Growth in an oil abundant economy: The case of Venezuela
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Betty Agnani*and Amaia Iza†

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Abstract

Venezuela's growth experience over the past fifty years is characterized by a high economic growth rate from 1950 to 1977 and a low economic growth rate in the period 1977-2003. In particular, using the definition of "great depression" by Kehoe and Prescott (2002, 2007), we show that Venezuela *is* in a "great depression" since late seventies. Also, we show that although Venezuela is an oil abundant economy, this growth experience is largely accounted for by the evolution of its real non-oil Gross Domestic Product. We make a growth accounting exercise to quantify the extent to which the growth experience in non-oil sector is due to physical capital accumulation and we find that is the evolution of total factor productivity what mainly explains the behaviour of the non-oil sector. Finally, we also make some correlations to figure out whether the oil sector has affected the non-oil sector, either through its capital accumulation or through the evolution of its total factor productivity. We find that the correlation between oil revenues and capital per worker or non-oil total factor productivity is always negative.

JEL codes: O47, Q32

Key Words: Non-renewable resources, growth accounting, Total Factor Productivity, oil rents.

*Universidad de Granada

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1 Introduction

This paper focuses on the growth experience in Venezuela over the past fifty years, characterized by an expansion period from 1950-1977 with a high average growth rate, and by an implosion period from 1977-2003 with a low average growth rate, as already noted by other authors such as Arreaza and Dorta (2004), Bello and Restuccia (2002), Del Bufalo and Ríos (2002), Hausmann (2002), Hausmann and Rigobón (2002), Rubio (2002) and Schliesser and Silva (2000), amongst others. Using the definition of depression by Kehoe and Prescott (2002, 2007), our first finding is that Venezuela is in a "great depression" since late seventies (as also pointed out by Bello and Restuccia (2002)) satisfying the three conditions stated by these authors.

As many of the above authors mention, the collapse suffered by Venezuela is so spectacular that its per capita Real Gross Domestic Product in 2003 (Real GDP per capita $_{2003} = 6253$) was almost the same than in 1960 (Real GDP per capita $_{1960} = 6092$). If we measure its wealth through GDP and we compare it at international level, the Venezuelan economy has also suffered a relative loss of wealth, as pointed out by Saez and Pineda (2004), amongst others.

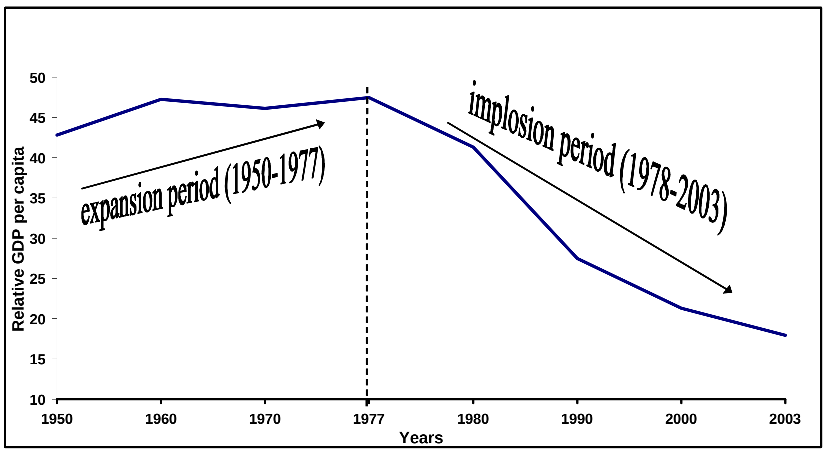

Figure 1. Venezuelan / USA GDP (per capita)

Venezuela has been an oil abundant economy since late nineteen twenties and a mayor oil exporter since the early fifties. There is extensive theoretical and empirical literature regarding the curse of natural resources: see Gylfason (2001a, 2001b) Gylfason et al. (1999), Hausmann (2002), amongst others. These papers study the factors that could lead an oil abundant economy to sluggish economic growth, focusing on several phenomena such as the Dutch disease, lack of human capital accumulation, corruption and rent seeking, and deficiencies in institutions. All these hypothesis are assuming that oil rents have a negative effect on the behavior of the non-oil sector. In this paper, we will analyze, through simple correlations, whether the oil rents might have affected the non-oil sector, either through its capital accumulation or through its total factor productivity (TFP).

There are several papers that have analyzed the Venezuelan growth experience in the last fifty years. For example, Bello and Restuccia (2002)[1], point to rent seeking and public economic policy failures as the factors behind the paradoxical behavior that has characterized the Venezuelan economy in the last fifty years, with a high recorded economic growth rate over the period 1950-77 and a low economic growth rate over the period 1977-2000. Moreover, they claim that the growth experience has nothing to do with the fact that Venezuela is an oil abundant economy.

However, other authors attribute the origin of Venezuela's poor policy-making to its abundance of oil. Among those descriptive papers, Karl (1997) states that it is a representative oil producing country whose political system is based on redistribution of petroleum rents, leaving the political system with no tradition of justifying the state's use of general taxation, with string-pulling ("amiguismo") and rent seeking taking place outside standardized parameters. Hausmann (2002) mentions that the presence of oil created mechanisms for conflict resolution based on the redistribution of oil rents. Nevertheless, whatever the origin of these bad government policies, the quality of the institutions in Venezuela, through the procedures required to become an entrepreneur in a given economy, is somewhat low according to some measures, as indicated in Djankov *et al.* (2002).

