

**FISCAL POLICY IN COLOMBIA:
PROCYCLICAL OR
COUNTERCYCLICAL?**

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FISCAL POLICY IN COLOMBIA: PROCYCLICAL OR COUNTERCYCLICAL?

JAIRO J. PARADA AND WILLIAM R. BACA

INTRODUCTION

This paper attempts to verify with quantitative and descriptive techniques if the fiscal policy in Colombia has been procyclical or countercyclical in the periods 1950 – 2004 for the case of Non Financial Public Sector Deficit (NFPSD) and 1962 – 2004 for the case of Central National Government Deficit (CNGD).

This paper proposes an econometric estimation using a couple of VAR models. On one hand a VAR model for the Non Financial Public Sector Deficit (NFPSD). And on the other, we explore the case for the Central National Government deficit (CNGD). We analyze the NFPS and CNG deficits with regard to the inflation rate (INF) and the growth rate of GDP. The VAR model estimation allows us to analyze the impulse – response functions. These empirical results will allow us to see how the economic activity and inflation rate react to an increase on budget deficit in the case of the NFPS or CNG's deficit.

The data was taken from Colombia's central bank (Banco de La República) and the national department planning office (Departamento Nacional de Planeación-DNP). The data for the NFPS deficit was collected from 1950 to 2004 while for the CNG deficit the information corresponds to the period 1962 – 2004. We had a problem with the unemployment rate data. We only found quarterly data from 1976 to 2004. This did not allow us to make a complete description for the whole period prior to 1976, and to sustain the idea that during decelerating phases of the economic activity, when fiscal policy was countercyclical the unemployment had lower levels compared with the procyclical years.

The results obtained show evidence how fiscal policy at least in the short run might be stabilize the economic activity for the Colombian case. This goes against the orthodox claims oriented to reducing budget deficit as a fiscal policy amidst a recession.

This paper has been organized in six sections. The first section is an introduction. In the second and third sections, we will introduce a theoretical revision regarding the theoretical background with respect to the subject of the paper. In the fourth section, we expose a descriptive analyzes that aim to identify in which periods the fiscal policy in Colombia was countercyclical and procyclical. In the fifth section, we will show the econometric estimation of the VAR models. In the last section, conclusions will be derived.

THEORETICAL REVIEW

We start with a theoretical revision of several authors related with the discussion regarding countercyclical fiscal policy. Many mainstream economics authors state that countercyclical fiscal policy cause crowding out and inflationary pressures. On the contrary, other heterodox authors state that countercyclical fiscal policy might guarantee full employment and price stability. The revised literature covered both Colombians and international economists.

The first group claims that this fiscal policy causes: 1) high inflation rate, 2) crowding out of the private investment by government expenditure and 3) the fiscal policy role as stabilizer is less effective than monetary policy.

Easterly (1991) alleged that he had obtained evidence that support crowding out. Specifically, Easterly found that public capital has a negative effect over the private investment. Similarly, the contribution of public investment to economic growth is uncertain which means it is not possible to make inferences based on his results given the available evidence. He concludes that, an increase in a 1% of growth domestic product (GDP) financed with public debt produce an increase in real interest rate around 3% and 5%, and an increase in the inflation rate in 15 %. Also, Easterly states that public savings do not explain changes on private consumption.

According to Echeverry (1999), it is necessary to evaluate the size of aggregate demand components' flow funds and its effect over the families', firms' and government's balances when the government attempts to carry out a countercyclical fiscal policy. Thus, Echeverry says it does not make any sense to support countercyclical fiscal policy when agents' economic balances are negatives and when their liabilities are greater than their assets. The rationale for this comes from the fact that any injection of additional income through a countercyclical fiscal policy will increase their expenditures and liabilities generating a more unstable economy.

Most of papers on fiscal policy in Colombia are concerned on the structural nature of government deficit. They examine the issue of procyclical or countercyclical fiscal policy on a narrow empiricist vision. Moreover, fiscal policy research is based on a positive perspective instead of a normative one. For example, Lozano and Aristizabal (2003) studied the impact of fiscal policy over economic activity from 1990 to 2002 through impulse – responses exercises. They found that increase in the consumption government expenditure had a positive effect over GDP. On the other hand, Lozano and Aristizabal argued that fiscal policy was procyclical during the 90's.

By the same token, after econometrics estimations, Cuddington and Urzua (1995) state that countercyclical fiscal policy affects government revenue and not public expenditure. Government fiscal revenue regarding GDP cyclical movements had a correlated impact whereas the impact on public expenditure was not significant. Finally, Cuddington and Urzua state that government expenditure usually has been greater than its revenue, confirming the structural characteristic of the government budget deficit.

From a different perspective, Arestis and Sawyer (2003) summarize the four reasons in favor of the idea that crowding out is inevitable criticizing them. First, under the IS–LM's model the money supply is exogenous. Therefore, increases in government expenditure causing an increase in the interest rate that reduce investment explaining crowding out. But if we assume that money supply is endogenous and interest rate is fixed by the central bank's deliberated action the crowding out argument is weakened. The key here is that the alleged crowding out effect is affected by the central bank response and not for automatic market adjustments.

In the same direction, Chirinko (1993) and Fazzari (1993, 1994-1995) argued that the interest rate impact over investment is insignificant. According to Chirinko and Fazzari dominant variables over investment are the accelerator effect (increase in sales) and the cash flow effect. Likewise, activity variables such as the product have an impact over the investment. In sum, although fiscal policy increases interest rate, crowding out will not occur.

Regarding the Colombian case, Ramos y Rodriguez (1995) studied the relation between Non Financial Public Sector Deficit and the Central National Government Deficit, in relationship with the interest rate. Under Granger – Sims causality test they obtain as result that neither changes in the Non Financial Public Sector deficit nor Central National Government Deficit cause movements in the interest rates. According to Gomez (2000) there is not a negative relation between fiscal deficit and active real interest rates. This allow us to conclude that it is not possible to sustain that fiscal deficit has effects over interest rate and consequently negatives effects on private investment.

Second, it is asserted that government deficit absorbs savings of financial markets diminishing private investment. The argument is based on assuming that domestic savings is exogenous. But if we assume that savings are endogenous the results are different. In conclusion, an increase in the government expenditure has a positive effect on income and investment which at the same time increase saving levels instead of diminishing investment.

Third, if we have into account that crowding out is based on supply side equilibrium and this equilibrium is linked to concepts like NAIRU and natural unemployment rate, aggregate demand always adjusts to the supply side equilibrium. But it is also possible that aggregate demand might influence supply side equilibrium. A greater aggregate demand encourages major investment. Hence, capital stock is increased and therefore productive capacity. In other words, now the economy has a greater stock of capital.

The last reason, inspired on the Ricardian equivalence, asserts that fiscal policy is useless because of its expensive effects on aggregate demand are compensated with an increase in private savings. This means that agents take a decision to consume less in order to save more. But If we consider fiscal policy under functional finance approach, budget deficit is caused by government because there are differences between the level of savings and investment at a targeted level of income. For this reason, the Ricardian equivalence is scarcely relevant.

Arestis and Sawyer (1997) states that some people think Keynesian fiscal policy is associated with fine tune demand policy. However, they define Keynesian policy like aggressive demand adjustment. In other words, government use deficits in order to propel aggregate demand enough to reach sustainable high employment levels. In the same way, they define the reasons that inspire these kind of policies: i) market economies can't reach full employment because have unstable elements and ii) a better distribution of market power, income and wealth is needed in order to increase general well being of the society.

Similarly Mitchell and Wray (2005), and Juniper and Mitchell (2005), endorse the idea by which government appears as employer of last resort (ELR). Once high unemployment is identified, the government might guarantee job opportunities in recessives periods.

