BUDGET DEFICIT AND ITS EFFECTS ON INFLATION RATE (NEW EVIDENCE FROM ARGENTINA) MONETARY VISION

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ABSTRACT

This research explores the mechanism by which the general budget deficit affects the inflation rate in Latin America, taking Argentina as a model for these countries for the period (1990-2020). To re-test a hypothesis that has often been raised in economic literature, that there are direct effects of the budget deficit on the inflation rate, the researchers used the (ARDL) model to support and prove the hypothesis from which it was based in a country that suffers from major monetary and financial problems, describing this model as more consistent with the research data after conducting the unit root test as well as co-integration. As a result, the research came up with results that supported the research hypothesis, as an increase in the budget deficit by (1%) leads to a rise in the inflation rate by (1.35%), which supports the previous studies of this study and which makes the direct effect of the budget deficit on the inflation rate closer to the irrefutable truth.
Keywords: Budget Deficit, Inflation Rate, Argentina.

1. INTRODUCTION

The government's role in economic activity is vital to all developed and developing countries. However, the extent of government intervention in this activity varies from country to country (Al-Asar, 2016, 7). The fiscal imbalance is among the critical macroeconomic problems facing economies worldwide. Hence, the relationship between the budget deficit and macroeconomic variables represents one of the most widely discussed topics among economists and policymakers in developed and developing countries (Hango, 2021, 1).

Theoretically, budget deficits can be a source of inflation, and its effect on inflation depends on how long it lasts and how it is financed. On the one hand, if the government is only running a temporary budget deficit, it may only lead to a temporary increase in the price level but not inflation, no matter how it is financed. On the other hand, if the budget deficit is permanent and is financed through the new cash supply, then inflation occurs (Mishkin, 2004). However, the budget deficit is addressed by issuing government bonds purchased by non-banking entities and holding them until maturity. In that case, the budget deficit does not cause an increase in the money supply and thus does not lead to inflationary pressures (Hoang, 2014, 2).

According to (Muhammad, 2021, 364), it must be noted that the absolute figure of the deficit does not in itself represent a warning, but rather that its ratio to the gross domestic product is the basis that determines its effects since economic life is going through status of recovery and stagnation, which appear through fluctuations in its budget estimates, either intentionally or as an inevitable consequence result of the state's general budget deficit situations, and as the latter has the power and ability to find ways to finance this deficit, whether at the local or state level or by resorting to external parties, which may cause undesirable results in the other side of the economic balances, especially inflation (Mariam, 2019, 1). Reducing inflation rates by addressing the deficit in the state's general budget using pressure on public spending is part of the economic reform program proposed by the International Monetary Fund (Eid, 2012, 216).

The seriousness of the budget deficit in the economy does not depend only on the methods of financing it but also on the aspects of its spending, the nature of the economic structure, and the extent of its influence and impact on macroeconomic variables such as inflation, which is one of the most important leading indicators of the state's control over macroeconomic conditions,

which has been explained and attributed to several factors. Some are monetary, and others are related to an increase in aggregate demand or a decline in aggregate supply, thus causing negative repercussions that cast a shadow on the economic and social levels (Kasmiuri et al., 2020, 156).

After the crisis of the great global depression in the thirties of the twentieth century and the failure of the classical theory to address this crisis, three primary schools of thought emerged related to the issue of the state budget deficit, which are the Keynesian, neoclassical, and the Ricardian school (Shani, 2011, 28). The Keynesian theory claims that the budget deficit should be applied to improve the economic situation as an appropriate policy that enables politicians to increase social welfare. Thus, from the Keynesian perspective, governments deal with the variables of production growth and unemployment, and it also follows a policy that reduces the difference between real unemployment and the natural level of the unemployment rate. Therefore, the Keynesian theory predicts that the budget deficit is negatively associated with unemployment, while the budget deficit is positively associated with the economy's real growth rate. Accordingly, the economic growth rate variable is introduced as changes in the GDP growth to test this theory. The variable coefficient shows that fiscal policies should be used in such a way as to improve the level of economic output (Arjomand et al., 2016, 347).

The neoclassical model believes that the current budget deficit will leave a heavy tax burden for the future, which encourages consumers to increase consumption at present, and then reduces national savings, and interest rates must rise to balance capital markets and shrink investments due to decreased capital accumulation. In light of financing the budget deficit by domestic borrowing, the loanable funds available to the private sector decrease, interest rates increase, and private investment (to expand production) is discouraged. In either case, an increase in budgetary expenditures (or an increase in the budget deficit) will crowd out private investment and distort the efficient allocation of resources since private sectors are supposed to be more productive at generating returns (through competitive pressures), in the commodity market, when the economy is at total capacity and resources are employed (in the long run), any increase in public spending must necessarily lead to a decrease in the same amount of private spending (crowding) and create harmful effects in economic growth. Therefore, it is believed that the neoclassical theory relates to the long-run impact of the budget deficit on the economy, i.e., the neoclassical theory indicates an inverse relationship between the budget deficit and various macroeconomic fundamentals (Dao & Doan, 2013, 4).

