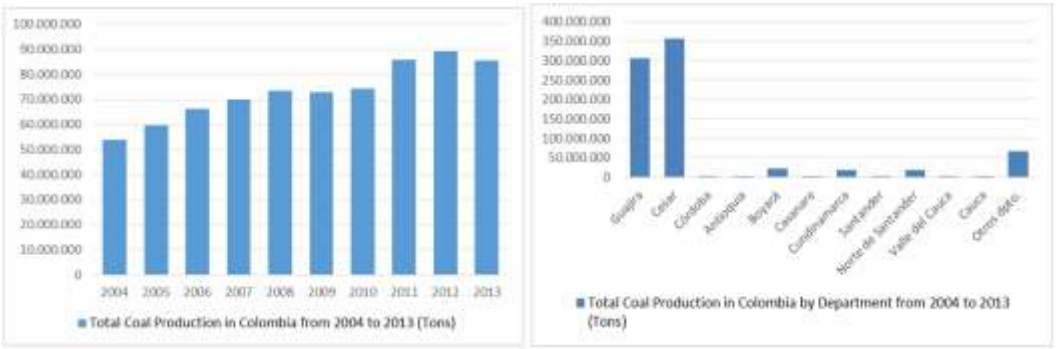

Figure 2. Total coal production in Colombia by department from 2004 to 2013.
Source: elaborated by the author, based on data from the Mining and Energy Planning Unit (Upme, 2010).

According to the information provided by the National Mining Agency (2014), coal production in Colombia during the period of analysis shows three particular periods. The first period, from 2004 to 2008, where the production of coal maintained a sustained growth, showed a variation of 10.74% in 2005, equivalent to 59,675,099 t. In 2006, the variation was 11 % with 66,191,863 t. In 2007 the variation was 5.61%. For 2008 the production was of 73,502,070 t, with an annual variation of 5%. The second period showed a reduction in coal production in the country that coincided with the world economic crisis, with a variation of -1 % in 2009, equivalent to 72,807,413 t. In 2010 the variation in production was 2%, equivalent to 74,350,133 t. The third period is characterized by a boost in coal production in 2011 and 2012, with a variation of 15.4% and 4% respectively. Finally, in 2013, production dropped slightly with a variation of -4%, equivalent to 85,496,062 t. The total coal production during the period was 735,129,279 t.

On the other hand, coal exports in Colombia in the period analyzed amounted to 50.224 billion dollars FOB, making it the second most exported product of the country after oil (Banco de la República, 2014i). From 2004 to 2010 there was sustained growth in exports which showed a boost in 2001 with 8.397 billion dollars FOB. In the two following years, there was a decrease in exports with a variation of -7% and -14% respectively. The average participation of coal in the total national exports during the period was 13%, with 2009 being the year with the greatest participation with 16% of the total. In relation to tons of coal exported during the period, it reached the sum of 675,626,567 tons, which represent 91% of the total national coal production (Figure 3) (National Mining Agency, 2014; Dane, 2014).

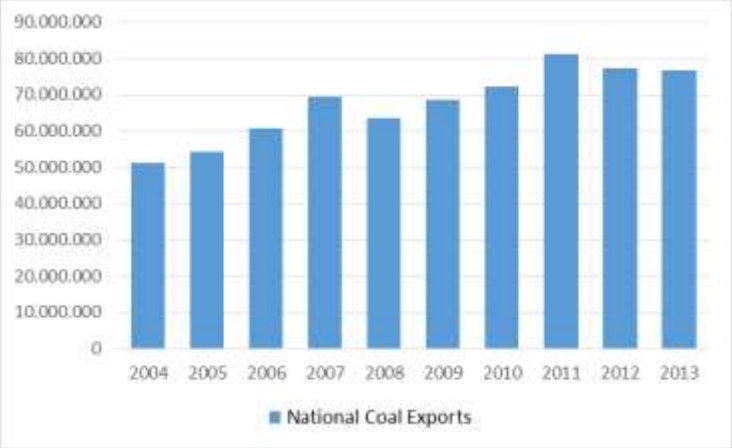

Figure 3. Colombian coal exports from 2004 to 2013
Source: elaborated by the author, based on data from the Banco de la Republica (2014i) and Dane (2014).

7The main destinations for Colombian coal exports in the period of 2004 to 2013 were the markets of the United States, Holland, the United Kingdom, Turkey, Israel, Chile, Brazil, Portugal, Spain, France, Italy, Denmark, Canada, Puerto Rico, Ireland and China, which form the first group of importer countries that exceeded ten million tons in the period analyzed. A second group is composed of the Caiman Islands, Peru, the Dominican Republic, Germany, Mexico, Guatemala, the Republic of Korea, Croatia, Scotland, Belgium, Argentina, Taiwan, Morocco, Panama, Slovenia, India, the Channel Islands, Guadalupe and Switzerland, whose importation was between one and ten million tons of coal during the period analyzed. Finally, there is a third group consisting of countries whose coal imports were between 100,000 and one million tons which are, Finland, Poland, Greece, Egypt, Ukraine, Cuba and Sweden. The rest of the countries that had coal imports of less than 100,000 tons were Malaysia, Norway, Trinidad and Tobago, Vietnam, the

Czech Republic, Saudi Arabia, Curaçao, Singapore, El Salvador, Iran and Russia (Dane, 2014) (Figure 4).