Vickrey (2000) stated that fiscal deficit is not an economic sin but an economic necessity. Stiglitz (2004) argued that government excessive expenditures are understandable when it is necessary to correct the demand failure. In this case government deficit is useful. A context where budget deficits can debilitate aggregate demand occurs when the economy is operating at a full employment level.

Taylor (2000) underlines fiscal discretionary policies based on the weakening of automatic stabilizers in the US economy, which have lost capacity to restore economic activity. For this reason, structural deficits are called to act discretionary in order to stimulate economic activity in case of recession.

Now, concerning expansive fiscal policies in developing countries, Taylor (1986) states that it "...is possible that government cause a budget deficit because of the investment level is low and foreign savings (S^F) is too big. Of course budget deficit stimulates aggregate demand and keeps high employment. In this circumstances, a negative value of government saving (S^G) is far to be considered "inflationary financing" very often mentioned by scholars."

Taylor (1986) also shows a couple of stylized facts in developing countries: " i) fiscal authorities use to operate through central bank and don't issue obligations to private sector and ii) similarly, balance of payments deficit should be financed through a diminution in government reserves" (Taylor 1986). For this reason "government deficit, in countries with underdeveloped capital markets, cause almost automatically increases on monetary base; reserve loss has the contrary effect". Here it is clear that the central bank mission is to control the monetary base through reserves drain in order to keep an interest rate that guarantee price stability.

For the Colombian case, Sarmiento (2002) has insisted in countercyclical fiscal policy. This author asserts that "traditional approach always assumes that the economic is at full employment". Moreover, the goal of countercyclical fiscal policy is to smooth output fluctuations and to overcome recessions". Sarmiento aims to show that money emissions

are not an inflationary policy. It allows the possibility to fight against unemployment because it represents a potential additional income.

THEORETICAL ASSESSMENT

The countercyclical fiscal policy is inspired on Keynes' thought. Keynes considered that facing situations of high unemployment and idle capital capacity, government should stimulate effective demand to reinforce output activity to foster more employment. However, Keynes warned about expansive government deficits beyond full employment that will result in a higher price level.

Similarly, Kalecki points out that profits come from private investment, capitalist consumption, government budget deficit and net exports balance. Under this conception, an increase on government deficit -*ceteris paribus*, will cause profits to be greater than private investment and capitalist consumption. Kalecki's taught us that government deficit allows capitalists to obtain profits greater than their expenditures.

But, how do we make countercyclical fiscal policy? Lerner (1943) proposes us the functional finance approach based on two main ideas: i) the first responsibility of the government is to keep the total growth rate of spending of the country in goods and services neither greater nor less than the rate which at the current prices would buy all the goods that it is possible to produce and ii) the purpose of taxes and bonds is not really to finance spending but to control the money supply where the emission of money is necessary in order the government to be able to meet its needs.

According to Wray (1999), fiat money is the money that government uses to pay its expenditures. And this same money is collected from tax payments. Because government has fiat money, in order to be able to collect taxes it might and should spend before it collects taxes. These mechanisms are based on the presence of an economy with monetary sovereignty.

Once government has spent through crediting its central bank's account, the government circulates fiat money. This situation causes an expansive effect on the monetary base through a reserves increase in the financial system. Once the taxes start to be collected in government commercial bank' accounts, these funds are transferred to the government central bank's account. It cannot be argued that taxes in commercial banks will increase bank reserves. In the same moment that these funds are transferred to the central bank, the monetary authority itself has to intervene to drain reserves excess on the monetary base aiming to keep interest rate stable compatible with sustainable investment level and guaranteeing price stability and full employment. In sum, it is a just a central bank reserve operation.

Last, fiscal policy is an expenditure decision. Therefore it is a decision about how fiat money circulates in the financial system to foster economic spending.

KEYNESIAN DEMAND APPROACH

Let's assume that households save and entrepreneurs invest. Hence firms' net asset balance is exactly offset for the net financial wealth of the household sector. By now we assume a closed economic. Under these conditions we have the next following identity:

$$S > \bar{I} + (G - T) \quad ,$$

where S are desired savings, \bar{I} is firms investment, T are taxes and G is government expenditure.

As we saw above, households have more desire savings than firms' investment. Also, the right hand side of the identity represents actual savings which depends of government budget deficit. In other words, government deficits can provide the additional income that household don't want to spend. For instance, given the investment and government expenditure then a reduction of taxes will increase government deficit that will allow actual savings to increase to reach the desired level of saving.

Blanchard (2000) claims that a fiscal contraction will decrease income level generating at the same time a decrease in consumption level less that the reduction of the output level and therefore deteriorating savings levels. Now if private savings are less than government's deficit national savings, savings will be reduced and we will have an increase in the interest rate and a lower investment level. Thus savings are affected by fiscal policy.

In the case of an open economic the identity showed above works perfectly adding net exports. Consequently, an increase in net exports will allow actual saving to meet with desired savings. Note that government deficit and positive net exports will increase actual savings.

We can define savings minus investment as "net nominal saving". In a closed economy it can be fiat money or government bonds. But in the open economy we have to include foreign liabilities. If the public want to have positive net nominal savings, the government has to run a deficit or the economy has to run a surplus trade. But just consider the government, and then, government deficits are necessary to allow the public to have positive net nominal saving.

ECONOMICS OF POPULISM

The economics of populism was defined by Dornbusch and Edwards (1992) as: "an economics approach that underline the economic growth and income redistribution against inflationary pressure, financing deficit, foreign sector restrictions and economic agents' reaction in front to aggressive policies that ignore the market". It can be argued that when we propose expanding fiscal policy, it refers to an example of economics of populism.

The orthodox claims for a low inflation and that the government will not run in deficits as macroeconomics stability program. It is proposed in spite of the existence of a real macroeconomic stability program concerning for full employment, stable economic growth, price stability and sustainable fiscal and foreign balances (Ocampo, 2004). This last idea is different from populism and orthodox recommendations.

Mainstream economics has taught us that macroeconomic and monetary authorities' credibility is based on its independence and respect for economic policy rules than impose restrictions to its discretionary policy tools. Ocampo (2004) asserts that: "the renunciation to the autonomy and discretionary in economic policies is not the solution to this dilemma". Is true that we need clear instruments and institutions that underline the credibility of monetary and macro authorities. But this shouldn't affect the required macroeconomic coordination between fiscal and monetary policies that guarantee a real stability program which consider full employment, price stability, stable economic growth and fiscal and foreign sustainable balances.

In past decades in Latin American, populist macroeconomic policies caused hyperinflation phenomenon. There is a belief that hyperinflation are caused by the government because of printing too much money. Indeed, the real reason is that the system tax breaks down. Hence fiat money becomes worthless which reinforce its break down. In other words, economic agents don't desire fiat money in order to pay their taxes. Specifically, in any economy there is a net demand for fiat money. If government issue fiat money in a situation when any agent has lost confidence on it, the final result become hyperinflation.

According to Wray (1999), the idea that "hyperinflation is caused by the government 'printing too much money', running the printing presses at 'full speed' captures only the effect, not the cause of the problem. It is usually the break down of the tax system, rather than the speed of the printing presses alone, which creates the hyperinflation".

FISCAL POLICY IN COLOMBIA: 1950 TO 2004

For the descriptive analysis about fiscal policy action we have used data for Non Financial Public Sector Deficit (NFPSD) and Central National Government Deficit (CNGD). On the one hand, we can define the first one as the sum of Central National Government and decentralized government sector balance which is conformed by government enterprises and territorial government. On the other hand, the central national government deficit embraces the difference between its incomes and expenditures. For the NFPSD we have data from 1950 to 2004 and for the CNGD from 1962 to 2004. The data periodicity is annual and both variables have been expressed in percentage coefficients with respect the GDP.