Through theoretical studies that provide a model to study the changes over time in GDP in an oil abundant economy such as Venezuela, for authors as Chalk (1998), Rodriguez and Sachs (1999), among others, the good and bad growth experience is not surprising, taking into account that exhaustible resource industries cannot expand at the same rate as other industries. In the steady state, production of the natural resource will tend to zero, but in the transition to it, the natural resource allows an economy to afford extraordinary consumption possibilities. Finally, Hausmann and Rigobón (2002) remark on the concept of 'inefficient specialization' which implies higher volatility of exchange rate and a slowdown of economic growth.

Our paper, unlike most of those papers, does not provide a model but considers a growth accounting exercize to analyze the factors behind the Venezuelan growth experience. We should focus on the dynamics of non-oil real GDP due to that changes over time in total GDP is practically that observed for non-oil GDP in the period 1950-2003, in spite of oil production represented, on average around 20% of total GDP in this period.

In particular, we perform a growth accounting exercise in the period 1960-2003 to quantify the extent to which the economic performance of the non-oil sector in Venezuela can be explained by physical capital accumulation or by the evolution of its total factor productivity (TFP). One of our results is that, in both subperiods, 1960-1977 (expansion period) and 1977-2003 (depression period), the changes in the TFP in the non-oil sector is chiefly responsible for

[1] They focus on the distortion in the allocation of resources due to the larger share of state enterprises. They consider a model of sectorial allocation to assess the impact of these distortions on total factor productivity.

the growth experience in Venezuela. Therefore, in the period 1977-2003 the decline of the TFP explains the poor performance of the Venezuelan economy.

Moreover, through the calculation of certain correlations, we quantify the correlation between oil rents and the non-oil TFP and between oil rents and the physical capital accumulation. Finally, we find that both correlations are clearly negative. In particular, the negative correlation between oil rents and the non-oil TFP throughout the period 1960-2003 indicates that increases in the oil rents are negatively correlated with the dynamics of non-oil sector, which supports any of the channels mentioned above, through which oil rents have a negative effect on the economy.

The rest of the paper is organized as follows: Section 2 gives the sources of the data used and some descriptive statistics that support the description of the Venezuelan economy, and shows that Venezuela is in a "great depression". Section 3 provides growth accounting exercise to give a quantitative assessment of the factors that explain not only the good performance of the Venezuelan economy in the period 1960-1977 but also the collapse of growth in the period 1977-2003. A simple statistical analysis between oil rents and the non-oil sector is analyzed in Section 4. Conclusions are presented in Section 5.

2 Data and Stylized Facts

2.1 Data

We use three different databases in this section. Firstly, we use the Penn World Table, Version 6.2 (Heston A. *et al.* (2006)), from which we use the following variables: Investment share of Real Gross Domestic Product per capita, government share of Gross Domestic Product per capita, and Real Gross Domestic Product Chain per worker and per capita.

Secondly, since the Penn World Table gives no information about the distribution of Gross Domestic Product (GDP) between oil GDP and non-oil GDP we use the database of the Central Bank of Venezuela (BCV), in particular the National Accounts through "Series Estadísticas de Venezuela (1940-1999)" and "Agregados Macroeconómicos (1994-2003)" to gather information about oil rents and total GDP, both in constant terms (base year 1997).

We also use the International Labor Organization (ILO), LABORSTA Labor Statistics Database data on the Labor Force of Venezuela and the Economically Active Population, available for the periods 1975-2002 and 1981-1995, respectively, to calculate the rates of growth of the working-age population and of the labor force for the whole period 1950-*2003* in order to do the growth accounting exercise.

2.2 Stylized Facts

This section provides some significant facts mentioned in the introduction regarding the growth experience in Venezuela, and the candidate factors that may explain it, with particular attention to oil rents since Venezuela is an oil abundant economy.

2.2.1 Venezuela is an oil abundant economy

(i) *Net World Oil Exporters.*

As may be seen in Table 1, for 2000 Venezuela, the only American member of OPEC, was the world's fourth biggest net oil exporter and the eighth biggest overall world oil producer, with vast proven oil reserves. Accordingly, Venezuela is considered to be an oil abundant country.

Table 1. Top World Oil Net Exporters, 2000.

Country[5]	**OPEC**	**Prod**[1]	**Com**[2]	**NOX**[3]	**POR**[4]	
		/day*			**/cap***	**%/TW**[6]
Saudi Arabia	yes	9.12	1.28	7.84	12,817.9	24.4
Russia	no	6.71	2.4	4.31		
Norway	no	3.32	0.21	3.11		
Venezuela	yes	*3.14*	*0.48*	*2.66*	*3,175.5*	*7.1*
Iran	yes	3.81	1.22	2.59	1,564.6	9.2
U. Arab Emirates	yes	2.51	0.33	2.18	32,277.2	9.1
Iraq	yes	2.59	0.5	2.09	4,870.1	10.4
Kuwait	yes	2.25	0.2	2.05	44,084.1	9
Nigeria	yes	2.15	0.29	1.86	271.2	3.2
Mexico	no	3.48	2.04	1.44		
OPEC					1,648.7	78.5

[1]**Prod=**Production,[2]**Com**=Consumption,[3]**NOX**=Net Oil Exports,
[4]**POR=**Proven Oil Reserves, [5]Ranked by its exports, [6]**TW=**Total World
*Measured in millions barrels of oil.

Source: Energy Information Administration (EIA).

The Organization of Petroleum Exporting Countries (OPEC) accounted for 40% of the world's oil production in 2000, but its members hold 78.5% of the world's proven oil reserves and a significant portion of the global oil trade. 60% of the oil pumped by Non-OPEC countries is almost entirely for domestic consumption and their oil exports are very low and decreasing rapidly.