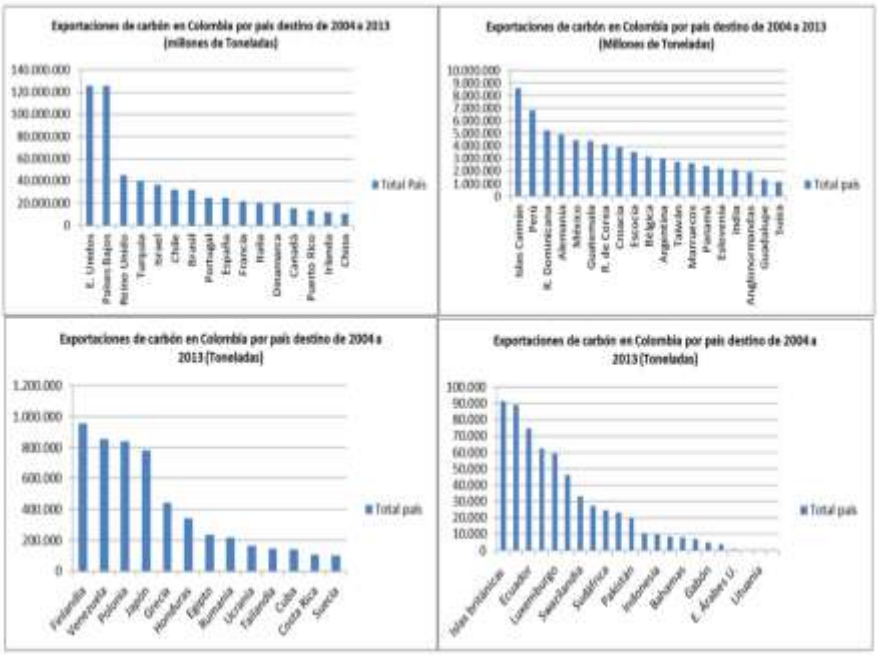

Figure 4. Coal exports in Colombia by destination country groups from 2004 to 2013.
Source: elaborated by the author, from the data base of the Dane (2014).

Before presenting the results of the evolution of FDI flows destined for the mining and quarrying sector and the extraction of coal, lignite and peat in Colombia, it is important to mention that the percentage participation of mining in the total national FDI in the period from 2000 to 2012 had the following dynamic. According to Fedesarrollo (2013), in 2000 mining had a participation of 1.8% of the total FDI, which then showed an increase in 2003 with 2.3% of the total. For the year 2006, there was a slight increase with 2.4%, which then decreased to and remained stable at 2.3% in the years 2009 and 2012 respectively. In this way, according to Rudas (2013), the mining sector showed almost constant rates of positive growth and above or close to that of the total FDI.

Evolution of the flows of foreign direct investment in Colombia by economic sector and in the mining and quarrying sector in the period from 2004 to 2013

In Colombia, the total FDI flows registered by the Banco de la República in the years from 2004 to 2013 reached the sum of 99.439 billion dollars, of which, 20.847 billion have been invested in the mining and quarrying sector, which absorbed 21% of the total flows of

foreign investment that entered the country in the period (Banco de la República, 2014). Separating the rates of the mining and quarrying sector, close to 18.649 billion dollars (89 %) was invested in the extraction of coal, lignite and peat while 1.967 billion dollars (9 %) were destined for the extraction of metal ores such as copper and ferronickel. With respect to the reinvestment of the profits from FDI and other activities in mining, negative balances were shown, particularly in the years 2007 and 2008, with a figure of -794 million dollars and -498 million dollars, respectively. For the years 2005, 2012, and 2013, the reinvestment of profits was 343 million dollars, 259 million dollars and 335 million dollars, respectively (see Table 1 and Figure 5).

Table 1. FDI flows in Colombia according to economic activity from 2004 to 2013. (Billions of dollars)

Year	Mines and quarries (including coal)	Oil Sector	Manufacturing	Transport, storage and communications	Financial and business services	Electricity, gas and water	Other economic activities	Stock
2004	1.246	.495	.288	.481	.244	.088	.279	3.122
2005	2.151	1.125	5.502	1.025	.245	-252	.434	10.230
2006	1.796	1.995	.815	1.065	.478	-.068	.663	6.744
2007	1.081	3.333	1.760	.401	1.359	-129	1.042	8.847
2008	1.790	3.349	1.696	.978	1.083	156	1.476	10.528
2009	3.014	2.637	1.364	.340	.711	-992	.940	8.014
2010	1.838	3.080	.210	-.356	.916	.043	.641	6.372
2011	2.480	4.700	1.214	1.760	1.160	.381	2.797	14.492
2012	2.474	5.471	1.985	1.245	1.077	.672	2.103	15.027
2013	2.977	4.909	2.586	1.474	1.606	.395	2.116	16.063
Total	20.847	31.094	17.420	8.413	8.879	.294	12.491	99.439

Source: elaborated by the author, based on official data from the Banco de la República de Colombia (2014). Other sectors include: agriculture, hunting, forestry, fishing, construction, trade, restaurants and hotels and community services.

