Fiscal Theory Of The Price Level And Domestic Public Debt In Algeria During The Period Between (1997-2018) Using ARDL Model

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Abstract:

The primary goal of this paper is to investigate the fiscal theory of the price level (FTPL) and the role of domestic public debt in the context of (FTPL) using annual data from the period spanning between 1997-2019. Hence, we try to check the effect of budget deficit on GDP, domestic public debt to GDP, broad money growth on the inflation rate, moreover the model used (ARDL) model. Furthermore, in our analysis, the results indicate that domestic public debt has no role in the inflation rate (FTPL) in the case of Algeria. Still, the results proved the strong existence of (FTPL) according to a non-Ricardian regime in Algeria's economy

Keywords: Fiscal policy; Inflation; Domestic public debt; ARDL model; Budget deficit.
JEL Classification: E62; P24; H61.

Introduction

The fiscal theory of the price level FTPL challenged the view of Milton Friedman, though he demonstrate in Monetarist school inflation is always and everywhere a monetary phenomenon, so FTPL theory explained inflation monetary phenomenon but is driven by fiscal policy, also FTPL theory it is called quantitative theory of public debt, because(QTPD) and budgetary policy determine the price level and monetary policy is play weak role in deciding it, thereby domestic public debt is a significant factor of inflation in FTPL, furthermore in the QTPD or FTPL theory, therefore fiscal dominance regime occurs when the monetary authority accepted and to accommodate government debt, then this process lead to higher seigniorage revenues as well as inflation rate rises, where the critical idea is the central bank monetization domestic public debt, as a result increasing money supply while domestic public debt costs rises and higher inflation rate, whereby the essence of FTPL theory the real value of government liabilities equal the current value of government surpluses expected in the future, yet this situation non-Ricardian regime, hence FTPL theory it appeared for the first time through the original paper by the both economists Thomas Sargent and Neil Wallace in 1981. Recently, his theory developed by many economists such as Woodford (1995, 1996, 1998), Leeper (1991), and Sims (1994), clearly in the case of Algeria the budget deficit is the most important economic problems experienced by developing countries and Algeria in particular, likewise in Algeria's economy the government is financing the budget deficit by issuance the government bonds or borrowing from central bank, which means that increase money supply lead to higher inflation rate and raises domestic public debt, in addition we attempt to propose the propose the problematic of this paper, in order to investigate FTPL theory and domestic public debt as follows:

What is the effect of fiscal theory, the price level FTPL on domestic public debt in Algeria's economy?

HYPOTHESIS

H0: There is a relationship between fiscal theory, the price level, and domestic public debt in Algeria's economy.

H1: There is no relationship between fiscal theory, the price level, and domestic public debt in Algeria's economy.

SUB-QUESTION

What fiscal theory the price level does mean?

What is the relationship between fiscal theory, the price level and public debt?

1. Budget deficit to GDP, Broad money growth, Domestic public debt to GDP, and inflation rate in Algeria

The figure (01) indicates the evolution of four supported variables in this study, firstly annual average inflation faces large fluctuations in the period between 1997 to 2018, especially in has minimum is 0.3% in 2000, thereafter it has maximum value is 8.9% 2012, after that it has reached 5.59% in 2017 and 4.27% in 2018, this is due to higher oil prices recently.

Figure number (01): The evolution of inflation rate, Budget deficit to GDP, Domestic public debt to GDP, and Broad money growth in Algeria (1997-2018)
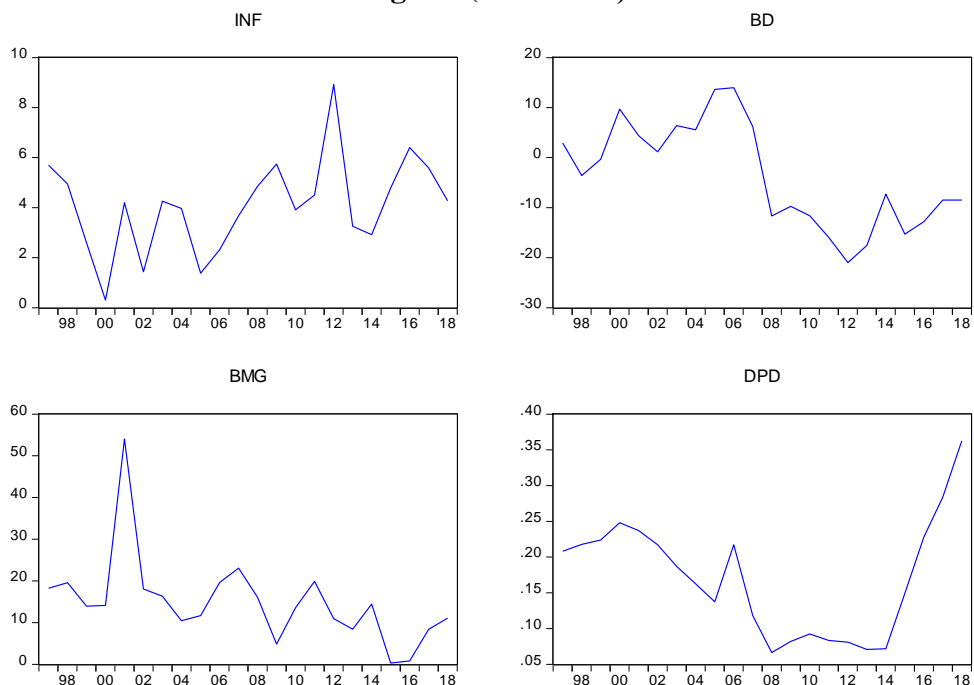
Source: prepared by authors relying on the eviews10 program.