On the other hand, the Ricardian equivalence hypothesis, known as the Barro-Ricardo equation, considers that the increase in the budget deficit, regardless of the financing method, does not affect the aggregate level of demand in the economy. Then there is a neutral relationship between the budget deficit and macroeconomic fundamentals. The theory asserts that the deficit resulting from an overall tax cut today, followed by an increase in total taxation in the future, will be fully offset by increased private savings as taxpayers realize that the tax has only been deferred, not abolished. Furthermore, increased private saving means the deficit will not affect national savings, interest rates, exchange rates, future domestic production, or national income. Moreover, the theory argues that governments' use of taxation or debt financing is not essential because when the government borrows rather than imposes taxes to finance public spending, the current generation is "taxed," resulting in higher public debt. However, their heirs must repay that debt (Hango, 2021, 24). Finally, this theory considers that the relationship between these two variables is indifferent since the budget deficit has no effect on macroeconomic variables in the long and short term, as it only postpones tax payments (Zoto & Berisha, 2016, 333).

Argentina went through an imbalance between government revenues and expenditures and regular and high inflation rates from 1960 to 1990. At the same time, the country's economic performance during the fifteen years that witnessed the highest inflation rates was very disappointing: Per capita income in 1990 was the same as in 1960. During the period (1991-2001), Argentina used more than 2% of its output, on average, to service its debt since its primary deficit

was zero, on average. The increase in debt to pay that interest explains most of the rise during the 1990s, leading to the debt crisis in 2001. The debt crisis was financially costly, and the government ended up with a higher level of debt, even considering the agreed settlement in 2005, the first step of the debt renegotiation process.

This debt burden remains today, exacerbated by a significant deterioration in the primary deficit to values similar to those prevailing in times of high inflation and economic misperformance. By the end of 2018, some potential risks of this deterioration in the primary deficit and the debt burden had already been recognized, and their impact became evident. The inflation rate was higher than the government expected, and an influx of dollars doubled the exchange rate in a few weeks, which led to two changes in the central bank's powers in 2018. Meanwhile, the interest rate charged on Argentine bonds rose so dramatically that the government was forced to seek financial assistance from the International Monetary Fund.

The last half century of Argentina's macroeconomic history is notoriously rich in extraordinary events. These events have presented the average Argentine with misery and pain, and we argue that they all seem to be symptoms of the same disease: the government's inability to restrict spending on actual tax revenue. The disease became active again around 2010, and its symptoms worsened dramatically in 2018. The government proposed a treatment supported by the International Monetary Fund, but will this effort be the ultimate cure?

It may be that Argentine society has not learned its lesson, and as with so many other times in the past, the disease will spread, and a new macroeconomic crisis will unravel, repeating the alternating cycle of optimism and frustration (Buera & Nicolini, 2019, 23).

2. LITERATURE REVIEW

(Khieu, 2021) conducted a study to understand the relationship between the budget deficit, money growth, and inflation in Vietnam during high inflation from 1995-2012. One of the study's results was that inflation increased due to positive shocks to money growth and that the budget deficit had no effect on money growth and hence inflation. (Samimi and Jamshidbaygi, 2011) carried out research to show the relationship between the budget deficit and inflation. This study explored the relationship between the budget deficit and inflation in Iran using quarterly data covering 1990-2008. The study's results indicated a significant and positive impact of the budget deficit on monetary variables and, consequently, inflation.

(Solomon and de Wet, 2004) examined the relationship between the deficit and inflation in the Tanzanian economy and established the causal relationship that extends from the budget deficit to the inflation rate using co-integration analysis during the period 1967-2001, where the results showed that economic growth in Tanzania and the budget deficit have a significant effect on inflation, as an increase in the level of economic growth in the country by 10 percent can lead to a permanent reduction in the price level by up to 35 percent.

(Bulawayo, Chibwe, and Seshamani, 2018) examined the relationship between the budget deficit and inflation and whether there is a significant causal relationship between the budget deficit and inflation. This study aimed at demonstrating the role of the budget deficit as a contributor to inflation in Zambia. The test showed that while the deficit has significant short-term effects on inflation, there is no significant long-term relationship. (Al-Azzam, 2005) examined the problem of the deficit in the general budget in Jordan and its chronic impact on many macroeconomic variables, and perhaps the most prominent and clear one is the effect of the deficit on the general level of prices, where the results of the study showed the validity of the effect of each of the internal and external loans that the government resorted to cover the deficit on the inflation rate in Jordan by influencing on the money supply on the one hand. On the other hand, the impact of external loans on the exchange rate of the local currency results from the increase in

repayment installments and interest. Consequently, it led to the depletion of the Central Bank of foreign currencies and its reflection on the prices of imported goods, and then a sharp rise in the prices of imported or manufactured locally, eventually leading to a high inflation rate in Jordan.

(Kadhim and Salih, 2015) They measured the impact of the general budget deficit and money supply on the general level of prices in Iraq during the period (1990-2013). The study's results confirmed the positive and significant effect of each of the general budget deficits and money supply on the general level of prices. Moreover, the study's results indicated a strong positive effect of government spending on the general level of prices.

(Konsowa, 2022) examined the effect of the actual total deficit in the general budget on the overall economic performance of the Egyptian economy using time series data for the period (1992-2019). The study concluded that there is a positive relationship between the actual total deficit of the budget and economic performance indicators, i.e., inflation, real GDP, and unemployment, and this means that a rise in the general budget deficit leads to an increase in inflation. Although it may stimulate output, it leads to an increase in unemployment. This can be justified by the increase in population growth rates at rates that exceed the growth rates of real GDP.