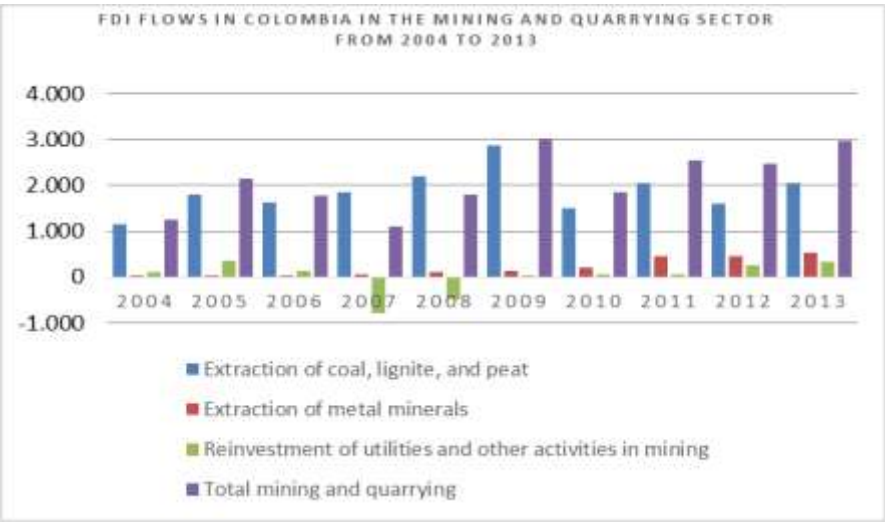

Figure 5. FDI flows in Colombia in the mining and quarrying sector from 2004 to 2013 (Billions of dollars).

Source: elaborated by the author, based on official data from the Banco de la República de Colombia (2014).

In Colombia, in the period of 2004 to 2013, the mining and quarrying sector (20%) and the oil sector (32%) absorbed 52% of the total FDI flows that entered the country, which represents US$ 51.941 billion. The manufacturing sector absorbed 17% of the total, followed by financial and business services (9%), transport (8%), other economic activities (12%) and electricity, gas and water with only 0.2% (see Figure 6). With respect to this, Garay (2004) maintains that traditionally FDI in Colombia has been characterized by being directed towards non-renewable natural resources such as coal, and especially, oil. However, if we compare the sectorial distribution of FDI in Colombia by economic sector in the period from 1994 to 2003, we find that the most attractive sectors for foreign investment were in this order: financial and business services (23%); manufacturing (18%); electricity, gas and water (18%); mining and quarrying (13%); transport, storage and communications (10%); and finally, the oil sector (7%) (Figure 6).

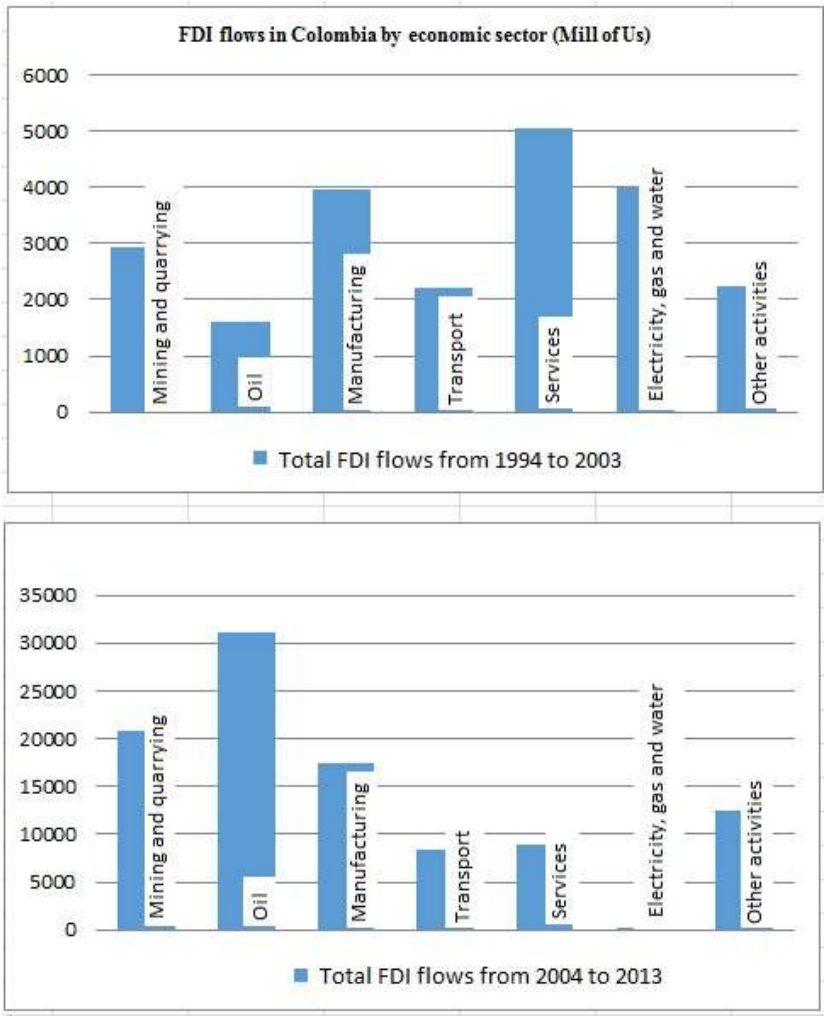

Figure 6. FDI flows in Colombia by economic sector and time period (Bill of Us)
Source: elaborated by the author based on data from the Banco de la República (2014).

As we can observe, in the period of 2004 to 2013, the oil sector has benefitted most, its participation going from 8% to 32% regarding FDI flows with respect to the previous period, while the mining and quarrying sector went from 17% to 21%. On the other hand, the manufacturing sector maintained a constant level for the two periods at 17%, while the sectors affected by a decrease in FDI from one period to the other were those of financial services, falling from 21% to 9%; transport, storage and communications that went from 10% to 8%; and electricity and gas, going from 16% in 1994 to 0.2% in the period from 2004 to 2013.