Secondly, we observed between 1997 to 2007 government budget balance is to achieve surplus as a result of higher petroleum revenues, thereby government budget revenues rise with a deficit in the budget balance for the year 1998, but between the period 2008 to 2018, it suffered

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from persistent deficits as a consequence from oil prices collapse and government revenues decline.

Thirdly, between 2007 to 2017 domestic public debt decreased as a result of the higher oil prices thus the rise in government revenues, after year 2014 and the crisis of oil prices collapse in 2015, so domestic public debt higher because the government resorted to unconventional financing and treasury bills issued. Fourthly, the graph of broad money growth indicates that broad money growth developed between 1997 till 2018, moreover it has highest value is 54.05% in 2001, next it has lower values are 0.2% and 0.81% in the both years 2015 and 2016, however his continue to higher, whereby it exceeded 8.38% in 2017 and it achieved 11.1% in 2018, then the reason for rises growth money broad is unconventional financing and printing money in Algeria.

2.Studies related to the framework of theoretical debate:

He starts with the first study by economists Thomas Sargent and Neil Wallace (1981), which confirmed that domestic debt and government budget deficits would ultimately be monetized in the long term. The central bank used a monetization mechanism due to the tight current monetary policy, so finally, a higher inflation rate, as well as denoted to support the fiscal dominance hypothesis (Sargent & Wallace, 1981). Similarly, Woodford (1995) displayed a non-Ricardian regime and proposed the general price level determined by fiscal variables and money supply that reduces the reel value of public debt and decreases the reel value of portfolios invested. Negatively impacts in the private assets and the wealth effect. Instead, Woodford (1996) researched the stabilization price level and control of public debt. Besides, he indicates available restrictions for growth in public debt.

Meanwhile, he supported the non-Ricardian regime by his view that the money supply is not only an element in determining inflation but also the budget deficit is an essential factor in inflation (Woodford, 1996). Woodford (1998) demonstrated that public debt access to a specific limit. The fiscal authority changes its policies, and the budgetary policy leads to fluctuations in the government budget. The author argued the importance of managing debt in general equilibrium prices, obviously non-Ricardian

regime. Additionally, inflation changes due to higher public debt (Woodford, 1998).

Further, Leeper (1991) explained the fiscal and monetary policies in the various regimes. According to the behavior of these policies and depending on the effects of debt or shocks of government debt. We distinguish between active and passive approaches, for instance, when fiscal dominance means that fiscal policy is active. Also, the government determines fiscal policy because fiscal policy has independence, and it ignores debt levels (Leeper, 1991). Subsequently, Cochrane (1998) described government debt in the long term and the optimal active and passive policies in fiscal theory, so he finds that the structure of government debt is essential for the impact of surpluses on the inflation rate (Cochrane, 1998).

3. EMPIRICAL STUDIES

During the last period, some empirical articles talked about the effect of public debt on inflation in the fiscal theory of the price level (FT framework PL). We mention some of them as follows:

Bildirici and Ersin (2007) investigated the relationship between domestic public debt and inflation under (FTPL) theory in nine countries. They divided nine countries into three groups. The first group are Turkey, Brazil, and Mexico. The second group of countries include Japan, Canada, and Belgium. The third includes Spain, Greece, and Portugal. Using panel cointegration, panel VEC model, panel VAR model, FMOLS method, and DOLS method over the period (1980-2004), the results show that the first group of countries obtain high inflation. In these countries, increased costs of domestic public debt rise due to inflation. The main result of the increased cost of borrowing means that non −The Ricardian regime (BILDIRICI & Ersin, 2007).

Similarly, Bildirici and Ersin (2005) analyzed the effect of domestic debt on inflation over the period (1933-2004) in Turkey; they used two regression models. On the one hand, they studied the long-run relationship between domestic debt and inflation. On the other hand, they tested the relationship between primary surplus and public domestic debt under (FTPL) theory and applied the cointegration method and vector error

correction model (VEC). In contrast, the study indicates the inflationary impacts of public domestic debt in non- Ricardian regimes (Bildirici & Ersin, 2005).