(Muhammadin, Abdel-Hadi, and Abu Al-Ezz, 2016) They conducted a study to assess the effects of monetary and fiscal policies on treating inflationary pressures in the Sudanese economy. First, they analyzed the data related to the study (1989-2013). The study concluded that the dependent variable (inflation) and independent variables (money supply, budget deficit, and exchange rate) are statistically significant. Among the most important results of the study is the existence of a direct relationship between the rate of inflation and the money supply, an inverse relationship between the rate of inflation and the budget deficit, and a direct relationship between the rate of inflation and the exchange rate.

3. METHODOLOGY

The Auto-regressive Distributed Lag Model was used in Argentina from 1990 to 2020. The study used the variables (inflation, budget deficit, total external debt balances, money supply in the broad sense, and official exchange rate).

Table 1. Description of the study variables and data sources

Variable Type	Variable	Indicator	Unit	ID	Source
Dependent Variable	Inflation Rate	Annual prices paid by consumers (CPI)	(%)	Y1	World Bank Database
Independent variables	Public Budget Deficit and Surplus	GDP	(%)	X1	International Monetary Fund
	Total external debt balances	gross national income	(%)	X2	World Bank Database
	Money supply in the broad sense	GDP	(%)	X3	World Bank Database
	The official exchange rate	Local currency per US dollar	Nominal	X4	World Bank Database

Source: World Bank database, International Monetary fund

The variables that will make up the standard study model can be described in the following mathematical formula:

$Y1 = F(X1, X2, X3, X4)$ …… (1)

Where:

Y1 is the dependent variable represented by the inflation rate, expressed as consumers' prices (annual percent).

X1 is the public budget deficit and surplus, a percentage of the gross domestic product.
X2 is the gross external debt, which is expressed as external debt balances as a percentage of gross national income.
X3 is the money supply in the broad sense as a percentage of the gross domestic product.
X4 is the official exchange rate (local currency per US dollar, period end).

3.1 AUTO-REGRESSIVE DISTRIBUTED LAG MODEL

This standard approach was used and implemented by (Pesaran & Shin, 1999) and developed in 2001 by (Pesaran et al., 2001). This model has many characteristics, the most important of which are the following (Canal-Fernandez & Fernandez, 2018, 1-23):

1. The model can be used if the variables are of the same order (that is, they are at the level or first difference) or a combination between the two, but provided that the variables are not integrated of the second degree.

2. When applying the cointegration methodology, the model has better characteristics in the case of small samples compared to the two-stage Engle-Granger methodology (Engle & Granger, 1987) and the Johansen-Juselius methodology (Johansen & Juselius, 1990) in the vector auto-regression model which requires large volume samples.

3. This model enables us to separate or isolate the effects of the long-term from the short-term, as well as determine the rank or complementarity of the relationship between the dependent variable and the independent variables in both terms (Jarallah & Thanoun, 2013, 39).

Accordingly, from the previous and the aforementioned mathematical formula (1), the Auto-regressive Distributed Lag Model will be estimated according to the following standard formula:

$$\boldsymbol{Y1_t = \alpha_0 + \beta_1 Y_{t-1} + \beta_2 X1_{t-1} + \beta_3 X2_{t-1} + \beta_4 X3_{t-1} + \beta_5 X4_{t-1} + \sum_{i=1}^{p} \gamma_1 \Delta X1_{t-i} + \sum_{i=1}^{p} \gamma_2 \Delta X2_{t-i} + \sum_{i=1}^{p} \gamma_3 \Delta X3_{t-i} + \sum_{i=1}^{p} \gamma_4 \Delta X4_{t-i} + \sum_{i=1}^{p} \gamma_5 \Delta Y_{t-i} + \emptyset ECM_{t-i} + \varepsilon_t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where:
Δ are differences for each dependent and independent variable separately, t is the time, α_0 is constant, and p is the number of distributed Lag.
$\beta_1, \beta_2, \beta_3, \beta_4$ are relationship parameters in the long run, that is, they are responsible for the existence of the long-run relationship between the independent variables and the dependent variable.

$\gamma_1, \gamma_2, \gamma_3, \gamma_4$ are relationship parameters in the short run, through which the so-called long-run relationship equation between the dependent variable and the independent variables is reached (i.e., the cointegration equation)

ECM is the error correction coefficient, which must be negative and significant to be there an error correction as well as the possibility of returning to the equilibrium position
ε_t is the random variable or what is known as the random error limit of the model, as it includes all other variables that were not measured and entered into the model and that have an impact on economic performance indicators.

