Master's Thesis of Public Administration

The Role of Public Investment in the Process of Economic Diversification

The case of Ecuador 2007 – 2017

경제 다각화 과정에서 공공투자의 역할

: 2007-2017 년 에콰도르 사례를 중심으로

August 2021

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Submitting a master's thesis of Public Administration

April 2021

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Confirming the master's thesis written by
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June 2021

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Abstract

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The research aims to analyze the process of economic diversification in Ecuador in 2007 – 2017, specifically if the allocation of public investment was made in concordance with programs, policies, and strategies designed to achieve diversification in new non-oil sectors of the economy

In the same line, the investigation starts with a theoretical discussion about the modern theories of diversification and industrialization focusing on developing countries, characterized by the abundance of natural resources. The approaches formulate the best policy designs and institutional arraignments to achieve structural change (the research assumes that the public investment in specific sectors responds to the policies the diversification). The theoretical approaches highlight the role of the government to address the market failures in the mobilization of recourses for new economic activities

The methodology of the thesis combines qualitative and quantitative analysis. The qualitative analysis decomposes the policy formulation and implementation for structural change. While the quantitative analysis measure, through descriptive statistics, the amount of public investment (education, agriculture, infrastructure, manufacturing, R&D, and credits) and the impact on the country's economic structure.

Finally, the research concludes with the following results:

- First, the policy formulation is similar to the best practices analyzed by the modern theories of diversification.

- Second, public investment in the sectors that can boost diversification significantly increased,
- Third, diversification, measured by the traditional and nontraditional exports, improves its value; however, modest magnitude.
- Fourth, the implementation of the policy, the economic rigidities of Ecuador, and the lack of cooperation with the private sector might be the causes of the modest and insufficient results in terms of diversification.

Keywords: public investment, economic diversification, public policy, and economic growth.

Student ID: 2019-20153

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Chapter 1. Introduction

The investigation aims to analyze the process of diversification in Ecuador in the last developmentalist period from 2007 – 2017. With this purpose, the thesis will focus on the allocation of public resources trying to identify if the investment was made in concordance to the programs, policies, and strategies, which were designed to achieve diversification in new non-oil sectors of the economy.

Ecuador has experienced three periods of industrialization and diversification. Unfortunately, the results are mainly modest with a poor diversification and industrialization in specific sectors. The three periods were driven and financed mostly by the State with the national income resulting from the extraordinary increases in prices of Ecuador's primary products exported by Ecuador (Calderón, 2017). It is essential to mention that currently, the country's primary income is crude oil[1]production.

The last process of diversification and industrialization implemented was from 2007 and 2017. This period was characterized by an increase in the public investment in specific strategic sectors, which resulted in numerous policies and programs that supported diversification and industrialization of the national production. The macro-policies were focused on horizontal policies related to infrastructure and human capital, while the vertical policies aimed to improve industries' productive capacities with the provision of inputs using subsidies, credits, and tax benefits.

[1] The economic history of Ecuador is marked by an excessive dependence on few products—first the cacao boom (1860–1920), then that of bananas (1948–1966), and now of petroleum (Mather, 2017).

In the same line, the policy documents that have guided this process National development Plans and specific documents as the Industrial Policy of Ecuador; Agenda for Productive Transformation; National Strategy for the Change of Productive Matrix. The mentioned documents specified that the public and private investment should be centered in various horizontal and vertical policies that reach the national production transformation from a primary base to a more diversify and industrialize. Additionally, the government will assume the role of driving the country's development, offering solutions to the market failures that have affected Ecuador's economic structure.

It is known that developed states have transited from economies centered on few products until diversifying their production[2], generating better incomes and less vulnerable economy[3] (Mather, 2017). Korea, Japan, Taiwan, among others, are considered examples of how structural change is a crucial factor in achieving a developed country (Peet & Hartwick, 2015). The mentioned countries have guided the development of the policies that Ecuador has used in the studied period.

In concordance with the theory that will be reviewed in the next sections, the process of diversification needs large amounts of resources, between private and public investment. In the case of public investment, the resources should incentive the creation of new economic sectors (new products and services specially manufactured). The investment in the formation of new sectors is considered an inefficient allocation of resources

[2] In developed countries is present a U-shaped trend in which diversification accelerates until a certain point of inflection in the growth of a country as measured by GDP per capita, and afterward reverses toward accelerating export specialization (Rodrik (b), 2004).

[3] Little has changed in the distribution of Ecuadorian exports since the 1970s, such that in 2010 a full 72% were composed of just five products: crude petroleum, bananas, fuel oils, shrimp, and flowers (Mather, 2017).

in the context of a free market. This effect as a result of the existing traditional products that have stables markets and costs of production, while the new products will suffer from lack of information and uncertainty about the real cost of production and the possible absorption of the production (Rodrik (b), 2004).

In the same line, the market failure mentioned states that the capital does not naturally allocate to new sectors in normal market conditions. The effect is more prevalent in developing countries rich in natural resources, where the private investment focuses on the production of natural resources that are more profitable than other economic sectors (oil in the case of Ecuador) (Ismail, 2010).

As was mentioned, countries rich in natural resources presents special rigidities in the movement of capital that should be considered. The booming sector (oil in Ecuador) with astronomical rents will attract investment, letting other sectors without capital (Nazmi & Ramirez, 1997). The mentioned effect will produce an overspecialization in one sector, which will result in problems of the extreme volatility of the economy, an increase in inequality, low income, and other problems related to corruption and poor institutionality (Naranjo, 2006).

On the other hand, the discussion point about the relevance of public investment in economic growth and economic diversification will be analyzed in the next chapter. This discussion will be made based on the public investment made in specific sectors and actions, not considering the total amount of public investment in an economy. The mentioned consideration to separate the literature that maintains that in general public investment is less beneficial than the private; additional, I will analyze studies about public investment in developing countries, where the economic and political structure is different.

The existing literature of diversification and industrialization processes in Ecuador have not deeply analyzed the public investment made by the public sector in the last period, and neither have extensively analyzed the policies implemented. The lack of literature that combines the policy analysis and the quantitative measures of diversification is needed to approximate the real State of the economic diversification and industrialization in Ecuador.

Finally, the research question of this investigation is: Was the allocation of public resources a cause of a modest diversification in the last developmentalist period 2007 – 2017? First, I will use a qualitative method for an in-depth analysis of the policy formulation and implementation (public investment) of diversification policies. And second, descriptive statistical analysis will be done about the results of the diversification in Ecuador, considering the public investment's quantity and location.

This research's significant risk is the availability of information, mainly about data that can be quantitatively analyzed, especially in the public investment per sector, and the number of resources allocated by policies for industrialization and diversification. Additionally, with the change of government (since 2017), some documents have been deleted from the official webpages; in this sense, I had used information from external webpages or academic documents used to analyze the policy and contrast with the official information.

In the same line, I will use mainly governmental information, programs, policies, official data, and other academic documents that have contributed to this topic. Furthermore, due to the risk mentioned before, the investigation will use, in some cases, second-hand data of academic sources and non-governmental organizations with a high academic reputation that could make valid the conclusions. In the next section, I will resume the

research methodology that this dissertation will use to achieve the objectives previously mentioned.

Analytical framework

The investigation aims to analyze the process of diversification in Ecuador in the last developmentalist period 2007 – 2017; with this purpose, the thesis will focus on the allocation of public resources trying to identify if the investment was made in concordance to the programs, policies, and strategies; which were designed to achieve diversification in new non-oil sectors of the economy.

In this sense, the dissertation will develop a theoretical framework that endows it with adequate analytical tools for deconstructing the government's role and the public resource allocation in the process of economic diversification.

The thesis will use one leading analytical theory in diversification, emphasizing industrialization in developing countries, and other theoretical approaches to illustrate Ecuador's economic structure. The secondary theories are the Dutch disease and resource course that could be considered transversal to explain the behavior of countries with economies centered on natural resources and the distortions produced in the market and institutions. The next lines will explain how the theoretical framework will help to deconstruct and analyze the analysis case.

The thesis's primary theoretical approach will be summarized as follows: The State should intervene in the process of diversification to incentivize private investment to move their capital to non-traditional economic sectors (Rodrik (b), 2004; Hausmann & Rodrik, 2003; Lin, 2017). The government's role is supported by the assumption that the market does not

allocate resources in new sectors, and this effect is more distinguishable in countries rich in natural resources (Rodrik (b), 2004; Hausmann & Rodrik, 2003; Lin, 2017; Naranjo, 2006). The public investment should focus on specific areas and actions that I will discuss later.

Furthermore, conceptualizing the theoretical approaches of diversification, the theory identifies the following actions where the public investment should focus: incentives for new productive sectors, high-risk finance, research & development, subsidies for general training, and infrastructure (Rodrik (b), 2004; Hausmann & Rodrik, 2003; Lin, 2017; Cherif & Hasanov, 2016). Furthermore, the thesis will be completed in two steps seeking to have a complete picture of the process of diversification in Ecuador.

First (1), I will analyze the policies implemented in Ecuador. This section will present the first impressions of the policies implemented and could identity briefly other factors that might have influenced the process of diversification. To guide the first analysis, I will enumerate the actions of public investment and the considerations that will be made in the case of Ecuador:

- Incentives for new productive areas: competitive funds transferred to private entrepreneurs that want to explore new economic activities that will generate spillovers. At this point, the investigation will consider other types of incentives like general subsidies and the transfer of technology.
- High-risk finance: public funds delivered by public credit institutions focused on new productive activities and other startups.
- Research and development: transfer of public resources to research public institutions. I will also consider public funds focused on the development of new productive technology

- Subsidies for general training: public investment in institutions in charge of the workforce's capacitation. This section will not consider the transfer of money or the creation of educative centers
- Infrastructure: the investment made in airports, roads, ports, hydroelectric and general construction.

Second (2), the investigation will analyze the public investment made in the economic sectors prioritized in the policies of diversification (that have analyzed in the first step); here, the primary information that Ecuador has in terms of investment is the Gross Fixed Capital Formation - GFCP per industries and sectors. At this point, I will assume that public investment responds to the policies in diversification implemented in Ecuador.

In the next section, I will show the variables and the information of each variable. It is essential to mention that this thesis will use qualitative methodology to analyze the policy and quantitative data (descriptive statistics) to analyze the relation between public investment and diversification.

Dependent variable: diversification in Ecuador period 2007 – 2017. The degree of diversification, following the existing in the literature, will be measure by the following indicators:

- GDP per economic sector, the modification in the composition.
- Products exported by Ecuador, variation, or increase of other products that were exported, and the fluctuation of crude oil.
- Employment by sector data about the workforce's mobility from the traditional sector to other non-traditional sectors.
- Diversification and concentration index generated by the United Nations Conference on Trade and Development.

Independent variable: public investment in non-traditional sectors. Non-traditional sectors in Ecuador will be considered all that do not relate to oil. Following the theory, the sectors analyzed will be agriculture, manufacture, education, credits, R&D, and infrastructure. For this, I will operationalize the variable with the following data:

- Gross Fixed Capital Formation for manufacturing and infrastructure;
- Investment in the Ministry of Agriculture for this sector
- Public Bank Data about credits for innovative (available productive credits) sectors
- Government expenditure in Research and Development
- Gross Fixed Capital Formation in Education

The investigation will have two steps to decompose the process of diversification and public investment in Ecuador. The first step will identify the policies and sectors prioritized and will be guided by the theoretical approach about diversification. The second step will result in identify if the public investment was made in concordance with the policies analyzed in the first step.

Finally, measure the public investment and analyze the characteristics of the policies implemented in Ecuador might identify the factors that could influence the process of diversification in the country. The results will produce practical information about the rigidity of the Ecuadorian economy and the actions implemented to achieve the goal of diversifying the productive structure of Ecuador.

Structure of the thesis

The present document is divided into five chapters. Chapter I introduces the research presenting the overview of the country's economic structure, the diversification policies applied, and the analytical framework that the thesis will follow, the research structure, and the methodology.

Chapter II is the theoretical background that the thesis will use to guide the case of analysis. Chapter II will first analyze the public investment as a factor for economic growth; second, the influence that the public investment has to create a diversified economy, this considering that developing countries' economies have unique features and behaviors that should be separated from the developed countries.

Chapter III will make a general analysis of the government's policies in the studied period 2007 – 2012 to diversify and industrialize the economy; and a descriptive statistical analysis about the amount of resources made by sectors in these periods. The document will center the attention mainly in the two first National Developmental Plan (2007- 2010; 2009 - 2013) and in the specific policies implemented to diversify the productive structure of the country: Industrial Policy of Ecuador 2008 – 2012; Agenda for Productive Transformation 2010 - 2013. Additionally, the dissertation will briefly analyze the implementation of specific policies and programs designed to diversify the economy.

Chapter IV will continue with the qualitative and quantitative analysis of the process of diversification for the period 2013 - 2017. The main document to analyze will be the National Developmental Plan 2013 - 2017 and the National Strategy for the Change of the Productive Matrix 2015. Finally, the thesis will present the entire public investment made by Ecuador and analyze the fluctuation in diversification indicators.

For the descriptive statistical analysis, I will use data of the Central Bank, Superintendency of Banks and National Institute of Statistics, and Census of Ecuador from the public sector. Moreover, to complete the public investment information, I will use data of the following international organizations United Nations (UNCTAD, UNIDO, FAO, and UNICEF) and the World Bank.

Finally, the thesis's conclusions will be presented in the Chapter V with an analysis of Ecuador's policy formulation in the process of diversification and industrialization; and in the same line, the results in diversification in concordance with the quantity of resources invested. Additionally, the author will make a policy recommendation directly related to the country's structural problems and the consequence of implementing policies of diversification and industrialization.

Chapter 2. Theoretical background

Ecuador has experienced three periods of diversification and industrialization driven by the State; in these periods, the State has played the role of organizer of the economy and an active position in the market, creating demand and supply of products and services. In the same line, the government in the studied period has designed vertical and horizontal policies to improve Ecuador's diversification and industrialization.

With this framework, this chapter will present the theoretical approaches that will help deconstruct the government's role in periods of diversification and industrialization. Moreover, the dissertation will analyze the influence of pubic investment in the economic growth of developing countries. The primary approach is the new debate about diversification and industrialization for developing countries, and finally, the obstacles to diversification in middle-income countries rich in natural resources.

Public investment and development

Public investment has been a significant point of discussion in the field of economic development. Theories of development have fundamentally discussed the role of government and its efficiency and, on the other hand, the capacity of the market to create wealth and inequality. Since the ideas of Keynesianism, the State has emerged as a coordinator of the economy, in some cases, as an actor in the market with an expansive public investment (Routley, 2012). The role started after the great depression in 1930, implementing policies and programs with large amounts of public investment to promote economic growth.

Nevertheless, as was mentioned, there is still a big discussion about the importance of private and public investment and its economic growth

effects. This debate produced several studies using different methodologies and perspectives.

Table 1 Empirical studies based on developing countries

Author(s)	Region and sample period	Model specification	Conclusions
Beddies (1999)	Gambia 1964 to 1998	Cobb Douglas	The impact on the growth of private investment is more than public investment.
Bèdia (2007)	Cute d'lvoire 1969-2011	Cobb Douglas	Public investment contributed more to economic growth than private investment in the long run.
Belloc and Vertova (2004)	Selected HIPC	Cobb Douglas	Public investment is more important than private investment in the growth process.
Coutinho and Gallo (1991)	33 developing economies 1970-1988	Cobb Douglas	Private investment spurs growth more than public investment.
Erden and Holcombe (2005)	Sample of developing economies 1980-1997	Standard investment model	The public investment complements private investment.
Ghali (1998)	Tunisia 1963-1993	VECM	Public investment retards economic growth.
Ghura (1997)	Cameroon 1963-1996	Cobb Douglas	Private investment plays a more significant role in the growth process than public investment.
Hague (2013)	Bangladesh 1972-2011	Cobb Douglas	Private investment is more critical than public investment in growth.
Khan and Kumar (1997)	95 developing countries 1970-1990	Cobb Douglas	Private investment accelerates growth more than public investment
Khan and Reinhart (1989)	24 developing economies	Neoclassical production function	Private investment is more efficient in the growth

			process than public investment.
Mallick (2002)	India 1950-1993	VAR	Public investment is more important to growth than private investment.
Nazmi and Ramirez (1997)	Mexico	Modified neoclassical production function	Both public and private investment have identical impacts on economic growth, while public investment stifles private investment.
Odedokun 1997	48 developing countries	Modified production function	No infrastructural public investment stifles private investment.
Ramirez (1996)	Mexico and Chile 1940-1992	Linear growth Model	While both public and private investments exert a significant positive impact on growth, a complementarity relationship was reported.
Ramirez and Nazmi (2003)	Nine major Latin American economies 1983-1993	Cobb Douglas	Both public and private investments are essential to growth.
Sahoo et al. (2010)	China 1975-2007	Cobb Douglas	Both public and private investments are relevant, with public investment playing a complementary role in growth.
Serven and Salimano (1989)	Cross-section of developing economies	Private investment models	Private investment is superior to growth than public investment.

Source: (Makuyana & Odhiambo, 2016)

Table 1 shows studies made in developing countries and the impact of public and private investment; some investigations support that public investment is inefficient and crowds out private investment; others maintain that this public investment will attract private investment.

Nevertheless, this table does not show the particularity of each country's context or the central policies that each country has applied. This thesis will

investigate the allocation of the public resources in the last process of diversification and industrialization in Ecuador, which could illustrate the successive problems in the last process of diversification and industrialization in this country.

In the same line, several authors have focused its attention on the State as an actor that invests in infrastructure (highways, streets, bridges, water and sewer systems, transit systems, and airfields) and the effect in economic growth (Erenburg & Wohar, 1995). Other authors have maintained that the State should provide necessary physical infrastructure, not limiting its intervention to basic public goods, and participating in necessary capabilities to improve production factors like free social insurance, free education, the welfare state, and other policies programs that also considered the creation of SOEs.

However, each country presents its characteristics and must be analyzed considering the particularities. In this line, authors as Miguel D. Ramirez and others have analyzed developing countries and the relation between private and public investment. Ramirez found that the relation in these countries is different comparing developed countries. Institutional factors, subsidies to the production, the State as an active economic agent, and taxes could positively influence the relation before mentioned (Ramirez & Nazmi, 2003; Makuyana & Odhiambo, P, 2016; Odedokun, 1997).

According to the investigation of Mohin Khan and Mammohan Kumar, private investment has a more productive impact on the economic growth in developing countries, but this relation is most apparent in countries of LAC and Asia. Additionally, public investment has higher return rates in low-income countries than in high-income countries (Khan & Kumar, 1997). This effect can suggest that the investment in infrastructure and human capabilities could complement private investment.

Economic growth considers private and public investment necessary in developing countries. Furthermore, the State's investment must be focused on infrastructure, education, and human capital. On the contrary, public investment in state-owned enterprises and the State as an active economic agent results in a crowd out of private investment and slows economic growth (Ramirez & Nazmi, 2003; Makuyana & Odhiambo, 2016; Odedokun, 1997).

Additionally, it is essential to mention that developing countries with low general investment, with zero economic and social infrastructure, should be analyzed independently; here, the State's intervention is fundamental. The State must invest in areas where the market actors will not receive economic revenues; these areas are public goods and products that will not generate immediate revenues to private actors.

Finally, after reviewing the role of public investment in developing countries and the specific areas that should focus, it can be concluded that public and private investment are necessary for the economic growth of countries. In the specific case of developing countries, the role of public investment should be in basic infrastructure, human capital, the welfare state, and in public goods where the market does not allocate resources.

In the same line, in the process of diversification, the public investment has an important role that was mention in this section; in the following lines, the thesis will focus on the role of public investment in the process for diversification and the areas that the investment should be directed and the policies that should embody the public investment.

Diversification and industrialization policy

Developed countries have shown that the development path is to achieve a diversified and industrialize the economy. The evidence suggests that these countries have moved from an agrarian economic structure to a diversify and high value-added structure; the trajectory is not the result of the forces of the free market and the parsimonious allocation of resources, but the influence of the government in the planning and adequate allocation of resources (Lin, 2017; Rodrik, 2005)

Developing countries have applied policies centered on the process of diversification and industrialization. However, they have failed in these processes due to several factors like lack of financial resources, poor institutionality, human capital, weak or inexistent infrastructure. Additionally, evidence shows that a country with an excessive concentration in the economic structure presents a high Gini coefficient and high vulnerability to international crises and shocks (mostly natural resource-dependent economies) (Rodrik, 2005).

In this sense, the economic structure of a country is significantly related to its economic performance (Rodrik (b), 2004). This effect could be considered comparing countries that have specialized in a few primary products and others that have diversified in high value-added products[4] (Rodrik (b), 2004). According to some authors, this structure results from endogenous factors like resource availability, environmental conditions, comparatives advantages, and other economic variables (Lin, 2017).

[4] Exist evidence that developed countries concentrated in a few specialized products increase their incomes as consequence of an efficient specialization after a period of economic diversification (Rodrik (b), 2004)

In the next paragraphs, I will present two fundamental theoretical approaches to economic development about the process of diversification and industrialization for developing countries.

New Structural Economics - NSE theory considers capital, labor, and natural resources as endogenous factors. These factors are differently endowed in each country; an economy that tries to deviate from their comparative advantages is prone to have a poorly industrialization and diversification performance (Lin, 2017; Lin (b), 2010). Capital accumulation will make that these factors evolve; however, if there is an overaccumulation in factors that the economy does not possess comparative advantages, the resources invested will not be efficiently used, and the production will lose competitiveness. This effect has been seen in developing countries that tried to give a big step in terms of diversification and industrialization (Lin, 2017; Lin (b), 2010).