On the other hand, we have estimated the GDP gap through Hodrick – Prescott filter. It allow us eliminate the GDP's trends that after we subtract from observed GDP having as result the GDP gap.

Once we defined the time series data we will analyze them on the graph presented below. In this paper, budget deficit is defined as the difference between its expenditures and incomes, $(G - T)$. Therefore we identify budget deficits with positive values and budget surplus with negative values. Also, when the GDP gap is positive this means that economic growth is greater than its potential and when is negative this means that economic growth is not greater than its potential. Periods which fiscal policy was procyclical means that both GDP gap series and fiscal deficit are moving in the same direction. In another case it is evidence for a countercyclical behavior.

On the other hand, we know that fiscal policy would be expansive when the GDP gap is negative and the government decides increase budget deficit. It would be recessive when the GDP is negative and the government decides to reduce the budget deficit. For the first case, the countercyclical fiscal policy will be stabilizer in consequence it will help to increase the level of employment. But the procyclical fiscal policy will destabilize the economy because it can help to reduce the level of employment. An empirical evidence of this idea is found in Junguito and Rincon's work (2004) which describes the changes in the fiscal policy in Colombia during the XX century.

A careful analysis of the fiscal policy was carried on every decade from 1950 to 2004 which can be summarized in Fig. 1 to 9¹. Table 1 shows the results found. In fact, macro policies in Colombia show that Colombian government has used both approaches where countercyclical policies are dominant with respect to procyclical ones. Changes in macro policies seem to be associated also with the behavior of the external sectors. During processes of adjustment of negative balance of payments procyclical policies are predominant.

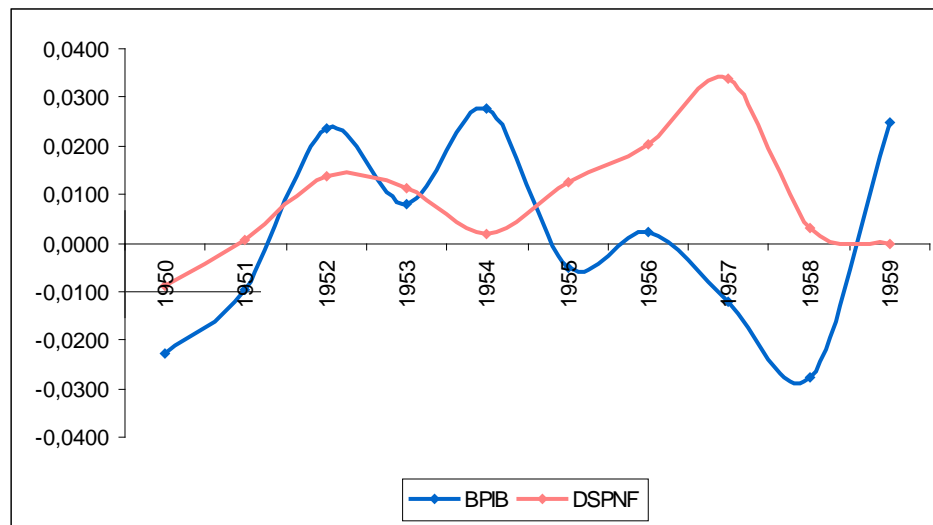
¹ A detailed and careful analysis can be seen in Baca (2007) where every presidential period is examined and the cyclical fluctuations of the economy are considered.

Table 1. Results summary of the fiscal policy

Period	Fiscal Policy	Period	Fiscal Policy
1950-1953	Procyclical	1977	Countercyclical ¹
1954-1955	Anticíclica	1978	Countercyclical
1956	Procyclical	1979	Countercyclical ¹
1957	Countercyclical	1980-1982	Countercyclical ¹
1958	Procyclical	1983	Countercyclical ⁴
1959	Procyclical ⁵	1984-1986	Countercyclical ⁴
1960-1962	Procyclical	1987	Procyclical
1963-1964	Procyclical	1988-1989	Countercyclical ^{1,2}
1965	Countercyclical ¹	1990-1994	Procyclical
1966	Countercyclical	1995-1996	Countercyclical
1967-1970	Countercyclical ¹	1997-1998	Procyclical
1971	Countercyclical ¹	1999	Countercyclical ³
1972-1973	Procyclical ⁵	2000	Countercyclical ⁴
1974-1975	Countercyclical ¹	2001-2002	Countercyclical ¹
1976	Countercyclical	2003-2004	Countercyclical ²

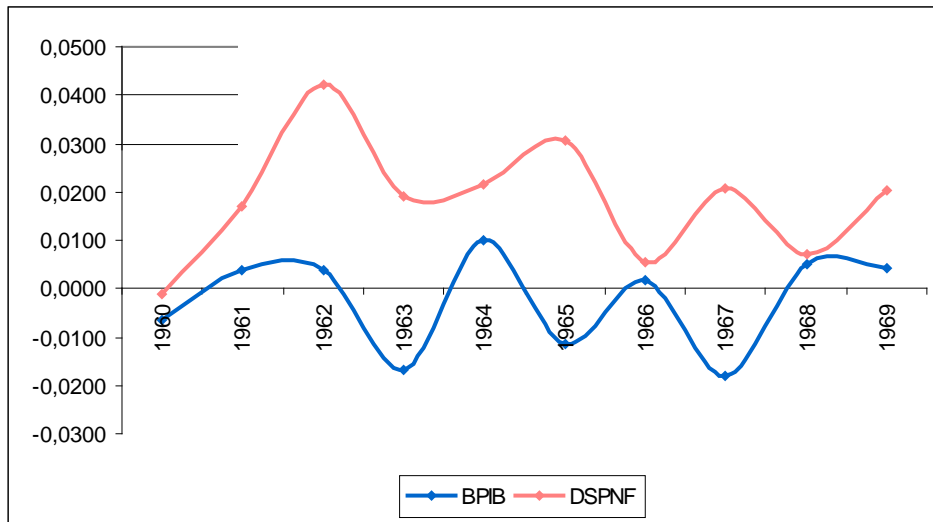
Source: Elaborated by Baca (2007).

Figure 1. GDP gap vs NFPSD: 1950-1959



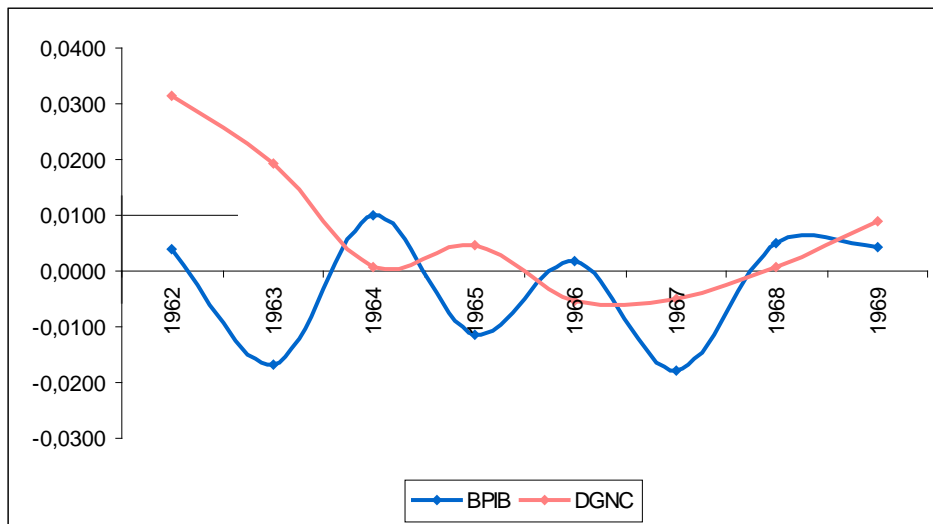
Source: Elaborated by the authors based on Departamento Nacional de Planeación (DNP) and Banco de La República .