(ii) *The share of oil revenues in total GDP in Venezuela is around 20%.*

Figure 2 uses data from the Central Bank of Venezuela to show GDP at constant prices in local currency for oil and non oil sectors , as a percentage shares. We can see the extent to which the total GDP has relied on oil rents in recent years in Venezuela, and also that the ratio of the oil sector to total GDP is around 20%.

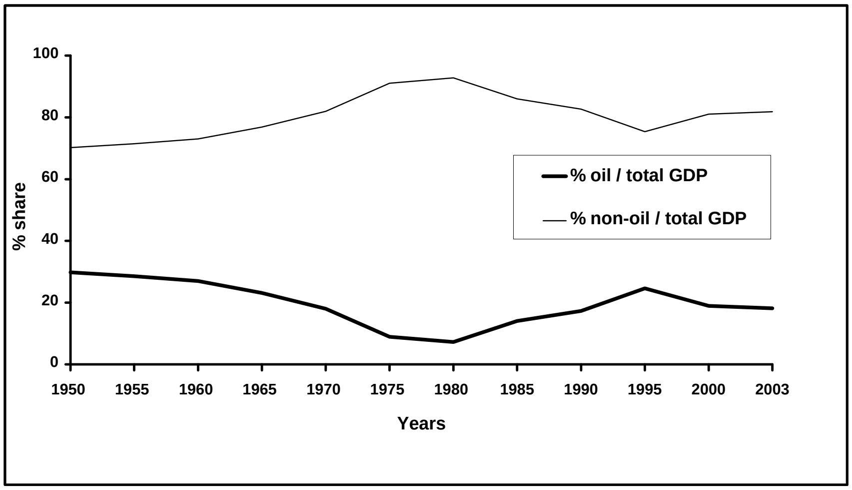

Figure 2. % Share of Crude Oil in Total GDP

In order to obtain a breakdown of GDP in per worker terms, from PWT data, in oil and non-oil, as is shown in Figure 3 we have used the share of these two components from the Central Bank of Venezuela data. The correlation between the total GDP and non-oil GDP in the period 1950-2003 is 0.96, in contrast to the correlation between total GDP and oil GDP in the same period, which is -0.36.

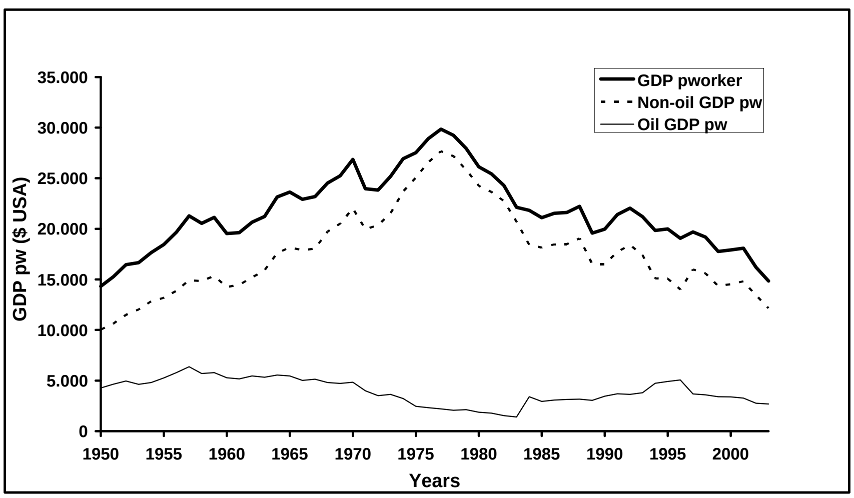

Figure 3. Venezuela's GDP per worker (PPP)

2.2.2 Growth experience

(i) *Changes over time in the economic growth rate in Venezuela.*

The growth rate of GDP in Venezuela has become negative over the last twenty six years. Venezuela had a high positive economic growth rate in the period 1950-1977 and a low economic growth rate in the period 1977-2003.

Using data from the Penn World Tables, Figure 4 shows the growth experience in Venezuela over the past fifty years through the growth rate of Real GDP at 1996 constant price (PPP), in per capita (Chain series) and per worker terms[2]. Notice that the growth rate is practically the same for the two variables.

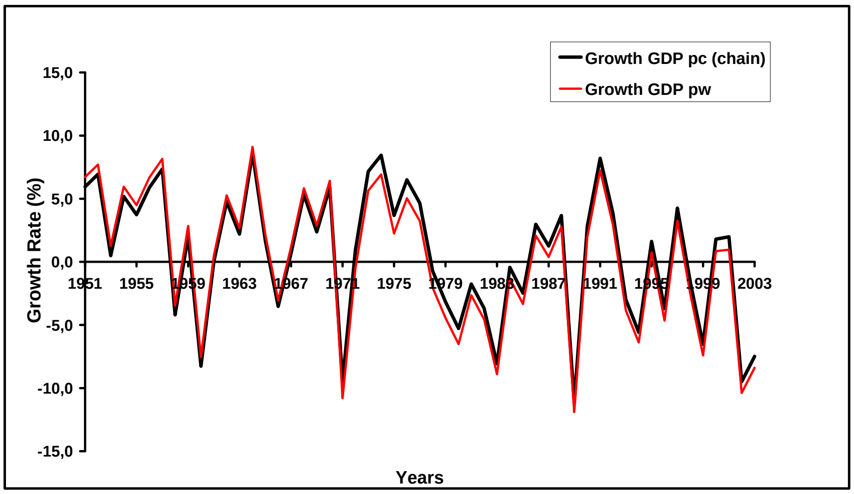

Figure 4. Venezuela's Real GDP growth (per capita & per worker)

Analyzing the paradoxical experience of Venezuela's GDP growth rate in per capita terms using data from the Penn World Tables, we can see in Figure 5 that there is, on average, a positive growth rate of 2.67 % for the expansion period 1950-1977, and a negative growth rate of -1.75 % for the implosion period 1977-2003.