In the same line, if an economy accumulates capital in sectors that possess comparative advantages, the returns will be higher, which will also make that future investments would be less costly, considering the transfer of technology and knowledge from developed countries with similar comparative advantages (Lin, 2017; Lin (b), 2010).

Until this point, the research has reviewed the Ricardian comparative advantages of the NSE approach. The upgrade proposed by this theory is centered on the role of government and the appropriate policies for moving these comparative advantages from traditional production to others more productive and more diverse activities; that, as a result, will improve the country's income and permit a less vulnerable economy.

Developed countries have invested resources in new and more productive economic areas and have maintained their economic growth and

development. However, developing countries that have concentrated on a few primary products have impeded their development path. Evidence suggests that economies with high diversification increased their income and have fewer volatile economies. In the same line, high value-added products show better economic performance and positively influence economic growth (Agosin, 2007).

The research has reviewed, until this point, the main assumptions of the New Structural Economics that support the comparative advantages for creating effective policies for industrialization and diversification. Nevertheless, according to authors like (Hausmann & Rodrik, 2003) these assumptions do not reflect the market's interactions, and more importantly, these authors show empirical evidence of countries that do not follow their comparatives advantages and have achieved industries considered highly successful nowadays.

In the same line, India and the information technology sector show a country that grows in a framework of low-income performance since 1980. The comparative advantages in India's start point of development were not on high skill workers or technology-intensive sectors. However, India has succeeded in the technology sector (Hausmann & Rodrik, 2003). Bangladesh possesses an intense labor sector and is creating higher incomes in producing hats, knitted or other products with textile material, shows that this industry is essential, but that also possesses other activities that do not rely on labor-intense skills (Hausmann & Rodrik, 2003).

> "Consider Pakistan, which is not too dissimilar to Bangladesh in its economic circumstances. Pakistan exports a large quantity of bedsheets, but few hats. Since these commodities are fairly standardized and labor-intensive, it is difficult to believe that the resource endowments and cost structures of the two countries predispose them in any predictable way to specialize in one but not the other. More likely, existing patterns of specialization are the consequence of historical accidents and serendipitous choices by entrepreneurs (Hausmann & Rodrik, 2003)."

This trend is followed by other countries; in Central America, Honduras and Dominican Republican are considered countries with very similar endowments. Nevertheless, the Dominican Republic exported US$119 million in footwear uppers (HS 640610) to the US, while Honduras exported none (Hausmann & Rodrik, 2003). Honduras is a significant exporter of ignition wiring sets (HS 854430), whereas the Dominican Republic barely exports any (Hausmann & Rodrik, 2003). In Asia, Taiwan exported US$279 million of bicycles to the US against Korea's US$623 thousand; Korea exports many air conditioning machines, Taiwan very few (Hausmann & Rodrik, 2003).

The authors show empirical evidence supporting that "the specific product lines that eventually prove to be hits are typically highly uncertain and unpredictable. (Hausmann & Rodrik, 2003) ". This invalid and critic the approach of Lin and his New Structural Economics. Nevertheless, despite these discrepancies, both approaches have structural similitudes in the role of government and market failures. In this point, both approaches support the interventions of the government in these failures.

The government should intervene with specific policies to move investment from traditional economic activities to other more productive and diverse; this influence can be summarized in two central actions. First, the combination of policies between incentives and punishment, discipline, and reward in the formulation of industrial and diversification policy (Hausmann & Rodrik, 2003; Rodrik, 2005; Lin, 2017; Lin (b), 2010). Second, the creation/transformation of public institutions that are in charge of the economic restructuring, which should be in part integrated with the private sector and the same time, independent for making the adequate decisions in the policy formulation (Hausmann & Rodrik, 2003; Rodrik, 2005; Lin, 2017; Lin (b), 2010).

In order to explain government policies and the allocation of private and public investment, it is necessary to explain why actors in developing countries and in free-market conditions do not naturally invest in new economic areas. The literature explains this effect by two externalities: coordination and information (Hausmann & Rodrik, 2003; Rodrik, 2005; Rodrik (b), 2004; Lin, 2017; Lin (b), 2010).

The externality of coordination (1) is first related to making the new activity profitable. New productive activities that depend on other inputs need that different actors produce the necessary inputs, and these investments should already exist or start simultaneously. The State as a coordinator actor should absorb the information of the private sector and process it, showing the missing links in the productive chain and the capital returns that could produce (Hausmann & Rodrik, 2003; Rodrik, 2005; Rodrik (b), 2004; Lin, 2017; Lin (b), 2010).

To illustrate this externality, an entrepreneur intends to export apples. However, it is necessary to have at the same time investment in other parts of the chain. In the example, it is also needed investment in a packing company that allows the first entrepreneur focus on his activity and do not make other investment that could produce a shortage of future resources (Hausmann & Rodrik, 2003; Rodrik, 2005; Rodrik (b), 2004; Lin, 2017; Lin (b), 2010). In this case, the coordination in different but complementary investment should be made by one actor that considers all the productive chain (Hausmann & Rodrik, 2003; Rodrik, 2005; Rodrik (b), 2004; Lin, 2017; Lin (b), 2010).

The externality of information (2) is related to discover the new industries and the costs of production. In normal market conditions, this discovery will produce winners and losers. Nevertheless, in developing economies,

these costs could stop new entrepreneur explore options, additional the discovery of this cost could be beneficial to other entrepreneurs that could imitate that activity with a lower cost; profits are socialized, but losses are personal (Hausmann & Rodrik, 2003; Rodrik, 2005; Rodrik (b), 2004; Lin, 2017; Lin (b), 2010). In this externality, the key element is having comprehensive information about adequate industries and profitable products. For this, the entrepreneur should know the cost of production and adequate investment (Hausmann & Rodrik, 2003; Rodrik, 2005; Rodrik (b), 2004; Lin, 2017; Lin (b), 2010).

Consequently, in the formulation of public policy, investment, and considering the externalities before mentioned, the government should intervene. First, boosting the private sector in non-traditional areas, and in case these show that are not profitable immediately, remove the resources and relocated to other activities (Rodrik, 2005; Hausmann & Rodrik, 2003). In the case of Latin America in the period 1970, the incentives have been conferred, but have not been removed after known some industries were not profitable (Rodrik, 2005; Hausmann & Rodrik, 2003; Kwon, Mkandawire, & Palme, 2009).

Second, to formulate an adequate diversification program, a capable bureaucracy with a certain level of integration with the private sector is necessary. The private sector knows about its own business, the obstacles, weaknesses, and opportunities; this information is necessary to produce the country's best policies and should be transferred from the private to the public (Rodrik, 2005; Hausmann & Rodrik, 2003; Lin, 2017). The government should have bureaucrats that work with the private sector, balancing the country's best options and the private's best results.

With this framework, once defined the role of government and some market considerations, the thesis will concentrate on public policy and the

investment in diversification programs for developing countries, especially in the case of Ecuador.

The government should invest resources in policies promoting the new productive activities that are not naturally driven by the free market conditions. The investment could be articulated in forms of loans, fiscal reductions, subsidies, and technology transfer, among others (Hausmann & Rodrik, 2003; Rodrik, 2005). Here the risk of new activities should be shared between the government and the private sector.

At this point, it must be considered that before the government invests in promoting new activities, the government should promote a friendly environment for private investment. In this case, the implementation of public investment policies in diversification could fail if there are no other horizontal structures in specific necessary infrastructure, human capital, and welfare (Shenggen, Jitsuchon, & Methakunnavut, 2004; Rodrik, 2003).

Similarly, should be mention that the public investment by one side try to upgrade the economic structure from traditional and non-diversify sector to a one more productive and diversify; and for the other side, influence the attraction of foreign private investment, that for several authors, is more productive than the public investment (Makuyana & Odhiambo, 2016).

Moreover, for developing countries, the public and private investment are necessary for economic growth. The public investment should be allocated in specific policies and sectors that will improve the capacities of the State, resulting in a reduction of the transactional costs, creating a suitable environment for private investment, while at the same time producing policies that reduce as much as possible market distortions (Ramirez & Nazmi, 2003). Which, as was shown, are mainly infrastructure, education, and health. On the contrary, public investment in state-owned enterprises

and the state as an active economic agent could results in a crowd out of private investment and slows economic growth (Ramirez & Nader, 2003; Makuyana & Odhiambo, 2016).

Indeed, infrastructure has shown a positive effect in developing countries crowding in private investment and boosting the Gross Domestic Product - GDP (evidence shows that the multiplier effect is of short duration due to the characteristics of a public good) (Ramirez & Nader, 2003; Nazmi & Ramirez, 1997; Ramirez (b), 1996). Additionally, in late-developing countries, invest in education and human capital have been used as a development tool, improving the conditions for the implementation of ambitious economic programs (Kwon, Mkandawire, & Palme, 2009).

In sum, upgrading and improvements require essential coordination, with significant externalities to firms' transaction costs and returns to capital investment. Thus, in addition to an effective market mechanism, the government should play an active role in facilitating structural changes.

Historical evidence shows that western industries have grown, not in free-market conditions, but frameworks of protection policies. In Asia countries like South Korea, Taiwan, Japan has implemented policies driven by the State with an export-oriented character using public investment to boost the enterprise's capacities (Lin (b), 2010). Indeed, in the Japanese example, the government took an active role, creating state factories in shipbuilding, mining, textiles that, after a period, were sold to the private sector and received subsidies after been sold (Lin, 2017; Peet & Hartwick, 2015).

Once I have shown (1) that the public investment is necessary for economic growth in developing countries, (2) that the government has a primordial role in the process of diversification, and (3) that the public investment should be focused on the externalities of coordination and information. In

the following section, I will enumerate policy recommendations and other institutional arraignments that will guide and analyze the policies implemented in Ecuador and the allocation of public investment.

Political leadership at the top, in this specific case, the responsibility of economic restructure should be in charge of a high political figure that has direct communication with the president or prime minister and has a strong presence in the government cabinet (Rodrik (b), 2004). This top policymaker will have the capacity to coordinate between different bureaucrats' levels and require the formulation and implementation of policies to other institutions and ministries. Finally, this well-known figure will give a high level to the policies implemented and accountable for industrial policies (Rodrik (b), 2004).

Coordination council**,** this institutional choice should be a place where the public and private exchange information about each sector. This place includes the presence of different private actors nor only the well-organized actors, but the small and not big entrepreneur. The private could start asking for fewer transaction costs to the government, tax reductions, among others, while the government will request for high levels of investment in adequate productive spaces. This model is more comfortable to describe but hard to manage, could be severely affected by the country's idiosyncrasy and others' rent seeking-actors (Rodrik (b), 2004).

Subsidies self-discovery, the externality of information mentioned before, will support government investment in new activities that will benefit other possible actors. This investment is necessary for conditions where the entrepreneur needs financial resources to start the activity and adapt the process of production (Rodrik (b), 2004). Nevertheless, the distortion that this subsidy could create and other risks related to corruption and rent-

seeking should be considered. In this line, the author proposes the following conditions.

- The industries should be substantially new activities;
- The activity should be potential to provide learning spillovers to others in the economy;
- The private sector entities are willing to submit themselves to oversight and performance audits.

Higher risk financing**,** the investment that should be done in the latter phase of the project will need more recourses that the early stage; these resources will be considered of high risk, which will make costly for the entrepreneur access through a standard financial institution (Rodrik (b), 2004). In this case, the government should offer alternatives for the private sector like development banks, publicly funded venture funds, public guarantees for longer-term commercial bank lending, or special vehicles that direct a share of public pension fund assets to a portfolio of higher risk investments (Rodrik (b), 2004).

Internalizing coordination externalities**,** the government should know from the private the possible obstacles for generating positives externalities; the space for this interchange was mentioned before from a macro perspective. However, it should be considered that each activity is different and should be evaluated in this position. In this case, the government should analyze this possible coordination and make the State's best decision.

Public research and development, the transfer of technology from a developed country to other is not an action that will deliver immediately efficient results; according to the literature, the benefits will begin when the technology transferred to start a process of adaptation to the new environment (Rodrik (b), 2004). The adaptation process will require R&D;

for this, the government should offer this service to specific activities that could be led in articulation between the public and the private, analyzing the externalities and benefits to some productive chain and others.

Subsidies for general training, new activities, and new technology will require a trained workforce with skills that are not developed in the countries. In this case, the possible training costs could imply lower return rates for the private and delay the new activity's development. In this case, the government should offer financial resources to train the workforce and offers capacitation in new skills; this action will induce new positives externalities inside the activity and to other activities.

Nationals abroad**,** people living and working abroad possess the training, education, and other skills acquired in developed countries, which could mean that their influence in the developing countries could bring benefits in discovering need economic activities and boost them. In this sense, the government could bargain to bring the back to the country and offers them exceptional support for starting new productive activities.

Obstacles to diversification in countries rich in resources

Once reviewed, the public investment and policies focus on diversification; the thesis will consider the economic structure for the Ecuadorian case, which is defined by the dependency on the oil and the constraints that this dependency has formed.

Furthermore, the theoretical approach of Dutch disease[5] is not new in the academic field of economic development. Nevertheless, since the last

[5] In this section the investigation will focus on the effects of the Dutch disease related to the movement of the factors of production (labor and capital), but the research will not expand the effects in the real exchange rate

period of high in the international price of natural resources, this theory has become an essential tool to analyze the current situation of developed and developing countries and the interaction between diversification policies and revenues from natural resources.

In the last section of this document, we have established basic requirements and public incentives to initiate the process of diversification: coordination between investment, expansive information, subsidies self-discovery, high-risk financing, public research and development, workforce training, necessary infrastructure[6]. However, rich in natural resources countries present special features that could make the appliance of the policies and programs mentioned difficult to apply.

The Persian Gulf's big oil exporters' case is interesting to analyze[7]; these countries are considered high-income countries. Through public investment, these countries have achieved high rates of education, health, infrastructure, and low poverty (Cherif & Hasanov, 2016). However, these necessary capabilities have not been enough to diversify their economies. The Persian Gulf economic structure has remained to the income from natural resources and other few industries concentrating their income on the traditional exporting products (Elbadawi & Gelb, 2010).

Labor and capital movement

The Persian Gulf Countries - PGC has invested in heavy industries as chemistry and energy, which are capital intensive, resulting in few linkages

[6] Others conditionalities as implementing structural reforms, improving institutions and the business environment, and regulations will not be entirely cover but briefly mention.

[7] The Persian Gulf Countries can provide characteristics and experienced related to Ecuador in areas as salaries, education and rigidities characteristics in high- and middle-income countries.

with the rest of the economy, the rest of the production of the country cannot provide the necessary inputs to these industries (Elbadawi & Gelb, 2010). Tradable goods and high technology products are still imported, and the technology transfer to the rest of the sectors is considered low (Cherif & Hasanov, 2016).

The State has played a role as a coordinator actor, providing incentives to different productive activities and offering subsidies to create inputs that are needed to complete the chain of the existing heavy industries (Elbadawi & Gelb, 2010). However, the movement of production factors is still conditioned by the economic structure, and the existing rigidities result from the abundance of natural resources. The factors of production are concentrated in the natural resources industries result of the large and rapid revenues. The interaction between the government policies for diversification and the rigid economic structure is a clear symptom of the Dutch disease (Elbadawi & Gelb, 2010).

The issue mentioned in the last paragraph related to the rigid mobility of capital and labor is also seen in middle-income countries, as Ecuador that have implemented policies and programs focused in increase the manufacturing sector, but that is affected by the increase in the revenues of the oil sector, distorting the private investment in activities that will generate rapid and high income.

PGC's difficulties with their dependency on the oil industry are mainly due to the excessive investment in the oil and the lack of institutions that effectively manage the resources. This issue is also observable in middle-income countries as Ecuador. However, exist other determinants that affect the institutionality in Ecuador. In the case of PGC, the problems of institutionality and the movement of the labor force are related to the high wages that offer the public sector, making that the labor force does not apply

to other industries that provide lows salaries (Cherif & Hasanov, 2016; Alsharif, Bhattacharyya, & Intartaglia, 2016).

Similarly, the effect of labor and capital concentration is an effect described by the Dutch disease in the tradable and non-tradable sectors of the economy (Ismail, 2010). Nevertheless, in the PGC countries, the public sector also attacks production factors by the high wages offered (Elbadawi & Gelb, 2010; Cherif & Hasanov, 2016).

The concentration of capital in natural resources industries is produced in the same line as the human capital but in a different sector. For instance, the oil industries have better revenues than the tradable sector, which causes private investment to concentrate on this sector, producing a lack of resources in the manufacturing sector, generating a process of deindustrialization in periods of high international prices of the mentioned commodities. The concentration of capital is also an effect of the market failure discussed before, the no allocation of capital in high-risk investments, which in this case are new activities (Alsharif, Bhattacharyya, & Intartaglia, 2016).

Countries like Indonesia and Mexico have concentrated their policies on creating free zones, tax incentives, and non-tariff barriers. Nevertheless, more important efforts have been made in two specific points to attack foreign investment and create new industries that diversify their economy: first, Indonesia have devaluated the exchange rate in1980 that was the largest among the developing countries, and second, both countries had low wages in comparison to other countries to attack foreign investment (Cherif & Hasanov, 2016).

In sum, countries with high revenues from natural resources industries: first concentrate the investment and human capital in natural resources

industries, letting the tradable sectors without these inputs. Second, tradable and non-tradable sectors increase the wages looking for new human capital, producing a crowd out effect in investment due to the low competitiveness in the country in terms of production costs. And third, after the booming period the loss of competitiveness is hard revert producing asymmetries and other types of adjustment relate to high consumption, high salaries, high government expenditure.

Additionally, in this theoretical chapter, the investigation has analyzed specific horizontal and vertical policies concentrated in infrastructure and necessary capabilities promoted by the government, and other vertical policies focused on incentives that the government should implement to stimulate the market signs. However, in the present subsection have been analyzed other determinants for attack investment, create new industries, and complete the productive chains; which are related to macroeconomic stability and currency devaluation. Unfortunately, these determinants and their policies will not be analyzed in the present dissertation.

Finally, once the thesis has analyzed the obstacles, constraints, and rigidities that countries rich in natural resources have in their economic structure, the thesis can have a complete image of the difficulties that a country as Ecuador should address to diversify its economy. The policies analyzed in the section mentioned should also be implemented in a bigger framework that helps the country manage the oil revenues and the institutionality necessary to implement long-term programs and policies that look to cure the resource curse and Dutch disease.

Chapter 3. The rigid economic structure of Ecuador and the process of diversification 2007 - 2012

The present chapter is divided into two main sections: the first section will present a general overview of the past processes of diversification and Ecuador's industrialization. This section aims to give a general understanding of the results of diversification policies implemented in Ecuador and how these processes have affected the country's economic structure.

The second section of the present chapter will analyze the policies, programs, and public investment of diversification and industrialization in Ecuador in 2007 – 2012[8]. In this first period, the government applied several policies in the productive area; however, I will focus on the actions directly related to diversification and industrialization in line with this thesis's objective. The present section will mix qualitative analyzes and descriptive statistics to illustrate the amount of resources invested in each government period and the results in diversification and industrialization.

Ecuador: Periods of diversification and industrialization

The first process of diversification of Ecuador occurred from 1950 to 1971. The initial actions were promoted by government experts of the Central Bank of Ecuador that requested to be part of ECLAC being aware of the new economic growth approaches developed by this organization. In this sense, the country received a complete document about the economic structure of Ecuador (Moya, 2019). The technical document sustained that Ecuador had a primitive economy, and to achieve economic growth; the

[8] The next chapter will analyze the period 2013 - 2017 of industrialization policies

country needed to create capable institutions and bureaucracy, public investment in necessary infrastructure and a process of diversification focused on industrialization. This first stage of diversification was financed by external debt (Moya, 2019).

In the same line, after a few years of implementation, the process of diversification was financed by an increase in the national income due to the elevated prices of the primary products (Moya, 2019). Similarly, other factors that made viable the process of Import Substitution Industrialization - ISI were: the increase in the national income resulted from the new expansive period of export of bananas and the resulting incremental consumption of exporters and other related actors (Arantes, 2019).

In this first period, the government applied strategies focused on expansionary government expenditure, productive credits, increased investment in the infrastructure, and an institutional change inside the government (Calderón, 2017). Industrialization was a primary focus on creating public institutions and State Own Enterprises that reach modernize the agriculture sector and create a manufacturing sector that, at the moment, non-existed (Calderón, 2017). Moreover, in this first period of diversification and industrialization, the country sought to expand the internal market by implementing a process of land reform in 1964 under a Military government (Moya, 2019).

In 1967 the government presented legislation for the industrial sector in Ecuador, giving tax benefits to new industries. In the same period, the National Finance Corporation – CFN provided credits to this economic sector. In trade defense, Ecuador imposed tax barriers looking to decrease the imports of consumer goods and promote the substitution with national products (Moya, 2019). The sectors selected in this process were the light industry, food, and textiles. However, the national production did not cover

the national consumption, and due to the deterioration of the terms of the exchange of primary exports, Ecuador suffered a currency shortage and an increment of the external debt resulting in an abrupt stop in the industrialization drive (Calderón, 2017).

The results of the first period of diversification are mixed; the industrial sector grew an average of 4.41% per year between 1966 and 1970. Furthermore, the share of national exports increased from 11.3% in 1965 to 13.6% in 1969. However, the Ecuadorian economy was still characterized as an exporter of traditional products. Imports of raw materials, intermediate goods, and capital goods used in the industry grew 41.8% between 1965 and 1969 (Moya, 2019).