Nastansky and Strohe (2015) tested the association between domestic debt and inflation under (FTPL) theory, then in Germany, using the vector error correction model (VEC) and generalized impulse response function, over the period (1991-2014), therefore they found the positive link between domestic debt and inflation, so non- Ricardian regime (Nastansky & Strohe, 2015).

Correspondingly Know et all(2006) examined the association between public debt and inflation to test the view of Thomas Sargent and Neil Wallace(1981) explained that in countries that suffer from large public debt, high public debt leads to inflationary effects, this study applied(VAR) vector autoregression, dynamic fixed effects panel, panel generalized method(GMM) and pooled panel OLS in 71 countries, during the period(1963-2004), the results show that positive relationship between public debt and inflation in highly indebted countries, so there is evidence of Sargent and Wallace view in(1981) (Kwon et al., 2006).

In the same manner, Dobrowolski and Pawlowlowski (2018) studied the main elements of public finance. They relied on the budget deficit, budget expenditure, public debt, and inflation, following Thomas Sargent and Neil Wallace view (1981), during the period (2011-2017) in Poland. This study employs logical and statistical methods, it found that inflationary pressures are not due to public finances (Dobrowolski & Pawłowski, 2018).

Aimola and Odhiambo (2021) aim to study the effect of public debt on inflation during the period (1983-2018) in Gana. They used the autoregressive distributed lag model (ARDL). After that, the findings show a positive relationship between public debt and inflation. This result supports the (FTPL) theory, so non- Ricardian regime (Aimola & Odhiambo, 2021a).

On the other hand, Urquhrat (2021) studied the association between public debt and inflation in an Emerging Market economy the case of Paraguay, under (FTPL) theory. Next, this paper applied (SVAR) approach over the period (1993-2019) using time-frequency data. However, the

findings show that the public debt shock positively impacts inflation, so the non-Ricardian regime and support (FTPL) theory (Urquhart, 2021).

Also, Aimola and Odhiambo (2021) researched the relationship between public debt and inflation over the period (1983-2018) in Nigeria, under (FTPL) theory, they utilized (ARDL) model approach. Moreover, the findings indicate that public debt does not affect inflation statistically significantly. Therefore, non-Ricardian regime is absent (Aimola & Odhiambo, 2021b).

Further, Mazhoud and Achouche (2017) evaluated the relationship between primary budget balance and government liabilities. For that they utilized the inflation rate, the rediscount rate, the domestic public debt, and the final household consumption over the period between (1989-2013) in Algeria, after that in this study, both authors used (VAR) model and (VEC) model. Lastly, the critical results they found are a positive correlation between inflation rate and domestic public debt, their non-Ricardian regime, and the validity of (FTPL) theory in Algeria's economy (Mezhoud & Achouche, 2017).

Romero and Marin (2017) explored the association between inflation and public debt, using the vector autoregression (VAR) model, panel generalized methods of moments (GMM) and dynamic fixed effects panel for 52 countries during the period (1961-2015). They confirmed the strong and positive relationship between inflation and public debt, particularly in indebted countries under (FTPL) theory, which means that increased public debt leads to a higher inflation rate, so non-Ricardian regimes in developing countries (Romero & Marín, 2017).

In another study, Saungwene and Modhiambo (2021) aimed to assess the effect of the public debt of inflation over the period (1980-2020) in Zimbabwe under (FTPL) theory, in sum they applied (ARDL) model, the result of (ARDL) model confirmed long-run relation between public debt and inflation. Both authors observed a positive and significant association between public debt and inflation and the non-Ricardian regime in Zimbabwe (Saungweme & Odhiambo, 2021).

Moreover, Afolabi and Atolagbe (2018) investigated the impact of domestic public debt, budget deficit and money supply on inflation rate

under the view of fiscal dominance theory in Nigeria. First, the authors used quarterly data (1986-2016). This study estimated (VEC) mechanism, showing that domestic public debt, money supply, and budget deficit have insignificant effects on the inflation rate, so the non-Ricardian regime is absent (Afolabi & Atolagbe, 2018). Siddiqui et all (2022) explored the effect of public debt on inflation under (FTPL) theory over the period (1986-2020) in Pakistan. Using annual data, the authors applied (ARDL) model and (ECM) model. The study found that positive and significant association between public debt and inflation, so this study supports the non-Ricardian regime (Siddiqui et al., 2022).

For the same objective, Thahara and Washima (2019) attempted to examine the impact of public debt on inflation according (FTPL) theory in Sri Lanka, and they utilized (ECM) model from the period (1977-2015). Hence the main results show that the positive impact of public debt on the inflation rate advocates the view of Sargent and Wallace in (1981), then the existence of the non-Ricardian regime (Thahara & Washima, 2019).