[2]GDP per person is total GDP over total population, and GDP per worker is total GDP over labor force, *which is a census definition based on the economically active population.*

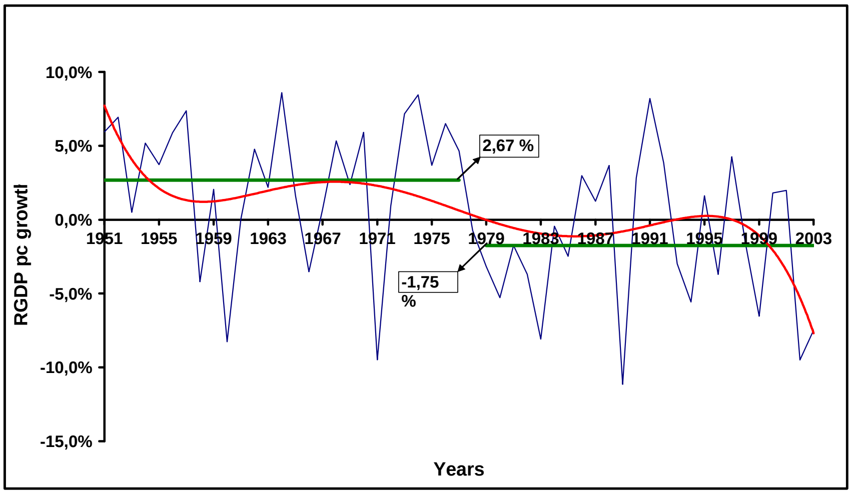

Figure 5. Venezuela's Real GDP growth (per capita)

On the other hand, we can see in Figure 6 that most of the changes observed in total GDP come from the dynamics of non-oil GDP (both data at constant prices from the Central Bank of Venezuela). Therefore, the factors behind both the good times and the bad times or depression experienced in Venezuela must be those factors that explain the evolution of non-oil GDP. The correlation between the growth rate of total GDP and the growth rate of non-oil GDP in the period 1950-2003 is 0.92, while the correlation between the growth rate of total GDP and the growth rate of oil GDP in the same period is 0.11.

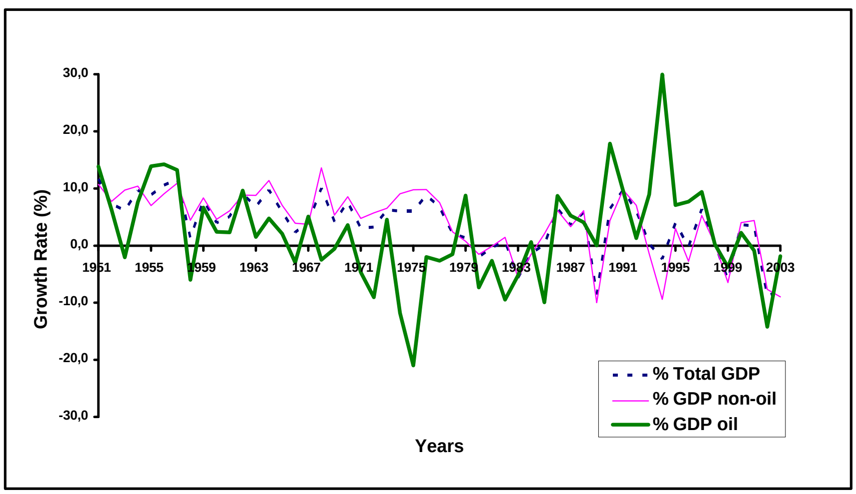

Figure 6. Venezuela's GDP growth at constant prices.

(ii) *Venezuela's GDP as a deviation from a trend.*

Figure 6 reports Venezuela's GDP per worker (data from Penn World Tables) as a deviation from the 1950 trend through the solid line, and has been detrended by a common 2% growth rate as in Kehoe and Prescott (2002)[3]. In consequence, we can see in Figure 7 the deviation of the Venezuelan GDP per worker from the 1950 trend. We obtain that the Venezuelan economy's behavior, as indicated in Bello and Restuccia (2002), can be broken down into two different sub-periods. In the sub-period 1950-1977 per worker output was above the 1950 trend, peaking in 1957 at about 30% above 1950 trend. By contrast, from the eighties onwards, the economy has been significantly below the 1950 trend value, in 2003 at 36 % below the 1950 trend.

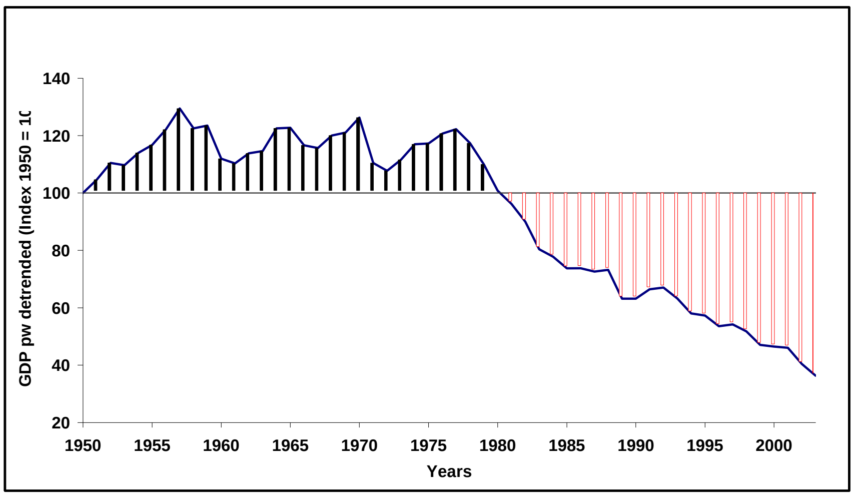

Figure 7. Venezuela's GDP per worker (detrended by 2 %)

