The relations between foreign direct investment, government investment and unemployment (Ecuador 2003-2013)

Las relaciones entre la inversion extranjera directa, inversion gubernamental y el desempleo (Ecuador 2003- 2013)

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Resumen

El desempleo puede dar una idea relativa de la salud de la economía de un país, y entre los factores que tienen influencia sobre el desempleo tenemos la inversión directa extranjera y el gasto gubernamental. El objetivo de este artículo es el de explorar, entender y medir las relaciones entre la inversión directa extranjera y el gasto gubernamental con el desempleo en Ecuador. Cada una de las variables usadas en este artículo fue reseñada. El modelo de mínimos cuadrados ordinarios fue utilizado para determinar la existencia de relaciones entre las variables y medirlas. Los resultados muestran relación significante entre las variables de gasto gubernamental y desempleo. El caso contrario fue para inversión directa extranjera y desempleo para el caso ecuatoriano.

Palabras clave

Inversión directa extranjera, gasto gubernamental, desempleo, inflación, mínimos cuadrados ordinarios, Ecuador.

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Abstract

The unemployment rate gives a relative idea of the overall economic health of a country. This paper's aim was to explore, understand and measure the positive or negative relationship between foreign direct investment and government investment with unemployment in Ecuador. The ordinary least square regression model was used to determine if there were any relations between the variables and to measure them. The databases used for this econometric analysis were generated and published by Ecuador's Central Bank, the Ecuadorian National Institute of Statistics (INEC) and the National Secretariat of Planning and Development (SENPLADES). The results show significant relations between government investment and unemployment. On the contrary, there is no relationship between foreign direct investment and unemployment for the Ecuadorian case.

Introduction

Public Investment can boost economic growth and development through different routes such as the creation of jobs. However, how long can this growth be sustainable by any given country and would it be more efficient to rely more heavily on foreign direct investment (FDI) instead of public investment?

FDI is any inward flow of money to a country used in financing the creation of companies or productive projects (Camara de Comercio de Guayaquil, 2013). The relationship between FDI and Economic Growth differs from theory to theory. The neoclassic economic growth models state that FDI does not influence the Economic Growth in the long term as a result of the perfect competition (Herranz & Barraza, 2009: 117).

Hanson (2001) debates that the evidence that FDI does indeed generate significant spillovers for hosting nations is rather weak (p. 23).

On the other hand, other authors such as Mencinger (2003) consider the benefits of FDI to be dual. First, it can help countries with insufficient domestic savings to finance their expansion and in second place; multinational presence in a country is usually linked to positive externalities (p. 499).

Unemployment rates have been used by various authors as a welfare indicator, linking unemployment to other variables such as crime and urban violence (Tedesco, 2000: 535), economic stagnation (Jones, 1985: 7) and political instability (Azeng, Yogo, Kayizzi-mugerwa, & John, 2013: 19).

Different studies (Allsopp & Vines, 2005: 505-506), (Andrade, 2010: 6), (Barrientos & Santibañez, 2009) (Bivens, 2012: 8-9), (Clements, Gupta, & Inchauste, 2004: 18), (Feldmann, 2006: 464), (Martins & Veiga, 2013: 19), however show different answers to the matter of public spending and economic growth, making this topic unclear. For this reason, specific verification for Ecuador is necessary in the context of specific variables such as unemployment that gives an idea of the welfare of a given society. The results of this study will be useful for policy makers in addressing the issue of unemployment. It will serve as a baseline for future studies on unemployment in Ecuador.

Theoretical framework

Variables background
Unemployment in Ecuador

In Ecuador, labour structure underwent critical situations that affected its stability during the 90's. Among the determinant factors for those situations, there were the 1998 El Niño disaster and a drop in the international oil price during 1999. By the end of the 90s, the economic crisis resulted in a recession of the economy that ultimately forced a massive closure of businesses and an increase in unemployment. Within this context, the unemployment rate increased, even higher than the historical average, and wages rapidly lost their purchasing power (Sistema Integrado de Indicadores Sociales del Ecuador, 2006: 8).