The second industrialization process applied in Ecuador covers the period between 1972 – 1982. The State financed this process with resources generated by crude oil exports. In this period, the exports growth exponentially by discovering new oil zones in the Amazonia (Arantes, 2019; Calderón, 2017). Additionally, between 1972 and 1973, the oil prices quadrupled from $2.50 a barrel to $10 a barrel, the value of Ecuadorian petroleum exports rose by more than $200 million (Mather, 2017).

In the second period of ISI, the public investment focused on infrastructure and a good environment for the oil and mines industries. The policy included a mix of direct and indirect subsidies, freezes on tariffs and prices of essential goods, and tax exemptions (Gonzalez, 2012). The oil sector development benefitted from a surge in foreign direct investment, which went from US$571 million in 1973 to US$807 million in 1978 (Gonzalez, 2012). Besides, increasing international liquidity led to amplified public and private borrowing, boosting current spending, large investment projects, military purchases, and debt service (Gonzalez, 2012).

The results of the second period of industrialization were positive for Ecuador. The higher industrial growth, which was reflected in the exports of the fish and processed cocoa branches. (Moya, 2019) The degree of import substitution increased from 44.3% in 1975 to 73.3% in 1982. According to Bértola & Ocampo, the GDP of Ecuador's industrial sector between 1974 and 1980 increased by 10.2%. "…industrialization advanced rapidly in several small countries, particularly in Ecuador… [the increase in industrialization was] mixed in them, as we have pointed out, with a primary-exporting structure… (Bértola & Ocampo, 2010)" The participation in industrial value-added in 1974 in Ecuador was in food, drinks, and tobacco with 30%; while the second was the oil refining with 16.1% (Bértola & Ocampo, 2010).

About the sustainability of the ISI process, after the growth in Ecuador's national income as a result of high oil prices, the fake security made that the government expand the investment in infrastructure and public goods, which at some point had to depend on external debt when the oil prices fell (Mather, 2017). In 1982 and 1983, the prosperity ended with the decrease of the Ecuadorian income resulting in a subsequent economic crisis and a severe affectation to the implementation of ISI, which finally ended as a result of massive external debt, weak productive chains, monopolistic structures, and an elevated portion of import inputs in the production (Arantes, 2019; Calderón, 2017).

Similarly, in 1984, the debt had risen to absorb some 60% of export earnings; the International Monetary Fund – IMF, was willing to renegotiate debt payments but only after forcing Ecuador to make massive cuts in public spending (Mather, 2017). Additionally, Dutch Disease symptoms were registered as a disequilibrium in the current account, and a notable increase in the imports of capital goods and intermediate inputs (Arantes, 2019; Calderón, 2017).

Ecuador, in the 90s, implemented orthodox economic policies (Washington Consensus), mainly focuses on macroeconomic stability, the exportation of primary products, fiscal adjustment, and payment of the external debt (Arantes, 2019; Calderón, 2017). In this period, the modest improvements in the industrial sector achieved in the past periods were almost destroyed (Calderón, 2017). The adoption of the Dollar as a legal currency in 2000 was the consequence of the worst economic crisis result of the low prices of crude oil, high international debt, and the deregulation of the finance system (Calderón, 2017).

Finally, as a conclusion of the historical process of diversification and industrialization. Ecuador has grounded all the diversification processes with resources of the exploitation of natural resources (high international prices of banana and oil) and external debt. The non-regular income makes the public investment inconstant, presenting shocks of reduced resources that affected the implementation of diversification and industrialization policies. In the same line, the improvements made in the past periods have been severely affected by the policies implemented in the 90s, which were focused on exports the comparatives advantages of Ecuador and let the market allocate resources in the most profitable activities in Ecuador (the traditional oil, bananas, coffee).

Additionally, other determinants that have formed the country's current economic structure is the strong resilience in the concentration of exports maintained in the traditional oil, banana, coffee (at that moment). The Ecuadorian rentier elites and their risk-averse to invest in new activities. Issues related to corruption and lack of a capable bureaucracy have made the implementation present several failures. Moreover, the policies designed to impulse diversification and structural change in Ecuador have suffered from fundamental failures, mainly in the implementation of

incentives maintained by the government even when the selected industries' activities have not been profitable. This failure becomes a burden for the state.

Ecuador: new promotion of diversification and industrialization 2007 – 2012

The present section will analyze in a timeline the central policies and programs that are considered vital for the process of diversification in Ecuador in the period 2007 – 2012. In this period is located the first impulse for diversification; focused on industrialization. And it was characterized by enough public resources to implement policies, almost fixed institutional structures with a nodal agency that elaborated and mandated the execution of diversification policies.

The policy and data analysis will focus on the characteristics of the policies and programs based on the second chapter of this thesis, which presents a specific type of policies and institutional architecture that a country could follow to start a process of diversification and industrialization.

National Development Plan 2007 – 2010: The first policy formulation for structural change

In 2007 a new government considered an outsider presented a discourse aiming to develop the country through the modernization and diversification of the economic structure. In this sense, in the first development plan, the government diagnosed the country's situation. In this document, the government introduced a complete framework of the weaknesses and problems result from the past years of economic and political instability; that under the government's perception was the result of a long period of policies that can be linked directly with the Washington Consensus and the neoliberal period (Calderón, 2017; Gonzalez, 2012).

The Plan specified one of the main goals of productive diversification embodied in objective 11 related to the economic system. Regarding diversification in agriculture, the support to the national production is maintained by policies in access to credits and public investment, protective tariff policy, and in particular, to programs that add value to the current production (SENPLADES, 2007). In the same line, about the process of diversification and especially in manufacturing, the Plan stipulates the promotion of the light industry in the country that use a large quantity of labor force and possessed extensive and intense productive chains, these industries considering agriculture, and forestry (SENPLADES, 2007). In this first period, the government used investment in necessary infrastructure and the creation of institutional capacities to base the process of diversification (SENPLADES, 2007).

As part of the qualification and training of the workforce, necessary for new economic activities and more importantly, for diversification and with particular emphasis in light and medium industry; the government established special programs to capacitate the labor force, which will also increase the productivity in the industries and sectors mentioned before (SENPLADES, 2007). Additionally, for industrialization, the government promoted foreign investment, credits for industry, and innovation (SENPLADES, 2007). The government proposed implanting a research system, establishing the lines of investigation that should be followed. In the same line, other actions related were the promotion of scholarships that could improve the country's human capital in the country (SENPLADES, 2007).

In infrastructure, the most crucial objective was to increase public investment in the country's essential capacities to decrease production costs for private actors (Calderón, 2017). Mainly in highways, roads, airports,

maritime ports, and the coordination between all the national institutions that intervene in this area (SENPLADES, 2007). This policy was one of the most crucial actions since the beginning of the government. The past periods of the governments presented a low investment in necessary infrastructure that left space to the government since 2007 to start a process with high multiplier effects and high returns to the private and the public.

In other export-related actions, the public institutions and their services were improved, especially in production capacitation, tariff barriers, and incentives (quality certification and sanitary regulations areas were included), through the coordination between institutions and promoting the services with a better formed public institution (Andrade, 2015). The capitalization of the public banks and the institutions' reconfiguration in light of the new development objectives was a significant worry (Calderón, 2017).

Concerning the country's strategic sectors (hydrocarbons, mine, and electricity), the government proposed to diversify the electric production with the creation of a new hydroelectric. In oil, the government planted a decisive role in producing and distributing oil and its derivatives, while in mines, focused on improving the forms of production (SENPLADES, 2007).

The specific goals based on the objectives before mentioned are the following:

- Obtain an average annual growth of 5.5% of the industrial GDP
- Achieve a 12% share of tourism in non-oil exports of goods and services
- Increase state oil production to 336,000 barrels per day
- Increase to 80% of the state roads in good condition

- Achieve 6% growth in the agricultural sector
- Increase national participation in public procurement
- Promoting research, science, and technology
- To reach as industrial exports the same export amounts of non-oil primary products

In conclusion, the plan presented a well-based macro policy for economic diversification, first with the government as a driver of economic development with fundamental policies in the strategic areas that could directly contribute to the country's economic diversification. Second, the lines are broad and could be interpreted so that the Ministries in charge could execute the adequate policy; however, this characteristic could also be a weakness in this critical process. The Plan lacks vertical policies; on specific sectors and could be understandable interpreting this first document as a diagnosis of Ecuador's current situation in 2007.

In the same line, the role of the State as an active agent in all the areas of the country is revived with a strong presence given by a potential public investment result of the high incomes of primary products. In the productive area, objective 11 enclosed the policies referred to diversification and industrialization, showing that these objectives will be promoted and driven by the central government using the institutional arrangements to bargain with the private sphere.

Finally, as the first document of policies and as a general document does not poses vertical or specific industries to be diversified (only mentioned the sectors agriculture forestry and industry). However, in the practice of diversification, the Ministries in charge of the execution started with industries that could improve in short terms and diversify the production for internal and external markets.

Institutional architecture for diversification 2007 – 2012

Once reviewed the first National Development Plan and the base data of diversification and public investment, it is crucial to consider the institutional capabilities created to manage the complicated process of modifying Ecuador's productive structure and the active role of the State.

After the neoliberal period, Ecuador presented general institutional weakness related to low intervention in the private sphere, the poor coordination between public institutions, and poor articulation with private institutions (Andrade (b) & Nicholls, 2017). This issue was more perceptible in the productive area where the privates assumed public roles, and the public was relegated to a low regulator or watcher of the current relations between the privates (Andrade, 2015). To address this problem, in 2007, the government created several institutions in charge of coordinating the government's strategic areas, increased investment for public institutions, and with the constitution[9] amplified the range of the public spectrum.

The transformation of the planning institution of Ecuador was vital to administrate the new process of diversification. The National Secretariat of Planning and Development – SENPLADES, becomes the institutions responsible for the State's strategic lines, this in the economic and the productive areas. As coordinators institutions, the government created the Coordinating Ministries that were above the traditional Ministries (Andrade, 2015; Calderón, 2017). The new Ministries' main objectives were the definition of the responsibilities between institutions and the coordination, reducing the possibility of duplicate actions (Calderón, 2017; Andrade, 2015).

[9] The Constitution of Ecuador was reformed in 2008 expanding the role of the state (Andrade, 2015).

The coordinating ministries were divided into seven major coordination areas: strategic sectors, economic policy, production, social development, internal and external security, politics and natural heritage, and culture.

Table 2 Coordinating Ministries related to diversification

Coordinating Ministry of Production, Employment, and Competitiveness - MCPEC	Coordinating Ministry of Economic Policy - MCPE	Coordinating Ministry of Knowledge and Human Talent - MCCTH
• Ministry of Agriculture, Livestock, Aquaculture, and Fisheries - MAGAP • Ministry of Industries and Productivity - MIPRO • Ministry of Tourism • Ministry of Foreign Trade • Ministry of Transport and Public Works • Ministry of Labor	• Ministry of Finance • Central Bank	• Secretariat of Higher Education, Science, Technology and Innovation - SENECYT • Ministry of Education • Ministry of Culture and Heritage

Source: (Calderón, 2017)

The first institutional structure for the process of diversification and industrialization in Ecuador generated several opinions between policy actors, academics, and the general population. The Coordinating Ministries had to harmonize the actions between institutions improving the State's efficiency; however, the critics maintained that the bureaucracy has increased, elevating the government expenditures; additionally, the decisions and process take more time.

In the same line, the Coordinating Ministries were losing their primary coordinating capacities assuming other roles that should be the Ministries' responsibility, this specifically with the MCPEC, which assumes the execution of policies and programs, making that the coordination role pass to a second place (Calderón, 2017; Andrade, 2015). Other institutions created in the first period of diversification were Commissions, Committees, and Sectoral Councils. The most important for this research is the Production Sector Council[10], which coordinates, articulates, and approves public policies related to production at the national level. Nevertheless, these essential functions were not fully complete by a discoordination and lack of consistency in the meetings, becoming in problem-solving committees (Andrade, 2015).

The nodal agency is the institution responsible for coordinate the policies between public institutions; and negotiate the actions with the private sector (Andrade, 2015). Additionally, this nodal agency has the responsibility of select the industries that could receive the incentives of the state and upgrade the production searching competitiveness in the international market while measuring their progress and defining future actions in line with the current progress of the selected industries (Andrade (b) & Nicholls, 2017).

In this first stage, the nodal agencies were SENPLADES, and in part MCPEC, the new public structure created and reformed were the pillars to manage a process of diversification. However, in this first state, these

[10] The Production Sector Council is made up of the MCPEC (which chairs it), the Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP), the Ministry of Industries and Productivity (MIPRO), the Ministry of Tourism (MINTUR), the Ministry of Foreign Trade (MCE), the Ministry of Transportation and Public Works (MTOP), and the Ministry of Labor; in addition to the National Secretariat of Planning and Development, the Technical Secretariat of the National System of Professional Qualifications and Training, the National Public Procurement Service, and the National Transit Agency (Calderón, 2017).

institutions and others presented several failures: high movement of authorities and public officials of medium and low rank, resulting in an inconstant implementation of policies and high costs of learning; other problems related to conflicts between institutions and inside the ruling party were present in the ten years of government (Andrade, 2015; Calderón, 2017).

Industrial Policy of Ecuador 2008 - 2012

The government that assumes drive the development of the country in 2007; in 2008, launch the first policy document with specific guidelines to diversify and increase the value-added of the Ecuadorian production. The document was elaborated[11] by the Ministry of Industries and Productivity - MIPRO that, as we mentioned before, was the Ministry in charge of executing the policies (Andrade, 2015). The policy document made a first analysis of the current situation of the country's economic structure, the industries, and products that have the potential to be exported after a certain period of policies (Ministry of Industries and Productivity, 2008).

As a first analysis of Ecuador's productive (non-oil) structure in 2007: The Food and Beverage sector was the most important, representing an average of 55.9% of the non-oil industrial GDP in 2007. The next most important sectors were textiles and clothing, with 14.3%. Wood and its products with 9.4%; chemicals; rubber and plastics with 6.7%. Metallic and non-metallic products with 6.4%, paper, and its products with 3.7%, machinery and equipment with 3.3%, and tobacco products with 0.3% (Ministry of Industries and Productivity, 2008).

[11] Other public and private institutions participated in the construction of the document as: National Secretariat of Planning and Development, Coordinating Ministry of Production, Employment and Competitiveness, Coordinating Ministry of Economic Policy and Secretariat of Higher Education, Science, Technology and Innovation (Ministry of Industries and Productivity, 2008).

The document established policies related to improving the productive structure of Ecuador in lines of productivity, value-added, and diversification:

- Increase of added value in the national production
- The diversification of products and markets
- Enhancing the growth of the social and solidarity economy
- Promote technological innovation to enhance endogenous growth
- Support the development of priority industrial sector

Finally, the document for industrial development transferred the general principles to specific guidelines for productive development. The document also provided strategic directions for primary activities as a basis for adding value and complimentary services. However, this initiative did not achieve the government's necessary consensus, frustrating its implementation (Calderón, 2017).

Additionally, after one year of government, the selected industries and products were not explicitly dictated; nevertheless, the Ministry responsible for executing industry policies and the other for agriculture started with an early selection of productive industries and products. This issue will be analyzed in the following sections of this document, specifically in the diversification policy practice.

National development plan 2009 – 2013

After a period in office and due to the country's constitution's modification, the government was re-elected for the period 2009 - 2013. A new Development Plan was formulated for the mentioned period, “The National Plan for Good Living 2009 – 2103”. The document presented a more mature

policy formulation with more accurate policies and goals. The macro policy formulation follows, in general, the same lines of the previous development plan made in 2007 in the productive spectrum.

The economic diversification and industrialization were embodied in two connected strategies and one goal related to the economic system. Objective 11 specified that the State is a central actor for the development of the economy, the primary role is in the field of planning and most importantly, as an active agent that will intervene in the market relations (SENPLADES, 2009). The State will stimulate specific sectors and industries using public investment, public purchases, and hiring services (SENPLADES, 2009). The government's active role as a planning actor and an economic agent that stimulates the supply and demand in the market will be present in all the policy documents that will be reviewed.

Furthermore, the Plan stipulated specific policies and objectives directly related to diversification and public investment. "…[the] economic system must seek productive transformation, diversification, and specialization, based on the promotion of diverse forms of production (SENPLADES, 2009)". In the same line, but about infrastructure, "To strengthen and expand the coverage of basic infrastructure and public services in order to increase economic capacities and opportunities. (SENPLADES, 2009)". In research and development, the Plan formulated that R&D should be a public good provided by the government "To promote access to knowledge and technology and foster their endogenous generation as a public good (SENPLADES, 2009)".

Expanding the formulation of the policies, the government specified various guidelines and industries that should receive incentives and support of the government to improve these sectors: "… the national production of software, agri-food, textile, and footwear, under socially and

environmentally responsible parameters (SENPLADES, 2009)". The metrics and goals of the objectives 11 are:

- To reduce the concentration of exports per product to 0.72 by 2013;
- To reach 5% growth of the non-oil industrial GDP by 2013;
- To increase the participation of national food production concerning total supply to 98% by 2013;
- To substitute 8% of non-metal mining imports by 2013;
- To reduce the concentration of exports per exporter by 0.06 points by 2013.
- To increase the proportion of the role of small and medium-sized companies in the State's purchasing of goods and services to 45% by 2013;
- To increase the public banks' volume of operations by 69% by 2013;
- To increase the share of investment of nominal GDP to 8.1% by 2013;
- To decrease by 10% the average time of transport between cities by 2013.

The strategies that the government formulated to diversify and industrialize the production focused on substituting the industrialized imports of the country and diversify the exports with products that have value-added and can impose an international price:

- Transformation of the Economy's Model of Specialization Through the Selective Substitution of Imports
- Increase of Real Productivity and Diversification of Exports, Exporters, and Markets

The import substitution was focus on secondary and tertiary sectors, value-generating sectors, and infrastructure. These industries should absorb qualified labor, contribute to food sovereignty, have a low environmental impact, and were based on competitive advantages (SENPLADES, 2009). To achieve the objectives mentioned, the State should provide public goods and incentives, which were mentioned; infrastructure, education, R&D, subsidies, and credits.

In the present Plan, diversification should be focused on value-added products and not center on Ecuador's primary exports. The deconcentration of destinies was an essential part of the policies; the country had to find new markets that increase the consumption of Ecuadorian products incentivizing new and more exports (Andrade, 2015). The diversification of the internal market was also a priority, and this was based on creating internal demand, stimulating the consumption of the population with an increment on basic salary (Andrade, 2015).

In sum, the National Development Plan 2009 – 2013 was focused on selective industrialization and diversification emphasized on the internal and external market. The policy package is similar to the one adopted by countries of Asia and Europe after World War II (Andrade, 2015). The increase of exports and new destiny markets would increase the middle- and low-class purchasing power in Ecuador, increasing the internal market's consumption, generating a virtuous circle for the Ecuadorian economy.

Finally, the State looks to compensate for the market failures by providing basic public goods as infrastructure, education, R&D, and public incentives as subsidies and tax benefits. Factors that are widely known have positive returns to the country and are not profitable for private agents.

Organic Code of Production, Commerce, and Investments - COPCI

The Code of production was launched in the same line as the Agenda for Production Transformation (this policy document will be analyzed in the next section) and was directly linked with the institutional architecture and the incentives to create new industries. The Code placed the Production Sector Council as the planning and monitoring body for industrialization substitution and diversification of production policies, while the Coordinating Ministry of Production, Employment, and Competitiveness - MCPEC was assigned to coordinate and execute them (Andrade, 2015).

Similarly, the Code gave the Production Sector Council, and specifically the MCPEC, the authority to carry out three major types of policies for selective industrialization and production diversification: an industrial policy in the restricted sense; innovation and technology policy; and a policy towards micro, small, and medium enterprises (MSMEs) (Andrade, 2015).

In the same line, the Code's main objective was "to regulate the production process in all its stages, promote increased value-added production, and transform the production matrix (Freire, 2012)". The normative seeks to achieve: 1) a productive transformation such that Ecuador's economy increased value-added goods and services that are produced in an energy-efficient way that protects the environment, thus ending the dependency concerning the production and export of primary goods; 2) a democratic productive transformation that is inclusive of territories, human groups and firms traditionally excluded from economic development (Freire, 2012).

For the implementation of the diversification policies, the Code created the Production Sector Council, and additionally, created the Advisory Council

for Productive Development and International Trade, composed of representatives of the private, mixed economy, and popular and solidary sectors; autonomous local and regional governments. The instrument mentioned gave the industrial policy the space between the public and the private to share their perspectives about the sector's future and the best policies. The Code in this aspect is a valuable policy instrument; however, it is not new in the institutional architecture of the State.

Following the National Development Plans reviewed, this document had mentioned the importance of spaces between the public and the private in the creation and focalization of diversification and industrial policy. However, it is valid to mention that, before the creation of the Code, other instruments have proposed the formation of this type of body; nevertheless, In this sense, more important than the institutionalization of this body is the execution of this organism and the relations between both actors that could create a trusted environment and a fluid exchange of information.

In order to analyze the Code, a summary of its structure will be presented. The normative was composed of six sections, each one conceived as a vital element to improve the country's diversification and industrialization. Nevertheless, the implementation of the policies and formulation of more specific programs and instruments were in charge of the Coordinating Ministries and other institutions.