Also, if we look at the percentage participation of the mining and quarrying sector in the total FDI flows in Colombia in the period of 2004 to 2013, we find that for the year 2004, the sector managed to attract 38% of the total flows that entered the country. For 2005, participation was 21% and 26% for 2006. In the year 2007 there was a decrease in FDI flows going to the sector, which had a participation of 13%. For 2008 it rose to 17% and then to 37% in 2009. For the following years, the sector again showed a decrease in FDI, 29% in 2010, 17% in 2011, 16% in 2012 and 18% in 2013. As regards the oil and mining sectors, the results demonstrate a significant increase in FDI flows in recent years, which is related with the high international prices of coal, the stable economic performance of those sectors, as well as economic policies oriented towards promoting them as drivers of economic growth, which makes them attractive for foreign investment.

Evolution of the flows of foreign direct investment in the extraction of coal, lignite and peat in Colombia from 2004 to 2013

In relation to FDI in the extraction of coal, lignite and peat in Colombia, in the period of 2004 to 2013, close to $US 18.649 billion was invested, which represented 18% of the total national FDI. The yearly average for this activity was $US 1.865 billion, which showed sustained growth as from 2006, reaching its highest point in 2009 with $US 2.858 billion. For the year 2010 there was a marked drop of FDI in this sector with a variation of -47%. In 2011 there was a variation of 35% with $US 2.035 billion. For 2012 the variation was -20% with $US 1.608 billion while in 2013, the variation was 27%, reaching the figure of $US 2.045 billion (Figure 7).

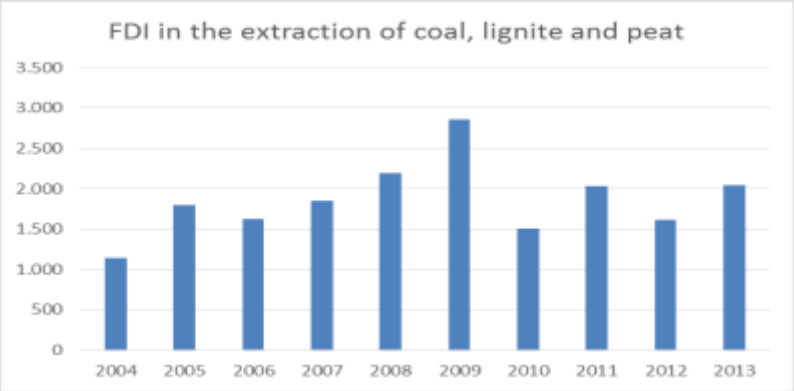

Figure 7. Evolution of FDI flows in the extraction of coal, lignite and peat from 2004 to 2013 (Bill of Us).

Source: elaborated by the author, based on official data from the Banco de la República de Colombia (2014) and the Colombia Mining Information System SIMCO (2014).

Figure 8 illustrates the comparison of the variation of FDI flows in the mining and quarrying sector and in the extraction of coal, lignite and peat, where it can be appreciated that coal is the principal receiver of FDI in the Colombian mining sector.

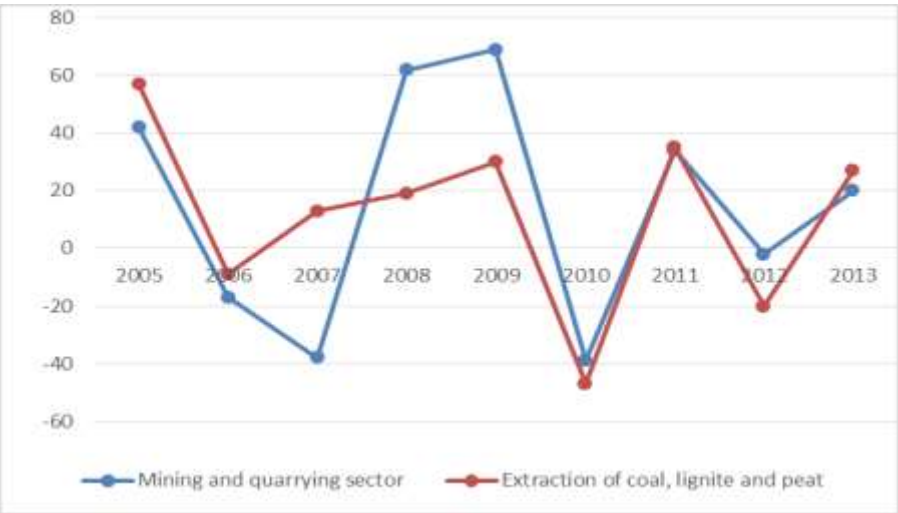

Figure 8. Percentage variation of FDI flows in the mining and quarrying sector and in the extraction of coal, lignite, and peat 2005 - 2013.
Source: elaborated by the author, based on official data from the Banco de la República de Colombia and the Colombian Mining Information System -SIMCO.

Figure 9 illustrates the three groups of investor countries in Colombia. Unfortunately, it was not possible to access the information regarding the investments by country of origin and destined economic sector, as it is not publicly available. Thus, the information is presented according to total FDI flows that the countries deposited in the period of 2005 to 2013 without any discrimination. In the first group are found countries with FDI above US$1 billion. In descending order they are: the United States, England, Panama, Spain, Anguilla, Bermuda, Switzerland, Chile, Mexico, the Cayman Islands, the British Isles, Brazil, France, Canada, Barbados and Luxembourg. The second group is composed of countries where the sum total of FDI is between US$ 100 million and US$ 1 billion. In descending order, they are: Germany, Venezuela, Austria, Peru, Uruguay, the Bahamas, Ecuador, Italy, Holland, Japan, Argentina, Belgium, the Republic of Korea, Norway, Ireland and Costa Rica. The third group is made up of countries where the investment amounts are below US$ 100 million. In descending order, they are: Australia, the Netherlands Antilles, China, Denmark, Puerto Rico, the Republic of Cyprus, Portugal, Israel, India, Sweden, Curaçao, the Dominican Republic, Singapore and Bolivia.