As well Kryeziu and Durguti(2019) investigated the impact of fiscal deficit on inflation rate under (FTPL) theory, then both authors used five independent variables, such as budget deficit to GDP and public debt to GDP in Eurozone countries, using a linear regression model and secondary data over the period(1997-2017), also this paper found that public dept to GDP ratio has a negative and significant effect on inflation rate, so this result does not support the non-Ricardian regime(Kryeziu & Durguti, 2019).

However, Oyeleke and Orisadare (2018) examined the impact of money growth and public debt on the inflation rate under (FTPL) theory in Nigeria, using the unrestricted (VAR) technique over the period (1980-2015). They employed annual secondary time series data, showing that public debt represents a large share of inflation variance, while inflation is a fiscal phenomenon, so the non-Ricardian regime in Nigeria (Oyeleke & Orisadare, 2018).

4. MODEL AND METHODOLOGY
4.1 ECONOMETRIC APPROACH

This study employed the autoregressive distributed lag (ARDL) model or ARDL bound test technique, while proposed by Pesaran and Shin(1995), Pasaran and Shin(1999), and Pesaran et all(2001), also(ARDL)

model is utilized because of its advantages it has compared to another econometric model especially the cointegration procedures, such as Engle and Granger(1987) , Johansen and Juselius(1990), besides it attempts estimating the short run and long run parameters of the(ARDL) model simultaneously, hence evade the issue of nonstationary data of time series(Al-Jafari & Altaee, 2019). While the time series is stationary at the level I (0), or integrated of the first order I (1), or a combination between I (0) and I (1) (Malika & Salim, 2021), provided that the time series are not integrated of the second difference I (2).

4.2 DATA SOURCES

In our analysis, we will try to test the (FTPL) theory and domestic public debt in Algeria's economy, so this paper based on the work of Olarewaju et all(2018), thus these authors focus on the relationship between inflation, budget deficit, domestic public debt and money supply, further the present study on investigating the effect of domestic public debt, broad money growth and budget deficit on inflation rate in Algeria, moreover, we will employ all variables during the period(1997-2018), we used the data type was annual data, also the data of time series was obtained from different issues of international monetary fund, central bank of Algeria, the ministry of finance Algeria and world bank.

Thereafter the model specified of the study as indicated below:

INF=F (BD/GDP, DPD/GDP, BMG%)

Where:

INF: is inflation rate.

BD/GDP: is budget deficit to GDP.

Dpd/GDP: is domestic public debt to GDP.

BMG%: is broad money growth.

4.3 RESULTS AND DISCUSSION

4.3.1 RESULTS OF TIME SERIES STATIONARY FOR STUDY VARIABLES (Unit root tests)

Table number (01): Results of (ADF) AND (PP) tests at level and first difference

	UNIT ROOT TEST TABLE (PP)			
At Level				
	INF	BD	DPD	BMG

With Constant	t-Statistic	-3.6538	-1.5039	-0.7131	-3.5297
	Prob.	*0.0133*	*0.5121*	*0.8225*	*0.0174*
		**	n0	n0	**
With Constant & Trend	t-Statistic	-8.1113	-1.9878	0.8006	-7.1014
	Prob.	*0.0000*	*0.5741*	*0.9994*	*0.0001*
		***	n0	n0	***
Without Constant & Trend	t-Statistic	-1.3036	-1.3168	0.2925	-1.6348
	Prob.	*0.1715*	*0.1678*	*0.7610*	*0.0950*
		n0	n0	n0	*
At First Difference					
		d(INF)	d(BD)	d(DPD)	d(BMG)
With Constant	t-Statistic	-11.6069	-4.3362	-2.9252	-16.9333
	Prob.	*0.0000*	*0.0032*	*0.0601*	*0.0000*
		***	***	*	***
With Constant & Trend	t-Statistic	-11.6711	-4.2056	-3.5669	-16.2518
	Prob.	*0.0000*	*0.0177*	*0.0591*	*0.0000*
		***	**	*	***
Without Constant & Trend	t-Statistic	-12.4519	-4.4642	-2.9373	-13.6897
	Prob.	*0.0000*	*0.0001*	*0.0055*	*0.0001*
		***	***	***	***

UNIT ROOT TEST TABLE (ADF)					
At Level					
		INF	BD	DPD	BMG
With Constant	t-Statistic	-3.6514	-1.4942	-0.1958	-3.5297
	Prob.	*0.0134*	*0.5168*	*0.9250*	*0.0174*
		**	n0	n0	**
With Constant & Trend	t-Statistic	-4.4459	-1.9546	0.6921	-6.5857
	Prob.	*0.0105*	*0.5911*	*0.9991*	*0.0003*

		**	n0	n0	***
Without Constant & Trend	t-Statistic	-0.2577	-1.3128	0.5854	-2.8463
	Prob.	*0.5799*	*0.1689*	*0.8347*	*0.0073*
		n0	n0	n0	***
At First Difference					
		d(INF)	d(BD)	d(DPD)	d(BMG)
With Constant	t-Statistic	-3.5391	-4.3216	-2.9252	-4.2100
	Prob.	*0.0198*	*0.0033*	*0.0601*	*0.0057*
		**	***	*	***
With Constant & Trend	t-Statistic	-3.3699	-4.2023	-3.6153	-4.0022
	Prob.	*0.0889*	*0.0178*	*0.0541*	*0.0317*
		*	**	*	**
Without Constant & Trend	t-Statistic	-5.4617	-4.4393	-2.9373	-6.5606
	Prob.	*0.0000*	*0.0001*	*0.0055*	*0.0000*
		***	***	***	***

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant

*MacKinnon (1996) one-sided p-values.