The Venezuelan economy has declined far and rapidly, starting from the initial time of the implosion period, 1977, enough for Venezuela to be considered as having been in a great depression for the last twenty five years, as defined by Kehoe and Prescott (2002,2007). We have chosen 1977 as initial year of depression period and the three conditions stated by these authors are satisfied. First, there is a deviation at least 20% below trend in some years after the start of the recession. Second, detrended GDP per worker falls at least 15 % between 1977 and 1987. Figure 8 shows these two technical conditions. Since 1983 the economy has been at least 20% below trend, and within the first decade from the depression started, in particular from 1980, the economy felt by more than 15 %. Third, Figure 9 displays that the deviation is sustained. i.e. the growth

[3]Kehoe and Prescott (2002) claim that the trend growth rate is defined as "the average growth rate of the industrial leader" since, under the absence of any barriers or constraints, all industrial countries should grow at the same rate. In the 20th century the U.S.was the industrial leader and its average growth rate was 2%. That is why this is the figure chosen for the trend.

rate of the real GDP per worker in Venezuela in the period 1980-2003 is below the 2% trend.

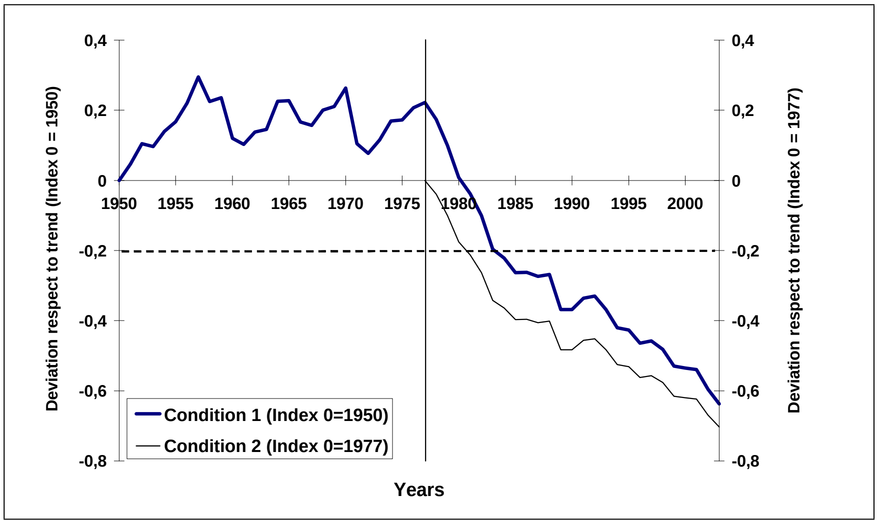

Figure 8. Depression's conditions by Kehoe and Prescott's definition

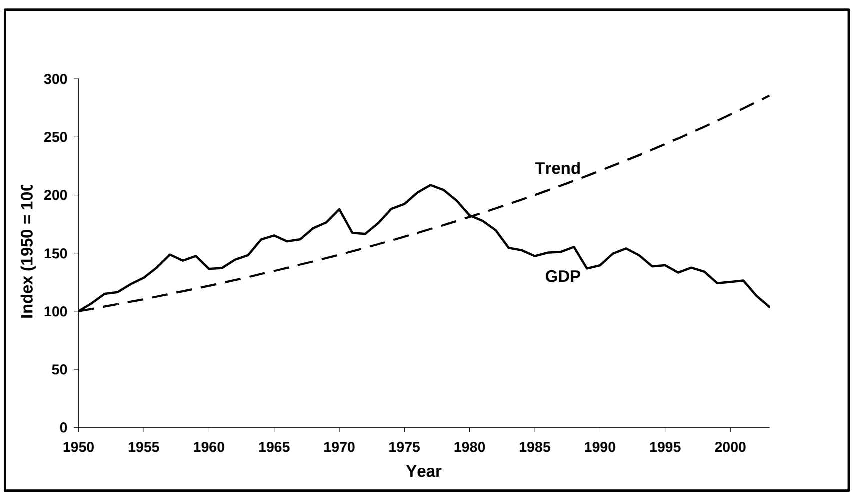

Figure 9. Real GDP per worker in Venezuela, 1950-2003

(ii) *International Real GDP per capita (constant prices).*

Table 2, using data from Penn World Table (2006), shows the Real GDP per capita at 1996 Constant Prices (Chain series) in PPP for a sample of European and Latin American countries, including Venezuela. As already mentioned in BCV (2006), it can be seen that Venezuela in the fifties was almost twice as rich as Mexico, Spain or Portugal and only slightly poorer than Uruguay. In 1977, Venezuela is 60% much richer than Mexico, 37% richer than Uruguay and almost as rich as Portugal. However, in 2003 Venezuela was in the throes of a very deep depression, with a real GDP per capita that was three times lower than Portugal, and barely 70% of that of Uruguay. Venezuela was much richer in 1977 than in 2003.

Table 2. GDP per capita (PPP) in constant prices

Country	**1950**	**1977**	**2003**
Spain	2928	11978	20644
Portugal	2386	9208	17333
Uruguay	5515	7152	8855
Mexico	2709	6127	7938
Venezuela	*4809*	*9802*	*6253*

Source: Penn World Table (2006)

Extending the previous sample, as is shown in Figure 10, Venezuela could be compared with European countries like Italy or Spain in the period of growth, and it was located over the Latin American countries, single below Argentina. In the period of recession, not only it is located very below the average of the European countries, but even below of countries such as Uruguay or Mexico, and in 2003 it is the poorest country of the sample.