Figure 2. GDP gap vs NFPSD: 1960-1969



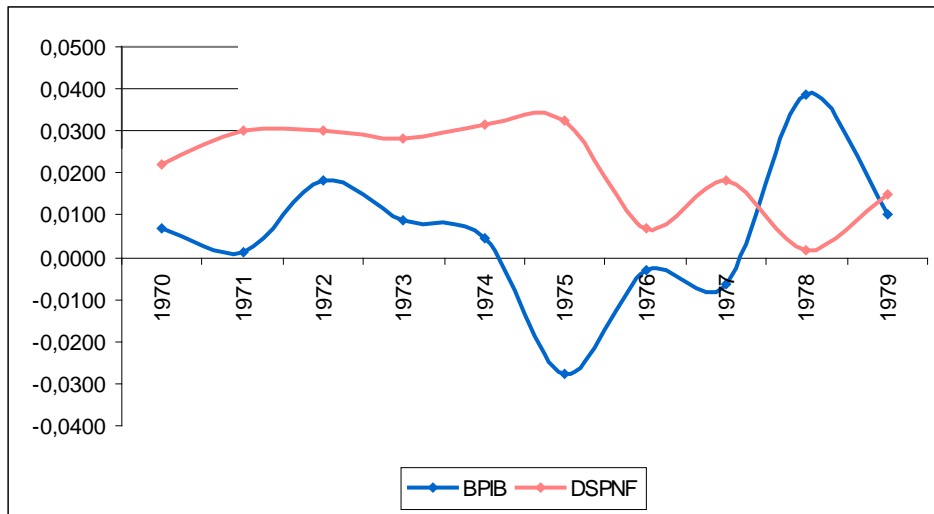
Source: Elaborated by the authors based on Departamento Nacional de Planeación (DNP) and Banco de La República .

Figure 3. GDP gap vs CNGD: 1962-1969



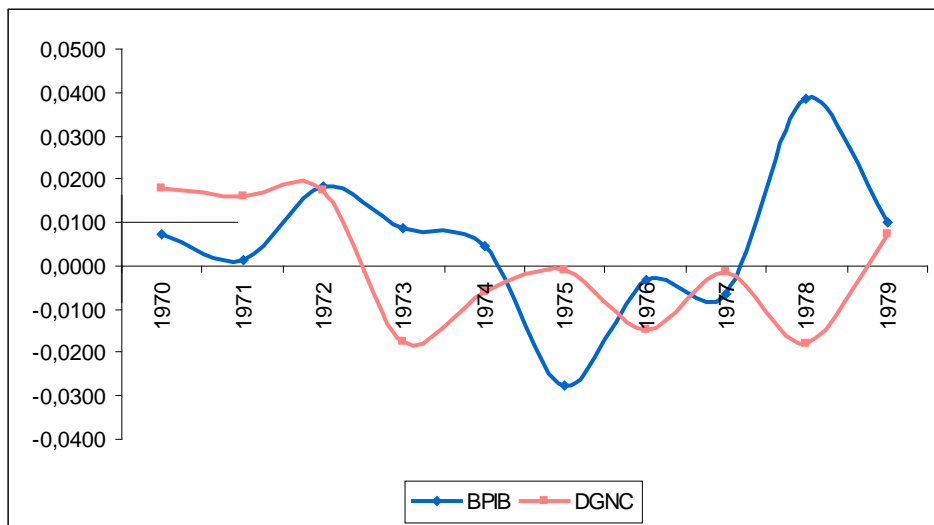
Source: Elaborated by the authors based on Departamento Nacional de Planeación (DNP) and Banco de La República .

Figure 4. GDP gap vs NFPSD: 1970-1979



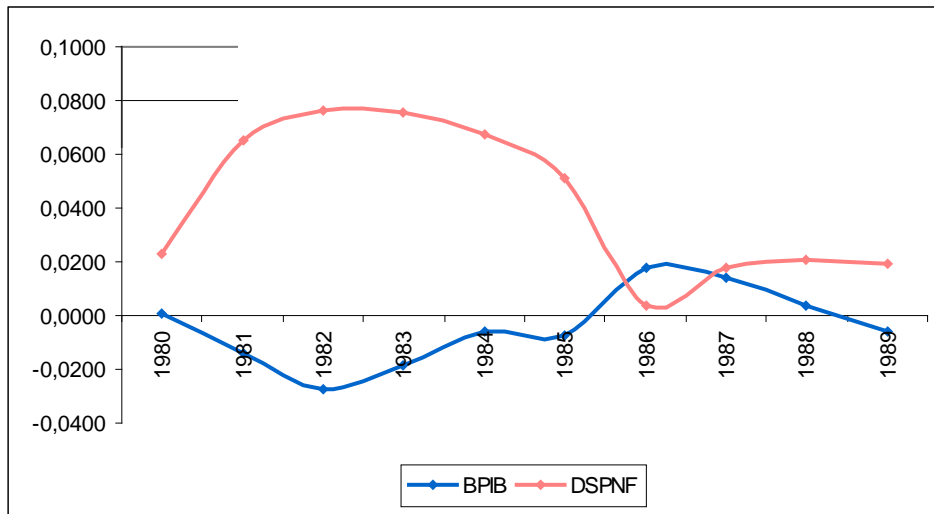
Source: Elaborated by the authors based on Departamento Nacional de Planeación (DNP) and Banco de La República .

Figure 5. GDP gap vs CNGD: 1970-1979



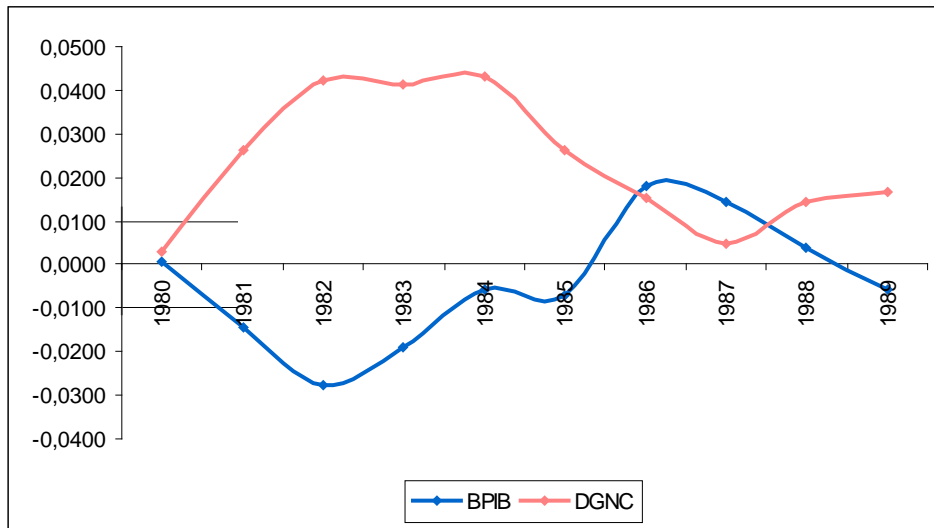
Source: Elaborated by the authors based on Departamento Nacional de Planeación (DNP) and Banco de La República .