Section I: Productive development, mechanisms, and institutions in charge: the code created the Production Sector Council; Advisory Council for Productive Development and International Trade and creates the system of innovation, training, and entrepreneurship, which concentrate public and private instruments available for the promotion of innovation, training, and entrepreneurship (Freire, 2012).

Section II: Development of productive investment and its instruments: The Production Sectoral Council is assigned as coordinator instance for the implementation of policies related to industrialization and diversification; in this line, all the institutions should coordinate their actions first with the council (Freire, 2012). Additional are created three types of tributary-fiscal incentives for investments. Finally, the Code authorizes the establishment of Special Areas for Economic Development (Freire, 2012).

Section III: Entrepreneurial development of micro, small and medium-sized firms (MIPYMES) and production democratization: special attention was dedicated to the MIPPYMES by the government formulating purchases mechanism that might increase the consumption of their production (Freire, 2012). Regarding financing and considering the lack of risk capital instruments available in Ecuador, the code mandates the creation of risk funds focused on the construction and operation of new industries (Freire, 2012).

Section IV: International trade: instruments and regulation entities: The Code created the International Trade Committee – COMEX, chaired by the MCPEC, in charge of the formulation of foreign trade policies; COMEX was integrated by the public institutions in this matter. The committee sought to promote the Ecuadorian exports through preferential tariff programs, drawbacks, loan programs, business intelligence data, training, promotion in international markets, and the establishment of an export insurance mechanism (Freire, 2012). Finally, the Code created a particular institution to promote Ecuadorian exports[12]; the Institute for the promotion of exports and foreign investment – PRO ECUADOR (Freire, 2012).

[12] CORPEI was the private institutions in charge of the promotion of the Ecuadorian exports abroad, this institution received public funds until the creation of PROECUADOR (Tonon, 2010).

Section V: Systemic competitiveness and facilitation of customs procedures: The State sought to use public investment to improve the infrastructure to reduce production costs and facilitate the trade inside the country and outside the country (Freire, 2012). Additionally, public purchases would incentivize specific sectors that could promise a rapid development for the internal and external market.

Section VI: Sustainability of production and its relation to the ecosystem: The Code establishes tax incentives that promote "clean production" and energy efficiency.

In sum, the Code established the coordination framework for the process of diversification and created the policy tools that should be implemented by the government. However, according to Andrade's investigation, the Code was not a revolutionary document or gave new diversification instruments; the Code only organized the existing mechanism in the productive matter (Andrade, 2015).

Agenda for Productive Transformation - APT 2010 - 2013

In 2010 the government perceived that the situation of the productive structure of Ecuador has not changed; and the government launched the Agenda for Productive Transformation (discarding the previous policy document The Industrial Policy of Ecuador 2008 - 2012) elaborated by the Production Sector Council, led by the Coordinating Ministry of Production (Andrade, 2015).

The document embodied policies and instruments to achieve the diversification and industrialization of the Ecuadorian production (Calderón, 2017; Andrade, 2015). The government's role was mainly to conduct the private investment in the industries maintaining the prices of

production low through instruments managed by the public (Andrade, 2015).

Moreover, the public investment reach improves horizontal and vertical policies, strategic provision of public goods, and solving institutional problems (information and coordination asymmetries) (Production Sector Council, 2010). The document is specified that the resources (public and private investment[13]) are not scarce but should be focused on the correct and efficient sectors. At this point, the government should intervene as an external agent to improve the coordination between public and private and incentivizing the efficient allocation of public and private resources through public mechanisms.

In the horizontal policies, the government focused the public investment on infrastructure to reduce the production cost for the private actors (Production Sector Council, 2010). The systemic competitiveness as an ecosystem that allows the private actors to innovate and reduce costs was not a new government idea. However, the document specified the following sectors prioritized: infrastructure, energy matrix, skilled human talent, and the reduction of bureaucratic processes (Production Sector Council, 2010). Furthermore, more important, the areas are together and aligned by one single strategy of diversification and industrialization.

Once established, the horizontal policies that should provide general capabilities that search improve Ecuador's economic structure; the document specifies priority industries or sectors that have comparative

[13] In Ecuador, private investments have been based on high and rapid profitability, cheap labor, fiscal and tax incentives, and access to natural resources. The allocation of private investment in the booming sector; while the tradable sector maintained without investment, is a symptom of the Dutch disease, in the officials' documents these problems could be solved with the intervention of the state through institutional arraignments.

advantages and that in the future can compete in the international market after a period of vertical policies.

Table 3 Prioritized sectors of the Agenda for Productive Transformation 2010 – 2013

Primary Sector	Industry Sector	Tertiary sector
Renewable energies (bio-energy and alternatives)	Technology: hardware and software Biotechnology (biochemistry and biomedicine)	Tourism
Sustainable agroforestry chain and its elaborated products	Pharmaceuticals and chemicals	Environmental Services
Fresh and processed foods	Metalworking	Transport and logistics

Sources: (Production Sector Council, 2010)

The support of the government to the selected sectors and industries consisted of non-refundable credits, essentially donations from the State; fiscal incentives such as reduction of income tax for investments, conditioned to the generation of new jobs and for a maximum period of up to ten years; public purchases and preferential access to credit in the Public Banks; and finally, public-private partnerships for the creation of new companies in areas of technological frontier (Production Sector Council, 2010).

Another instrument was the creation of Special Economic Development Zones; the Zones were supposed to be delimited by the State focused on activities linked to technology transfer, innovation, provision of specialized logistics services, and industrial transformation through the establishment of special incentives conditioned. The Special Zones could attack foreign

investment, transfer technology and knowledge, generate industries and services with value-added, obtain new exportable products and services resulting in new territorial zones of development, and finally, more income for the country (Production Sector Council, 2010).

Similarly, all the vertical and horizontal policies were structured to configure a chain that connects two levels of companies and industries. The first level included big companies that historically have exported products; this definition could also consider public enterprises (Andrade, 2015). The second level of companies was considered medium and small-size firms, which might provide to the first level inputs and services to complete the chain of production (Andrade, 2015).

It is essential to mention that the relation between the two levels structure is concentrated on the external market and the internal market looking for import substitution. The two-level structure would receive the Special Zones of Economic Development benefits, transferring technology between then and absorbing the labor force, while the State reduces the taxes and provides subsidies or credits (Production Sector Council, 2010).

The document structures vertical policies to promote Ecuadorian exports. The tools designed by the government focused on international trade were multilateral and bilateral trade negotiations; strengthening of the institutional apparatus for foreign trade; international promotion coordinated by a specialized agency; development of technical and logistical infrastructure, both public and private, dedicated to exports; specific measures for small producers with export potential; and a set of traditional trade management tools (Production Sector Council, 2010).

Another significant area was the Research and Development, the Agenda through the Secretariat of Higher Education, Science, Technology, and

Innovation - SENECYT sought that the public research institutions and others focus their investigations in the identified sectors prioritized for industrial development. The research institutions had to facilitate the transfer of knowledge and technology and a rapid application in the prioritized industries (Production Sector Council, 2010). The government in this area invested public resources in policy tools as funds, credits, and subsidies. (Production Sector Council, 2010).

The policy instruments, conceived as incentives by the government, in the Agenda and the Code analyzed created programs and projects designed to overcome the market failure described before. The policy instruments were focused on the lack of incentives to invest in the country's nontraditional areas of production; the new areas presented a high risk of failure and high investment in resources.

The most important programs were: EmprenEcuador, CreaEcuador, Innova Ecuador e InvestEcuador. Moreover, the application of these programs suffered from lack of resources to be continued and lack of management capabilities and were dissembled (these programs will be analyzed in the following section focus on the execution of policies) (Calderón, 2017).

It is notable that the formulation of this document has more vertical policies and focused on instruments that should be applied by the Ministries, the Special Zones and the high-risk funds are considered fundamental for the transformation of the economic structure, additional the alignment of the infrastructure in concordance with one single strategy provided an excellent form to the document.

Finally, the implementation of the Agenda presented several failures related to a poor articulation between the public institutions and with the private actors, poor execution by the institutions of the sector, lack of continuity in

the agenda, low capacity of monitoring and adjustment in the process (Andrade, 2015). The spaces of dialogue also presented a lack of continuity and coordination between entities. In general, the implementation was centered on the space of the MCPEC, while other institutions directed its own policies according to their authorities (Calderón, 2017). Moreover, the authorities' movement and lack of links with the private sector resulted in the termination of the Agenda.

Additionally, the prioritized sectors did not consider a system view of the productive chain, and almost all the products and industries can be prioritized (Calderón, 2017). In the same line, the Agenda was compared with an NGO that provides insufficient funds to create assistance programs, which supposed to create adequate capacities and incentives for new industries; moreover, the programs did not consider the demand of the market and only focused on industry supply (Calderón, 2017).

The practice of diversification and industrialization 2007 - 2012

The present section will analyze the projects and plans executed under the reviewed policy formulations: National Development Plans, Industrial Policy of Ecuador 2008 – 2012, and the Agenda for Productive Transformation 2010 – 2013.

It is essential to mention that the agriculture sector's policies and instruments moved in a different line; the government focused mainly on the industrialization of the production and was driven by the MAGAP and in coordination with SENPLADES and MCPEP. In the same line, the first part will analyze the actions implemented (public investment) in the agriculture sector in the period 2007 – 2017, and the second subsection will analyze the manufacturing sector.

Agriculture

In the period studied, the Ministry of Agriculture was one of the most critical institutions in executing policies; this feature resulted from Ecuador's agricultural characteristics[14]. The agriculture sector is formed by a significant portion of big farmers with political influences given by the historical process since the republican periods. And, small and medium farmers focus on production to the internal market with political power given by their organization's power and mobilization (Egas, Shink, Inurritegui, & De Salvo, 2018). The government in the analyzed period tried, on the one hand, to benefit the small and medium farmers of the country while maintaining the support of the big farmers (Egas, Shink, Inurritegui, & De Salvo, 2018).

In 2007 the first policy document launched for the agricultural sector was "State Policies for Ecuadorian Agriculture 2007-2020" this document failed in the persecution of its objective due to the mobility of authorities in the Ministry of Agriculture. For 2009 and 2010, the Organic Law of the Food Sovereignty Regime and the Good Rural Living Development focused its attention on Ecuador's small and medium farmers (Calderón, 2017).

The policy documents mentioned were focused on reviving the presence of the State in the rural areas. The state strengthened its influence by delivering subsidized inputs such as agrochemicals or certified seeds, organizational fortification projects for producer associations with the provision of

[14] Primary agricultural GDP, contribute, in aggregate, 14% of real GDP on average for the decade 2005 - 2015 (Egas, Shink, Inurritegui, & De Salvo, 2018). 1 in 4 people are employed in purely agricultural activities, without even considering agroindustry or the productive chains generated by this sector (Egas, Shink, Inurritegui, & De Salvo, 2018).. The lowest productivity is found in agriculture. In 2013, each person employed in agribusiness contributed 12,000 dollars a year in value added; in agriculture, each person employed contributes only about 3.3 thousand dollars a year, which means that productivity is almost 3.6 times higher in agribusiness than in agriculture (Egas, Shink, Inurritegui, & De Salvo, 2018).

machinery, equipment, infrastructure, and on-farm services (Egas, Shink, Inurritegui, & De Salvo, 2018). Other policies that supported agricultural production were the tariff barriers and minimum support prices (Egas, Shink, Inurritegui, & De Salvo, 2018).

Since 2012 the agricultural sector started a new modernization process focus on small and medium farmers; this in contrast to the years before when the primary attention was on import substitution and the promotion of manufactured products. The most important actions could be summarized as the democratization of access to production factors, increased productivity, and commercial repositioning of small and medium-sized producers; expansion, diversification, and innovation of rural technical services (Egas, Shink, Inurritegui, & De Salvo, 2018).

In 2015, the book of policies named "The Ecuadorian agricultural policy: Towards sustainable rural territorial development 2015-2025" was elaborated. The actions to be followed in the white book were segmented. First, general support of the agricultural sector with policies that support small and medium farmers, and. Second, substitute imports and diversify the production allowing entrance to the international market (Ministry of Agriculture, Livestock, Aquaculture, and Fisheries, 2015).

The process for substitute agricultural imports was the first goal in the mentioned book of policies; however, due to the comparative advantages that are present in the internal production was not the center of the existing policies. During this century, 7.2% of total imports correspond to the agricultural sector; of this total, 4% are raw materials and intermediate products for agriculture, 2.8% are non-durable consumer goods, basically, primary food goods and 0.4% are imports of capital goods for agriculture. (Ministry of Agriculture, Livestock, Aquaculture, and Fisheries, 2015).

In the same line, the other segment of policies has been focused on increasing the number of products that can be exported. At this point, the book of policies for the agriculture sector identified several fruits, vegetables, and livestock products that possess some potentials to be exported[15]. The products selected are similar to the products mentioned in the reviewed policy documents analyzed. Nevertheless, in the policy document, the number of priorities products has increased (Ministry of Agriculture, Livestock, Aquaculture, and Fisheries, 2015).

In order to have a complete picture of the public support to the agriculture sector in Ecuador, in the following lines, the main policy instruments directly related to diversification and industrialization will be analyzed in the period 2007 – 2017.

I. Public purchase of food: Between 2013 and 2015, the Food Supply Institute, PRO-ALIMENTOS purchased food as part of state food programs, such as the School Alliance Program (PAE), through direct contracts with associations of small and medium producers (Egas, Shink, Inurritegui, & De Salvo, 2018). In 2016 PRO-ALIMENTOS were absorbed by the National Storage Unit and this program pass to the Ministry of Agriculture.

II. Provision of inputs and fixed capital: several programs of the Ministry of Agriculture and other attached institutions were involved in direct transfer of capital goods and inputs from the government to the producers (Egas, Shink, Inurritegui, & De Salvo, 2018), the most important will be listed in the following lines:

[15] Pineapple, papaya, mango, passion fruit, tree tomato, grapefruit, blackberry, quinoa, corn, amaranth, peas, cauliflower and broccoli, commercial woods, palm (oil) balsa wood, trout pargo, Cobia Huayaipe, Sardine, Hake, Fishmeal Horse Mackerel, Giant Frog Squid, Canned oysters from the sea (Ministry of Agriculture, Livestock, Aquaculture, and Fisheries, 2015).

- First, the National Seed Project for Strategic Chains provided certified seed (rice and corn) to farmers and fertilizers to increase agriculture's unitary productivity.
- Second, the National Fine Aroma Coffee and Cocoa Reactivation Project delivered to farmers plant renovation and certified seeds, additional machinery, equipment, and post-harvest infrastructure.
- Third, Agricultural Competitiveness and Sustainable Rural Development co-financed the actions that increased the productivity of peanuts, bananas, milk, onion, corn, rice, and other cereals.
- Fourth, credits provided by the National Bank were increased, creating lines specifics for small and medium farmers with special rates.

Finally, this section has summarized the Ministry of Agriculture's central policies and programs; nevertheless, other programs and public supports to the agriculture sector are not summarized in the past subsection due to the lack of available information.

III. Technical assistance: Several technical assistance projects were implemented during the period 2006 - 2016. The most important were: The National Meat Program, with on-farm support for meat farms, and the PIDASSE program (Ecuador's Integrated Project for Sustainable Agricultural, Environmental and Social Development), implemented on the Santa Elena Peninsula between 2010 and 2016 (Egas, Shink, Inurritegui, & De Salvo, 2018). It is essential to mention that MAGAP has in territory programs that focus on technical assistance in different matters, not only the projects before mentioned.

IV. Agricultural insurance: the program of insurance implemented by the MAGAP subsidized 60% of the value of the insurance to the producers of

rice, corn, bananas, beans, soybeans, coffee, cocoa, quinoa, sugar cane, livestock, among others (Egas, Shink, Inurritegui, & De Salvo, 2018). The agriculture insurances' subsidies had limits of the size of production of the number of units; and covered claims such as droughts, floods, frost, uncontrollable diseases and pests, and other minor claims. Between 2010 and 2016, the program executed $35 million and secured more than one million hectares (Egas, Shink, Inurritegui, & De Salvo, 2018).

Public investment in agriculture has not been limited to the Ministry of Agriculture; other attached institutions (National Institute of Agricultural Research of Ecuador - INIAP, and Agrocalidad) had its own programs supporting diversification in this sector (Calderón, 2017). INIAP is the institution responsible for R&D and Agrocalidad execute policy related to the sanitary status of the country and food safety.

About infrastructure, the Ministry has made significant investments in infrastructure for community use in several areas of the country as community irrigation works, flood prevention in agricultural areas prone to excess rainfall, the construction of community storage silos, and the construction of public centers for the production of bio-inputs for agriculture (Calderón, 2017). Additionally, the National Dairy Network project consisted of constructing liquid milk collection centers for community use.

In 2017 one last program named "la gran Minga Agropecuaria" was launched with the following objectives:

- Access to markets through marketing contracts and the provision of collection centers.
- Provision of subsidized input kits.
- Supply of irrigation.

- Exchange of old tools and equipment for new ones.
- Preferential agricultural credit.
- Agricultural and livestock insurance.
- Free technical assistance and training.
- Strengthening of associative enterprises.
- Legalization of land.

However, since 2014 the country's public investment has decreased in line with the low international prices of oil; as a result, the agriculture sector was severely affected by the reduction of public resources in the programs of agriculture support. Additionally, the rotation of high public officials made that the priorities on the policy changes in the same line the selected industries and products. The modification in the political line in agriculture can also be linked to the indigenous movement and the economic elites which can move forward or behind the government's actions.

Manufacture and industry

The MCPEC started in 2008 with the first program focus on modernizing specific sectors, in line with the National Development Plan 2007 – 2010 and the Industrial Policy 2008 – 2012. The program's name was "Productive Bets," the Ministry established sectors according to their viability and priority (Andrade, 2015). The first sector was named "Star," which was composed of processed food, metalworking, biofuels, wood and forestry, fisheries and derivatives, aquaculture, consulting services, electronic engineering, and software (Andrade, 2015).

The second sector, named "emerging," was composed of consulting services, electronic and software engineering, transportation, and logistics services. The third sector, named "to be developed," consisted of tourism services and biofuel production. Finally, the fourth sector, named "reserve,"

was made up of the industries of transport, services, and logistics (Andrade, 2015).

In the star selection, all the industries (except biofuels and software) were objective of protectionist policies in the '60s and '70s in the past process of Import Substitution Industrialization (Andrade, 2015). The mentioned industries were perceived as the more promising due to the development path that already had decades before and by the capacity to absorb labor (Andrade, 2015).

In the metalworking industry, the specific products that the government focused was bodywork, white goods (appliances), and bridge-building. Again, industries that received various support from the past governments but that to some degree have potential in the international market (Andrade, 2015). However, the bridge buildings were a new sector selected and could be developed with the State's support.

In line with the Agenda for Productive Transformation 2010 – 2013, one prioritized sector was the Pharmaceuticals; the Ecuadorian government created a public enterprise named "ENFARMA EP." The pharmaceutical was created in 2009 through a presidential decree and focused on the production, commercialization, and investigation of medicines for human, veterinary, and agroforestry use (Arantes, 2019). The SOE reached to provide medicines to all the public health networks of Ecuador; however, this enterprise closed after seven years (Arantes, 2019).

ENFARMA had, as a major objective, provided generic drugs to hospitals of the public network. The policies implemented to support the new SOE were trade policy measures, such as protections, international negotiations, licenses, and subsidies (Andrade, 2015). However, the new industry has several problems related to coordination and productive inefficiencies.

The SOE suffered from structural problems of public institutions in the country, lack of clear objectives, lack of efficient production, and inadequate coordination between the public and the private sector (Arantes, 2019). In the first instance, the public investment for ENFARMA was large, expecting to provide medicines to larger population groups.

Nevertheless, according to the investigation of (Arantes, 2019), the private sector was interested in dissolving the new competitor and used the political tools to make that the SOE fail. Additionally, other issues related to the high movement of authorities inside the institution caused more problems of coordinating between the public and the private (the case of ENFARMA is interesting; however, due to the space limitations will not be extensively discussed).

In the same line, with the APT, the MCPEC was in charge of executing other programs related to diversification and industrialization: EmprendEcuador; InnovaEcuador; CreaEcuador; Without Procedures; and InvestEcuador. In the following lines the thesis will elaborate a description of the programs:

- "EmprendEcuador" concentrated in the creation of new companies, with advisory services to the management of these companies, oriented towards exports in the sectors identified by the APT as priorities (including biotechnology, renewable energy, and pharmaceuticals) (Calderón, 2017).
- “InnovaEcuador" provided the risk capital to companies that needed to improve productivity by acquiring or adapting and developing new technologies (Calderón, 2017). The beneficiaries were selected from the priority sectors of the Agenda.

- “CreaEcuador" was a program of public-private partnerships, similarly to "EmprendEcuador; however, the creation of the new companies should be done in regions of the country with no industrial development; here the geographical criterion seemed to have more weight than that of prioritizing manufacturing sectors or technological innovation (Calderón, 2017).

Furthermore, Andrade mention in his research that the MCPEC sponsored 179 projects; one third was implemented with other public agencies nationwide, the rest with local public agencies, and none with private companies (Andrade, 2015). In the same line, the Ministry of Coordination of Strategic Sectors, in charge of the design and coordination of policies for the management of non-renewable natural resources, energy, telecommunications, roads, and transportation, financed or presented for financing 120 projects, none of which contemplated partnerships with private industrial or service companies (Andrade, 2015).