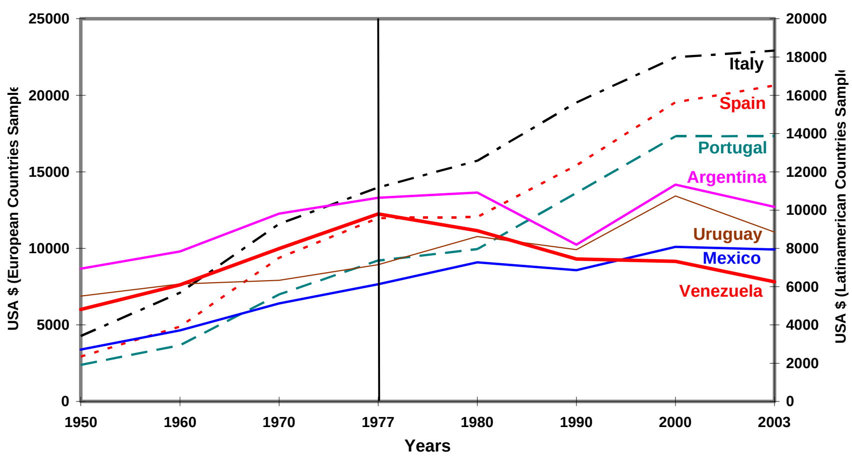

Figure 10. Relative GDP per capita (PPP).

We also can show this fact through an analysis in relative terms. Table 3 shows the relative wealth of the Venezuelan economy together with a sample of other countries, with respect to the United Stated's Real GDP per capita in constant prices (PPP), obtained from the Penn World Tables data. Whereas its relative wealth in the period 1950-1977 was around 0.46, in the last twenty six years it has been decreasing, and in 2003 it was only 0.18 of the GDP per capita for the US. It is also observed a decrease of the GDP in Mexico in relation to the United Stated's Real GDP per capita, but the drop is not so spectacular.

Table 3. Index GDP / US' GDP per capita (PPP)

Country	**1950**	**1977**	**2003**
United States	1	1	1
Spain	0.26	0.58	0.59
Portugal	0.21	0.45	0.50
Uruguay	0.49	0.35	0.25
Mexico	0.24	0.30	0.23
Venezuela	*0.43*	*0.47*	*0.18*

Source: Penn World Table (2006)

3 Growth Accounting

This section uses growth accounting exercise in the period 1950-2003 to analyze the factors that explain not only the good performance of the Venezuelan economy in the period 1950-1977, but also the collapse of growth in the period (1977-2003). The results not consider the initial period 1950-1960 in order to eliminate the effects of initial conditions, and they are shown into two subperiods according to the pre-depression and depression period. Our aim is to quantify how far the economic performance of the non-oil sector in Venezuela can be explained by physical capital or by the evolution of total factor productivity (TFP).

As mentioned in the previous section, the growth experience in Venezuela in the period 1950-2003 is mainly driven by the non-oil sector. Furthermore, since oil production in Venezuela depends on OPEC quotas and its oil value added depends mainly on the international price, and not on domestic market conditions, we focus on an analysis of the non-oil GDP. This approach is fairly widespread in the relevant literature (see, amongst others, Schliesser and Silva (2000), and Arreaza and Dorta (2004)).

We consider that the technology of the non-oil sector can be represented by an aggregate Cobb-Douglas production function:

$$Y_t = A_t K_t^{\alpha} L_t^{(1-\alpha)},$$

where Y_t is final output (non-oil), K_t is physical capital, L_t is labor, and A_t is TFP.

We will consider that the labor force is the product of employment times the average hours worked (per year). Therefore, we can express the non-oil production per worker in the following way:

$$\frac{Y_t}{N_t} = A_t \left(\frac{K_t}{N_t}\right)^{\alpha} \left(\frac{h_t N_t}{N_t}\right)^{(1-\alpha)},$$

where N_t denotes employment at time t[4] and h_t denotes average hours worked (per year)[5]. We can obtain the value for the Total Factor Productivity as follows:

$$A_t = \frac{(Y_t/N_t)}{(K_t/N_t)^{\alpha} h_t^{(1-\alpha)}},$$

where $(Y_t/N_t) \equiv y_t$ is Gross Domestic Product per worker in the non-oil sector[6]; and $(K_t/N_t) \equiv k_t$ is the stock of physical capital in per worker terms.

To generate a series for k_t we follow the paper by Bergoeing *et al.* (2002), among many others (see Kehoe & Prescott (2007)), using the perpetual inventory method (Conesa and Kehoe (2005)). First of all, from the investment process, we have the following law of motion for the physical capital per worker,

$$k_{t+1}(1+n) = (1-\delta)\, k_t + i_t,$$

where i_t, is total investment per worker[7], δ is the constant depreciation rate and n is the labor force growth rate[8].

We have chosen to set a constant depreciation rate of 0.10, which is the standard value for the depreciation rate used in the Real Business Cycle literature (see, among many others, Kydland and Prescott (1982)). Other values considered are, for example, 0.09 for Japan in Hayashi and Prescott (2002), or 0.05 for México and Chile in Bergoeing *et al.* (2001).

[4] We consider employment instead of working age population for two reasons: *(i)* lack of data on working-age population, *(ii)* we have used the data on Gross Domestic Product per worker, provided by the Penn World Table, so there is consistency on the variables used.

[5] The data for average hours worker per year are taken for Groningen (2006).