4. RESULTS AND DISCUSSION

4.1 UNIT ROOT TEST OF STUDY VARIABLES

Table 1. Results of unit root test for inflation model variables in Argentina

Unit Root Table: Augmented Dickey-Fuller Test						
At Level						
Variables		Y1	X1	X2	X3	X4
Constant	T-Stat.	-170.7815	-0.4276	-1.9523	-4.6987	5.7652
	Prob.	0.0001	0.8919	0.3052	0.0012	1.0000
	Sign.	***	n.s	n.s	***	n.s
Constant &Trend	T-Stat.	-204.8070	-1.0922	-1.9114	-2.1690	7.2970
	Prob.	0.0000	0.9138	0.6237	0.4887	1.0000
	Sign.	***	n.s	n.s	n.s	n.s
Without Constant &Trend	T-Stat.	-131.4255	0.2757	-0.8401	0.7966	0.6448
	Prob.	0.0000	0.7592	0.3436	0.8795	0.8494
	Sign.	***	n.s	n.s	n.s	n.s
At First Difference						
Variables		d(Y1)	d(X1)	d(X2)	d(X3)	d(X4)
Constant	T-Stat.	-232.3337	-3.4559	-5.0442	-4.6545	9.3689
	Prob.	0.0001	0.0169	0.0003	0.0009	0.0000
	Sign.	***	**	***	***	***
Constant &Trend	T-Stat.	-220.1241	-3.5595	-4.9480	-5.2293	10.3366
	Prob.	0.0000	0.0515	0.0022	0.0011	0.0000
	Sign.	***	*	***	***	***
Without Constant &Trend	T-Stat.	-239.9287	-3.3999	-5.1259	-4.4415	8.9333
	Prob.	0.0000	0.0014	0.0000	0.0001	0.0001
	Sign.	***	***	***	***	***
- (*, **, ***) refer to the level of significance at (1%, 5%, 10%), respectively. - (n.s) refers to non-significance						

Source: prepared by the researcher based on the data of Eviews 12.

Table 1 shows the unit root test for the variables of the first model in Argentina, as it becomes clear that the dependent variable (inflation rate) appeared static at the level. Accordingly, it rejects the null hypothesis and accepts the alternative hypothesis, which states that this variable does not have a unit root, meaning it stays at the level. As for the rest of the variables (all independent), they appeared non-static, which means accepting the null hypothesis, which states that these variables contain a unit root because the calculated (t) values are less than the tabular (t) values, and when taking the first difference of these variables, they become static, which means that the variables are integrated at the level and the first difference. Therefore, this indicates the possibility of applying the (ARDL) model.

4.2 DETERMINE THE OPTIMAL LAG PERIODS

Figure 1 shows the selection of the optimal lag periods for the variables of the inflation model in Argentina, and depending on the (AIC) criterion, the optimal lag periods that rid the model of the problem of autocorrelation between the residuals are (2). Thus, the model that will be selected according to the Auto-regressive distributed lag (ARDL) methodology is (1, 1, 1, 2, 1) and according to the criteria of selecting AIC lag periods, as the length of lag that gives the most negligible value for these criteria is chosen. Figure 1 below shows this according to the selection of the AIC criterion as follows:

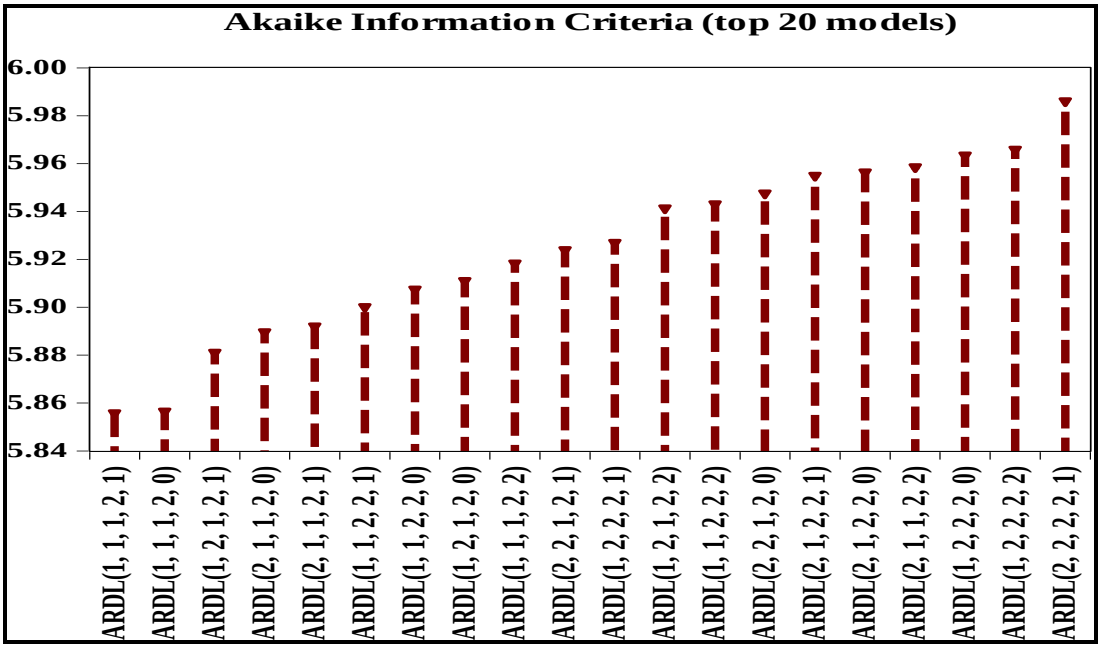


Figure 1. Lag periods according to the AIC criterion method for the inflation model in Argentina
Source: Prepared by the researcher based on the data of Eviews 12

4.3 The Co-integration Test

Table 2 shows the use of the bounds methodology test to detect co-integration between the variables of the first model in Argentina, as it becomes clear to us that the value of the calculated (F) statistic has reached (248.387), which is greater than the value of the tabular (F) statistic at a significant level (5%) at the lower and upper limits. This indicates the rejection of the null hypothesis and the acceptance of the alternative hypothesis, which states the existence of co-integration, a long-term relationship between the inflation rate, and all independent variables.