Source: Prepared by researchers using Eviews10 program.

The main objective of this paper is to study the effect DPD/GDP, BD/GDP and BMG% on inflation rate in short term and long term in Algeria, therefore in our study we try to choose appropriate estimation technique or econometric approach, subsequently we need to test of stability or stationary time series, due to the most time series suffers from spurious regression and they contains unit root, after that we applied the both tests of unit root, firstly Augmented Dickey fuller test (ADF), secondly Philip Perron test (PP), while the results of stationary tests based on the (ADF) test and (PP) test, we get the same results, however the results in table(01) show that the both variables are INF and BMG stationary at level, but the other variables are BD to GDP and DPD to GDP stationary and stability after the first difference, so the all variables are integrated in order I(0) and I(1), in addition the conclusion we will used(ARDL) model, because we will study the long term and short term relationship between all variables in this paper.

4.3.2 CHOOSING THE OPTIMAL LAG LENGTH
Figure number (02): Results of ARDL lag selection

Akaike Information Criteria (top 20 models)
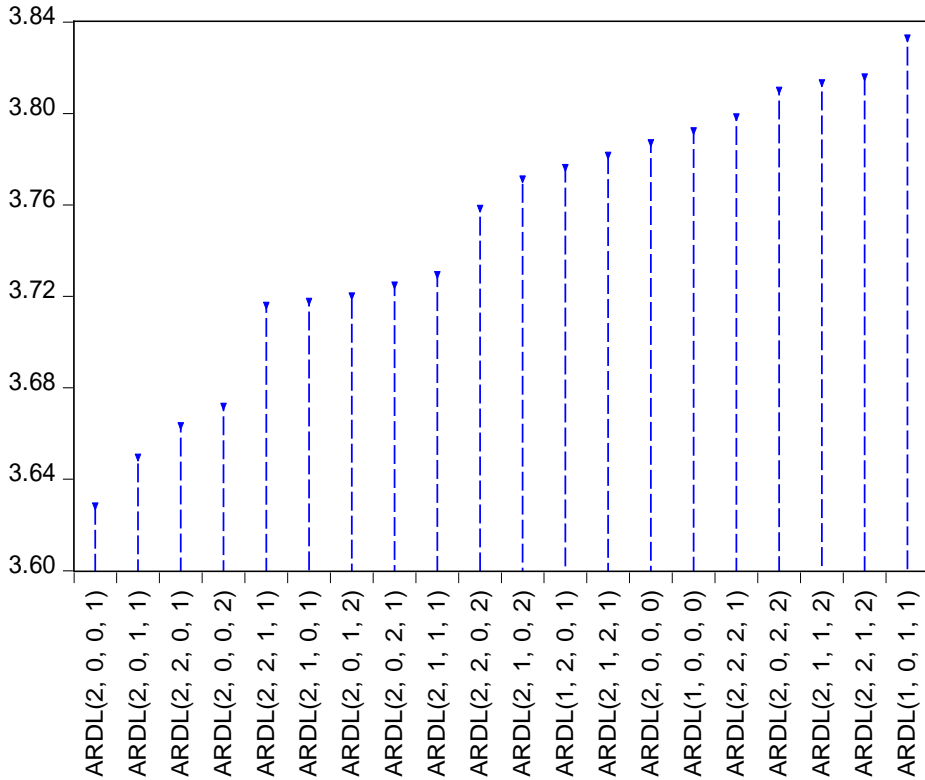
Source: Prepared by researchers using Eviews10 program.

We are to test the maximum lag length determined by utilizing Akaike information criteria (AIC), while figure (02) show that the optimal slowdown or the optimal number of lag length selected is (2,0,0,1), to study the effect of all variables on the inflation rate.

4.3.3 INVESTIGATE COINTEGRATION USING BOUNDS TEST
Table number (02): Bounds test of ARDL model

F-Bounds Test	Null	Hypothesis:	No	levels relationship
Test Statistic	Value	Signif.	I(0)	I(1)

			Asymptotic: n=1000	
F-statistic	9.469196	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66
Actual Sample Size	20		Finite Sample: n=30	
		10%	2.676	3.586
	1%		4.614	5.966

Source: Prepared by researchers using Eviews10 program.