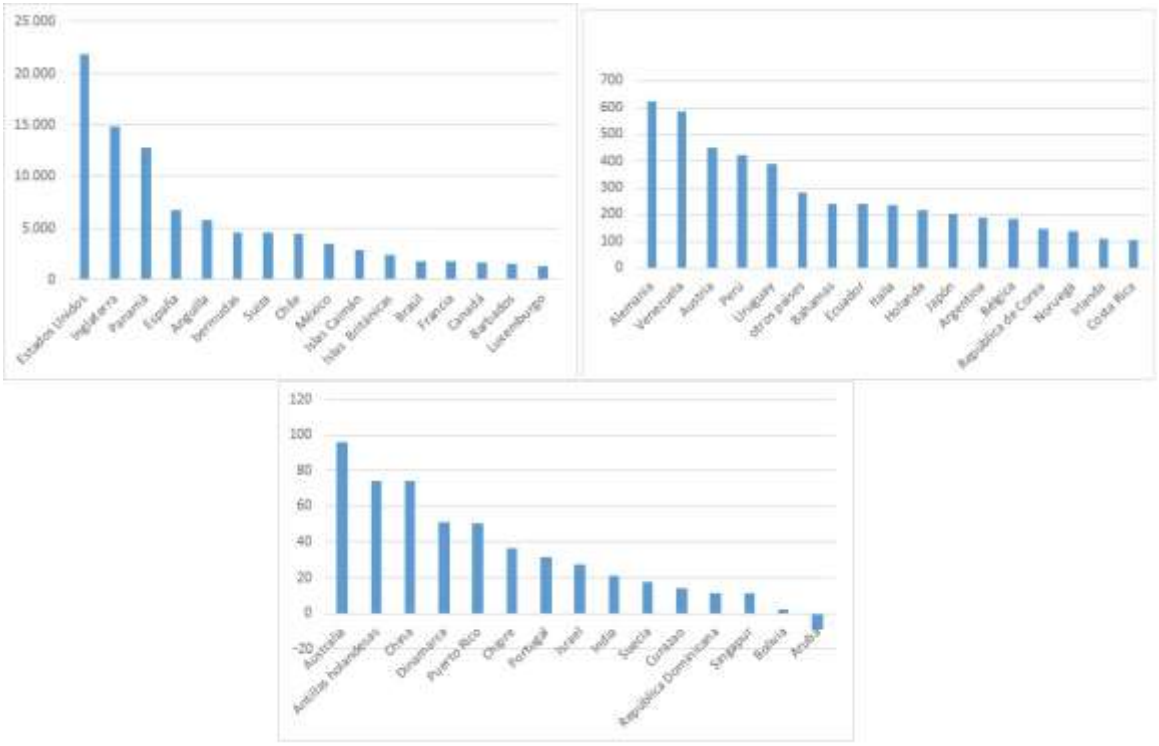

Figure 9. Total FDI flows in Colombia by country of origin from 2005 to 2013. (in billions of dollars)

Source: elaborated by the author, based on official data from the Banco de la República de Colombia (2014).

Discussion

In accordance with the results, there are some reflections that are to be put into discussion for future research. The first consists of calling attention to the tendency of FDI flows to concentrate in the primary sectors of the country, which has been possible thanks to the high international prices of *commodities* and the incentives granted by the state so as to attract foreign investment, added to the policies that seek to promote the mining and oil sectors as two drivers of the economic growth of the country.

The above is worrying if the modalities of the foreign investment that enters the country are not identified and characterized. That is to say, it is pertinent to subtract the amounts of FDI that enter the country, in particular in the sectors analyzed, with the intention of recognizing, quantifying, qualifying and characterizing the same contributions of the investment in terms of technology transfers, types of machinery supplied, contributions to the capital of the company, generation of employment, etc., with the aim of having a better understanding of the cause when evaluating and determining the contribution of FDI to the development of said sectors, as well as to the development and economic growth of the

country. On the contrary, there will continue to be figures that may hide the true purpose of the investment and its results. If we retake the discussions of Elías *et al.* (1998), Carkovic and Levine (2002), Alfaro (2003), Loja and Torres (2013) and the structuralism of the ECLAC, we find that the benefits of FDI directed to the primary sectors such as oil or mining are nearly non-existent or negative and can have serious repercussions, given the environmental externalities and the process of "decapitalization" and the "dismantling" of projects.

Nevertheless, it is necessary to clarify that thanks to the particularities of the mining industry, it is necessary to be careful with the analysis of the growth of FDI, as the period required for the investment in geological exploration to materialize in mining production is approximately nine years. That means that the resources that enter the country for expenses of functioning and exploration will be returned to the companies nearly a decade later and only if the project manages to overcome the technical, geological, environmental, social, economic and legal requirements necessary to allow the opening of the mine. Therefore, FDI cannot by itself explain the increase in the production of a mineral nor its export on the short term, except when its specific destination is the acquisition of projects in production, the expansion of operations or the opening of a mine, after the process of exploration (UPME, 2012). For the same reason, it is pertinent to separate and characterize the FDI flows that have entered the mining sector, taking into account the definitions and modalities of FDI existent in the country or creating categories so as to classify the empirical and immaterial contributions of the investment.