Ministry of Productivity - MIPRO, that supposed to be the institution in charge of implement the policy of industrialization and diversification, was, at some point, left behind by the MCPEC. However, MIPRO implemented programs related to construction (cement and asphalt), petrochemicals (the Pacific Refinery), steel and fertilizer production (urea); all these initiatives were carried out by SOEs (Andrade, 2015). Additional were implemented by MIPRO, programs aimed at micro, small and medium enterprises such as the acquisition of inputs for the State, and more general programs to support small and medium-scale manufacturing in general (Andrade, 2015).

Until this point in the policy formulation and implementation can be observed that the diversification statement was implemented first focus on substitute imports for internal consumption and second increase the number of exports value-added. In the same line, the industries selected by the

government have several modifications in their selection. Every ministry had its own selection according to their policy plan per year, which in general have differences with other ministries and more critical with the nodal agency plan. Additional to this, the definition of selected industries by SENPLADES and MCPEC was too broad, and, as was mentioned, almost all industries can compose this classification and received the government's incentives.

About the selection of sectors and industries, some of them have been subject to protectionism and incentives since the pasts industrialization processes in the decade of the '60s and '70s (Andrade, 2015). According to the government, these industries should be promoted because they had comparative advantages and had a development process behind them. However, the selection of the industries in Ecuador may be conditioned mainly by the budget constraints but also by other political factors that were more valuable than an accurate selection of promising sectors. On the other hand, the programs created to finance high-risk activities had a limited range, low funds, and the private sector did not actively participate.

Impact of public investment in diversification and industrialization 2007 – 2012

Once analyzed the two Nationals Development Plans and other policy documents important for this process, it is necessary to analyze the public investment made in Ecuador and the relation with the productive structure of Ecuador from 2007 until 2012.

The Data that will be shown is the first public investment and second economic diversification indicators. About public investment per sector, the Central Bank of Ecuador and the National Institute of Statistics and Censuses – INEC, present data in terms of Gross Fixed Capital Formation per industry and sectors. However, agriculture and R&D are lacking in the

database. In this sense, data from the UN agencies have been used to have a complete overview of public investment in the economic sectors related to diversification.

Diversification will be measure by the following indicators GDP per sectors, HHI index, traditional and nontraditional exports, and finally in the last section employment per sectors. The information will be analyzed first from 2007 – 2012 and finally, 2007 – 2017, to have a better overview of the process of diversification in Ecuador. The sources used are mainly the Central Bank of Ecuador, INEC, UNESCO, and FAO.

Regarding public investment, in the following tables, I will summarize relative information about its value in USD dollars and the relation with the total public investment or other relative values to have more perceptible information; additionally, three graphics will illustrate the trend in the years analyzed 2007 – 2017.

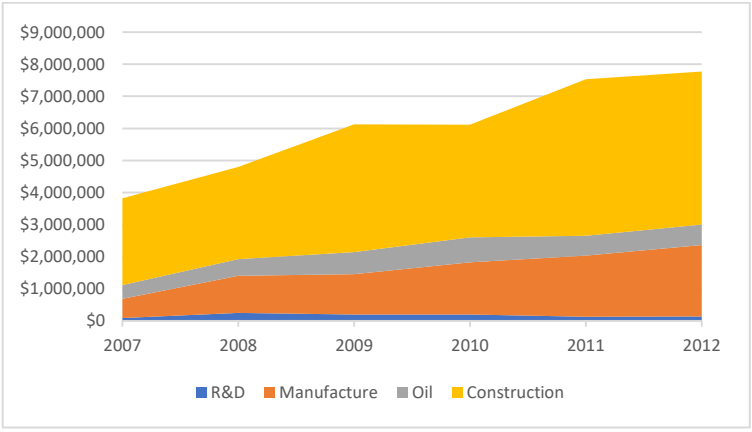
Table 4 Public investment and its representativeness in the total of these areas 2007 - 2012

Year	% R&D	% Manuf.	% Oil	% Const.	Total[16]
2007	2.25%	15.84%	11.20%	70.70%	$3,822,705
2008	5.08%	24.17%	10.82%	59.93%	$4,800,018
2009	3.19%	20.49%	11.35%	64.96%	$6,129,351
2010	3.29%	26.49%	12.72%	57.50%	$6,116,041
2011	1.72%	25.25%	8.31%	64.72%	$7,528,325
2012	1.74%	28.63%	8.33%	61.30%	$7,767,770
2013	2.25%	36.80%	16.96%	43.99%	$8,995,572

Source: Central Bank of Ecuador and UNESCO

[16] Sum of R&D, manufacturing, oil and construction, this relation was made to have a better perspective about the public investment, otherwise using the total public investment the values are meaningless.

Graph 1 Public investment in the manufacture, R&D, construction, and oil (thousands USD)



Source: Central Bank of Ecuador and UNESCO

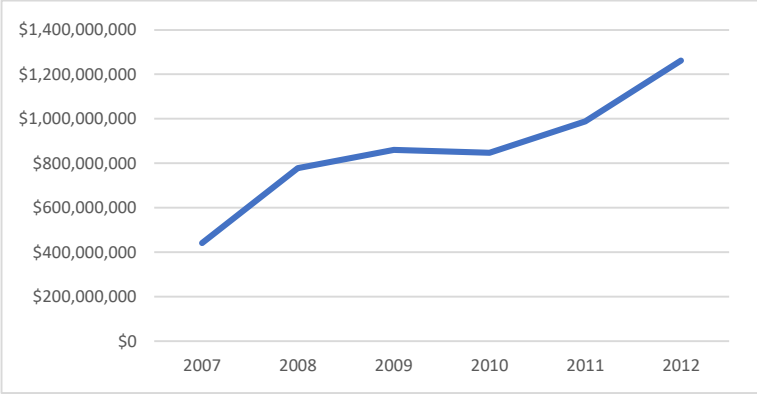
Table 5 Relation public productive credits and the total volume of credits

Year	Credit Volume[17]	% Public Credits
2007	11,549,459,629.65	3.82%
2008	14,328,358,182.81	5.43%
2009	14,010,981,713.23	6.14%
2010	15,839,259,789.89	5.35%
2011	20,975,730,588.65	4.71%
2012	27,814,849,775.50	4.54%

Sources: Superintendency of Banks of Ecuador and (Maldonado, 2017)

[17] The total value of the credits offered in Ecuador, this data will illustrate the magnitude of the public credits that might be linked to economic diversification.

Graph 2 Amount of credits provided by the Public Bank (USD)



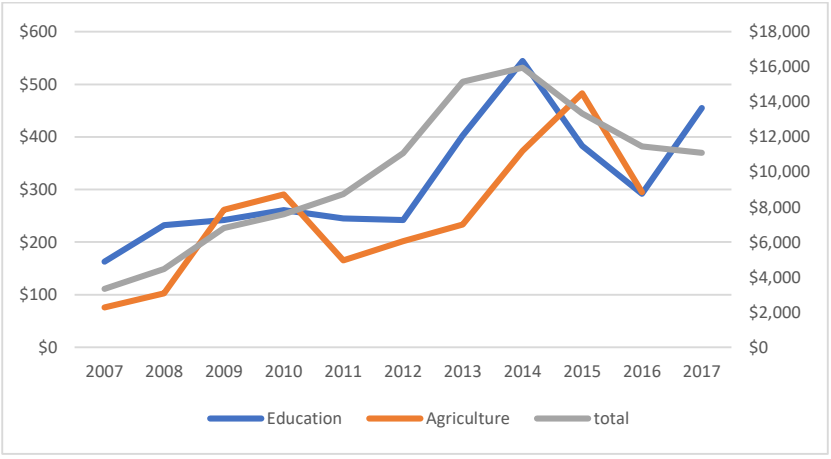
Sources: Superintendency of Banks of Ecuador

Table 6 Relation total public investment with PI in Education and Agriculture 2007 - 2012

Year	% Edu.	% Agri.	Total PI
2007	4.87%	2.26%	$3,337
2008	5.21%	2.30%	$4,454
2009	3.56%	3.84%	$6,794
2010	3.44%	3.84%	$7,576
2011	2.80%	1.89%	$8,744
2012	2.18%	1.82%	$11,066

Sources: Central Bank of Ecuador, FAO, and INEC

Graph 3 Public investment in education, agriculture, and total (million USD)



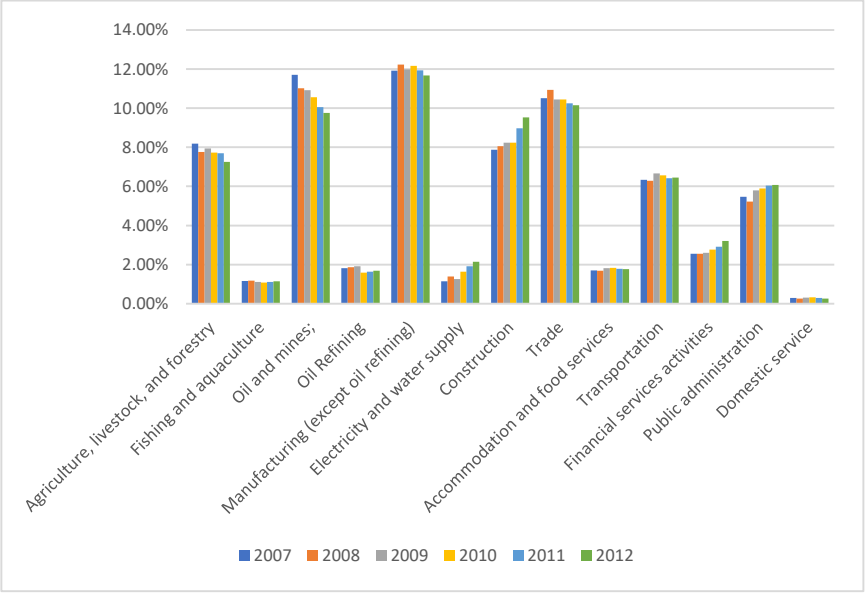
Sources: Central Bank of Ecuador, FAO, and INEC

Graphs 1, 2, and 3 present public investment data in different economic sectors and credits offered by the public bank in productive areas. The most significant increment are construction, manufacture, and credits. While R&D, oil, education, and agriculture have mixed trends. However, the total public investment in this first stage until 2012 has significantly grown, considering the trend from 2007.

Following the policy documents, the government has invested mainly in productive credits, infrastructure, manufacturing, and education. In agriculture, the data show fluctuation in the government expenditure; in the same line, other sectors have grown significantly; manufacture has increased its trend; however, it is still not comparable with the resources invested in agriculture.

The following graphs will show the indicators related to economic diversification and the possible impact of public investment.

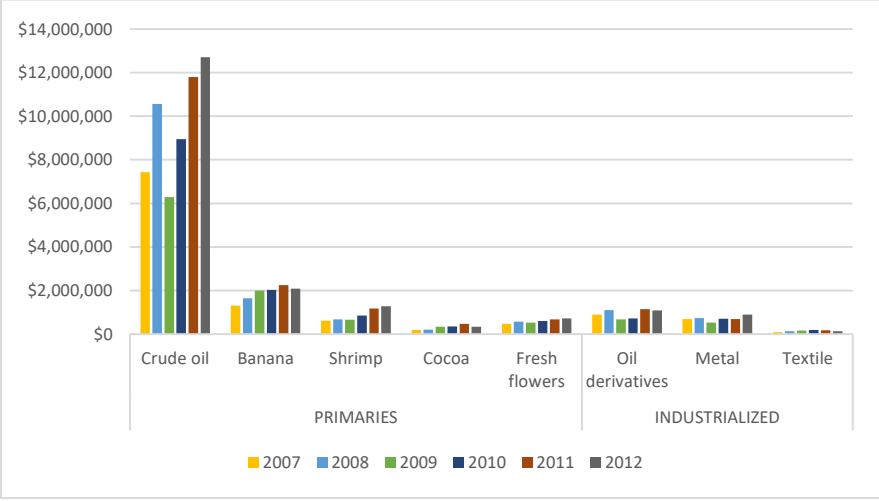
Graph 4 Composition of GDP per sectors 2007 – 2012



Sources: Central Bank of Ecuador

Graph 4 shows in percentages the composition of the total GDP of Ecuador per year. The sector named "others" has been excluded to better appreciate Ecuador's important economic sectors. Furthermore, the agricultural sector has lost its weight; in 2007, this sector represented 8.18% of the total GDP in 2007, while for 2012 represented 7.25% with the same relationship mentioned. Oil and mines have fluctuated in the same way; in 2007, it represented 11.70%, while for 2012 it represented 9.76%. The manufacturing sector had almost maintained its representativeness in 2007; it represented 11.91% and in 2012 11.67%. Nevertheless, construction and public administration have grown significantly compared with the other economic sectors in the GDP.

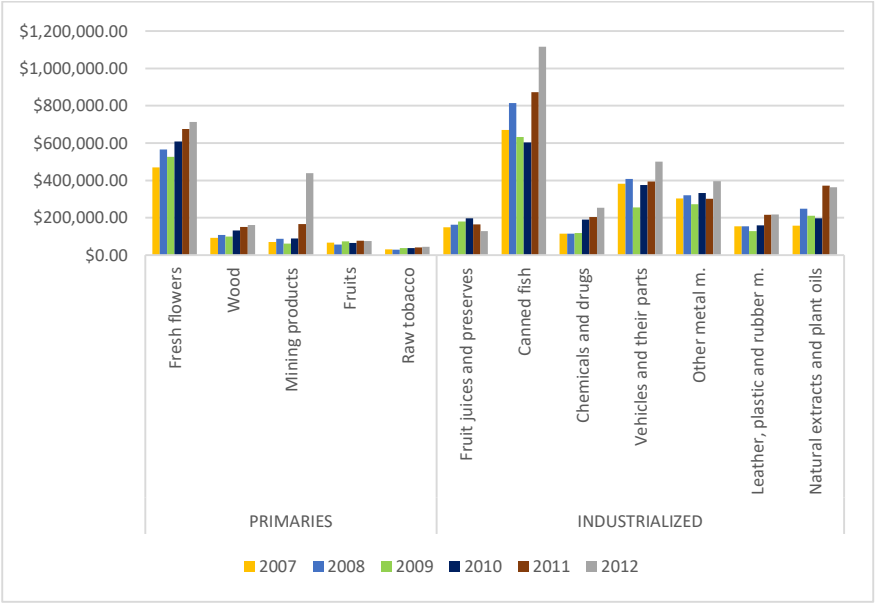
Graph 5 Ecuadorian traditional exports 2007 – 2012



Sources: Central Bank of Ecuador

Graph 5 shows that most of Ecuador's exports are supported by the primary products and especially crude oil, which presents various fluctuations but with an upward slope. Contrary to the data showed in the GDP by sectors, the agricultural sector has increased its exports only cacao have decreased in 2012. Crude oil in 2007 received $7,428,356, and for 2012 this amount grew to $12,711,229. Banana and Plantain in 2007 received $1,302,549 and for 2007 this amount grew to $2,078,402. The industrializes products have shown mixed results. Finally, until this point, the research can consider that the Ecuadorian exports have concentrated on traditional products.

Graph 6 Ecuadorian non-traditional exports in percentages 2007 – 2012



Sources: Central Bank of Ecuador

Graph 6 presents the non-traditional exports of Ecuador, which have the same trend as 2007, with a majority of resources received by the exports of industrialized exports, the most important product is canned fish, that in 2007 received $670,558.48 and in 2012, $1,115,231.71. While fresh flowers occupied the second place, in 2007 received $469,424.10 and in 2012 $713,502.08. It can be noted a general increase in products that are considered nontraditional: fresh flowers, wood, raw tobacco, fruit preserves, chemical and drugs, letter, and rubber. The weight of the industrialized exports in the general nontraditional exports can be interpreted as a partial improvement in the economic structure; however, the magnitudes are significantly different when comparing with the exports of oil and banana.

To illustrate the productive diversification in the country, the research will present one indicator widely used to measure the level of concentration in

the exports of one country; this indicator is published by United Nations Conference on Trade and Development – UNCTAD[18]:

- Concentration index: also named Herfindahl-Hirschmann Index (Product HHI), is a measure of the degree of product concentration. A value closer to 1 indicates a country's exports or imports are highly concentrated on a few products. On the contrary, values closer to 0 reflect exports or imports are more homogeneously distributed among a series of products.

The HHI shows an improvement in Ecuador's position; for 2007, the indicator was 0.524, while for 2012, this decreased to 0.517, which could be considered significant in a short period from 2007 to 2012. This considering other countries as Chile decreased from 2007 to 2012, from 0.3858 to 0.3628, while Venezuela increased this indicator in the same period from 0.6514 to 0.7616.

Finally, according to the data, the public investment in manufacturing and agriculture has increased in the same line with infrastructure, education, and R&D, and the public bank's credits. In the same line, Ecuador's exports had increased: oil, metal manufactures, shrimp, fresh flowers in traditional exports. While in the non-traditional exports: exist a prevalence of the industrialized products with mixed results, however, the majority of nontraditional had increased its values.

[18] Information about the data:
https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx
Information about the indicators:
https://unctadstat.unctad.org/wds/TableViewer/summary.aspx

Chapter 4. The change of productive matrix and the role of innovation 2013 – 2017

Chapter fourth will continue with the analysis of the process of diversification and industrialization initiated by Ecuador. The analysis will correspond to the last government period 2013 – 2017; the structure will continue with a qualitative analysis of policy and statistical analysis of the relationship between public investment and diversification.

The previous chapter reviewed the two first periods of diversification policies from 2007 until 2012, characterized by a generous budget financed by the national income increase. In the present chapter, the last period of diversification will be analyzed from 2013 until 2017, in light of the institutional modifications and the decrease of the national income.

The discourse of 'The change of the productive Matrix" 2012

SENPLADES in 2012 issue the first documents related to the Change of Productive Matrix "Transformation the productive matrix: productive revolution through knowledge and human talent." The new policy overcomes the past policy document, the Agenda for Productive Transformation. This document began with a diagnosis of economic structure and the levels of diversification and industrialization in Ecuador (SENPLADES, 2012).

The policy document established the main development lines focused on industrialization and diversification, embodied in the next National Development Plan 2013 – 2017. The primary factor of diversification follows the lines written in the previous two periods; however, new main determinants were introduced: creating strategic industries and the importance of knowledge and innovation for structural change. The

following points are the most important policies for the new productive matrix in the new policies for the government:

1. Productive diversification based on the development of strategic industries-refinery, shipyard, petrochemical, metallurgy and iron and steel, and new productive activities-mariculture, biofuels, forest wood products.
2. Adding value to existing production by incorporating technology and knowledge in biotechnology (biochemistry and biomedicine), environmental services, and renewable energy.
3. Selective substitution of imports with goods and services that are already produced in the country and that would be able to replace in the short term: pharmaceutical industry, technology (software, hardware, and computer services), and metalworking.
4. The promotion of new products from new actors, which are produced from the popular and solidarity economy. Or that include added value, fresh and processed food, clothing and footwear, tourism. The promotion of exports, diversify the national production and expand the international destinations of our products.

Additionally, the document selected 14 productive sectors and five strategic industries, which will be the base of the productive transformation (SENPLADES, 2012); the selection was made following a process of analysis focused on the factors of production of Ecuador and in the productive chains:

Table 7 Prioritized sectors of transformation the productive Matrix (2012)

Goods	Fresh and processed foods
	Biotechnology (biochemistry and biomedicine)
	Clothing and footwear
	Renewable energies
	Pharmaceutical industry
	Metalworking
	Petrochemicals
	Wood-based forest products
Services	Environmental services
	Technology (software, hardware, and computer services)
	Vehicles, automobiles, bodies, and parts
	Construction
	Transport and logistics
	Tourism

Sources: (SENPLADES, 2012)

Table 8 Strategic industries

Industry	Possible goods and services	Projects
Refinery	Methane, butane, propane, gasoline, kerosene, diesel	Pacific Refinery Project
Shipyard	Boat construction and repair, associated services	Shipyard implementation project in Posorja
Petrochemicals	Urea, herbicide pesticides, fertilizers, foliars, plastics, synthetic fibers, resins	Basic Petrochemical Plant
Metallurgy (copper)	Electric cables, pipes, lamination	System for the automation of registry, monitoring and mining control activities, monitoring, control, and large-scale work supervision.
Steelworks	Flat steel, long steel, and processed steel products	Geological mapping at a national level on a scale of 1:100,000 and 1:50,000 for the areas of most geological mining potential

Source: (SENPLADES, 2012)

The focalization of economic development in the selected sectors and selected strategic industries sought to give a new start to the process of structural change in Ecuador, configuring a process with new strategic industries that could start a new cycle of production and demand in the internal economy looking to expand the exports of new products.

Finally, it is necessary to consider that until 2012, before the last reelection of the president, SENPLADES maintained the position as a nodal agency with MCPEC. However, in 2013 with a new government period, a new political configuration inside the ruler party resulted in changes in the government's strategic authorities, making the documents analyzed to serve as a reference for the new National Development Plan 2013 - 2017.

National Developmental Plan 2013 – 2017

In 2013 the government of Rafael Correa was re-elected, and as was mention, the political structure suffers a transformation regarding the management of the strategic sectors and the process of diversification and industrialization. The Vice-presidency assumed the role that SENPLADES and MCPECP had in the period 2007 - 2012; the role assumed by the Vice-presidency was to formulate policies of structural change. The modification of the nodal agency was justified in the National Development Plan by the modest results in terms of industrialization and diversification (Andrade, 2015).