Table 2. Co-integration test for inflation model variables in Argentina

Test Stat.	Value	Signif.	I(0)	I(1)
F-stat.	248.387	10%	1.9	3.01
K	4	5%	2.26	3.48
		2.5%	2.62	3.9
		1%	3.07	4.44

Source: Prepared by the researcher based on the data of Eviews 12

4.4 Estimation and analysis of long- and short-term results and the error correction parameter

Table 3. Results of estimation of the inflation model in Argentina

Method: ARDL (1, 1, 1, 2, 1)			Dependent Variable: Y1	
Model Selection Method: AIC			Included observation: 29	
Variables	Coeffic.	Std. Error	t-Statis.	Prob.
Long Run Coefficients				
X1	1.348696	0.597910	2.255683	(0.0361)**
X2	-0.142473	0.050345	-2.829932	(0.0107)**
X3	0.582963	0.125654	4.639435	(0.0002)***
X4	1.083836	0.255228	4.246542	(0.0004)***
ECT = Y - (1.3487*X1 – 0.1425*X2 +0.5830*X3 +1.0838*X4)				

Short Run Coefficients				
D(X1)	3.837327	0.383836	9.997296	(0.0000)***
D(X2)	0.041152	0.034177	1.204108	$(0.2433)^{n.s}$
D(X3)	0.113403	0.325153	0.348769	$(0.7311)^{n.s}$
D(X3(-1))	-1.063582	0.323184	-3.290948	(0.0038)***
D(X4)	0.287695	0.102492	2.807006	(0.0113)**
ECM (-1)	-0.852787	0.021994	-38.77365	(0.0000)***
R^2	0.87	Adjusted R^2		0.84
- (*, **, ***) refer to the level of significance at (1%, 5%, 10%), respectively. - (n.s) refers to non-significance				

Source: Prepared by the researcher based on the data of Eviews 12

Table 3 shows the estimation results in the long and short term and the error correction parameter, as follows:

1. The results of the relationship in the long term

- The results indicate that there is a positive and significant relationship between the general budget deficit and its surplus as a percentage of GDP and the inflation rate, with a significant level of less than 5%, meaning that an increase in the general budget deficit by (1%) will lead to an increase in inflation rates by (1.349%), and this is consistent with the monetarists' point of view, who believe that the budget deficit is inflationary because it causes growth in the money supply in the economy, and supports the views of studies that believe that the increase in the budget deficit raises the rate of inflation.
- There is an inverse and significant relationship between the external debt balances as a percentage of the gross national income and the inflation rate with a significant level of less than 5%, meaning that an increase in external debt balances by (1%) will lead to a decrease in inflation rates by (-0.1425%), as the loans are directed towards investment fields expand the production base and increase the total commodity supply, and this reduces inflation.
- The results also show that there is a positive and significant relationship between the money supply in its broad sense (M2) as a percentage of GDP and the inflation rate with a significant level of less than 1%, meaning that an increase in the money supply in its broad sense by (1%) will lead to an increase in inflation rates by (0.5830%), and this is consistent with the point of Friedman view, who believes that inflation is a monetary phenomenon at all times and places.
- The results also indicate that there is a positive and significant relationship between the exchange rate and the inflation rate with a significant level of less than 1%, meaning that an increase in exchange rates by (1%) will lead to an increase in inflation rates by (1.0838%). An increase in the nominal exchange rate lowers the real exchange rate and raises inflation.

2. The results of the relationship in the short term

- The value of the random error correction coefficient (ECM) appeared negative and significant. It reached (-0.852787) with a significant level of less than 1%. This value confirms the validity of the long-term equilibrium relationship; that is, the imbalance of the inflation model in Argentina requires a year and two months to return to the equilibrium situation $\left\{\frac{1}{0.852787} = 1.17 \cong 1.2\right\}$
- The value of R2 was (87%), meaning that the changes that occur in the first model in Argentina are explained by the independent variables included in the model, and the remaining (13%) are explained by other variables outside the model or may be due to the random variable.

4.5 POST-TESTING OF THE MODEL
4.5.1 MODEL QUALITY TESTS
4.5.1.1 TEST OF NORMAL DISTRIBUTION OF RANDOM ERRORS

Figure 2 below shows that the value of the (Jarque-Bera) test was (0.1248) with a significant level greater than (5%). Therefore, we accept the null hypothesis, which indicates that random errors are normally distributed in the first estimated model.