Figure 6. GDP gap vs NFPSD: 1980-1989



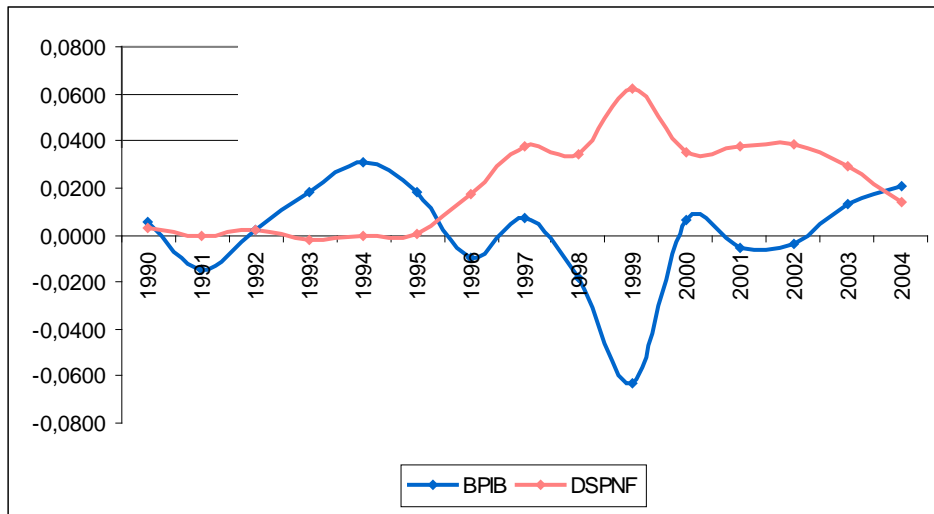
Source: Elaborated by the authors based on Departamento Nacional de Planeación (DNP) and Banco de La República .

Figure 7. GDP gap vs CNGD: 1980-1989



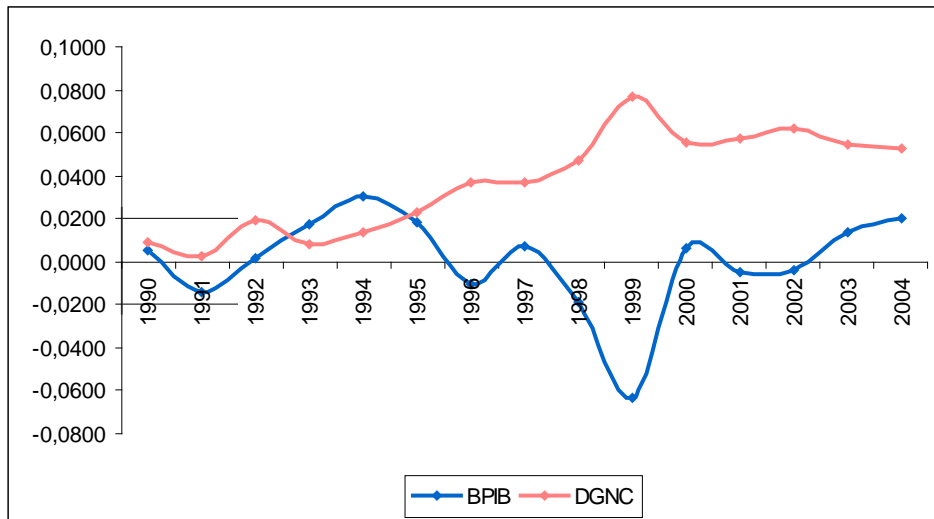
Source: Elaborated by the authors based on Departamento Nacional de Planeación (DNP) and Banco de La República .

Figure 8. GDP gap vs NFPSD: 1990-2004



Source: Elaborated by the authors based on Departamento Nacional de Planeación (DNP) and Banco de La República .

Figure 9. GDP gap vs CNGD: 1990-2004



Source: Elaborated by the authors based on Departamento Nacional de Planeación (DNP) and Banco de La República .

Unemployment and fiscal countercyclical or procyclical macro policies.

Our focus is on countercyclical fiscal policy which has a reaction against the business cycles decreasing tendency. Similarly, for procyclical fiscal policy, it means it has a reaction in the same tendency decreasing with respect to the business cycle. Specifically, this implies more taxes and less government expenditure when the economic is stagnant. We expect for the countercyclical fiscal policy the unemployment rate to be lower and in the procyclical one the unemployment rate to be higher. For instance, during Pastrana administration (1998-2002) the fiscal policy was procyclical and the unemployment rate reached high levels especially in 1999.

For an evaluation of fiscal policy on the unemployment rate we just found data from 1976. The data corresponds to quarterly from 1976 to 2004 for the national total. This affects our analysis which excludes the 1953, 1957-1958, 1963 and 1973 years, where the fiscal policy was procyclical because of lack of data. Consequently our analysis is referred only to the countercyclical periods from 1976 to 2004.

The only contractive procyclical period way was throughout 1983-1985, when the economy grew under its potential. This period was accompanied by a fiscal policy inspired in fiscal adjustments. As we expected the unemployment rate went from 11.09% in the first quarterly in 1983 to 14.15% in the second quarterly in 1985. Throughout the first quarterly in 1983 to fourth quarterly in 1985 the average unemployment rate was 13.03%. Throughout this period, between the first quarter in 1984 and the third quarter in 1985 the unemployment rate exhibited numbers beyond the average of 13.03%. The evidence implied a higher unemployment period.

Expansive countercyclical fiscal policy was successful during the period of study.² In 1977, the unemployment rate exhibited a reduction along the year. In the first quarter the unemployment rate showed an unemployment rate of 10.22% and finished in 7.85% in a continuous decreasing trend.

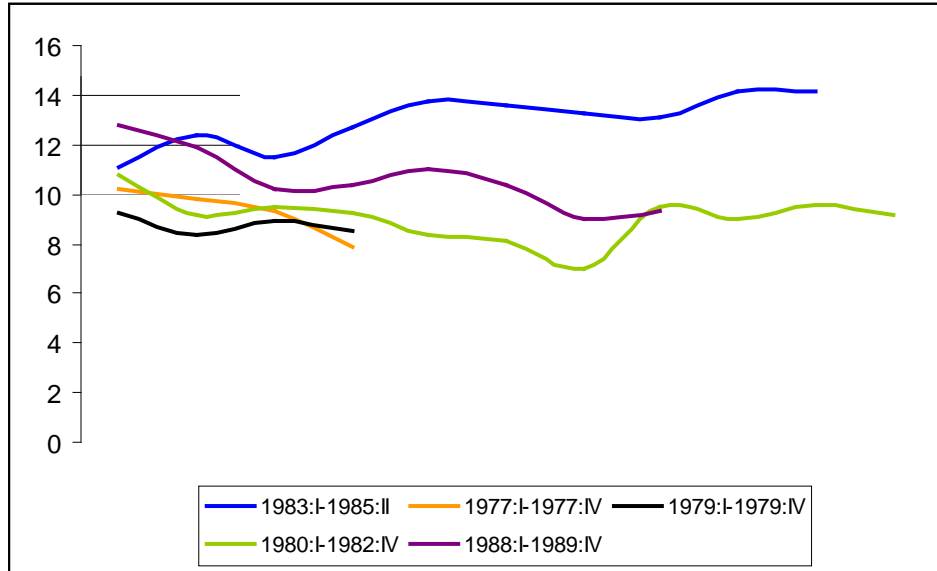
However, we must examine the events during the 90s, where outward and liberal oriented policies were introduced. In the 90's there is evidence that fiscal policy was expansive from 1996 to 1998. In 1999 the expansionary policy was abandoned because of falling government revenues debilitated by the general downfall in the economy output.

The unemployment rate in 1996 exhibited an increase along the whole year, going from 10.21% to 11.30% between the first and fourth quarter. The same happened in 1998 when the unemployment rate went from 14.41% to 15.63%. We can conclude that fiscal policy was not oriented to confront the deceleration of economic activity with rising unemployment. However, this period reflects the shock that trade commercial openness on the output and jobs creation.

² Again, see a careful and detailed analysis in Baca (2007).

In Fig. 10 we can observe that when fiscal policy was countercyclical the unemployment rate exhibited a tendency to diminish and when it was procyclical the unemployment rate showed a tendency to increase.

Figure 10. The unemployment rate.