On the other hand, the dollarization in Ecuador allowed the country to find stability in manufacture and selling prices as well as improving the country's economic image (Banco Central del Ecuador, n.d.-b). These features boosted a reactivation of the production force of the country that was visible in the decrease of the unemployment rate in terms of youth and gender. (Sistema Integrado de Indicadores Sociales del Ecuador, 2006: 3). Nonetheless, the dollarization also brought new risks for the ecuadorian economy. Because Ecuador was stripped of its monetary policy, it was rendered defenceless in terms of *seigniorage*. This means that any external factor could affect employment and production levels of the country (Acosta, 2001: 186).

In Ecuador, according to the *Sistema Integrado de Indicadores Sociales del Ecuador* (SIISE) in 2006, the most vulnerable groups, regarding unemployment, are young people between 18 and 19 years old and women. As of March 2014, the unemployment rate was 5.59%, showing an increase when compared to the same month in previous years. In March 2013 it reached levels of 4.64% and 4.88% in March 2012 but in general terms the trend has shown to be decreasing over time (INEC Instituto Nacional de Estadistica y Censos, 2014).

Figure 1. Evolution of the unemployment in Ecuador for the period 2003-2013 (In percentage)
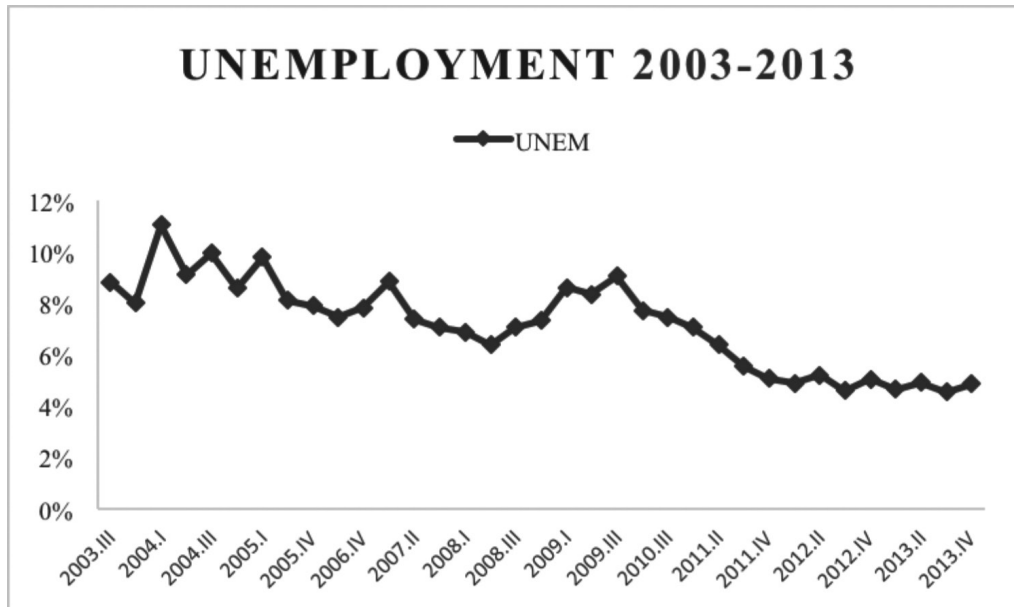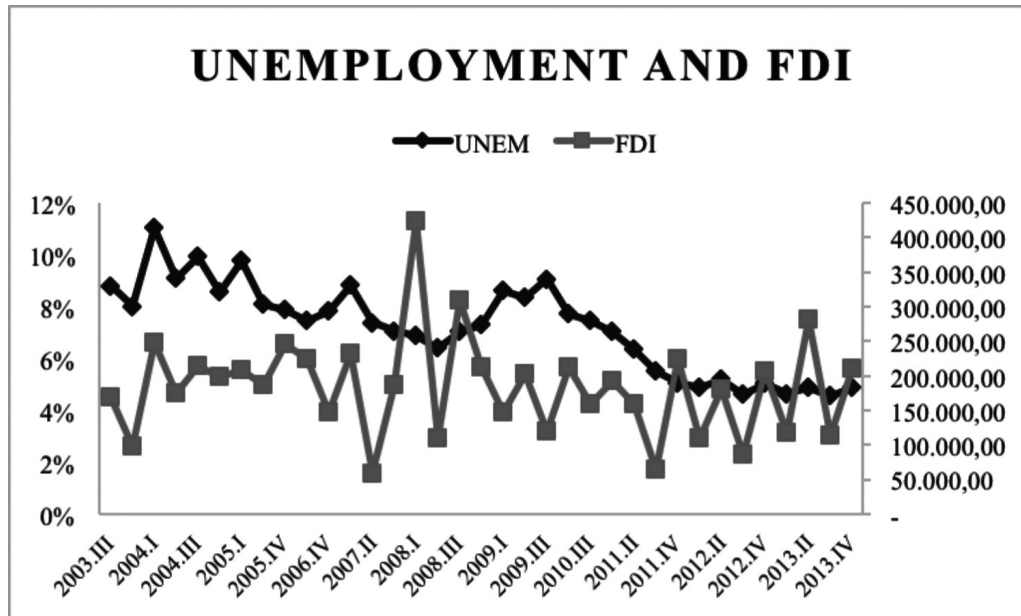
FDI in Ecuador