Essentially, we confirm from table (02) is to present bounds test of ARDL model, then the results indicate that the calculated F- statistic value equal (9.469196) was large than the higher and lower limits of bounds critical values at a significant level (1%,5%,2.5%,10%). Therefore, we accepted the short-run and long-run relationship between all variables, so cointegration was found in our study.

4.3.4 LONG-TERM COINTEGRATION TEST AND SHORT-RUN ANALYSIS

Table number (03): Results of estimation long term coefficients of ARDL model

	Levels Equation			
	Case 2: Restricted Constant and No Trend			
Variable	Coefficient	Std. Error	t-Statistic	Prob.
BD	-0.093669	0.019576	-4.784881	0.0004
DPD	0.967876	2.170791	0.445863	0.6630
BMG	-0.040880	0.022257	-1.836772	0.0892
C	4.055740	0.581747	6.971658	0.0000

Source: Prepared by researchers using Eviews10 program

Table number (04): The results of error correction model (ECM) analysis

| | ECM Regression | | | |
| | Case 2: Restricted Constant and No Trend | | | |
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	0.401965	0.148235	2.711670	0.0178
D(BMG)	-0.008631	0.021737	-0.397062	0.6978
CointEq(-1)*	-1.775239	0.225612	-7.868543	0.0000

Source: Prepared by researchers using Eviews10 program.

The main goal of this work is to test the existence or otherwise fiscal theory of the price level and the role of domestic public debt as an element of this theory in Algeria. The results of long run relationship can be written the equation after estimating long run ARDL model as follows:

EC=INF-(-0.0937*BD+0.9679*DPD-0.0409*BMG+4.0557)

Indeed, based on the table (03) and the equation obtained, we have observed a positive and insignificant relationship between domestic public debt (DPD/GDP) and inflation rate. Also, the coefficient (DPD) is positive with a value of 0.9679, and the Prob-value is 0.6630, greater than 10% indicating no existence long-run relationship between (DPD/GDP) and (INF). (DPD/GDP) does not impact (INF) in Algeria, showing the absence of the association between (DPD/GDP) and (INF) in the long run. The higher level (DPD/GDP) does not lead increase in (INF). This result is inconsistent with the view of Thomas Sargent and Neil Wallace in (1981). We conclude that not compatible with the fiscal theory of the price level in terms of domestic public debt. We confirmed that it is not an acceptable weak form of (FTPL) theory in Algeria's economy. However, the negative and significant relationship between budget deficit to GDP and inflation rate, furthermore the coefficient (BD/GDP) is negative equal 0.0937 and the probabilities linked of this coefficient is 0.0004 less than 5%, where one percent rises in (BD/GDP) leads to 0.0937 percent decrease in inflation rate, thereby the existence long run associated between (BD/GDP) and (INF), means that (BD/GDP) has negative influence on inflation rate, this result is in line with study of Michael Woodford in (1995), as well found parameter of budget deficit inversely linked to the general price level, also this result strongly supports strong form of (FTPL), because inflation is fiscal phenomenon and the strong form of (FTPL) it confirm that the path of

inflation rate is subject to influence and behavior of fiscal policy, so non-Ricardian regime in Algeria's economy, further broad money growth has significant and negative association with inflation rate, as well one percent increase in (BMG) lead to 0.0409 decrease in inflation rate, then this result is not suitable with (FTPL) theory, ditto the negative effect of (BMG) on inflation rate was contrary the quantity theory of money and fiscal theory of the price level, as we conclude it supports the price puzzle by Christopher A Sims(1962), similarly the error correction parameter is to measure the adjustment in the long run equilibrium, in table(04) regarding the ECT is significant and negative at the 5% or 1% significant level, it was equal (-1.775239), and the probability value is (0.0000) less than 5%, means that we find the existence long run cointegration , add to implies that disequilibrium short term errors and deviation in long term corrected by 177percent, as the negative result in the sign show that we obtained long term equilibrium in our study.

4.3.5 VALIDITY AND CKECK STABILITY TESTS OF ARDL MODEL

In table (05), we observed all the tests employed (Breuch Godfrey serial correlation, ARCH, Jarque Bera and Ramsey's RESET). Firstly, the Breuch Godfrey LM test is utilized to test the presence or absence autocorrelation problem. The LM test contains two hypotheses. Therefore, the null hypothesis shows that there is no serial correlation. In contrast, the alternative hypothesis refers to the serial correlation. After that the probability value F-statistic (prob, F (1.196317) =0.3388) is greater than 5% significant, since the P-value of LM test is insignificant, we reject an alternative hypothesis. Still, we cannot refuse the null hypothesis, which means that the model has no serial correlation. Secondly, another important test is the autoregressive conditional heteroskedasticity test. In short, it is called the ARCH test. Next ARCH test is employed to ensure that the estimated model does not contain a heteroskedasticity problem of residuals. Furthermore, the probability value validation of the F-statistic (prob, F (1.17) =0.5656) is more than a 5% significant level so that we can admit the validity of the null hypothesis. The absence of a heteroskedasticity problem and the residuals of this study do not suffer from this problem.