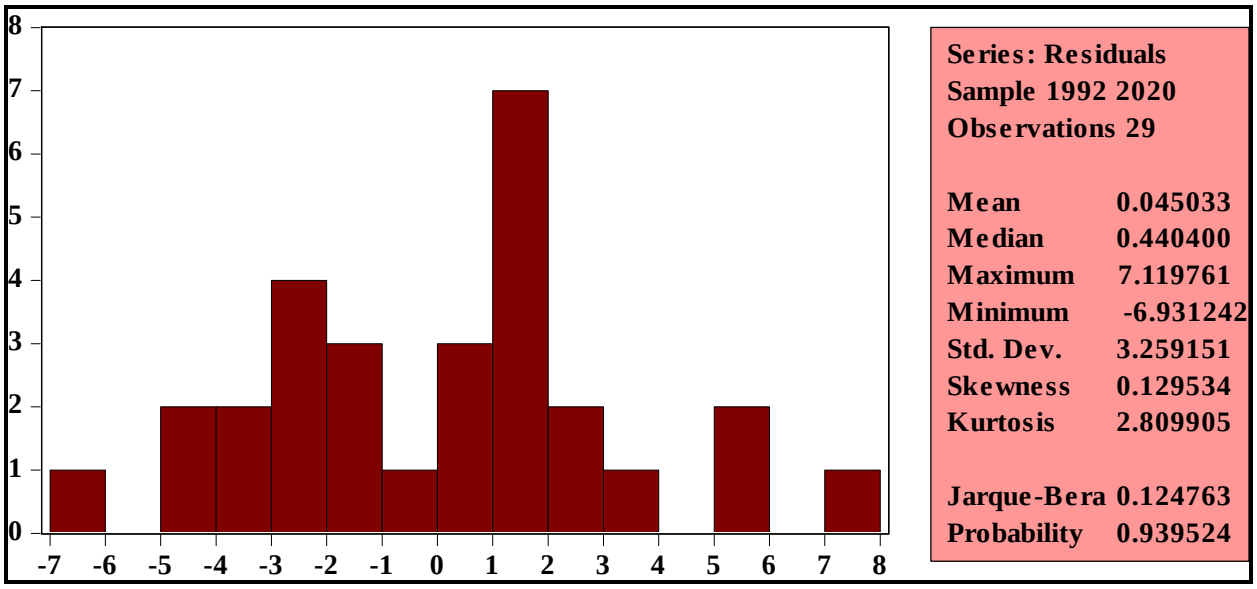


Figure 2. Test of normal distribution for random errors for inflation model in Argentina.
Source: Prepared by the researcher based on the data of Eviews 12

4.5.1.2 TEST OF AUTOCORRELATION PROBLEM BETWEEN RESIDUALS

Table 4 below shows that the value of the (Breusch-Godfrey) test was (0.687) with a significant level greater than (5%). Accordingly, we accept the null hypothesis, which indicates that the estimated model is free from the problem of autocorrelation between the residuals.

Table 4. Test of autocorrelation problem between residuals for inflation model in Argentina

Serial Correlation LM Test: Breusch-Godfrey			
F-stat.	0.6874	Prob. F (2,17)	$(0.5163)^{n.s}$
Obs.*R^2	2.1698	Prob. Chi-Square (2)	0.3241
- (n.s) refers to non-significance			

Source: Prepared by the researcher based on the data of Eviews 12

4.5.1.3 TEST OF CONTRAST INSTABILITY PROBLEM

Table 5 below shows that the (Breusch-Pagan-Godfrey) test had a value of (0.9725) with a significant level greater than (5%). Therefore, we accept the null hypothesis, which indicates that the estimated model has variance stability.

Table 5. Test of contrast instability problem for inflation model in Argentina

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-stat.	0.9725	Prob. F (10,18)	$(0.4981)^{n.s}$
Obs.*R^2	10.1723	Prob. Chi-Square (10)	0.4255

(n.s) refers to non-significance.

Source: Prepared by the researcher based on the data of Eviews 12

4.5.1.4 TEST OF MULTICOLLINEARITY BETWEEN INDEPENDENT VARIABLES

Table 6 shows the variance inflation factor (VIF) test to detect the problem of multicollinearity between the independent variables, as it is noted that all central inflation factors were less than (10), which means that the estimated model is free from the problem of multicollinearity between its independent variables.

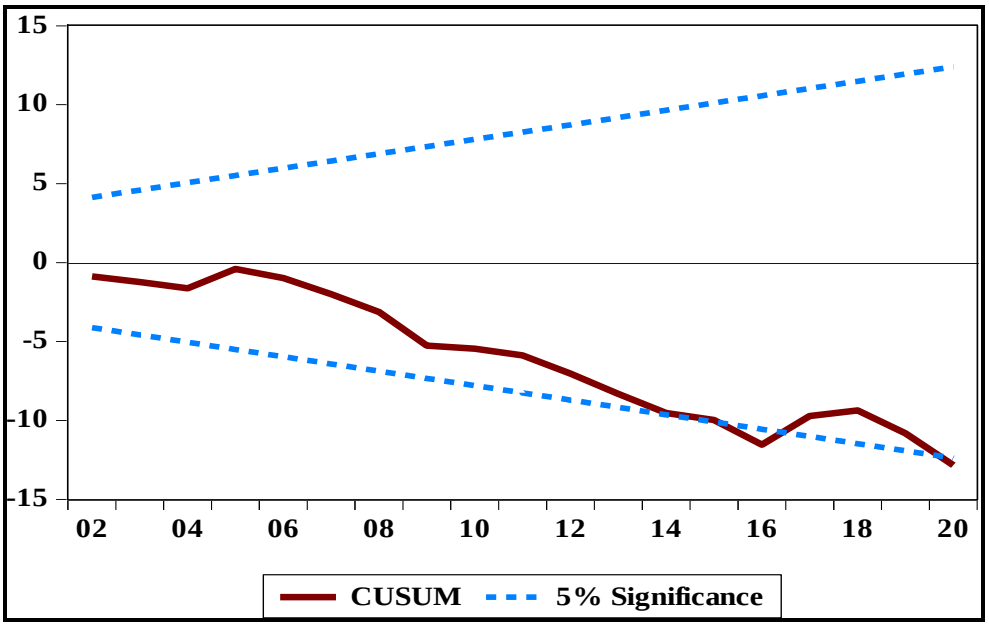
Table 6. Test of multicollinearity between independent variables for estimated inflation model in Argentina