According to the Community of Latin American and Caribbean States (CELAC), Ecuador´s FDI has been one of the lowest in the region from the 2005 to 2013. Ranking 8th over 10 in South America just above Bolivia and Venezuela. During this period, Ecuador received a total of $4,446 million while the top FDI destination, Brazil, received $331,514 million and the lowest, Paraguay, received $2,291 Million. This means that during the 2005-2013 period, Ecuador's FDI only accounted for 0.73% of the region, while during the 90's it reached 1.39% of the region (Hurtado, Abad, & Espinel, 2001: 106).

Figure 2. Unemployment and FDI for the period 2003-2013 in Ecuador (Percentages and thousands of dollars)

Source: Data retrieved from the Ecuadorian Central Bank Website and from the INEC website.

Ecuador's absolute variation, from 2012-2013, was $143 million with a growth rate of 24%. During the 2009 financial crisis, the FDI input to the region decreased to $69,738 million; conversely, in 2010 it increased to $83,009 million. This trend continued through 2011 reaching $127,099 million and in 2012, the inward FDI reached $132,234 million, representing the 13% of the world FDI flow (Camara de Comercio de Guayaquil, 2013: 1; CEPAL, 2014: 65). In 2013, the FDI levels on the region reached the record level of $157,548 million (CEPAL, 2014: 65).

Government Investment in Ecuador

In Ecuador, the Secretaría Nacional de Planificación y Desarrollo (SENPLADES) (National Secretariat of Planning and Development) is the one in charge of managing public investment. In order to keep improving their decisions of investment, they have implemented different methodologies and tools to help them funnel the public investment into the areas that need it.

Due to these efforts, Ecuador is the country with the highest investment in education in the region expressed as a percentage of the public social spending. It reached levels of a 56% in 2012 (CEPAL, 2014: 64). Ecuador's public investments as a percentage of the GDP in the region with 15% for 2012 (SENPLADES, 2013: 3).

SENPLADES states that during the first semester of 2009, Ecuador

spent in public investment $1,051 million and the unemployment rate was 6.8%. During the 2010 for the same period, the investment was of $1,528 million and the unemployment rate decreased to 5.9%. During the first se- mester of 2,013 public investment was $5,700 million while the unemployment decreased to just 4.7%; making Ecuador the country with the lowest unemployment rate of the region according to SENPLADES.