Source: Departamento Nacional de Planeación (DNP).

Econometric estimation

We estimated a VAR model attempting to explain the behavior of a group of variables (in our case: NFPSD, CNGD and Inflation) based on their lags. We will focus in the impulse response analysis. This analysis allowed us to evaluate the expansive effect that fiscal deficit would cause on the economic output activity and subsequently we would check the effect of fiscal deficit on inflation in the economy.

The estimation of a VAR model requires that time series have to be stationary. It means times series do not have unit roots. Another condition to estimate a VAR model is that variables cannot be cointegrated. For this reason we tested cointegration between the variables using the Johansen cointegration test. The cointegration presence, in an economic sense means the variables have an equilibrium relation in the long run. The criteria used in order to choose the lag length is based in Akaike Information Criteria (AIC) and the Schwarz Criteria (SC). However, according to Dserres and Guay (1995) for a better estimation we should choose the maximum lag where we have found white noise and normality on the errors. For that reason the model is tested with the adjusted Pormanteu test which allow us if there is evidence for residual autocorrelation, and it is tested with normality test Jarque Bera which allow us to check for evidence for non normality in the residuals.

A couple of VAR models were estimated. The first one includes the NFPS deficit, the inflation rate and the GDP rate. The second one include it except the NFPS deficit, in this case we have considered the CNG deficit.

For the unit root tests were used the Dickey Fuller (DF) and the Phillips Perron (PP). The criteria which help us to make a decision if the series show evidence of unit root is analyze the null hypothesis from the more restricted model (include trend and intercept) to the less restricted one (no deterministic components). If we wouldn't reject the null hypothesis in each model we can decide that the serie is non stationary.

The obtained results showed us that the NFPS deficit, CNG deficit, the inflation rate and the GDP rate have unit root in level. But these variables in first differences are stationary. For that reason all this variables were included in VAR model in differences.

For cointegration we used the Johansen cointegration test. The criteria used was verify the null hypothesis was the "Pantula' criteria". This criteria considers that the researcher should start the test from the more restricted model (in this case the model 2) to the less restricted model. We have to compare the trace with its critic value throughout the model 2 to model 4 and the model which include the major number of cointegration relations or vectors. The researcher should stop the test when there is not evidence to reject the null hypothesis from r vectors of cointegration.

For the CNG deficit, the inflation rate and GDP rate under the trace test and maximum Eigen value we found evidence to not reject the non cointegration null hypothesis ($r=0$). For the SPNF deficit, the inflation rate and GDP rate under the trace test we found evidence to not reject the null hypothesis in the model 4 ($r=0$). Under the maximum eigen value test we found evidence to not reject the null hypothesis in the model 2 ($r=0$). In each case we have evidence in a 1% and 5% of statically significance.

VAR model with Central National Government deficit

By the criteria from AIC and SC the lag length optimum was one. At this lag length the VAR model exhibited evidence for non residual autocorrelation and normality test on the residuals. Besides, the model presents the stability condition because of none of its Eigen values is greater than one. It means that all the Eigen values were inside from unit root circle.

The formal model specification is the next one:

$$\begin{bmatrix} \Delta x \\ \Delta \pi \\ \Delta y \end{bmatrix} = \begin{bmatrix} \alpha_x & \alpha_\pi & \alpha_y \\ \beta_x & \beta_\pi & \beta_y \\ \varphi_x & \varphi_\pi & \varphi_y \end{bmatrix} \cdot \begin{bmatrix} \Delta x_{t-1} \\ \Delta \pi_{t-1} \\ \Delta y_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_x \\ \varepsilon_\pi \\ \varepsilon_y \end{bmatrix}$$

Where,

Δx = Déficit del Gobierno Nacional Central (primeras diferencias).

$\Delta \pi$ = Tasa de inflación (primeras diferencias).

Δy = Producto Interno Bruto (primeras diferencias).

We should warn that parameter interpretation from a VAR model is too complex and our interest is to check the impulse response functions. Nevertheless, in table 2 we found that lagged fiscal deficit has an apparent positive effect on the inflation without statically significance (Observe the t value). For the GDP case, the fiscal deficit has a negative impact, it mean a greater deficit from one period lagged has contrary effects over the economic activity but, similarly this result doesn't have any statistic significance.

Table 2. Econometrics Results: VAR model with CNG deficit

	$\alpha_x \Delta x_{t-1}$	$\alpha_\pi \Delta \pi_{t-1}$	$\alpha_y \Delta y_{t-1}$
Δx	-0.253 (-1.349)	0.043 (1.444)	0.068 (0.599)
$\Delta \pi$	0.638 (0.932)	-0.459 (-4.226*)	0.284 (0.680)
Δy	-0.007 (-0.023)	0.008 (0.180)	-0.337 (-1.798*)

Source: Elaboración propia. Cálculos del autor.

(*)Significativo al 5%.

VAR model with Non Financial Public Sector Deficit

By the criteria AIC and SC the lag length optimum was four. But at this length the model exhibited problems with respect to normality in the residuals under the multivariate normality test (*Jarque Bera*). Hence, we found the maximum lag length possible that had not problem both autocorrelation and normality. As result, we obtained the lag length for four. In the same way the model had the stability condition because of the Eigen values were inside from the unit root circle.

The formal model specification is the next one:

$$\begin{bmatrix} \Delta x \\ \Delta \pi \\ \Delta y \end{bmatrix} = \begin{bmatrix} \alpha_x & \alpha_\pi & \alpha_y \\ \beta_x & \beta_\pi & \beta_y \\ \varphi_x & \varphi_\pi & \varphi_y \end{bmatrix} \cdot \begin{bmatrix} \Delta x_{t-1} \\ \Delta \pi_{t-1} \\ \Delta y_{t-1} \end{bmatrix} + \begin{bmatrix} \alpha_x & \alpha_\pi & \alpha_y \\ \beta_x & \beta_\pi & \beta_y \\ \varphi_x & \varphi_\pi & \varphi_y \end{bmatrix} \cdot \begin{bmatrix} \Delta x_{t-2} \\ \Delta \pi_{t-2} \\ \Delta y_{t-2} \end{bmatrix} \\ + \begin{bmatrix} \alpha_x & \alpha_\pi & \alpha_y \\ \beta_x & \beta_\pi & \beta_y \\ \varphi_x & \varphi_\pi & \varphi_y \end{bmatrix} \cdot \begin{bmatrix} \Delta x_{t-3} \\ \Delta \pi_{t-3} \\ \Delta y_{t-3} \end{bmatrix} + \begin{bmatrix} \alpha_x & \alpha_\pi & \alpha_y \\ \beta_x & \beta_\pi & \beta_y \\ \varphi_x & \varphi_\pi & \varphi_y \end{bmatrix} \cdot \begin{bmatrix} \Delta x_{t-4} \\ \Delta \pi_{t-4} \\ \Delta y_{t-4} \end{bmatrix} + \begin{bmatrix} \varepsilon_x \\ \varepsilon_\pi \\ \varepsilon_y \end{bmatrix}$$

Δx = Déficit del Sector Público No Financiero (primeras diferencias).

$\Delta \pi$ = Tasa de inflación (primeras diferencias).

Δy = Producto Interno Bruto (primeras diferencias).

In table 3, we can observed that fiscal deficit for the first and second lag has an effect positive over the economic activity in a statically significance way. For the third and fourth lag, the influence continues being positive but without statically significance. On the other hand, the relationship from NFPS deficit has a negative effect on the inflation rate in three lags which are 1, 2 and 4. These results mean that an increase of fiscal deficits in the periods t-1, t-2, and t-4 are has a low correlation with the opposite sign with inflation without statistic significance.