Similarly, the Plan analyzed the productive structure of Ecuador for the new period of government. The industrial sector had grown in Ecuador more than in the rest of Latin America (from 2007 to 2011 grown by 3.2% while Latin America grew in 2,1%), but the growth had not succeeded in increasing the industry's share of national production (in 2000 the industry

occupied the 15.2% of the GDP; in 2007 13,7 and 2012 12.8%), and the level of participation achieved in 2012 was still far below the Latin American average (SENPLADES, 2013).

In 2007, the percentage of primary products exported was 80%, and in 2012, the percentage grew to 81%. Similarly, the imports of high and medium technology products grew; from 15% to 16%, and from 46% to 47%, respectively (SENPLADES, 2013). Based on the modest outcomes of the policies implemented about the productive transformation of Ecuador (plus the political changes inside the ruler party), SENPLADES and MPCEP became support agencies for the process of diversification and industrialization.

Furthermore, about the new proposals for structural change, the National Developmental Plan established one main objective directly related to the process of diversification and industrialization the "Objective 10: To promote the transformation of the productive structure (SENPLADES, 2013)". The idea of the change of the productive matrix was not new, as was shown in the last chapter; however, the present document's innovation is the emphasis on activities intense in knowledge and strategic industries. The policies proposed in the objective 11 are:

- To diversify and generate larger value-added in national production.
- To promote technology-intensive commodity, intermediate, and finished goods production.
- To diversify and generate value-added in priority sectors providing services.
- To promote public investment and procurement as strategic State elements in transforming the productive structure.
- To coordinate the raising of financial and non-financial resources to transform the productive structure.

The metrics and goals of the objective are:

- Increase the share in exports of high, medium, and low-technologically intensive products based on natural resources to 50.0%.
- To reduce non-petroleum imports of commodities and those based on natural resources by 40.5%.
- To increase the share of the manufacturing industry to 14.5%.
- To reverse the trend of the share in imports of agricultural produce and meats down to 5.0%.

Objective 10, and the specific policies were in general in line with the previous Development Plans (2007 – 2010 and 2009 – 2013) and the two main policy drivers (Industrial Policy of Ecuador and Agenda for Productive Transformation) analyzed in this dissertation, the substitution of imports and diversification of exports.

The new proposition base in this document is the knowledge transfer and the Schumpeterian approach of innovation. Regarding the Schumpeterian proposal, innovation is the motor of the economy, and the creation of new products drives the market (Andrade, 2015). The innovation in Ecuador and, in general, will stimulate the market to create new products that are not in the actual stock; allowing the imposition of a price by one actor, while in the process of catching up, Ecuador could enjoy a period of high incomes (Andrade, 2015).

Additionally, the change in Ecuador's productive matrix is based on organized the structural change with two big sectors or levels in the productive chain (similar was proposed in the APT). One sector of high technology and other medium technology. The first level will absorb the medium technology sector's production, and the second sector will absorb

the country's labor (the selected sectors of high and medium technology are the same as the table 6) (Andrade, 2015).

In sum, the National Development Plan 2013 – 2017 follow the main lines of development designed in the previous periods of government; the new determinants of development are the primacy of knowledge and innovation; and the necessity of the strategic industries. New industries intense in knowledge and the two levels structure of the economy could be seen as the structural base for the process of diversification and industrialization. Additionally, the nodal agency's modification generated a new institutional architecture, which will be analyzed in the following section.

Institutional architecture for the change of the productive Matrix

In the studied period, Ecuador took as a base the development of the East Asian countries, with a nodal agency that coordinated structural change between the public institutions and the private sector. The nodal agency's role was essential to have a complete perspective of the economy's structure and the productive chains. In response to this model, Ecuador designed, since 2007, a structure of the nodal agency and coordinating ministries that could give form to the public policy formulation, coordination, implementation, and evaluation.

However, as was shown in the previous section, until 2012, the structural change results were modest in relation to the resources invested (additional with the political changes inside the ruler party) (Andrade, 2015); the government decided to change the nodal agency and upgraded this role to the vice-presidency. The modification looked for an increase to the top level of the public policy generation (Andrade, 2015).

Similarly, the Intersectoral Committee for the Change of the Productive Matrix[19] was created to elaborate the new public policy in line with the National Development Plan 2013 - 2017, which, as was mention, sought to raise the economy of finite resources (natural resources) to one of the infinite resources (knowledge and human talent) (Calderón, 2017).

Additionally, the government created the Technical Secretariat of the Inter-institutional Committee for Change of the Productive Matrix, attached to the vice-presidency. The new technical secretariat was in charge of coordinating, monitoring, and evaluating the implementation of strategies, plans, programs, and projects related to the productive matrix change (Calderón, 2017). The role of SENPLADES was moved to the vice-presidency, while the role of MCPEPC moved to the new Secretariat.

The committee presented strategic objectives related to diversification and industrialization based on the country's development's new determinants.

- Efficiency and innovation: increasing innovation, technology, and knowledge-intensive production.
- Demand efficiency: increase the value of production and incorporate Ecuadorian components (local value-added); diversify production and favor the expansion of markets; increase and diversify exports and strategically substitute imports.

After two years, the vice-presidency elaborated a new policy instrument to guide the new strategy of economic diversification and industrialization

[19] The Intersectoral Committee was composed of the Vice President of the Republic, the National Secretary of Planning and Development; the Coordinating Minister of Production, Employment and Competitiveness; the Coordinating Minister of Economic Policy; the Coordinating Minister of Strategic Sectors; the Coordinating Minister of Knowledge and Human Talent; and the National Secretary of Higher Education, Science, Technology and Innovation.

named the "National Strategy for the Change of the Productive Matrix in 2015", which will be analyzed in the next section.

Finally, the modification of the nodal agency in the Ecuadorian case brought a new generation of public policy focused on the knowledge and innovation for the production matrix's change. Nevertheless, considering the characteristics of the public sector of Ecuador and the relation with the private sector, the modification of the institutional architecture has severe implications in the implementation of the policies. It is necessary to consider the high costs implied for the vice-presidency and the new secretariat to learn about the elaboration of policies and the most important, the coordination between the public and private.

In the same line, the Vice-presidency had to address the structural problems of the Ecuador institutionality, the duplication of projects and activities, or the lack of coordination between institutions of the same sector, the high mobility of personnel, and the lack of continuity in policies (Calderón, 2017). And at the same time, implement policies of structural change that had suffered a break between the public institutions and the private actors.

National Strategy for the Change of the Productive Matrix in 2015

The National Strategy was elaborated in 2015 by the Vice-presidency and the Intersectoral Committee for the Change of the Productive Matrix. The strategy was centered on generating productive activities intense in knowledge and with a robust exchange in the chains between the first and second level industries.

In the same line, the document was structured by three main sections: first, horizontal policies to improve production conditions and favor the innovation and competitiveness environment (Vicepresidencia de la

República del Ecuador, 2015). Second, vertical policies for the development of a limited set of prioritized productive chains; and third, policies for productive chains based on large projects (Vicepresidencia de la República del Ecuador, 2015).

The horizontal policies

The policies were focused on creating adequate conditions to promote development, productive diversification, and stimulate private actors with an attractive environment. For this process, the public institutions analyzed the significant obstacles for the private sector and decided the following actions to generate adequate answers (Vicepresidencia de la República del Ecuador, 2015).

Productive incentives: the actions were focused on creating the necessary macroeconomic conditions and establish adequate stimulus for specific industries and market behaviors; the following actions should be implemented:

- Expand productive financing
- Improve the business climate
- Encourage productive private investment
- Promote public procurement to encourage productive transformation
- Promote diversified and sustainable foreign trade
- Promote the regulatory agenda to support the productive transformation and eradication of poverty

Policies for human talent, knowledge, innovation, and culture: the innovation as a factor for productivity and the generation of knowledge was a fundamental base, the government specifies the following actions:

- Expand and improve the supply and quality of science, technology, and education.
- To improve the educational and scientific offer articulated to the needs of the productive transformation.
- Generate better articulation between the creation, application, and circulation of knowledge and national production to generate an environment of innovation.
- Promote the culture of innovative entrepreneurship.

Infrastructure and services policies for production: creating an adequate infrastructure that promotes productive diversification and the private have a good environment to start a business.

- Increase coverage, service provision, continuity and quality according to the change in the productive matrix.
- Encourage efficient, responsible, and sustainable consumption of strategic resources.
- Intensify the use of infrastructure and services of strategic sectors to develop productive chains with added value.

Selected productive chains

In the past periods, the government has supported heavily the provision of infrastructure that facilitates private activities generating higher capital returns to private investments. At this point, the government decided to implement vertical policies for a certain number of productive chains. (Vicepresidencia de la República del Ecuador, 2015) The vision of the country's economic and productive sectors as a complete structure was

primordial to the provision of organization and link between actors in the market.

In the same line, the organization's role of the government focused on identifying the private industries and create policies to solve the obstacles of the private sector (Vicepresidencia de la República del Ecuador, 2015). Additionally, the provision of information about products lacking in specific productive chains was another role that the government was looking for the adequate articulation between private actors in the market with the public's support through the generation of public instruments (Vicepresidencia de la República del Ecuador, 2015).

Similarly, the first objective was to increase the productivity of the selected industries; and second, accumulate knowledge about the successful policies that could be implemented in other chains, the last objective with the participative space between the public and the private that stimulate the horizontal and vertical policies that could serve for both areas of the economy (Vicepresidencia de la República del Ecuador, 2015).

The process of select industries sought to improve the trade balance by selecting industries that could increase the quantity of exports or substitute imports. The selected industries were related to the following aims:

- Exploit existing comparative advantages to build competitive advantages in the agribusiness sector: cocoa and coffee manufactured products, mariculture, and dairy products.
- Reduce external dependence on manufacturing sectors by promoting basic industries: petroleum derivatives, metalworking, pharmaceuticals, rubber and plastic, forestry, pulp, and paper.

- Promote knowledge-intensive activities and innovation with high growth potential in the world economy: tourism, ICT software and services, logistics, and environmental services.

Basic industries: complete the productive chain

The creation of the basic industries sought to supply essential inputs to the Ecuadorian industries that have been imported from abroad, affecting the balance of payment. Additional to the supply of products, the construction and the operation of the industries will absorb labor and result in new backward productive chains (Calderón, 2017). The government assumes an active role in creating these strategic industries due to the private actors' lack of actions in this matter (Calderón, 2017).

The basic industries prioritized were: refinery and petrochemicals, steel (flat steel), copper smelter, refinery, an aluminum smelter, shipyard, and pulp (Calderón, 2017). The MCPEC was in charge of creating a catalog for private investment; The MCPEC made the fundamental studies of feasibility as a primary incentive to the private investment.

Table 9 Basic industries projects

Project	Localization	Investment (millions USD)
Pacific Refinery	Manabí	12 500
Linear AlkylBenzene Petrochemical Plant (LAB)	Manabí	500
Petrochemical plant Polyethylene Terephthalate (PET)	Manabí	1 400
Flat Steel Plant - Direct Reduction of Iron (DRI)	Manabí	1 100
Flat steel plant - ferrotitaniferous sands	Manabí	675
Repair yard	Guayas	180
Offshore Support Vessel (OSV) Class Shipyard	Guayas	100
Large shipyard	Guayas	700
Aluminum smelting plant	Manabí	2 500
Copper smelting and refining plant	Manabí	2 000

Pulp plant	Manabí	2 800

Source: (Calderón, 2017)

Finally, with the decreased international oil prices, a significant appreciation of the dollar, and an earthquake that hit the Ecuadorian coast, the government suffered from a lack of resources to invest in the mentioned actions. Since 2014 the oil fall prices and the resources were insufficient to maintain the flow of public investment as a policy tool to stimulate the market's signs. With this framework, the government began to design new policies focused on private international investment to support the creation of new industries.

Additionally, the remaining problems related to the lack of institutional capacities, lack of articulation between public institutions and with the private sector, the lack of trust between the public and private, and the high mobility of authorities and middle-rank public officials made that the policy instruments analyzed fail in the implementation. Other actions related to tax reforms and the coming electoral year in 2017 made this strategy's implementation unfeasible.

The practice of industrialization and diversification 2013 – 2017

The change of the productive matrix in 2012, the National Developmental Plan 2013 – 2017, and the National Strategy 2015; gave the start to a new diversification and industrialization phase, emphasizing activities intense in knowledge and the promotion of basic industries. In the following sections, the implementation of programs and public projects will be reviewed, concentrating on the state's lack of resources due to the low international oil prices.

Defensive trade policy and the strategic import substitution

Ecuador's prosperity period with high incomes resulted from the extraordinary international oil prices made that the population consumes an excessive quantity of imported products, with a subsequent large deficit in the trade balance. In 2013, through COMEX, the government started a complete revision of the tariff, non-tariff, and defense measures to reduce the trade deficit (Calderón, 2017).

The first action in 2014 was focused on increasing the trade barriers (taxes) to consumer goods (mainly smartphones and vehicles); the second protective action in 2015 was the result of the currency's devaluations by Colombia and Peru, that increased the imports to Ecuador. To reduce the imports, Ecuador imposed barriers to products elaborated in Colombia and Peru; this action had several complaints of the countries in front of the Community of Andean Nations - CAN, resulting in eliminating these actions (Calderón, 2017).

The third action was implemented in 2015 due to the decrease of the national income, the devaluation of the currency from Colombia and Peru, and the increased trade disbalance. The government activated a temporary and non-discriminatory policy of tax barriers to 2,955 tariff sub-items (30% of total imports), expecting a reduction in imports of 2,200 million dollars (Calderón, 2017). After these actions, and faced with the business sector's continuous claims, at the end of 2015, several raw materials, inputs, and capital goods were excluded from this measure (Calderón, 2017).

Similarly, in 2014 as a complement of the mentioned policies, the Strategic Import Substitution was introduced; the policy emphasized the stop of

supply products standing new barriers (tax or technical[20]) (Calderón, 2017). The measures expected to maintain in Ecuador 6000 million dollars in 2014 – 2017 with the last paragraph's actions (other measures related to quality regulations were imposed, but this document will not analyze it) (Calderón, 2017).

Public Purchases as a productive instrument

Ecuador, since 2008 increased public purchases using it as an essential instrument of policy; the highest point was in 2013 with 10.843 million USD. However, in the following years, public investment decreased by the mentioned factors (Calderón, 2017). On average, the public purchases in the studied period represented: 45% corresponds to works, 30% to the purchase of goods, 20% to the acquisition of services, and 4% to the contracting of consultancy services (Calderón, 2017). Public procurement is responsible for one-third of the general state budget and represents between 8% and 10% of the GDP (Calderón, 2017).

In the ten years analyzed, the public purchases sought to stimulate specific industries and products that have advantages, and that could enter the international market and substitute imports. The public purchases in the period were based on the following lines:: (1) prioritize those suppliers or providers that offer incorporation of a national component; (2) promote the participation of MSMEs and actors of the popular and solidarity-based economy; and (3) establish procedures and methodologies for technological disaggregation, knowledge and technology transfer in the purchase of

[20] Regulatory policies had specific instruments, focusing on quality technical regulations, protective trade measures and the implementation of public procurement mechanisms to prioritize the local market (Calderón, 2017). Production promotion policies were more general, considering a series of sectoral initiatives to strengthen productivity and boost growth in national supply and demand (Calderón, 2017).

goods and services with an imported component, including consulting services (Calderón, 2017).

Furthermore, in 2015 the program IngeniaTEc, started a process to search national companies that offer (or could offer in a certain period) manufactured products that Ecuador had imported from abroad to substitute these imports. In this process, Ecuador would save 370 million dollars; however, the system's implementation was difficult due to the specification of the national component of the product (Calderón, 2017).

At the beginning of 2016, as part of the actions aimed at strengthening local industry, an agreement was signed between the public companies of the strategic sectors and a group of 22 national private companies to generate a system of local suppliers of pumps, valves, cables, transformers, pipes with and without seams (Calderón, 2017). With this program, it is estimated that purchases of more than 1,600 million dollars could be generated until 2025, a figure that could increase by 1,000 million dollars as the Pacific Refinery project advances (Calderón, 2017). It is essential to mention that this basic industry had to attack private investment and produce industrialized products based on oil; however, now the industry has several causations of corruption and public funds' lousy use.

Productive financing

Ecuador's public bank was created several decades before; the current institutions offer credits classified as productive, commercials, and consumer credits. The public bank has several institutions, but the principals for this investigation are Banecuador and National Finance Corporation – CFN. The first institution was created for small companies and natural people, while CFN targets medium and big companies.

Between 2013 and 2015, CFN reduced the resource destined for credits from 631 million dollars to 522 million dollars in activities oriented to the productive sector, reducing the low public investment. It is important to mention that the fresh and processed food sector was positioned as the most considerable credit recipient, representing nearly half of the financing granted to the productive sector (Calderón, 2017).

In 2014, the Progresar Program was launched to support the national industry by strengthening the credit system for small and medium entrepreneurs. The Progresar Program established three specific financial tools for the productive sector: guarantee fund, financing of fixed assets, and risk capital (Calderón, 2017).

- The guarantee fund was created to provide credits to companies that contribute to the change of productive matrix, but that for lack of enough guarantees cannot access to the private bank. The fund started with a budget of 170 million USD. The fund managed to formalize more than 100 guarantees, allocating more than half of the resources distributed to the agricultural and livestock production processing sector and the logistics sector; 83% of the resources were allocated to the purchase of fixed assets and 17% working capital.
- Finance of fixed assets, this instrument we designed to provide credits to companies that have the intention to buy a movable and immovable property or other inputs; these should be focused on a process that contributes to the change of the productive matrix and should be aligned to the COPCI, with activities that increase the valued added, imports substitution and promotion of exports of new products. In 2014 the instrument provided to the manufacturing industry 22 USD million and 14 USD million to the tourism sector.

- The strategy related to risk capital was established with a special program named "Entrepreneurs League" that provided non-refundable funds to new activities related to the change of the productive matrix and import substitution. More than 1000 people participated and were selected 21; however, the funds were limited.

The COPCI continues providing both general and sectoral tax incentives to stimulate productive private investment. The general incentives provided several benefits related to income tax, ranging from a tax reduction, exemption from advance payment, and access to additional deductions derived from improved productivity, innovation, environmentally efficient production, and payment of the living wage (Calderón, 2017). The sectorial incentives related to the change of productive matrix gave the exoneration of the income tax.

Education and innovation as the center of the Productive Matrix

The SENESCYT led the structural reforms to strengthen the university, technical education, and scientific research institutions. Furthermore, SENECYT promoted scholarships and educative credits for people that had the intention to study abroad. Simultaneously, it stimulated the quality of education in Ecuador, restructuring the normative to qualify each institution and eliminate low-level institutions (Calderón, 2017). In the same line, substantial investment was made to create educative projects: Yachay, the "city of knowledge" (university of science), Ikiam University, the National University of Education, and the University of the Arts.

Moreover, between 2007 and 2015, expenditure on higher education grew from USD 421 million to USD 2.16 billion per year, reaching an accumulated investment of US$11.425 billion in this period. In 2015,

spending on higher education reached 2% of GDP. Besides, more than 18,645 scholarships have been granted for specialization studies in universities abroad, 50% of them in the areas of engineering, industry, and construction, with an investment of more than 402 million dollars (Calderón, 2017). According to the World Bank data, the percentage of GDP in education grew from 4.34% in 2009 to 5.26 in 2014.

The Prometeo program started in 2013 with the aim of attack scientists and academics to Ecuador; the program finished in 2017; the beneficiaries of the program were distributed: 670 were integrated into universities and study centers, while another 178 worked in different government entities. Between 2010 and 2015, the Prometeo programs allowed the development of 1.014 projects with 834 researchers and teachers of 51 different nationalities, where 51% came from Europe, Asia, and Africa, concentrated basically in basic, life, and natural resources science.

About innovation, the government implemented programs with a particular focus on the creation of new products or services that could promote the change of productive matrix:

- Bank of ideas: people presented their projects related to innovation that could contribute to the protective's matrix change; these projects were analyzed, and the winners receive integral accompaniment, financing, and business model development. For 2015, 161 projects were selected, of then 40 received seed capital, capacity-building programs for entrepreneurs, and incubator support for six months (Calderón, 2017).

- IngenitaTec: was a competition program that sought the promotion, design, and construction of prototypes using domestic components that can be produced locally, contributing to import substitution

(Calderón, 2017). In the program, various products might be produced with the condition of sign a contract with the provider of the products and the private enterprise to assure that the product will be consumed (Andrade, 2015).

Impact of public investment in diversification and industrialization 2007 - 2017

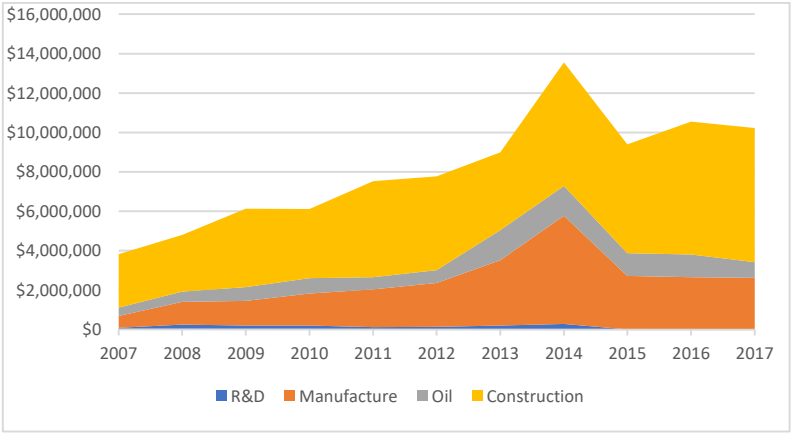
This section will first measure the public investment per sector from 2007 until 2017, evaluating the policies analyzed and the major sectors of the Ecuadorian economy. In a second step, the indicators of diversification will be measured using several data that could give a holistic perspective of Ecuador's diversification state in the studied period. Indicators of exports and specialized indicators in diversification will be compared with the amount of resources invested by the government in policies of structural change.