Figure 3. Unemployment and government investment in Ecuador for the period 2003-2013 (In percentages and thousand dollars)
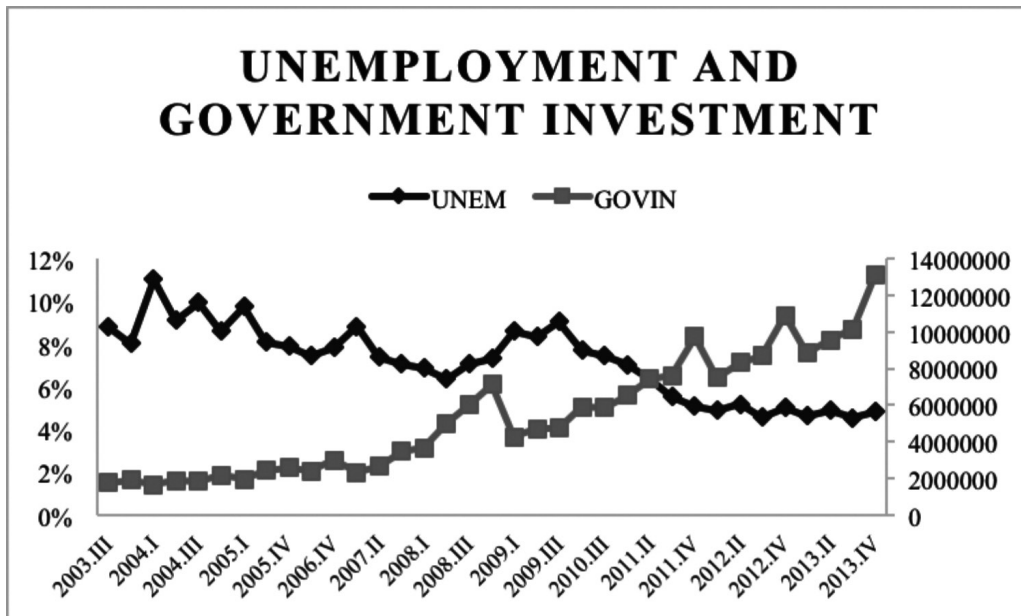
Source: Data retrieved from the Ecuadorian Central Bank Website and from the INEC website.
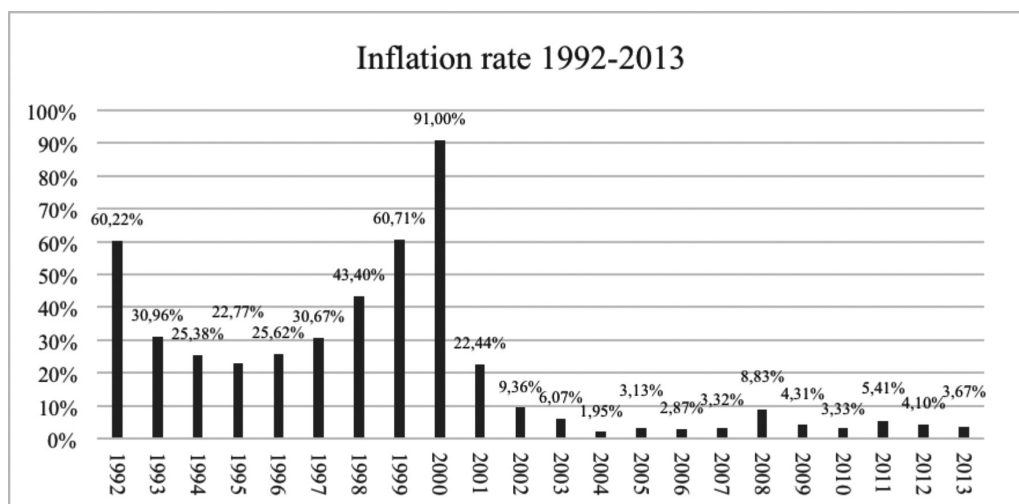
Inflation in Ecuador

Inflation refers to the increase of the price of goods and services over time and it is expressed in percentages. In Ecuador, inflation is measured using the urban consumer price index (CPI) (*índices de precios al consumidor del área urbana*) (Banco Central del Ecuador, n.d.-a). Since inflation needs comprehensive information on the price levels on different products, the information for this measure is taken from surveys on the basic food basket across the country.