Table 3. Econometrics results: VAR model with NFPS deficit

	$\alpha_x \Delta x_{t-1}$	$\alpha_\pi \Delta \pi_{t-1}$	$\alpha_y \Delta y_{t-1}$	$\alpha_x \Delta x_{t-2}$	$\alpha_\pi \Delta \pi_{t-2}$	$\alpha_y \Delta y_{t-2}$
Δx	-0.009 (-0.046)	0.031 (0.721)	-0.067 (-0.455)	0.107 (0.548)	0.002 (0.046)	-0.051 (-0.292)
$\Delta \pi$	-0.675 (-0.982)	-0.551 (-3.561*)	0.875 (1.649**)	-0.785 (-1.118)	-0.145 (-0.839)	0.891 (1.403)
Δy	0.429 (1.848*)	-0.023 (-0.441)	-0.7041 (-3.923*)	0.433 (1.828*)	-0.065 (-1.114)	-0.426 (-1.984*)
	$\alpha_x \Delta x_{t-3}$	$\alpha_\pi \Delta \pi_{t-3}$	$\alpha_y \Delta y_{t-3}$	$\alpha_x \Delta x_{t-4}$	$\alpha_\pi \Delta \pi_{t-4}$	$\alpha_y \Delta y_{t-4}$
Δx	-0.023 (-0.121)	0.008 (0.171)	-0.205 (-1.253)	-0.182 (-1.039)	-0.015 (-0.391)	0.031 (0.224)
$\Delta \pi$	0.383 (0.565)	0.150 (0.881)	0.713 (1.215)	-0.172 (-0.274)	0.094 (0.652)	0.988 (1.972*)
Δy	0.101 (0.441)	-0.068 (-1.192)	-0.250 (-1.261)	0.037 (0.175)	-0.094 (-1.933*)	-0.229 (-1.358)

Source: Elaborated by the authors. (*) Significant at 5% and (**) Significant at 1%.

Impulse Response Analysis.

An impulse response analysis was performed based on both VAR models. Our interest was the effects on GDP and on the inflation rate from changes in fiscal deficits for CNG and NFPS deficits measured in standard deviations through the error term as shown in Figs. 11, 12, 13 and 14.

Figure 11. GDP response front a shock in the CNG deficit errors

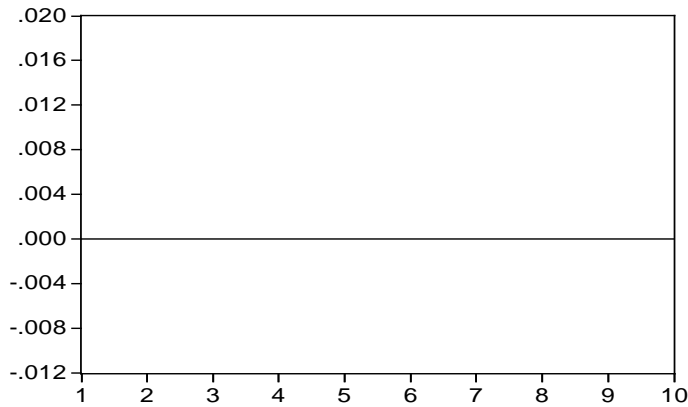


Figure 12. Inflation response front a shock in the CNG deficit errors

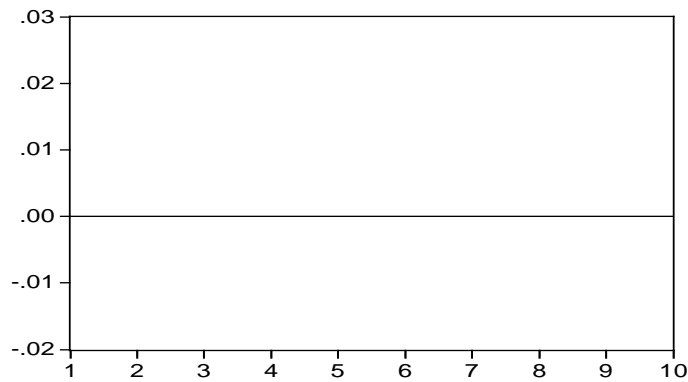


Figure 13. GDP response front a shock in the NFPS deficit errors

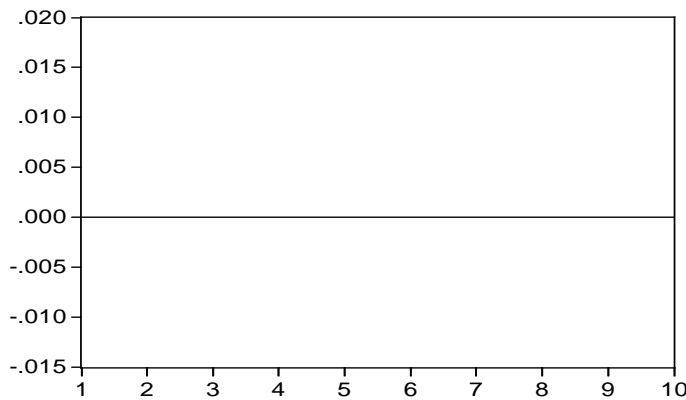
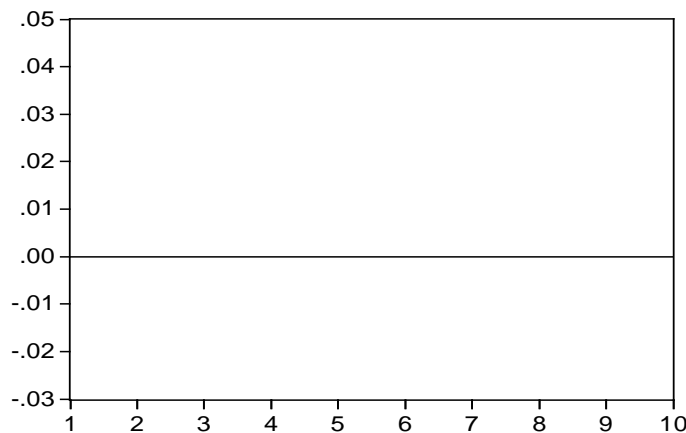


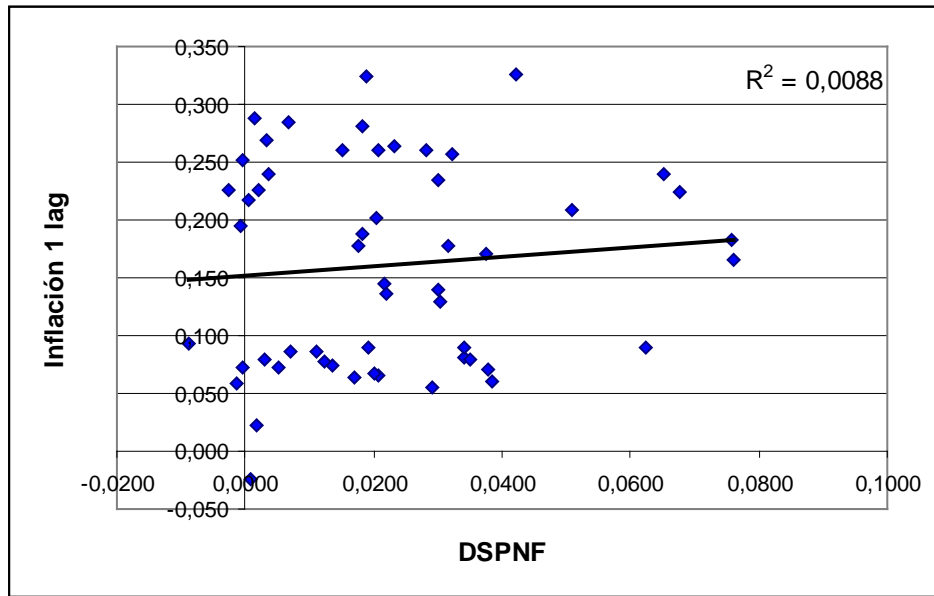
Figure 14. Inflation response front a shock in the NFPS deficit errors



From impulse response analysis we can conclude that fiscal policy has an positive effect on the output in the short run and can be countercyclical. The inflation exhibited period of lags whereas the inflation get activate but with weaker responses compare to the output responses. For the CGN deficit the order of lag was one and for the NFPS deficit was four. This result show us that the margin of action of the central bank in order to promote drain reserves excess that guarantee a stable interest rate and prices stability is possible in case of expansionary fiscal policy.