Secondly, there exists the possibility that the FDI flows are distributed in the departments and regions where the greatest volume of coal reserves, production and exportation is concentrated in Colombia. From the above it is seen that in the year 2006, FDI directed towards the mining sector rose to 1.796 billion dollars which includes the 1.7 billion for the purchase of 33% of Cerrejón by the company Xstrata (now Glencore) (Portafolio, 2006). In the FDI figures for 2009, the mining sector was the greatest receiver of resources, with 3.014 billion dollars, within which is included two billion for the sale of Prodeco in an operation that only implied the transfer of the ownership of the mine site (Portafolio, 2009). In the same year, Vale contributed 373 million dollars in acquisitions and 300 more in reinvestment (UPME, 2012). For 2010 FDI was of 1.838 billion dollars, which includes the purchase on the part of the Panamanian company Medoro (Gran Colombia Gold) of assets such as: Frontino Gold Mines for 380 million dollars, Mineros Nacionales and Colombia Gold for the value of 50 million dollars. Other operations were also presented such as the purchase of the Francia mine by the Goldman Sachs group for 200 million dollars (Portafolio, 2009).

As we can see, it is pertinent to separate and characterize the FDI flows that enter the mining sector by country of origin as well as destination. The analysis of the geographic distribution of FDI in the Colombian territory would allow the corroboration of the hypothesis mentioned above, as well as providing more detailed information about the contribution of FDI on a sectorial and regional level, taking into account the different mining districts of the country, as well as the characteristics of the population and workers in the investments destination areas. The above would be of use in order to verify if there is a direct or indirect benefit to foreign investment, not only on a sectorial level, but also on a social and work level, if we take into account that the transfer of knowledge, machinery, and the creation of jobs are some of the possible benefits derived from the investment. In this respect, it is worth mentioning that there has been no analysis of the geographic distribution of FDI in the national territory that separates the FDI flows by economic sector, country and company of origin, place of destination and the modalities of the investment.

Thirdly, the importance of investigating the relation between FDI and the sustainable development of the sector is highlighted. If one of the benefits of FDI is the transfer of knowledge, machinery and technology, in the case of a sector of a primary nature and one of extraction such as coal, it is essential to analyze in what way said transfers and contributions that come from abroad are framed in a better management of the productive schemes of the sector, or on the contrary, the concentration of FDI in the primary sectors of the country is due to the lack of technical and environmental regulation on the part of the pertinent authorities, which would be disadvantageous for the development of the sector and of course for the population near to the mining and related transport ventures, as well as the workers, the landscape and the sustainable development of the nation.

CONCLUSIONS

The coal mining sector in Colombia shows a real economic potential that is seen reflected in the reserves and quality of the coal, as well as in the dynamic participation of its exports in the international market and its significant attraction of FDI. In the period from 2004 to 2014, FDI showed a concentration of 52% of the total flows of FDI in the primary sectors of oil (31%) and mining (21%). Of the total FDI that entered the mining sector, 89% was directed towards the extraction of coal, lignite and peat. The above was possible thanks to the incentives and economic policies oriented towards capturing and attracting greater FDI flows, and especially, the policies oriented towards the development of the mining and oil sectors as two drivers of the economic growth of the country. Nevertheless, there is concern about the “prioritization” of the FDI that enters the country, due to the lack of disaggregated information that would allow the observation of the modalities in which the investments are carried out and the geographic distribution of the same.

In this context, it is concluded that if the coal mining sector represents a real potential for foreign investors, for the country it is pertinent to carefully analyze what have been the modalities that these investments have taken, above all in the primary sectors. In recent years and due to neoliberal reforms, FDI has had a privileged place in the development policies of countries in development, with the expectation that FDI directly or indirectly contributes to increased production and employment, as well as increasing learning capacity and technological ability. In the case analyzed, the fact that FDI is focused in the extraction of mineral resources and oil reduces the expectations of these benefits, even more when the way in which these investments have materialized is unknown.

On the other hand, the geographic distribution of the reserves as well as the exploitation and exportation zones for coal in the country are known, it would also be pertinent to locate the geographic distribution of the FDI that enters the mining sector. The above would allow the verification and understanding of the routes that FDI takes in the national territory and above all the verification of the empirical contributions of foreign investment in the sector of study. In this way, it is concluded that the reach of the study has allowed the identification of the evolution of the FDI flows that have entered the mining sector in the determined period, but that is not sufficient for identifying and determining the contributions of FDI in the development of the sector, given that it would be pertinent to separate the FDI figures, taking into account the variables of the investments country of origin, the mining locations the investment is destined for and the modalities that this investment has taken, which would be in relation to the generation of employment, the transfer of capital, knowledge or technology.

REFERENCES

Agencia Nacional de Minería. (2014). *Regalías y contraprestaciones económicas. Producción nacional de minerales. Serie de 2004 a 2013*. Recuperado de http://www.anm.gov.co/?q=regalias-contraprestaciones-economicas

Alfaro, L. (2003). Foreign direct investment and growth: does the sector matter? Boston: Harvard Business School. Recuperado de http://www.grips.ac.jp/teacher/oono/hp/docu01/paper14.pdf

Banco de la República de Colombia. (2014). *Estadísticas, flujos de inversión directa según actividad económica y país de origen, anual desde 1994 y trimestral desde 1696.* Recuperado de http://www.banrep.gov.co/es/inversion-directa

Banco de la República de Colombia. (2014i). *Principales exportaciones y resto de exportaciones. Mensual desde 1970. Balanza comercial. Exportaciones totales FOB.* Bogotá. Colombia. Recuperado de http://www.banrep.gov.co/es/balanza-comercial

Banco Mundial. (2014). *Crecimiento del PIB porcentaje anual*. Recuperado de http://datos.bancomundial.org/pais/colombia

Baracaldo, F., Garzón, P. & Vásquez, H. (2001). *Crecimiento económico y flujos de inversión extranjera directa*. Universidad Externado de Colombia. Facultad de Economía. Recuperado de http://portal.uexternado.edu.co/pdf/1_facultadEconomia/Publicaciones/DocumentosDeTrabajo/AnalisisDeseriesDeTiempoDelSecuestroEnColombia.pdf

Bernal, H. (2012). *Inversión extranjera directa en Colombia en el siglo XX, énfasis en el sector petróleo*. Tesis de doctorado. Universidad de los Andes. Recuperado de http://mba.americaeconomia.com/sites/mba.americaeconomia.com/files/inversion_extranjera_directa_en_colombia_en_el_siglo_xx.pdf

Borensztein, E., De Gregorio, J. & Lee, J-W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economics 45*, 115-135.