Ecuador has experienced inflationary phenomena in more than one occasion. According to Miguel Tomalá (2010) there have been three inflationary processes in the modern economic history of Ecuador. The first occurred during the 80's finishing with the ending of Rodrigo Borja's presidential mandate; the second started with president Sixto Durán

economic policies and ended with the 1998-1999 crisis. The third stage started in the year 2000 when Ecua-

dor adopted the US Dollar as its official currency (p. 5).

Figure 4. Ecuador´s inflation rate for the period 1992-2013 (Percentages)

Source: Data retrieved from the Ecuadorian Central Bank Website.

The dollarization allowed the reduction of the inflation rate, albeit not immediately, it brought down the rates to a single digit figure. It also stopped the exaggerated increase of prices in the country. From the year 2001 and on, Ecuador started presenting economic stability, and one of the main features of this stability was a reduction on the price level increase. The reduction was not as steep as the government expected due to draughts and the eruption possibility of the Tungurahua volcano.

In 2002, the inflation rate was 9.36%, in 2003, it was 6.07% and the tendency continues showing a decrease over time of the inflation rate. In 2004, the inflation rate fell to 1.95%. For the

first three years of the 2000s, the goal of bringing inflation down to one digit numbers was achieved.

For the next three years, inflation rate was stable in Ecuador but in 2008, due to the 2008 financial crisis, inflation rate reached 8.83% featuring increases in the international price of raw materials including the oil barrel. This increase in the international oil price allowed Ecuador to finance its government spending programs with ease and shielded it from the global crisis.

For the period, 2009-2012 inflation levels have remained relatively stable with an upsurge during 2011 due to protectionist policies erected during this year and tax incentive for producers (Jácome, 2012: 9).

Methodology

This research is descriptive because the relationship among different variables is being proven and measured (Bernal, 2010: 113). The goal of this study is to prove if the FDI, the government investment, hereinafter called GOVIN, or the inflation have any impact on unemployment and to measure that impact. Unemployment is the dependent variable while FDI, government investment and inflation are independent variables.

The analysis was performed for the range of years 2003-2013 due to the unavailability of data for some of the variables for previous years. The data corresponds to a time series data and during the measurements of the regression model, a lag of 1 period was applied to the variables FDI, GOVIN and INF. By applying lags, the regression models are strengthened and robust estimates are provided. Wilkings (2013) states that researchers should continue to apply lagged dependent variables as a strategy for robust estimation and consistency in the coefficients (p. 1).

The databases used for this econometric analysis were generated and published by the Ecuador's Central Bank, the Ecuadorian National Institute of Statistics (INEC) and The SENPLADES. These databases are public and available in their respective websites. The information collected from a public entity is considered valid and official.

Within the GOVIN variable, 'infrastructure and investment (capital spending)' and current use were used. Capital spending in Ecuador is destined to strengthen strategic sectors of Ecuador altogether with investment on human talent. Capital spending focuses primarily on reinforcing strategic activities for the holistic improvement of the country. It also includes salary payments which have an impact on unemployment in Ecuador.

The first step in the treatment of data was to identify any incompatible datum within the database. Incompatible datum were found within the foreign direct investment dataset where negative values were found. In order to continue with the analysis and having in mind that negative FDI values, might indicate discharges of liabilities or disinvestments. Accumulated flows can also result in negative values, for example, when loans from a foreign enterprise based in national territory exceed the original capital invested by the parent company to the overseas company.

Considering the previously stated reasons and keeping in mind that a negative FDI value does not transcend beyond numbers, those data were excluded from the final time series data altogether with the respective entries for the other variables.