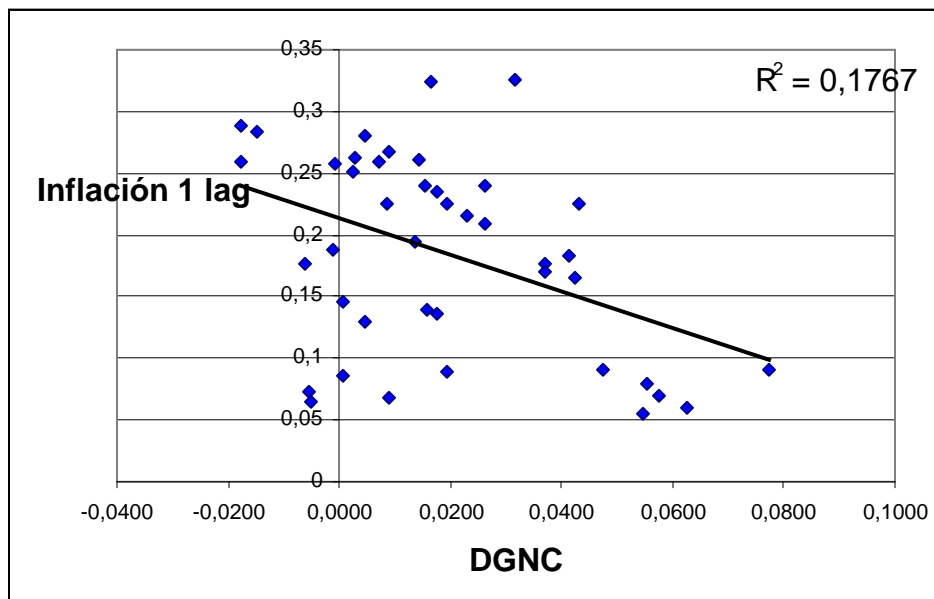
Also, we can observe in figure 15 and 16 that fiscal deficit does not have a clear relationship with respect to inflation rate. Specifically, for the NFPS deficit case we obtain just a cloud of scattered dispersed points and for that reason is not clear to assert that fiscal deficit cause inflationary pressures. This result have coincidence with the impulse response analyzes. On the other hand, we can observe a paradoxical result because of observing that when the fiscal deficit increase the inflation decrease showing a negative relationship among these variables. The reader can observe that R2 coefficients are not high indicating that there is no a strong correlation between these variables.

Figure 15. NFPS deficit Vs Inflation (1950-2004)



Source: Elaborated by the authors based on Departamento Nacional de Planeación (DNP)

Figure 16. CNG deficit Vs Inflation (1962-2004)



Source: Elaborated by the authors based on Departamento Nacional de Planeación (DNP)

CONCLUSIONS

This paper allows us to conclude that when fiscal policy was countercyclical and expansive and the GDP was below its potential, we have evidenced lower unemployment rates. This can suggest us that fiscal policy would be an instrument to stabilize the business cycle.

In a couple of VAR models and through the impulse response functions, we found that an increase in the fiscal deficit is a key element to stabilize the economic activity. Besides, the increase in the fiscal deficit will not be inflationary. For instance, the inflation had reaction of one lag year front an increase in the CNG deficit and lag four year front an increase in the NFPS deficit and in both cases the reaction was much lower compared with the GDP reaction.

If we recognize that the economy operates in a monetary environment it is possible to understand that unemployment rate increases because of a very restricted money supply policy. According to Wray (1999, 84): "since the government is the sole supplier of fiat money, and since fiat money is essentially a resource that is potentially unlimited in supply, it makes little sense to restrict the supply of fiat money to extent that this causes unemployment, unless unemployment serves a useful purpose".

This is totally in accordance with Bonilla et al (2003) who points out that: "the redistributive policies mixed with macroeconomic countercyclical policies can improve the functioning of the labor market and can reduce inequality". The same author reviewed other studies that asserted that "rich countries with a higher welfare state not only enjoy less inequality but exhibit lower unemployment rates". In summary, we can assert that the better social policy is promoting the struggle against the unemployment.

It should be clear that the central bank should operate in a macroeconomic plan that guarantees full employment and prices stability. The central bank should not be concentrate exclusively in a low inflation target and in promoting fiscal austerity. The central bank should guarantee full employment in coordination with the government. The independence notion of the central bank is overcome under a monetary economy and teaches us that is not the key for lower inflation rate.

In Colombia the Constitution restricts the borrowing of money of the government from the central bank. In fact it is only possible if the central bank board takes a unanimous decision.

The government does not have to 'print' more money to increase government spending. Emissions trough printing money are not strictly necessary. The most important variable is 'inside' money since the government credits his account in the central bank. From this account the government makes its payments and causing the increase of the reserves and of course the monetary base.

The optimum ratio among the fiscal deficit with respect to the GDP does not have high importance if we understand that fiscal deficit is an economic policy instrument that increase the employment, and in coordination with the central bank guarantee prices stability. In the period that we studied Colombia have exhibited constants fiscal deficits and when exhibited surplus were for a short period of time. In Colombia we should advance to a pragmatic policy that allows us to use fiscal policy and its potential in the short run.

The theoretical concept expose here is far away from an example of economics populism. The success of countercyclical fiscal policy is the monetary sovereignty. The key is promoting the change of external debt by internal debt. It is valid to assert that it is a very target for a developing nation. But Argentina, Brazil and Uruguay just showed the desire of their governments to have monetary sovereignty. Nowadays, China is one the developing countries that have advanced in monetary sovereign.

Why the monetary sovereign is necessary? Because it guarantees that any monetary regime (gold standard, fixed exchange, currency board etc.) cannot limit the potential of macro policies. Without money sovereignty it is not possible to increase the fiscal deficit because of the restrictions imposed by these regimes. For instance, under a gold standard regime use the fiscal deficit as stabilizer element cannot allow the agents to run against its currency. In this case the currency is limited and it is possible that the public run against it and the agents can lose credibility and go for backup in others currency (Tcherneva and Wray, 2005). If there is not credibility in the local currency it will be possible that the tax system breaks down and in consequence there will be inflationary pressures.

It avoids the internal debt situation that results in higher interest rates through bonds deficit financing. The logic of our analysis rests on assumptions different from general equilibrium model. For that reason is not acceptable that government has to pay higher interest rates for public debt just because it is not attractive for the investors much lower interest rates. In the drain reserves excess operation the central bank offers to the investors an interest rate which returns some positive margin for them. This same rate will guarantee that full employment and price stability be possible.

Maybe the imperfect structure of the government bonds market can explain the higher interest rates. This is not a competitive in the liquidity provision for the government and of course it makes possible the market power of private financial groups on the government.

The fiscal policy should be countercyclical in Colombia. The assumptions of full employment are much beyond our possibilities but we must strive to move in the right direction. . The deficit is a key instrument to stabilize the economic activity in recessive situations and where it is not possible operate in full employment. We cannot forget price stability. The sovereign monetary concept should be essential to carry out a

macroeconomics program that gives us the key for the full employment and price stability.³

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³ All the appendix which contains all the econometric work can be seen in the original work by Baca (2007) under request.

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