Variance Inflation Factors (VIF)			
Variable	Coefficient Variance	Un centered VIF	Centered VIF
Y1(-1)	8.71E-06	2.028602	1.930349
X1	0.516647	10.52373	6.586996
X1(-1)	0.434652	6.416858	4.003076
X2	0.002663	12.62992	3.403538
X2(-1)	0.003738	17.35317	4.743430
X3	0.092215	81.18374	2.598893
X4	0.005502	3.111803	2.427962
C	45.49592	58.97371	NA

Source: prepared by the researcher based on the data of Eviews 12

4.5.2 TEST OF ESTIMATED MODEL STABILITY

Figure 3 below shows that the graph line to test the cumulative sum of the recurring residuals had existed during the period (2015-2016) the critical minimum, and then both limits did not cross. As for the graph line to test the cumulative sum of squares of the recurring residuals for the period (1990-2020), it fell within the critical limits (lower and upper limit) and did not exceed them at a significant level (5%). Accordingly, we infer from this test that the estimated model has stability and harmony between the long and short-term results.



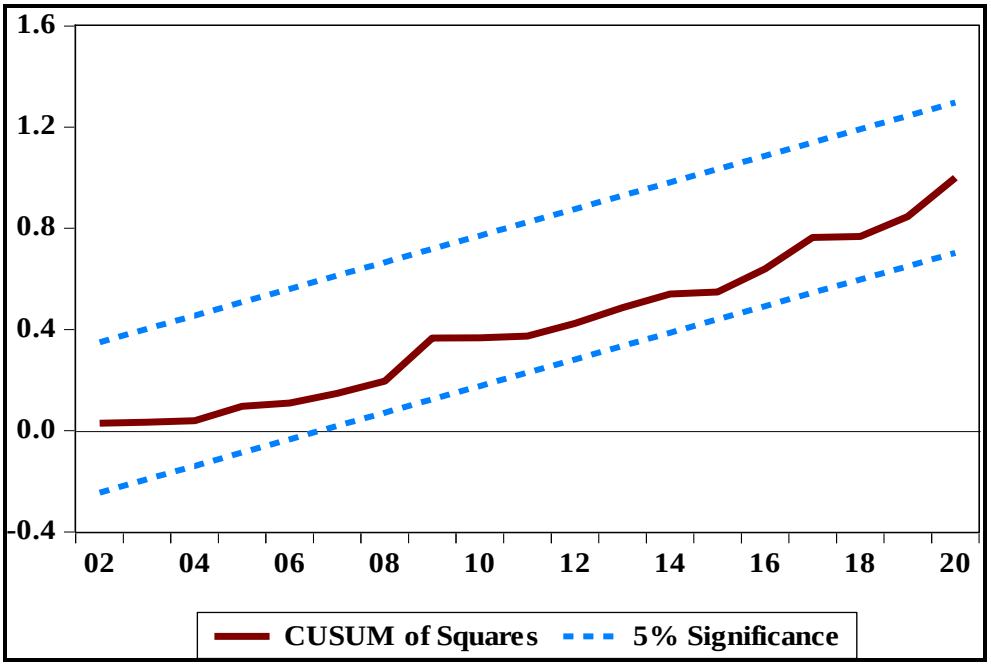


Figure 3. Structural stability test (CUSUM and CUSUM of Squares) for inflation model in Argentina
Source: Prepared by the researcher based on the data of Eviews 12

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

1. There was a positive and significant effect of the general budget deficit and surplus on the inflation rate in Argentina. This means that Argentina did not direct public expenditures towards investment fields to increase its domestic production, which led to an increase in aggregate demand over aggregate supply and, thus, an increase in inflation rates.
2. There was a long-term inverse effect of the external debt balances variable on the inflation rate in Argentina. This means that Argentina should have exploited these debts to serve the productive process but directed them toward consumption expenditures, which led to an increase in inflation.
3. The impact of the money supply in its broad sense (M2) on the inflation rate was positive and significant in the long term in Argentina. This means the inability of Argentina to increase its domestic production to meet the increase in the money supply, which led to a rise in inflation rates, in addition to weak monetary policy in Argentina to face inflation in the long term.
4. The relationship was positive and significant in the long term between the exchange rate and the inflation rate in Argentina, as an increase in the nominal exchange rate means a decrease in the real exchange rate, and this encourages the economy to compete and thus increase inflation rates.

5.2 RECOMMENDATIONS:

Finally, the results of the research call on economic decision-makers to put an end to the increase in public expenditures (rationalization of consumer spending) and focus on decisions that support investment on the one hand and maximize general revenues on the other hand, as well as search for projects that raise the marginal product of each monetary unit borrowed from the outside. This will put the Argentine economy on the right track and get it out of the bottleneck and keep inflation within its acceptable limits.