Regarding the variable unemployment, in order to smooth the data and to have it normally distributed, natural logarithm was applied. The same treatment was applied to the remain-

ing variables in order to have consistency in the interpretation among the variables. The Ordinary Least Square (OLS) technique was used.

The ultimate aim of this paper is to confirm if the FDI or the government investment cause any impact on unemployment in Ecuador and to measure it. Unemployment is the dependent variable while FDI, Government Investment and Inflation are the independent variables. The following model represents the regression.

$$LNUNEM = \alpha + \beta_1 LNFDI + \beta_2 LNGOVIN + \beta_3 LNINF + \mu$$
Variables

Dependant Variable:

LNUNEM= Unemployment rate in quartiles from year 2003 until 2013 expressed in natural logarithm

Independent Variable:

LNFDI: Foreign Direct Investment in quartiles from the year 2003 until 2013 expressed in million dollars and converted with natural logarithm.

LNGOVIN: Government investment or gross fixed capital formation in quartiles from the year 2003 until 2013 expressed in million dollars and converted with natural logarithm.

LNINF: Inflation in quartiles from the year 2003 until 2013 and converted with natural logarithm.

Hypothesis
This research will work around the following hypothesis.

1. **H$_0$**: There is no relationship between unemployment, and foreign direct investment.
   H$_1$: There is a direct relationship between unemployment and foreign direct investment.
2. **H$_0$**: There is no relationship between unemployment, and government investment.
   H$_1$: There is a direct relationship between unemployment and government investment.
3. **H$_0$**: There is no relationship between unemployment, and inflation.
   H$_1$: There is a direct relationship between unemployment and inflation.

Analysis and results
The OLS regression was used to analyse the variables previously stated and the findings will be presented within this section.

Table 1. Regression Statistics

Regression Statistics	
Multiple R	0.854311389
R Square	0.72984795
Adjusted R Square	0.702832745
Standard Error	0.138456512
Observations	34

Fuente: Párraga and Villacís, 2015

The regression statistics table resulting from running the OLS regression model show an R Square value of 0.729. This means that independent variables predict 73% of the variation of the dependent variable.

Table 2. OLS Results

OLS Results			
	Coefficients	**Standard Error**	**t Stat**	**P-value**
Intercept	3.342264009	1.071301	3.119817	0.003978
LNFDI	0.004723282	0.057571	0.082043	0.935157
LNZGOVIN	-0.370331278	0.041846	-8.84986	7.27E-10
LNINF	0.12727247	0.051365	2.477788	0.019074
LNUNEM				

Fuente: Párraga and Villacís, 2015

Analysing the P-values for the independent variables we can conclude that the variable LNFDI is not significant for changes in unemployment due to its P-value being higher than 0.05. On the other hand, the P-value for the remaining variables is below 0.05, meaning that they are significant regarding the variable unemployment.

This results allows the author to accept the first null hypothesis (H_0: There is no relationship between unemployment, and foreign direct investment.) and to reject the null hypothesis number 2 (H_0: There is no relationship between unemployment, and government investment.) and number 3 (H_0: There is no relationship between unemployment, and inflation.).

After putting the coefficient values in the equation model, the following model emerges.

LUNEM = 3.34 + 0.004(LNFDI) - 0.37(LNGOVIN) + 0.127(LNINF)

For this equation, the coefficient of FDI is positive but not significant. For government expenditure, the coefficient is negative and significant. This means that for every change of 1% from one quartile to another in government expenditure, the unemployment will show a change of -0.37% for the next quartile. Likewise, for every change of 1% on the inflation rate from one quartile to another, the unemployment will show a 0.13% increase from the next quartile.

It is worth mentioning that for the Ecuadorian case, for the examined years, the Phillips curve did not apply.

The Phillips curve is a trade-off between inflation and unemployment rate. The New Zealand economist William Phillips developed the Phillips Curve during the 50'. It states that an increase in price levels will reduce real wages thus increasing labour demand and reducing unemployment. In short, it states that there is an inverse relationship between inflation rate and unemployment rate. While the former increases, the latter decreases and vice versa.