Borja, A. (1958). *Inversión extranjera directa y desarrollo: enfoques teóricos y debate contemporáneo.* Recuperado de http://aleph.org.mx/jspui/bitstream/56789/5581/1/DOCT2065069_ARTICULO_9.PDF

Bornschier, V. (1980). Multinational Corporations and Economic Growth: a Cross National Test of the Decapitalization Thesis. *Journal of Development Economics, 7,* 191-210.

Carkovic, M. & Levine, R. (2002). *Does foreign direct investment accelerate economic growth?* University of Minnesota. Department of Finance. WorkingPaper. Recuperado de http://siteresources.worldbank.org/INTFR/Resources/fdi.pdf

Conferencia de Naciones Unidas sobre Comercio y Desarrollo UNCTAD. (2013, junio). *Informe sobre las inversiones en el mundo, panorama general 2013. Las cadenas de valor mundiales: inversión y comercio para el desarrollo*. Nueva York.

Congreso de la República de Colombia (1991). Ley 9 de 1991. *Normas generales a las que deberá sujetarse el Gobierno nacional para regular los cambios internacionales y se adoptan medidas complementarias.* Bogotá, Colombia: Imprenta Nacional.

Congreso de la República de Colombia (2001). *Ley 658 de 2001, Código de Minas*. Bogotá, Colombia: Imprenta Nacional.

Congreso de la República de Colombia (2005). *Ley 963 del 8 de julio de 2005. Ley de estabilidad jurídica para los inversionistas en Colombia*. Bogotá, Colombia: Imprenta Nacional.

Contraloría General de la República. (2013). Minería en Colombia, derechos, políticas públicas y gobernanza. Recuperado de http://www.contraloriagen.gov.co/documents/10136/182119332/Libro_mineria_sep3_2013.pdf/65bf77a0-8b0b-430a-9726-dad0e72639c6

Contraloría General de la República. (2013i). Minería en Colombia, institucionalidad y territorio, paradojas y conflicto. Recuperado de http://www.contraloriagen.gov.co/documents/10136/182119332/MineriaEnColombia-Vol2.pdf/6cc33e0c-29e9-4a65-8561-1215fa8d07a0

De Mello, L. (1999). Foreign direct investment led growth: evidence from time series and panel data. *Oxford Economic, Papers 51*, 133-151.

Decreto 1844 (2003). *Modificación al régimen general de inversiones de capital del exterior en Colombia y de capital colombiano en el exterior*. Bogotá, Colombia: Imprenta Nacional.

Decreto 2080 (2000). *Régimen general de inversiones de capital del exterior en Colombia y de capital colombiano en el exterior*. Colombia: Banco de la República.

Departamento de Planeación Nacional. (1991). *Resolución 51 de 1991. Estatuto de Inversiones Internacionales.* Colombia.

Departamento Nacional Estadístico DANE. (2014i). *Producto interno bruto trimestral a precios corrientes. Grandes ramas de actividad económica. Series desestacionalizadas*. Bogotá D.C. Colombia. Recuperado de http://www.dane.gov.co/

Departamento Nacional de Estadística DANE. (2014). *Exportaciones colombianas por partidas arancelarias y países de destino.* Bogotá, Colombia: Grupo Ventas Directas, Dirección de Difusión, Mercadeo y Cultura Estadística Dane.

Egger, P. Pfaffermayr, M. (2001). Distance, trade and IED: A Hausman- Taylor SUR approach. Barcelona, España: Centre for Economic Policy Research.

Elías S., Fernández M. & Ferrari A. (2006). *Inversión extranjera directa y crecimiento económico: un análisis empírico*. Bahía Blanca, Argentina: Universidad Nacional del Sur, Departamento de Economía.

Fedesarrollo. (2007). *Impacto de la inversión extranjera en Colombia: situación actual y perspectivas. Proyecto elaborado por Fedesarrollo para Proexport. Informe final*. Bogotá, Colombia: Fedesarollo.

Fondo Monetario Internacional. (1994). *Manual de balanza de pagos*. (5ta ed.). Párrafo 359-362. Recuperado de http://www.imf.org/external/pubs/ft/bopman/bopman.pdf

Garay, L. J. (2004). *Estructura industrial e internacionalización 1967-1996 inversión extranjera en Colombia*. Bogotá, Colombia. Recuperado de https://pwh.dnp.gov.co/LinkClick.aspx?fileticket=vZv5DgPAl0o%3D&tabid=1287

Gaviria, A. & Gutiérrez, J. (1993). *Inversión extranjera y crecimiento económico*. Departamento Nacional de Planificación. Unidad de Análisis Macroeconómico. Archivos de Macroeconomía. Colombia. Documento Recuperado de http://www.scielo.org.co/scielo.php?script=sci_nlinks&ref=000120&pid=S0120-25962009000200005000018&lng=en

Haber, S. (1997). *Crecimiento económico e historia económica de América Latina. Una contribución a la crítica de la teoría de la dependencia*. Stanford University Press. Economía: teoría y práctica. No. 8. Recuperado de http://www.izt.uam.mx/economiatyp/numeros/numeros/08/articulos_PDF/8_9_Crecimiento.pdf

Hirschman, A. (1958). *The strategy of economic development*. New Haven, USA: Yale University.