Table number (05): Diagnostic tests of the ARDL model after estimation

The type of test used	Method	Test statistic	Probability	Conclusion
Serial correlation.	Breusch Godfrey serial correlation LM test	F-statistic= 1.196317	p-value= 0.3388	No serial correlation.
Heteroskedasticity.	ARCH	F-statistic= 1.17	p-value= 0.5656	There is no problem with Heteroskedasticity.
Normality test.	Jarque Bera	J-B= 0.854547	p-value= 0.652285	Residuals normality distributed.
Regression error specification.	Ramsey's RESET	F-statistic= 0.486565	p-value= 0.4988	There is no problem with misspecification errors and the ARDL model is dependent on linear form.

Source: Prepared by researchers using Eviews10 program

Thirdly, the normal distribution test for residuals checks the estimated model. It contains no problem of absence of the normality distribution of residuals, and we are utilizing Jarque- Bera test. Therefore, the probability value of Jarque- Bera statistic was (prob J-B (0.854547) = 0.652285) more than 5%, so the null hypothesis has been accepted. Likewise, the residuals are normality distributed in the model. Fourthly the regression specification test determined the presence or otherwise linear form for the model used in this study. Also, the null hypothesis was accepted because the probability associated with the REST test was 0.4988, greater than 5%. Hence, we confirmed the (ARDL) model employed is based on linear form and no mis specified functional problem; clearly, the (ARDL) model was good statistically.

4.3.5 (CUSUM) and (CUSUM SQ) test for the structural stability of the ARDL model

Figure number (03): the results of structural stability for ARDL MODEL
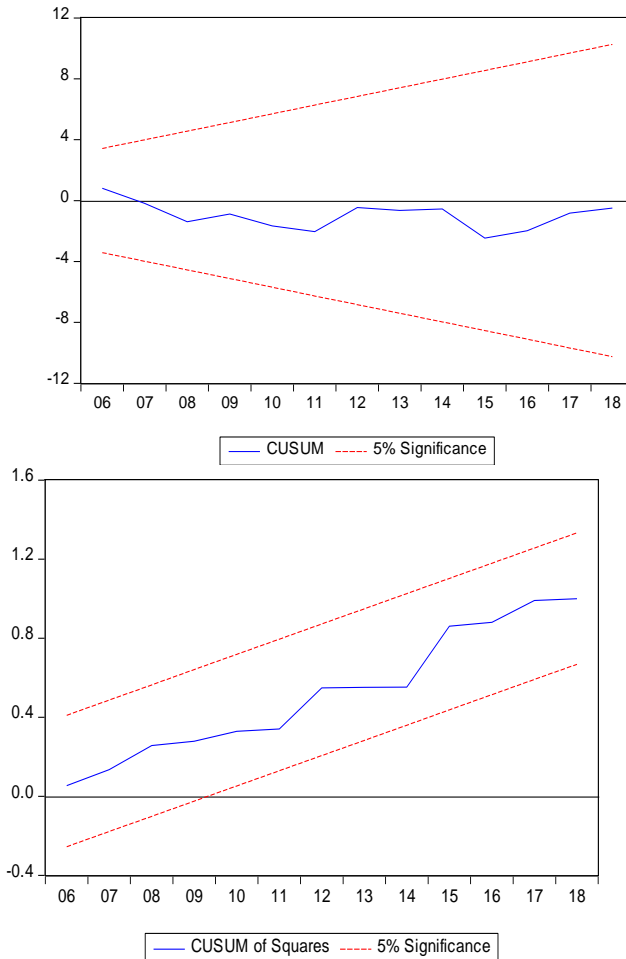
Source: Prepared by researchers using Eviews10 program

Figure (03) regarding two crucial diagnostic tests, namely the cumulative sum of squares and cumulative sum. Later both tests aim to examine coefficients' structural stability in the short term and long term. Undoubtedly, we note that the plots or blue lines of CUSUM and CUSUM SQ graphs fell specifically within the critical limits at 5% significant level.

Subsequently, the coefficients of the (ARDL) model are dynamic and stable, so the (ARDL) model is stable during the study period.

5. CONCLUSION

This study sought to examine the effect of fiscal theory on the price level (FTPL) of domestic public debt. However, we try to study the relationship between inflation rate, budget deficit to GDP, domestic public debt to GDP, and broad money growth. This paper employed the (ARDL) method for the period between (1997-2018) in Algeria. Likewise, the results show no link between inflation rate and domestic public debt to GDP. This suggests that there is no role for domestic public debt in the fiscal theory of the price level because of the absence of a weak form of (FTPL), but existence relationship between inflation rate and budget deficit to GDP. We explain that the existing strong form of (FTPL), so non-Ricardian regime in Algeria, also the negative relationship between inflation rate and broad money growth refers to the price puzzle in Algeria's economy throughout the study.