Conclusion

Ecuador, for the length of this study, has featured low levels of FDI even long before president Correa came to power. Thus, it is not surprising that under empirical research, its effect on unemployment is negligible

For the Ecuadorian case, the government expenditure in terms of gross fixed capital formation has been useful in improving the welfare of the country. This government investment is aimed at four main sectors that are: Safety and justice, strategic sectors and production, social development and human talent, and politics and economics (SENPLADES, 2013: 6).

The statistical findings presented within this paper are not surprising for the Ecuadorian reality. Since President Rafael Correa came to power, one of his presidency trademarks has been a high public expenditure focussed on social goals.

During January 2015, the Ecuadorian Finance Ministry issued a press release stating a reduction in the '2015 National Budget'. This reduction obeys to the drop of the Western Texas Intermediate (WTI) price. The reduction of the national budget is $1,420 million, $839.8 for investment and $580 million in current expenditure (Ministerio de Finanzas del Ecuador, 2015, para. 1). The 2015 total budget is $34,897 million.

Within the context of this drop in the oil price, it is important to highlight that the national budget already had an important deficit of around $8,000 million (Inteligencia Estratrégica, 2014: 2). This deficit started in 2011, when the oil price

was stable. In order to cover this fiscal deficit, the Ecuadorian government resorted to new loans from China, valued in around $7,500 million.

The Ecuadorian government states that this deficit is properly financed (even though it is financed with debt), but if the oil prices were to drop even more, Mr Rafael Correa stated that, the way to keep the budget buoyant will be to reduce government investment (Petroecuador, 2014: 10). Since Ecuadorian development is mainly fuelled by government investment, a reduction could be detrimental.

It is very unlikely that the oil price will recover its previous value over $90. This drop in the oil price marks an end to a so-called Ecuador's second oil boom. The end of this second boom will probably put an obstacle to the current Ecuadorian economic growth method that is based on high levels of government investment.

The year 2015 will be a rough year for Ecuadorian economy due to the low prices of oil. The Ecuadorian Government set the oil price in $79.7 for the 2015 national budget (Ministerio de Finanzas del Ecuador, 2014: 2). However, since the price has fallen below that level the impact will be double, on the side of the fiscal sector and on exports. A negative impact on exports might bring a negative balance on payment for the year 2015.

During the past 8 years of *Revolución ciudadana*, which is how the government styled itself, Ecuador's face has change indeed. The high amount of resources available to Mr. Correa's government has allowed it to establish policies based on heavy public expenditure and government investment. To supplement this behaviour and since Ecuador does not have its own currency, a structure were monetary resources were permanently entering was necessary.

Thus, the government realised that the national tax policy was the vital tool needed to keep budget funds afloat and healthy. Thanks to taxes, the government has been able to enjoy an increased liquidity altogether with the high oil price. These factors helped Ecuador, in building its public infrastructure and maintaining its bureaucratic apparatus.

The Ecuadorian government is proud of this improvement on infrastructure, poverty and structure of the public sector. According to national statistics previously mentioned, the government states that the current investment in terms of education and health has been historic and this is reflected in low unemployment levels and improvement of the overall welfare of the country.

However, the government structure in Ecuador has also another side. The restriction of importations in the pursuit of strengthening the national

industry, the unmet budget requirements that are currently covered by foreign loans and the high dependence on oil to cover the national budget puts the country on a tight spot when talking about the future of Ecuador's funding.

This is precisely the situation that looms for the years to come in terms of international oil price.

Since oil activities finance around 25% of the national budget (Coordinación de consistencia macroeconómica, 2012: 12) and keeping in mind that the international oil price is decreasing, the question of "how much longer can the Ecuadorian State keep promoting growth?" . Further discussion is needed to look for more efficient and less dependent sources of funding.

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