Table 10 Public investment and its representativeness in the total of these areas 2007 – 2017

Year	% of R&D	% Manuf.	% Oil	% Const.	Total
2007	2.25%	15.84%	11.20%	70.70%	$3,822,705
2008	5.08%	24.17%	10.82%	59.93%	$4,800,018
2009	3.19%	20.49%	11.35%	64.96%	$6,129,351
2010	3.29%	26.49%	12.72%	57.50%	$6,116,041
2011	1.72%	25.25%	8.31%	64.72%	$7,528,325
2012	1.74%	28.63%	8.33%	61.30%	$7,767,770
2013	2.25%	36.80%	16.96%	43.99%	$8,995,572
2014	2.14%	40.42%	11.23%	46.21%	$13,552,717
2015		28.98%	12.28%	58.74%	$9,404,175
2016		25.19%	10.91%	63.90%	$10,545,786
2017		25.62%	7.78%	66.59%	$10,224,521

Source: Central Bank of Ecuador and UNESCO

Graph 7 Public investment in manufacturing, R&D, construction, and oil (thousands USD)



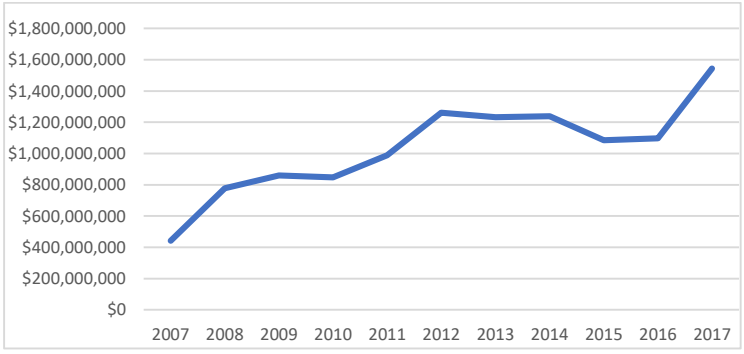
Source: Central Bank of Ecuador and UNESCO

Table 11 Relation public productive credits and the total volume of credits 2007 - 2017

Year	Credit Volume	% Credits
2007	11,549,459,629.65	3.82%
2008	14,328,358,182.81	5.43%
2009	14,010,981,713.23	6.14%
2010	15,839,259,789.89	5.35%
2011	20,975,730,588.65	4.71%
2012	27,814,849,775.50	4.54%
2013	34,080,001,942.37	3.62%
2014	32,794,559,316.22	3.78%
2015	27,336,899,438.59	3.97%
2016	26,334,886,807.17	4.17%

Sources: Superintendency of Banks of Ecuador and (Maldonado, 2017)

Graph 8 Amount of credits provided by the Public Bank (USD)



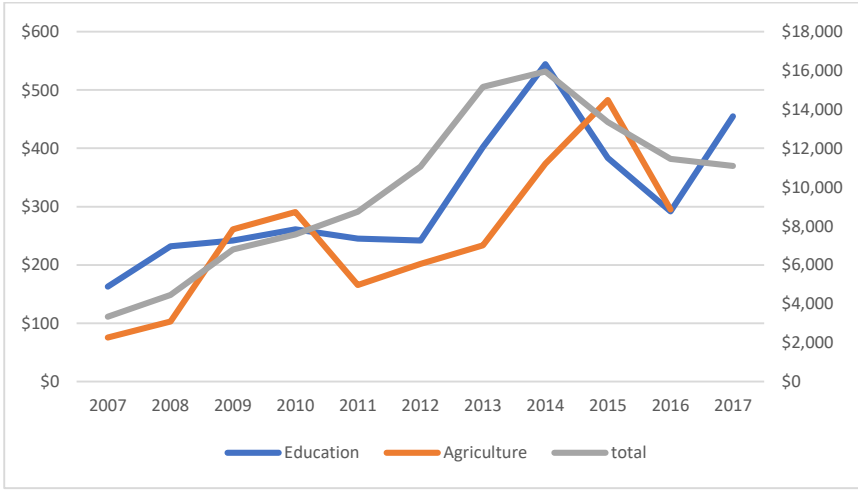
Source: Superintendency of Banks of Ecuador

Table 12 Relation total public investment with PI in Education and Agriculture 2007 - 2017

Year	% Edu	% Agr.	Total
2007	4.87%	2.26%	$3,337
2008	5.21%	2.30%	$4,454
2009	3.56%	3.84%	$6,794
2010	3.44%	3.84%	$7,576
2011	2.80%	1.89%	$8,744
2012	2.18%	1.82%	$11,066
2013	2.65%	1.54%	$15,155
2014	3.41%	2.34%	$15,953
2015	2.87%	3.62%	$13,344
2016	2.54%	2.57%	$11,464
2017	4.10%	0.00%	$11,097

Sources: Central Bank of Ecuador, FAO, and INEC

Graph 9 Public investment in education, agriculture, and total (million USD)



Sources: Central Bank of Ecuador, FAO, and INEC

In the ten years of consecutive policies of diversification and industrialization, the government in general increased the public investment, which is notable in graph 9; similarly, the total public investment decreases after 2014 in the period of low international oil prices. The government expenditure in education and agriculture presents the higher values with some variations in specific years; the focus on the state's necessary capabilities and the policies implemented are reflected in the resources invested.

In graph 7, the trend is upward in the four sectors: manufacturing, R&D, construction, and oil. However, construction and manufacture present high general values comparing with R&D and oil. The four sectors' tendency has the same trend after 2014, with a decrease in resources invested. Graph 8 presents productive credits delivered by the public bank; the trend is ascending with some periods of stagnation.

In general, the data shows a significant increase in the resources invested by the government, which in some years, duplicate or more its value. R&D

grew significantly from 2007 to 2008, the same effect in manufacturing, credits, and education. Finally, to have a better perspective of the fluctuations in public investment indicators per sector in the following table is presented the growth rate.

Table 13 The growth rate of public investment per sectors 2008 – 2017

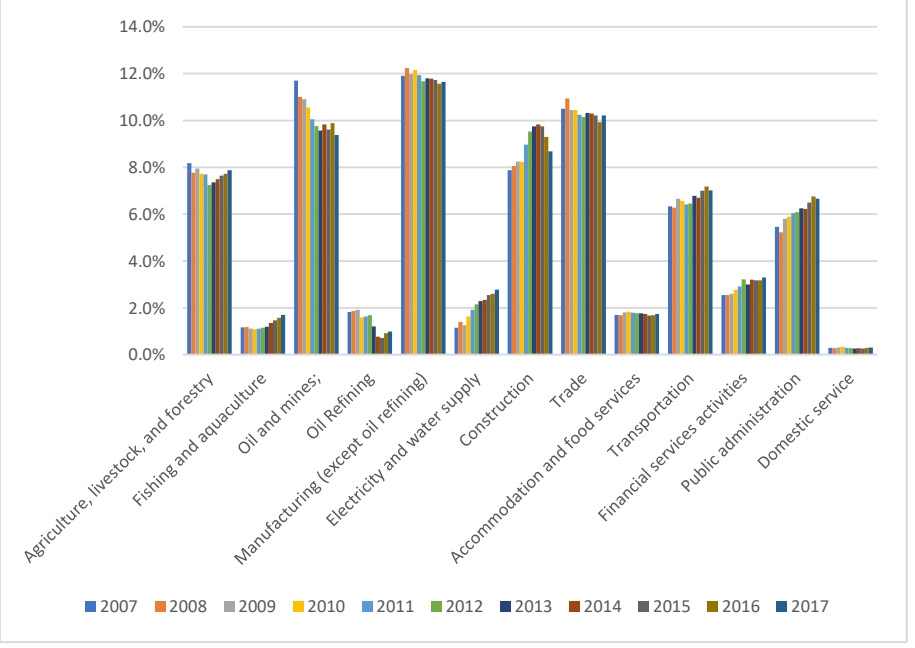
Year	R&D	Manufacture	Oil	Construction	Credits	Education	Agriculture	Total
2008	183%	91.53%	21%	6.44%	76%	42.82%	36%	33%
2009	-20%	8.29%	34%	38.41%	11%	4.21%	154%	53%
2010	3%	28.97%	12%	-11.68%	-1%	7.82%	11%	12%
2011	-36%	17.32%	-20%	38.56%	17%	-5.99%	-43%	15%
2012	4%	16.99%	3%	-2.27%	28%	-1.44%	22%	27%
2013	49%	48.86%	136%	-16.90%	-2%	66.47%	16%	37%
2014	43%	65.51%	0%	58.25%	1%	35.37%	60%	5%
2015		-50.25%	-24%	-11.79%	-12%	-29.63%	29%	-16%
2016		-2.54%	0%	22.00%	1%	-23.88%	-39%	-14%
2017		-1.38%	-31%	1.04%	41%	55.87%		-3%
Average	33%	22.33%	13%	12.21%	16%	15.16%	27%	15%

Sources: Central Bank of Ecuador, Superintendency of Banks of Ecuador, National Institute of Statistics and Censuses, FAO, UNESCO

Table 13 presents the growth rate in public investment in the sectors that are considered fundamental for the process of diversification and industrialization. On average, all the sectors present a positive increase; R&D first with the highest average growth rate with 33%; however, the availability of data only covers from 2007 until 2014; and agriculture with second-highest growth rate with 27%, but with significant fluctuations in government expenditure. The sectors that present the highest amounts of resources in USD are credits in the first place while education and agriculture in second and third place; while lower values are present in the infrastructure, manufacturing, oil, and R&D. Additionally, after 2014, the values are negatives for almost all the sectors.

The government since 2007 has focused, according to the data recollected, on infrastructure, education, and agriculture. The first two are considered necessary capabilities in the theory reviewed in this dissertation, which gives basic potentialities for economic growth and diversification. At the same time, agriculture received large amounts due to Ecuador's agricultural structure (after the oil is the second largest sector in exports). However, for diversification and industrialization, the investment should be made in areas related to manufacturing and R&D, as well credits. The first two present the lowest values in comparison with the sectors mentioned in the last paragraph. The growth rate is significant, but the amounts of resources are still low.

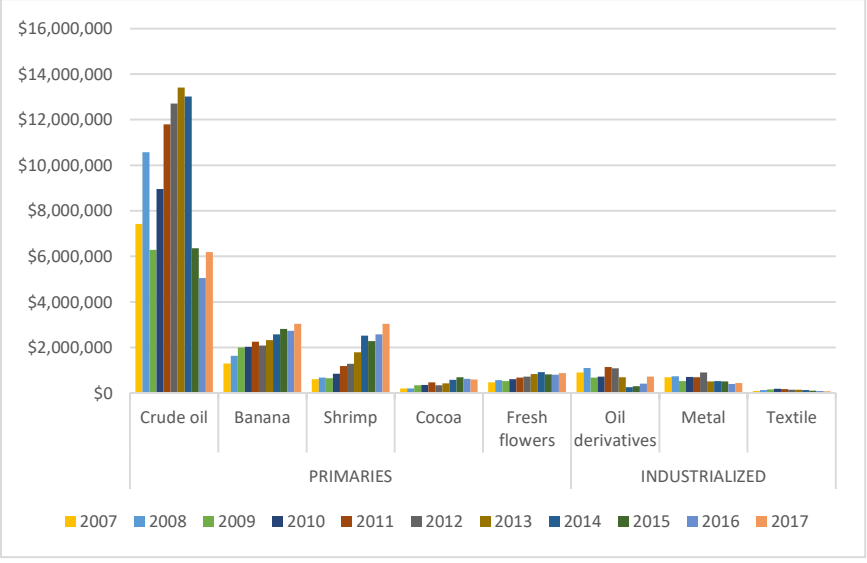
Graph 10 GDP per sectors 2007 – 2017



Source: Central Bank of Ecuador

The GDP per sector of Ecuador since 2007 presents several fluctuations. In agriculture, the sector recovers its weight almost returning to the value in 2007, oil decrease in its importance of the GDP in all the studied period with a significant trend from 2013, which can be a sign of relative increase of other sectors and the international shock in the oil prices. Manufacturing also shows a general trend ascending from 2007. In general, the sectors that should show the progress of diversification are manufacture and agriculture; however, the fluctuations and the composition of the GDP do not capture small variations in Ecuadorian production. In this sense, in the next lines, a complete analysis of the exports is presented.

Graph 11 Evolution of the Ecuadorian traditional exports 2007 – 2017



Sources: Central Bank of Ecuador

Graph 13 shows a general perspective of Ecuador's traditional exports with a clear ascendant trend in banana and shrimp products. However, crude oil has several fluctuations but with a trend following the international prices of oil. Furthermore, manufacturing presents a negative trend after 2012. To

have a better perspective of diversification, this section will analyze the Ecuadorian exports' growth rates located in Appendix 1 and 2.

Appendix 1 shows the variations per year of the rate of Ecuadorian exports per product in the traditional exports. This data was constructed to have a more sensitive perception of the possible diversification of Ecuador. The data shows that shrimp with 18.6% and cocoa with14.6% are the products that have grown more in this period in the primary products. While for the industrialized, hats with 16.7% and elaborated of cacao with 11.4% present the significant values. In general, the traditional primary products have grown by 5.8% and industrialized in 2.7%.

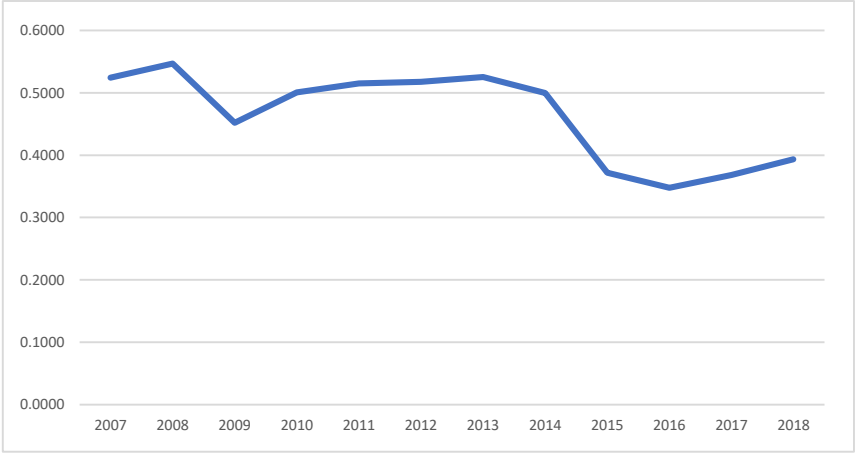
The data presented have limitations first about the magnitudes measured; the data show the percentage of growth or decrease but do not indicate the amount of resources that each product perceived or lost; in this line, it is important to have in mind the resources received in currency. Nevertheless, the data is a good proxy to understand the evolution or deterioration in the path to diversification and industrialization and the country's productive structure.

In Appendix 2, similar data is presented but for the nontraditional exports of Ecuador. For this research, this data is more critical due to the policies concentrated on Ecuador's nontraditional exports. The increase in exports of these products might show the impact of public investment in the change of Ecuador's economic structure. However, it is necessary to consider the data's limitations before mentioned

The mining products with 31.8% and abaca, with 12.4%, present the primary products' highest growth rates, moreover, for the industrialized, other products of the sea with 10.5% and manufactured products of banana with 16.6% have the highest growth rates. However, the data show products

that show negative rates as fruit juices and preserves with -0.8%, vehicles and its parts with -6.9%, and textile garments with -6.1%. The average growth rate of nontraditional products presents an increase of 7.9% while for industrialized 3.3%. The data follows the same trend as the traditional exports, with a notable difference between the increase in the exports of primary products, while the industrialized showing the lowest increase.

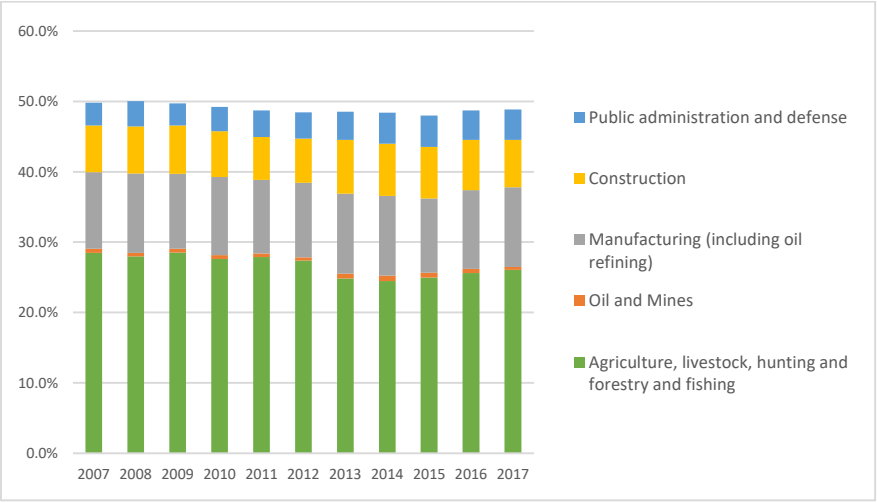
Graph 12 Herfindahl-Hirschmann Index 2007 – 2018



Sources: UNCTAD STATA

In graph 12, the concentration index shows small fluctuations from 2007 until 2014, improving significantly until 2009, while it is almost stable from 2010 decreeing since 2014. The improvement or less concentration from 2014 goes aligned with the fall in the oil prices, which could be a direct consequence in the representativeness of this product in the Ecuadorian exports, which might suggest that the income received can be noisy for the indicator.

Graph 13 Employment rate by activity 2007 - 2017



Sources: INEC

In graph 13, Ecuador's employment rate from 2007 until 2017 maintains the same structure with small agricultural variations from 28.5% in 2007 to 26.1% in 2017. For manufacturing, the fluctuation is lightly ascendant from 10.9% in 2007 until 11.3% in 2017. The significant variations in employment are related to public administration and construction, showing that these sectors increased its importance in the Ecuadorian economy; the GDP per sector supports this data showed before.

The information presented is important to have an overview of the economic structure of the country. Nevertheless, the Ecuadorian export data divided by traditional and nontraditional is more sensitive to small changes [21] . In the same line, the data shows that traditional and nontraditional exports of Ecuador have increased significantly for primaries products. However, the increase in the economic sectors has been modestly

[21] "For small and medium sized countries, export-based measures are better indicators as they are more likely to be outward oriented due to the relatively small size of their internal market (Alsharif, Bhattacharyya, & Intartaglia, 2016)."

represented in the GDP, where agriculture and manufacture have small variations.

Finally, following the data presented, Ecuador has increased the total public investment, and per sectors, the government has focused on the country's basic capabilities, infrastructure, and education. Additionally, agriculture has received an important portion due to the own characteristics of this sector. While manufacturing has received a small portion compared to the sectors mentioned; however, the growth rate had increased significantly. In this sense, it can be suggested that the policy focus on diversification has received significant public investment flows in line with the policy documents.

Furthermore, Ecuador's exports have increased in the analyzed years; nevertheless, the trend is significantly more significant for primaries products than for industrialized products. In the same line, in the classification of traditional and non-traditional exports, the data shows interesting information about the industrialized nontraditional products better represented than the primaries. For this dissertation, the significant attention is on the nontraditional products that should have increased its representativeness in the total of exports.

In the process of catching up in structural change, developing economies have potential advantages in technology terms because technology has already been developed, providing a faster catch-up process. Nevertheless, according to the theory analyzed, countries specialized in certain products have become efficient producers with low production costs that other countries cannot compete with.

In this line, Ecuador's exports have increased, and the industrialized exports have also grown after 10 years of public investment. Nevertheless, the

increase has not been reflected in the major indicators like the GDP, one of the government's main goals, according to the policy documents. Moreover, public investment has notably grown; the research might conclude that the total investment has not significantly improved Ecuador's economic structure.

Furthermore, and in line with qualitative analysis of the implementation of policy, it is notable the implementation problems in the ten years process. Institutional problems, coordination problems, and a private sector rentier might have seriously affected the implementation of the public investment. Additionally, the politics of the public resources and the obscure implementation could affect Ecuador's low diversification.

Chapter 5. Conclusions

Developing countries that have caught up developed countries have shown that their economic structures have moved from agriculture and low value-added products to more diversified and industrialized economic structures (developed countries diversified their production until some point, then returned to the specialization in certain products (Rodrik (b), 2004)).

In general, the policy formulation made in Ecuador from 2007 until 2017 has similitudes with the policy suggested by the theoretical framework with the state as an actor that intervenes in the market relations through various programs and policies focused on upgrading the economic structure of Ecuador. The state intervention has been made through subsidies, tax reduction, special economic zones, infrastructure, education, training, and R&D. Regarding institutional architecture, a nodal agency and coordinating institutions were created considering the complicated process of structural change. The thesis will summarize the periods of diversification, its policy formulation and implementation in the following paragraphs.

In 2007 the policy formulation can be considered general, focusing on the analysis of the economic structure and the major challenges of the government. The creation of the new institutional architecture takes form to manage the process of diversification with the creation of a nodal agency, coordinating ministries, and a sectorial council with the public and the private actors. Since 2008 the MCPEC began to select industries that can receive special treatment from the government.