Krugman, P. (1998). The role of geography in development. En B. Pleskovic, J. Stiglitz. (Ed.) *Annual World Bank Conference on Development economics*. Washington: World Bank and Oxford University Press. Retrieved from http://siteresources.worldbank.org/DEC/Resources/84797-1251813753820/6415739-1251813951236/krugman.pdf

Loja, L.C. & Torres, O. N. (2013). *La inversión extranjera directa en el Ecuador durante el periodo 1979-2011: análisis de su incidencia en el crecimiento económico*. Ecuador: Facultad de Ciencias Económicas y Administrativas, Universidad de Cuenca. Recuperado de http://dspace.ucuenca.edu.ec/bitstream/123456789/4728/1/TESIS.pdf

Mankiw, G., Romer, D. & Weil D. (1992). A contribution to the empirics of economic growth. *The Quarterly Journal of Economics, 107*(2), 407-437.

Ministerio de Minas y Energía (2012). *Cadena del carbón.* Bogotá, Colombia: Unidad de Planeación Minero Energética. Recuperado de http://www.simco.gov.co/LinkClick.aspx?fileticket=ghcA7YSxZko

O´Hearn, D. (1990). TNCs Intervening Mechanisms and Economic Growth in Ireland: a Longitudinal Test and Extension of the Bornschier Model. *World Development, 18*, 417-429.

Organización para la Cooperación Económica y el Desarrollo OCDE. (2011). *Definición marco de la inversión extranjera directa* (4 ed.). Recuperado de http://www.oecd-ilibrary.org/fr/finance-and-investment/ocde-definicion-marco-de-inversion-extranjera-directa/prefacio_9789264094475-1-es?site=fr

Portafolio. (2006, 2 de marzo). Glencore vende a Xstrata el 33 por ciento de El Cerrejón. *Revista Portafolio.* Recuperado de http://www.portafolio.co/archivo/documento/MAM-1934641

Portafolio. (2009, 29 de enero). Xstrata comprará Prodeco por US$2.000 millones, las dos firmas tienen participación en Glencore. *Revista Portafolio*. Recuperado de http://www.portafolio.co/archivo/documento/CMS-4783698

Prebish, R. (1949). *El desarrollo económico en la América Latina y sus principales problemas.* Chile: ECLAC, Santiago de Chile.

Ramírez, C. (2011). Marco jurídico de la inversión extranjera directa en Colombia. *Saber, Ciencia y Libertad, 6*(1), 163-177.

Ramírez, C. & Flórez, L. (2006). Apuntes de inversión extranjera directa: definiciones, tipología y casos de aplicación colombianos. *Apuntes de Economía*, (8).

Romer, P. (1986). Increasing Returns and Long-Run Growth. *Journal of Political Economy, 77,* 1002 -1037.

Romer, P. (1990). Endogenous Technological Change. *Journal of Political Economy, 98,* 571-5102.

Rubini, H. & Naranjo, M. (1997). Ahorro, inversión, mercado de capitales y crecimiento económico. *Cuestiones Económicas, 31,* 33-86.

Rudas, G. (2013). *Notas sobre el estado de la minería de carbón a gran escala en Colombia*. Foro Nacional Ambiental. Friedrich Ebert Stiftung en Colombia. Recuperado de http://library.fes.de/pdf-files/bueros/kolumbien/10468.pdf

Sala-I-Martin, X. (1994). *Apuntes de crecimiento económico*. Barcelona, España: Antoni Bosch.

Singer, H. (1950). U.S. foreign investment in underdeveloped areas, the distribution of gains between investing and borrowing countries. *American Economic Review, Papers and Proceedings* (40).

Sistema de Información Minero Colombiano SIMCO. (2014). *Inversión extranjera directa*. Recuperado de http://www.simco.gov.co/simco/Estad%C3%ADsticas/Inversi%C3%B3nExtranjera/tabid/124/Default.aspx

Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *The Quarterly Journal of Economics,* 70(1), 65-94.

Swan, T. W. (1956). Economic growth and capital accumulation. *The Economic Record*, 32(2), 334-361.

Stoneman, C. (1975). Foreign Capital and Economic Growth. *World Development, 3*(1), 11-26.

Unidad de Planeación Minero Energética UPME (2010). *Boletín estadístico de minas y energía; 1990-2010.* Bogotá: Ministerio de Minas y Energía.

Unidad de Planeación Minero Energética UPME. (2005). *Distritos mineros, exportaciones e infraestructura*. Bogotá: Ministerio de Minas y Energía.

Unidad de Planeación Minero Energética UPME. (2012). *Estudio de producción de coque y carbón metalúrgico, uso y comercialización*. Bogotá: Ministerio de Minas y Energía.

Unidad de Planeación Minero Energética UPME. (2006). *Plan Nacional de Desarrollo Minero, Colombia País Minero visión al año 2019*. Bogotá: Subdirección de Planeación Minera, Ministerio de Minas y Energía.

Unidad de Planeación Minero Energética UPME. (2012). *Plan Nacional de Desarrollo Minero, Sector Minero de Cara a la Sociedad*. Bogotá: Subdirección de Planeación Minera. Ministerio de Minas y Energía.

Zhang, K. (2001). Does foreign direct investment promote economic growth? Evidence from East Asia and Latin America. *Contemporary Economic Policy, 19*(2), 175-185.