6. Bibliography

Afolabi, J., & Atolagbe, O. (2018). Munich Personal RePEc Archive Empirical analysis of fiscal dominance and the conduct of monetary policy in Nigeria. American Journal of Humanities and Social Sciences Research, 2(10), 35–42.

Aimola, A. U., & Odhiambo, N. M. (2021a). Public debt and inflation: empirical evidence from Ghana. Development Studies Research, 8(1), 1–13.

Aimola, A. U., & Odhiambo, N. M. (2021b). Public debt and inflation nexus in Nigeria: An ARDL bounds test approach. Cogent Economics and Finance, 9(1), 1921905.

Al-Jafari, M. K., & Altaee, H. H. A. (2019). Determinants of inflation sources in Iraq: An application of autoregressive distributed lag (ARDL) model. Journal of Social Sciences Research, 5(2), 381–388.

Bildirici, M., & Ersin, O. O. (2005). Fiscal Theory of Price Level and Economic Crises: The Case of Turkey. In Journal of Economic & Social Research (Vol. 7, Issue 2).

BILDIRICI, M., & Ersin, O. O. (2007). DOMESTIC DEBT, INFLATION AND ECONOMIC CRISES: A PANEL COINTEGRATION APPLICATION TO EMERGING AND DEVELOPED ECONOMIES. Applied Econometrics and International Development, 7(1).

Cochrane, J. H. (1998). Long- term debt and optimal policy in the fiscal theory of the price level. Econometrica, 69(1), 69–116.

Dobrowolski, K., & Pawłowski, G. (2018). The condition of public finances and its impact on the level of inflation in Poland in 2011-2017, Współczesna Gospodarka, 9(4 (31)), 1–11.

Kryeziu, N., & Durguti, E. (2019). The Impact of Fiscal Deficit on Inflation Rate – Empirical Evidence Case of Eurozone. International Journal of Management Excellence, 12(2), 1814–1819.

Kwon, G., Mcfarlane, L., & Robinson, W. (2006). Public Debt, Money Supply, and Inflation: A Cross-Country Study and Its Application to Jamaica. IMF Staff Papers, 56(3), 476–515.

Leeper, E. M. (1991). Equilibria under "active" and "passive" monetary and fiscal policies. Journal of Monetary Economics, 27(1), 129–147.

Malika, M., & Salim, B. B. (2021). Dutch Disease and Exchange Rate in Algeria: An Empirical Investigation. Amity Journal of Management Research, 5(1), 145–165.

Mezhoud, W., & Achouche, M. (2017). Abstract: Algerian Review of Economic Development, 7, 307–326.

Nastansky, A., & Strohe, H. G. (2015). PUBLIC DEBT, MONEY AND CONSUMER PRICES: A VECTOR ERROR CORRECTION MODEL FOR GERMANY. Econometrics. Ekonometria. Advances in Applied Data Analytics, 1(47), 9–31.

Oyeleke, O. J., & Orisadare, M. A. (2018). Relative Importance of Public Debts and Money Growth on Inflation in Nigeria. International Journal of Economics and Finance, 10(7), 99–107.

Romero, J. P. B., & Marín, K. L. (2017). Inflation and Public Debt. Monetaria, 5(1), 39–94.

Sargent, T., & Wallace, N. (1981). 5. Some Unpleasant monetarist arithmeticme. Federal Reserve Bank of Minneapolis Quarterly Review, 5(3), 1–17.

Saungweme, T., & Odhiambo, N. M. (2021). Public debt and inflation dynamics: Empirical evidence from Zimbabwe. Croatian Review of Economic, Business and Social Statistics, 7(2), 14–30.

Siddiqui, T. A., Iftikhar, K., & Naqvi, Syed, Kamran, A. (2022). The Impact of Public debt on Inflation in Pakistan. Competitive Social Sciences Research Journal, 3(2), 392–402.

Thahara, A. F., & Washima, M. N. F. (2019). THE IMPACT OF PUBLIC DEBT ON INFLATION: A CASE STUDY OF SRI LANKA. International Symposium, November, 1192–1196.

Urquhart, M. D. (2021). Public debt, inflation, and the Fiscal Theory of Price Level in emerging markets: the case of Paraguay. Macroeconomics and Finance in Emerging Market Economies, 00(00), 1–27.

Woodford, M. (1995). Price-level determinacy without control of a monetary aggregate. LicyCarnegie-Rochester Conference Series on Public Policy, 43, 1–46.

Woodford, M. (1996). Control of the Public Debt: A Requirement for Price Stability? NBER Working Paper 5684, 1996.

Woodford, M. (1998). Public debt and the price level. Mimeo, 38, 1–64.