[6] Even though we should take into account the exact fraction of the total labor force working in the non-oil sector, if the share of the labor force in each sector is constant throughout the period, it should be adjusted by a constant, and therefore should not affect the results. However, Bello and Restucia (2002) claim that this is not the case. If we consider that the labor force working in the oil sector is virtually null, then the analysis performed is completly correct.

[7] To obtain the data for total investment per worker, we use the share of investment in Gross Domestic Product per capita in real terms (PPP) and constant prices, and of level Gross Domestic Product per worker in real terms (PPP) and constant prices. Concerning the evolution of total population and labor foce, since the average growth rate of both variables is practically the same (3%) in the period 1975-2003, we believe that the evolution of these two variable must be quite similar.

[8] We use the data of populations and we have calculated its average annual growth rate in the period (1950-2000).

Following Conesa, Kehoe and Rhul (2007) among others, the initial stock of physical capital is obtained such that the ratio of the stock of physical capital per worker to total non-oil GDP per worker in 1950 is equal to average ratio of the stock of physical capital to total non-oil GDP per worker throughout the period 1950-1960.

Regarding the choice for α, we consider the standard value used in the Real Business Cycle literature, 0.36. This is in contrast with the figure used in some growth accounting exercises made for Venezuela, in which the labor share is much higher (see Table 42 Elías (1992). However, as already pointed out by Saez and Puch (2004) among others, labor share in some countries might be overestimated due to be not adjusted to include self-employed and family workers when calculating the share of total income accounted by labor. As Bergoeing *et al.* (2002) point out, a high share of capital in total GDP implies an implausible high figure for the return on physical capital.

Given the synthetic series for k_t and our choice for capital share, α, we can calculate the non-oil TFP per worker series, A_t. Taking the natural logarithms of the production function per worker, we have:

$$\ln A_t = \ln y_t - \alpha \ln k_t - (1-\alpha)\ln h_t.$$

We have followed Bergoeing *et al.* (2002), which in turn follow Hayashi and Prescott (2002), in the growth accounting exercise. As Kehoe and Prescott (2002) state, we know that on a balanced growth path the growth of the output per worker is equal to the growth of the total factor productivity, and the ratio capital-output is constant. In order to isolate the effect of the total factor productivity and the accumulation of physical capital per worker on the growth of the output per worker, we follow Hayashi and Prescott (2002), Bergoeing *et al.* (2002), among others and we have decomposed the growth of real GDP per worker in the contribution of TFP changes, in the contribution of changes in capital-output ratio and in the contribution of changes in average hours per worker:

$$\begin{aligned}(\ln y_{t+s} - \ln y_t)/s &= \frac{1}{1-\alpha}(\ln A_{t+s} - \ln A_t)/s + \frac{\alpha}{1-\alpha}(\ln(k_{t+s}/y_{t+s}) - \ln(k_t/y_t))/s \\ &\quad - (\ln(h_{t+s}) - \ln(h_t))/s,\end{aligned}$$

where, following Hayashi and Prescott (2002),

$$y_t = A_t^{1/(1-\alpha)}(k_t/y_t)^{\alpha/(1-\alpha)}h_t.$$

In Table 4 below, we present the results of the growth accounting exercise carried out for the Venezuelan economy for the period 1960-2003. Table 4 shows us that, in both subperiods, 1960-1977 (expansion period) and 1977-2003 (depression period), the growth in the real non-oil GDP per worker, y_t, is chiefly accounted by the changes in the TFP, A_t. Therefore, most of the changes in the non-oil output in per worker terms, y_t was due to changes in the total factor productivity, A_t, rather than changes in the physical capital, k_t. See also Figure 11 where is clearly shown that growth experience in real GDP per worker in Venezuela over the period is driven by the evolution of the productivity factor, in particular, the sharp drop in y_t from 1978 to 2003, while average hours per worker, h_t, has remained constant during all period, however the TFP, A_t, has fallen as well as real GDP per worker.

Table 4. Venezuela's Growth Accounting.

Average Annual Changes (%)	
(1960-1977)	
Growth $y_{t(non-oil)}$	3.90
Due to A_t	5.80
Due to (k_t/y_t)	-1.78
Due to h_t	-0.12
(1977-2003)	
Growth $y_{t(non-oil)}$	-3.20
Due to A_t	-2.89
Due to (k_t/y_t)	-0.17
Due to h_t	-0.10

Source: Own calculations.

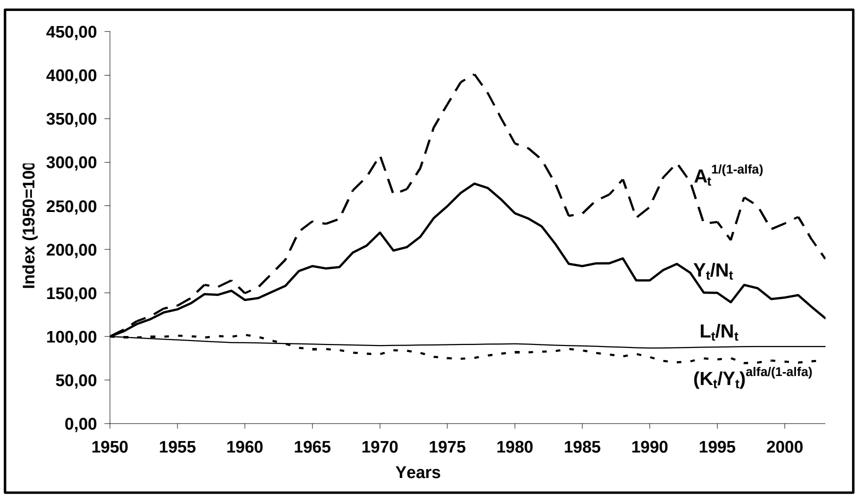

Figure 11. Venezuela´s Growth Accounting (1950-2003).