The Industrial Policy of Ecuador of 2008 was the first policy document centered on industrialization and diversification; however, it was overcome in 2010 by the Agenda for Productive Transformation that, together with the COPCI; started new programs and policies focused on diversification

with a wide selection of primary and industrial sectors. The formulation of the document presents horizontal and vertical policy fundamentals for economic diversification. Specific programs for high-risk activities were created and other related to the facilitation of processes: EmprendEcuador; InnovaEcuador; CreEcuador; Without Procedures; and InvestEcuador. This document started the consideration of two levels of industries and a global vision of provision of infrastructure.

For the final period from 2013 – 2017; exists two events to consider for the process of diversification. The first was the fall of the international oil prices in 2014, constraining the government's budget, reducing public investment, and forcing international debt. The second was the modification of the nodal agency and a new coordinating institution. From 2013 the vice-presidency was the new nodal agency with a new secretariat that assumed the roles of SENPLADES and MCPEC, respectively.

In this period, the change of the productive matrix was centered on the country's comparatives advantages, maintaining horizontal and vertical policies. Additionally, programs for innovators and industries with historical exports sought to focus on adding capabilities to these industries that do not need to start from zero. In the horizontal policies, the government maintained the investment in necessary infrastructure. However, it began with the propositions related to a good business environment for attack Foreign Direct Investment, which is fundamental for the creation of the economic structure of two levels.

About the two-levels industries, the government focused on the creation of basic industries that supply basic and intermediate inputs; hoverer, the government cannot cover the cost of creating the public enterprises in metalworking or the oil refinery. In this line, the MCPEC began a diffusion of an investment plan for international actors. Additionally, the public

credits become more critical to promote productivity in the country in the same line as the public purchases.

The implementation of policy, based on other researches (Andrade (b) & Nicholls, 2017; Andrade, 2015; Arantes, 2019; Calderón, 2017), shows severe problems in the country's institutionality, lack of connection between public and private sectors, high mobility of authorities, and poor continuity in policy implementation. For instance, the MCPEC sponsored 179 projects; one third was implemented with other public agencies nationwide, the rest with local public agencies, and none with private companies (Andrade, 2015).

In the same line, the private sector broke the relations at the beginning of Correa's administration due to a new normative, which increased taxes and processes for the enterprises in specific areas. Additionally, Ecuador's private sector has focused on private investment in traditional products with low investment in innovation, characteristics of countries rich in natural resources, and synthons of Dutch disease.

After reviewing the policies behind the public investment, the research can conclude that the public investment has been made according to the policy documents analyzed; however, the policy implementation has several failures that negatively have affected the process. Regarding the descriptive statistical analysis, the total public investment grew by 15%. The selected sectors increased by 20%; the more grew sectors were: R&D by 33%; agriculture by 27.4 %; and manufacture by 22.33%. The limitation in the analysis of the growth rate is the incapacity to include each sector's amount of resources; Agriculture grew less than R&D; however, the amounts of resources are not comparable.

Regarding diversification, the research used various indicators to reflect the productive structure of the country. The GDP per sector reflects small variations in the weight of agriculture and manufacture in 2007 – 2017; agriculture recovered its representativeness while manufacturing decreasing. Other sectors as public administration, construction, and electricity and water supply increased in the studied periods. However, the GDP does not fully capture the modification in the economic structure of the country.

In the same line, the HHI index was analyzed comparing the fluctuations between other countries in Latin-American; Ecuador presents a trend with small variations in 2009 and a significant decrease in 2014. However, the trend's variance might be caused by the oil price and its weight in the Ecuadorian exports, which decrease since 14, which might be too noisily for the indicator. Employment per sector shows interesting information about agriculture that decreased its value since 2007, starting with 28.5% in 2007 and for 2017 has decreased to 26.1%. Manufacturing has increased in a general trend from 10.9% in 2007 and 2017 by 11.3%. Other sectors, as public administration and construction, have also significantly increased its trend.

Finally, according to Nouf Alsharif, Sambit Bhattacharyya, and Maurizio Intartaglia, the adequate form of measure the state of diversification is with data on the country's exports[22]. The dissertation has measured the growth rate of the traditional and nontraditional exports of Ecuador. In traditional exports, the three most representative products have increased their value (oil, banana, and shrimp). Nevertheless, oil has decreased its weight since 2014. This may reflect that the rest of traditional exports positively

[22] "For small and medium sized countries, export-based measures are better indicators as they are more likely to be outward oriented due to the relatively small size of their internal market (Alsharif, Bhattacharyya, & Intartaglia, 2016)."

impacted Ecuador's diversification, especially in the GDP that was measured by the percentage of the total GDP. Nevertheless, the industrialized exports show a negative trend, mainly metal manufactures, which at the same time might reflect that the main goal of industrializing some sectors of the economy have not been achieved.

The nontraditional exports reflect sectors that the country might improve to diversify the country's structure; it is essential to mention that the magnitudes are different between this classification; the nontraditional exports represent a small portion of income if we compare traditional exports. However, its relative value is essential to capture the relation between implementing the diversification policies and Ecuador's economic structure.

Mining products and abaca have a growth rate of 31.8% and 12.4%, respectively, and industrialized banana products and sea products gave a growth rate of 16.6% and 10.5%. The total nontraditional primaries have increased by 7.9%, while industrialized 3.3%, which is a positive growth rate. Finally, the research conclude that Ecuador had a positive impact of the public investment in the process of diversification; however, this impact is modest and have been affected by the problems in the implementation of policy, additional, should be consider the gap of time between the implementation of the policy and the results.

Discussion

Ecuador, in the process of diversification and industrialization in 2007 – 2017, brought the state back. The policy documents examined follow the theories analyzed in the theoretical background with the government as a central player, addressing the market failures, and supporting innovative processes and new products for the international and external market.

The government selected industries and sectors that promised a good performance in the internal and external market after a period of support of the government. However, in this first point, the wide selection of industries and sectors might have negatives results in terms of efficient use of resources and monitoring. Additionally, the lack of evaluation of results and the political selection of industries may have affected the process of diversification.

The private sector of Ecuador has a severe break with the government result of tax and regulatory reforms, which made that, along the ten years, the lack of support of this sector might have affected the process. Similarly, Ecuador's private sector has a long history of dependency on natural resources that concentrated the factors of production in this sector, letting behind the tradable sector specially industry.

One major determinant of the process of diversification was the implementation of the policy. The research shows the poor institutionality of Ecuador that resulted in inefficient use of resources and the lack of continuity of policies and plans. The mobility of authorities, the discoordination between institutions, and the lack of continuity severely negatively affected this process. However, it is essential to mention that a process of structural change need time and resources to affect the economic structure of a country.

The investment in basic infrastructure and human capital was visible in the statistical analysis, which brought significant links and returns of capital; however, the economic growth cannot be sustained by capital accumulation. Innovation, technology, education, and R&D are fundamentals for diversification and economic growth. The state's investment has increased; however, the actions cannot be made in a unilateral way or with an inefficient use of resources.

Furthermore, the rigid economic structure of Ecuador is supported by the dependency on natural resources that have affected the mobility of the private investment and more in periods of high international prices of oil. Countries as Norway have been affected by deindustrialization, which presents evidence about the disbalance that causes an abundance of natural resources (Alsharif, Bhattacharyya, & Intartaglia, 2016). The case of Norway is more evident considering the low or inexistence government failures (Alsharif, Bhattacharyya, & Intartaglia, 2016).

The research can conclude that the policy formulation in diversification and industrialization embodied the best practices described by the most important economic diversification theories. The public investment increased significantly in the most critical sectors. However, the policy's implementation and the lack of coordination between the private and the public have seriously affected the process of diversification and industrialization.

In the form of recommendation, the market failures in investment allocation and diversification should be taken as the market failures related to human capital externality and public goods that are assumed by policymakers as law. The assumption might transform the diversification policies in long-term processes, or like Rodrick mention, normalize industrial policy (Rodrik (c), 2008). In terms of time, the structural change might take decades; in this sense, the best option is to institutionalize structural change policies with long terms policies.

Several packages of policies might be structured in forms of support to innovation in public institutions, and more critical in subsidies of technology transfer from the government to the private actors that have initiated innovators products or services. It is difficult to compare the

current economic and political situation with the post-second world war when countries as South Korea began their economic growth process; however, general lines might be taken from their experience.

South Korea achieved development after decades of policies focused on economic growth; however, a unique feature that was a base of the economic growth is the mobilization of effective institutions and a bureaucratic system with the most adequate people in decisive positions (Kwon (b) & Yi, 2009; Kim, 2014). Additionally, the coherence between a responsible private sector and an adequate set of policies mixed with liberalization and protection of infant industries resulted in a good match between the private and public sectors (Kwon (b) & Yi, 2009; Kim, 2014).

The public sector of South Korea value the most capacitated people with special characteristics in jobs, and the heads of the most important institutions were not military, political positions, but technocrats (Kim, 2014; Kwon (b) & Yi, 2009). While outstanding institutions like the Economic Planning Board were created with superpowers in a relationship of check and balance between then and the Park government, these special features supported the policy's adequate elaboration and implementation (Kwon (b) & Yi, 2009; Kim, 2014). The excellent administration of the government's incentives with performance standards promoted the efficient private industries that needed conditioned loans to survive in the market (Kwon (b) & Yi, 2009). Public investment in human capital and the consequence of the land reform provided a skillful workforce to start the process of development in South Korea based on the comparative advantages in textiles, until the upgrade to capital-intensive heavy and chemical industries (Kwon (b) & Yi, 2009; Kim, 2014).

Furthermore, discuss specifics labor, monetary, or macroeconomic policies may help the present thesis. However, the more useful information should

be based on the basic determinates of economic growth in South Korea that under the research are effective institutions, stable public administration, and coherence between the public and the private.

Exist several studies that found positives correlations between institutionality and economic growth (Kim, 2014). In the same line, the positive of the correlation between human capital first and institutionality second is supported, but other researchers included South Korea as an example (Kim, 2014). Based on this and with the results of this research, the Ecuadorian government since 2007 – 2017 have significative expanded the public investment in this sector, expecting positives results in a skillful workforce and institutionality.

On the other hand, it is difficult to compare the specific historic moments between Ecuador and South Korea's development process. However, the lessons about adequate and efficient institutions with prominent public administration should be followed by developing countries as Ecuador. And this might be one of the biggest failures for the process of diversification in Ecuador, resulting in an inadequate implementation of the policy.

Limitations and research agenda

The research fundamentally had limitations about the data offered by the public institutions of Ecuador. The Public investment per sector is presented from 2007 until 2017, without updates and with sectors as agriculture with incomplete data, which limits the understanding of the government expenditure in the policies. To have an overview, the dissertation used data of United Nations agencies; however, there might be some discrepancy in collecting the data and the form of being presented, limiting the possibility of realizing inferential statistical analysis using the information available.

Additional, specific policies and program's information are not available on the web pages of the country's public institutions, which also limits the direct analysis of the policy formulation. The research used relevant academics research that might not present biased information or analysis.

The research agenda for structural change is broad and has come back to the development studies due to the process of deindustrialization of the developed countries and the appearance of emerging economies that become centers of industrialization. Additionally, in developing countries, this phenomenon has brought attention to the concentration of investment in natural resources causing early deindustrialization.

For Ecuador, an in-depth study about the implementation of policies in the coordinating ministries and the nodal agency might be required to analyze execution. Additional other analysis about the determinants of the poorly Ecuadorian institutionality is needed to address future policies' future executions. From a regional perspective, countries like Chile and, more recently, Mexico are seen as countries that are changing their economic structures; it is fundamental to analyze each case to know their best practices, having a background similar institutional and political structures between the countries.

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Appendix 1

Table 7: Growth rate Ecuadorian traditional exports 2007 – 2017

Year	Traditional exports										
	Primaries										
	Crude oil	**Banana**	**Coffee**	**Shrimp**	**Cocoa**	**Abaca**	**Wood**	**Tuna**	**Fish**	**Fresh flowers**	**Total primaries**
2008	42.3%	25.9%	-16.4%	10.1%	2.2%	56.4%	16.2%	1.1%	17.4%	20.5%	34.1%
2009	-40.5%	21.7%	116.7%	-2.9%	69.2%	-10.4%	-8.0%	19.4%	27.5%	-6.8%	-26.6%
2010	42.5%	1.9%	19.6%	29.7%	2.6%	1.8%	32.2%	7.7%	-0.8%	15.3%	29.1%
2011	31.8%	10.5%	108.8%	38.7%	35.3%	-1.7%	14.5%	-18.6%	26.4%	11.2%	28.2%
2012	7.7%	-7.5%	-35.8%	8.5%	-27.2%	31.6%	6.8%	39.1%	20.4%	5.6%	6.0%
2013	5.5%	11.7%	-62.8%	39.5%	22.6%	-20.3%	6.6%	1.1%	-21.8%	16.4%	8.9%
2014	-3.0%	11.0%	-13.1%	40.9%	36.3%	-4.1%	34.3%	-8.5%	16.2%	10.6%	7.4%
2015	-51.2%	9.0%	-25.4%	-9.3%	20.2%	13.7%	14.5%	-11.6%	-13.8%	-10.7%	-32.8%
2016	-20.5%	-2.6%	-1.3%	13.2%	-10.3%	70.3%	-6.1%	2.5%	-9.2%	-2.1%	-10.8%
2017	22.5%	11.0%	-5.5%	17.7%	-5.3%	-13.2%	-3.6%	-10.6%	5.0%	9.8%	14.8%
Average	3.7%	9.3%	8.5%	18.6%	14.6%	12.4%	10.7%	2.2%	6.7%	7.0%	5.8%

Year	Traditional exports									
	Industrialized									
	Oil derivatives	Processed coffee	Elaborated of cacao	Fish flour	Other p. of sea	Chemicals and drugs	Metal manufactures	Hats	Textile	Total Indus.
2008	22.7%	10.0%	44.1%	-6.2%	21.4%	-0.6%	6.2%	4.2%	54.1%	15.3%
2009	-38.4%	-13.3%	-1.9%	30.3%	-22.0%	3.1%	-27.4%	44.3%	25.4%	-21.7%
2010	6.0%	13.0%	26.1%	30.2%	-4.2%	60.2%	33.7%	46.4%	18.2%	19.3%
2011	58.7%	36.6%	50.6%	20.9%	43.8%	7.7%	-1.7%	54.1%	-6.3%	25.6%
2012	-5.6%	29.7%	-2.9%	-3.4%	28.2%	24.1%	28.8%	-19.8%	-23.2%	8.1%
2013	-35.6%	2.5%	-4.9%	27.5%	21.2%	-18.2%	-43.3%	-9.2%	2.0%	-12.0%
2014	-62.6%	-19.2%	28.3%	-27.9%	-6.9%	-25.2%	2.0%	44.8%	-5.4%	-10.8%
2015	17.4%	-16.6%	-10.6%	7.0%	-23.5%	9.5%	-1.7%	19.2%	-23.7%	-8.0%
2016	32.8%	1.8%	7.6%	32.8%	-4.0%	-12.1%	-21.1%	3.9%	-19.7%	0.8%
2017	78.6%	-21.6%	-21.8%	-26.0%	26.9%	-6.6%	9.4%	-20.6%	-11.2%	10.6%
Average	7.4%	2.3%	11.4%	8.5%	8.1%	4.2%	-1.5%	16.7%	1.0%	2.7%

Sources: Central Bank of Ecuador

Appendix 2

Table 8: Growth rate Ecuadorian non-traditional exports 2007 – 2017

Year	Non-traditional primaries						
	Fresh flowers	**Abaca**	**Wood**	**Mining products**	**Fruits**	**Raw tobacco**	**Total P.**
2008	20.5%	56.4%	16.2%	25.1%	-13.3%	-2.7%	7.6%
2009	-6.8%	-10.4%	-8.0%	-28.9%	27.6%	28.9%	-5.5%
2010	15.3%	1.8%	32.2%	43.3%	-9.8%	-3.3%	13.8%
2011	11.2%	-1.7%	14.5%	86.5%	16.1%	12.2%	21.2%
2012	5.6%	31.6%	6.8%	164.0%	-1.2%	6.9%	23.8%
2013	16.4%	-20.3%	6.6%	11.6%	-8.7%	5.8%	12.7%
2014	10.6%	-4.1%	34.3%	119.2%	-1.5%	30.5%	41.2%
2015	-10.7%	13.7%	14.5%	-35.0%	18.6%	-6.4%	-18.6%
2016	-2.1%	70.3%	-6.1%	-55.5%	21.7%	-6.7%	-19.9%
2017	9.8%	-13.2%	-3.6%	-12.5%	10.5%	24.5%	3.1%
Average	7.0%	12.4%	10.7%	31.8%	6.0%	9.0%	7.9%

Year	Non-traditional industrialized														
	Fruit juices a	**Fish flour**	**Canned fish**	**Other products of the sea**	**Chemicals and drugs**	**Vehicles and their parts**	**Other metal manufactures**	**Garments textile fibers**	**Other textile**	**Leather, plastic and rubber**	**Plywood and pressed wood**	**Natural extracts**	**Banana products**	**Paper and cardboard**	**Total I.**
2008	8.4%	-6.2%	21.5%	14.0%	-0.6%	6.5%	5.8%	-13.5%	93.4%	0.3%	-9.5%	57.5%	-21.5%	1.4%	12.6%
2009	10.3%	30.3%	-22.4%	-4.2%	3.1%	-37.2%	-14.9%	-19.4%	37.0%	-17.2%	-15.1%	-15.5%	8.2%	-26.2%	-16.1%
2010	9.9%	30.2%	-4.5%	8.6%	60.2%	46.3%	21.8%	2.5%	20.6%	24.0%	12.5%	-6.6%	106.9%	35.9%	22.9%
2011	-16.6%	20.9%	44.5%	19.2%	7.7%	5.1%	-9.3%	19.2%	-9.6%	36.0%	1.7%	88.6%	11.3%	32.5%	16.8%
2012	-22.2%	-3.4%	27.8%	42.5%	24.1%	27.2%	31.0%	-5.6%	-26.3%	0.8%	34.7%	-2.1%	2.3%	7.4%	11.9%
2013	14.2%	27.5%	20.7%	37.9%	-18.2%	-70.1%	-9.4%	6.4%	1.1%	4.8%	-17.3%	-28.9%	14.9%	10.2%	-6.5%
2014	33.0%	-27.9%	-6.3%	-26.7%	-25.2%	3.4%	1.5%	3.9%	-7.6%	-2.0%	-0.3%	6.1%	22.5%	3.6%	-1.8%
2015	-15.9%	7.0%	-24.5%	19.2%	9.5%	10.1%	-6.7%	-21.1%	-24.4%	-23.2%	-7.1%	4.1%	6.3%	-10.3%	-9.4%
2016	-11.7%	32.8%	-4.4%	8.0%	-12.1%	-51.3%	-6.0%	-13.1%	-21.5%	-4.6%	15.9%	0.9%	-5.7%	-9.8%	-2.5%
2017	-17.6%	-26.0%	28.7%	-13.6%	-6.6%	-9.1%	14.3%	-20.7%	-8.3%	-12.2%	16.6%	-4.9%	21.0%	0.1%	4.7%
Average	-0.8%	8.5%	8.1%	10.5%	4.2%	-6.9%	2.8%	-6.1%	5.4%	0.7%	3.2%	9.9%	16.6%	4.5%	3.3%

Sources: Central Bank of Ecuador

국문초록

경제 다각화 과정에서 공공투자의 역할
2007-2017 년 에콰도르 사례를 중심으로

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글로벌행정전공

본 연구는 2007년부터 2017년까지 에콰도르에서의 경제 다변화 과정을 분석하는 것을 목적으로 한다. 특히, 새로운 비석유부분의 다각화를 달성하기 위하여 설계된 프로그램, 정책, 그리고 전략이 공공투자의 배분 측면에서 어떠한 방식으로 이루어졌는지 분석한다.

우선 본 연구는 풍부한 천연자원을 갖고 있는 개발도상국에 초점을 맞추어 다각화 및 산업화와 관련된 현대 이론에 대한 이론적 논의를 살펴보았다. 해당 접근 방식을 통하여 구조적 변화를 달성하기 위한 최선의 정책 설계 및 제도적 문제점을 설명할 수 있다. (본 연구는 특정 분야에 대한 공공투자는 다각화에 대응하는 것으로 가정한다.) 이론적 접근 방식은 새로운 경제활동에서 자원 활용 과정에서 발생하는 시장 실패에 대응하기 위한 정부의 역할을 강조한다.

본 연구에서는 질적 분석과 양적 분석을 혼합하여 사용하였다. 질적 분석을 통하여 구조적 변화를 위한 정책 수립과 시행을 구분하였다.

한편 기술통계분석 등의 양적 분석을 통하여 공공 투자액(교육, 농업, 사회기반시설, 제조업, 연구개발, 신용)이 국가의 경제 구조에 미치는 영향을 살펴보았다.

분석 결과는 다음과 같다.

- 첫째, 정책 형성은 현대적인 다각화 이론에 의하여 분석된 모범 사례와 유사하다.
- 둘째, 다각화를 촉진할 수 있는 부문에 대한 공공 투자가 크게 증가하였다.
- 셋째, 전통적 및 비전통적 수출로 측정된 다각화는 그 가치가 향상 되었으나 그 규모는 작았다.
- 넷째, 정책 집행 측면에서 에콰도르의 경제적 경직성, 민간 부문과의 협력 부재 등이 다각화 측면에서 미흡한 결과의 원인이 될 수 있음을 확인하였다.

주제어: 공공투자, 경제 다각화, 공공 정책, 경제성장
학번: 2019-20153