We have shown the results of the growth accounting exercise into two subperiods because we are interested in knowing whether the driving force in the expansion period is the same as in the depression period. As mentioned above, we do not consider the period 1950-1960 to eliminate the effects of initial conditions.

4 Oil rents and their correlation with the non-oil sector

In the following figures we ask whether, even though oil revenue accounts for only around 20% of total GDP (and cannot explain the growth experience in Venezuela), it could have had some effect on non-oil TFP or/and on physical capital accumulation.

Figure 12 compares the performance of non-oil TFP and oil rents, both in logarithm terms, in the period 1960-2003. In order to show both series in the same graph, we have used the two separated scale. We can see that non-oil TFP have not been affected positively by the oil rents. Table 5 shows their correlations throughout the period 1960-2003, which are significantly negative (-0.61). Moreover, when we divide the total period into two sub-periods, we can see that in both subperiods the correlation between oil revenue and non-oil TFP is clearly negative, stating that increases in the oil rents are negatively correlated with the dynamics of non-oil sector, which supports any of the channels of transmission from natural resource to economic growth, through which oil rents have a negative effect on the economy.

Figure 12. Ln(oilGDP) & Ln(non-oilTFP) in per worker terms

Table 5. Correlations		
OilGDP	**non oil TFP**	**stock of K**
1960-2003	-0.61	-0.25
Sub-periods:		
1960-1977	-0.88	-0.89
1977-2003	-0.56	-0.71

Source: Own calculations.

On the other hand, Table 5 shows that oil rents per worker, in logarithm terms, are negatively correlated with physical capital per worker, in logarithm terms, (-*0.25*) when considering the whole period (1960-2003), as well when calculating the correlation for the expansion and depression subperiods, at -0.89 and -0.71, respectively. Figure 13 displays that oil rents had a negative correlation with the stock of physical capital in the period 1960-2003. In this figure, we have displayed the series with two different scales, as in Figure 12, one for stock of physical capital and other for oil rents, in logarithm terms, in order to show both in the same graph, and we can see that oil rents have not had a positive effect on the physical capital accumulation from 1970.

Figure 13. Ln(oilGDP) & Ln(K) in per worker terms

Concerning the use of oil rents by the government in Venezuela there is a degree of consensus that i) it can be distinguished two periods (good and bad policies), and, ii) until the seventies oil rents were mostly used to modernize the Venezuelan economy. Schliesser and Silva (2000) mention that the urban process underwritten by oil rents increased labor productivity between 1950 and 1973, in contrast to the latter period 1974-1992. Karl (1997) and Del Bufalo and Rios (2002), amongst others, state that the use of oil rents financed the country's urban development and that profiteering took place outside standardized parameters after the first oil crisis, when oil rents decreased sharply. Rigobon in Jatar *et al.* (2003) mention that oil rents in the last thirty years have no longer sufficed to finance the growth of public expenditure (subsidies, etc.), and this, amongst other factors, increased public debt in Venezuela in the period 1976-2000.

If we make a quick look at both graphs, 10 and 11, it appears that in the period 1960-1977, the oil rents have been decreasing and the performance of physical capital accumulation and, overall non-oil TFP, has been quite good.

This observation is in concordance with the above mentioned papers that claim the good use of the oil rents up to late seventies. Also, the observation of the good performance of oil rents during the eighties and the bad performance of the non-oil sector during such a period confirm their claim of the bad management of oil rents in the last years.

5 Conclusions

Venezuela's growth experience in the last fifty years is characterized by a high economic growth rate during the period 1950-1977, and a low economic growth rate in the last twenty six years. This paper focuses on the growth experience in Venezuela over the past fifty years, characterized by an expansion period in 1950-*77* with a high average growth rate, and an implosion period in 1977-2003 with a low average growth rate, as already noted by other authors such as Arreaza and Dorta (2004), Bello and Restuccia (2002), Del Bufalo and Ríos (2002), Hausmann (2002), Hausmann and Rigobón (2002), Rubio (2002), Schliesser and Silva (2000) and Vera (2002), amongst others.

Our first finding is in line with the definition of "depression" by Kehoe and Prescott (2002, 2007), Venezuela is a great depression since the late seventies (as also pointed out by Bello and Restuccia (2002)).

We show that ,although Venezuela is an oil abundant economy, this growth experience is mainly accounted for by the evolution of real GDP in the non-oil sector of the economy. Furthermore, we carry out a growth accounting exercise to quantify how far the growth experience in the non-oil sector is due to physical capital accumulation, and our results show that most of it is accounted for by the evolution in TFP.

Finally, this is a huge literature that, on the one hand, analyze the channels through which the oil rents might affect negatively the manufacturing sector of the economy (Dutch disease, rent seeking, corruption, lack of human capital accumulation, etc.). On the other hand, there is also a vast literature that analyze the use of the oil rents in Venezuela. In particular, there are some papers (see, among others, Del Bufaloand Rios (2002), Schliesser and Silva (2000)) that claim that the oil rents in Venezuela have been managed correctly up to late seventies, but this has not been the case in the last thirty years. We have made simple correlations to analyze the effect of oil rents in the non-oil sector and we last finding is that both, the correlation between oil rents and physical capital accumulation, and the correlation between oil rents and the non-oil TFP, are clearly negative. Taking into account that in the period 1960-1977 the oil rents have been decreasing and the performance of physical capital accumulation and, overall non-oil TFP, has been quite good. This observation is in concordance with the above mentioned papers that claim the good use of the oil rents up to late seventies. Also, the observation of the good performance of oil rents during the eighties and the bad performance of the non-oil sector during such a period confirm their claim of the bad management of oil rents in the last years.

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