REFERENCES

[1] Al-Asar, K. (2016). Economics of Public Finance, Faculty of Economics and Political Science, Cairo University

[2] Al-Azzam, Farouk Ahmed, (2005). The Effect of Means of Financing the General Budget Deficit on Inflation in Jordan, *Al-Balqa Journal for Research and Studies*, 11(1):83-119.
[3] Arjomand M., Emami K., & Salimi F., (2016). Growth and Productivity; the role of budget deficit in the MENA selected countries, 1st International Conference on Applied Economics and Business, ICAEB 2015, Procedia Economics and Finance, 36(2016):345 – 352.
[4] Buera, F. & Nicolini, J. P., (2019). The Monetary and Fiscal History of Argentina, 1960–2017, Federal Reserve Bank of Minneapolis, 90 Hennepin Avenue, Minneapolis, MN 55480-0291. https://www.minneapolisfed.org/economic-research/
[5] Bulawayo, M., Chibwe, F., & Seshamani, V. (2018). The Impact of Budget Deficits on Inflation in Zambia, *Journal of Economics and Development Studies*, 6(2):13–23, ISSN: 2334–2382 (Print), 2334–2390 (Online), DOI: 10.15640/jeds.v6n2a3, URL: https://doi.org/10.15640/jeds.v6n2a3
[6] Canal-Fernandez, V. & Fernandez J.T, (2018). The long-run impact of foreign direct investment, export, imports, and GDP: evidence for Spain from an ARDL approach, *European Historical Economics Society*, No. 128.
[7] Dao Th. B., & Doan H. H., (2013). The relationship between budget deficit and economic growth in Vietnam, *SSRN Electronic Journal*. Hanoi University, January 2013, DOI: 10.2139/ssrn.2514134.
[8] Eid, S. A., (2012). An econometric study of the relationship between the deficit in the general budget, money supply, and inflation in the Algerian economy during the period 1980-2010, *Journal of Studies*, Economic Issue of the University of Al-Aghouat – Juan.
[9] HANGO, A. L., (2021). Analyzing the Effect of Budget Deficit Dynamics on Macroeconomic Variables in Namibia, Master of Science in Economics, University of Namibia.
[10] Hoang, K. V., (2014). The budget deficit, money growth, and inflation: Empirical evidence from Vietnam, *National Graduate Institute for Policy Studies*, Banking Academy, Vietnam, Online at https://mpra.ub.uni-muenchen.de/54488/
[11] International Monetary Fund, (2023). World Economic Outlook Database, Washington, D.C., USA.
[12] Jarallah, R. O. & Thanoun, M. A., (2013). Measuring the impact of financial development on economic growth in a sample of developing countries using the autoregressive model of distributed lag ARDL for the period (1960-2010), *Tanmiat Al-Rafidain Journal*, 35(114), University of Mosul, College of Administration and Economics, Mosul, Iraq.
[13] Kadhim, A. S. H. & Salih, A. W. A., (2015). The effect of the general budget deficit and money supply on the general level of prices in Iraq for the period (1990-2013), *Iraqi Journal of Economic Sciences*, issue 46: 62-84.
[14] Kasmiuri, K., Hadia, B. K., & Nariman, A. Sh., (2020). The reality of the relationship between inflation and the general budget deficit in Algeria - an econometric analytical study during the period (2000-2016), *Journal of Banking Financial Economics and Business Administration*, 9(2):155-176.
[15] Khieu, H. V., (2021). Budget deficits, money growth, and inflation: empirical evidence from Vietnam, Fulbright Review of Economics and Policy, 1(1): 61–78, Emerald Publishing Limited, e-ISSN: 2635–0181, p-ISSN: 2635–0173, https://www.emerald.com/insight/2635-0173.htm
[16] Konsowa, M. M. M., (2022). The Impact of the General Budget Deficit on Economic Performance in Egypt, *Journal of Commerce and Finance*, First Issue, Faculty of Commerce, Tanta University.
[17] Mariam, B. (2019). The Impact of the Budget Deficit on Inflation (The Case of Algeria - Analytical Study - for the Period 2001/2018), Master Thesis, Mohamed Boudiaf University - M'sila, Faculty of Economic, Commercial and Management Sciences, Department of Economic Sciences
[18] Muhammad, M. G. M., (2021). The reciprocal relationship between the Egyptian general budget deficit and the inflation rate, *Scientific Journal of Economics and Trade*, Faculty of Commerce, Sohag University.

[19] Muhammadin, A. H. J., Abdel-Hadi, H. A., & Abu Al-Ezz, N. A., (2016). The Impact of Monetary and Fiscal Policy on the Inflation Rate in Sudan, an Econometric Study for the Period (1989-2013), *Journal of Economic Sciences*, 17(2):145-156, Sudanese Central Bureau of Statistics, Cairo University, Institute of African Research and Studies. http://scientific-journal.sustech.edu/

[20] Samimi, A. J., & Jamshidbaygi, S., (2011). Budget Deficit and Inflation: A Sensitivity Analysis to Inflation and Money Supply in Iran, *Middle-East Journal of Scientific Research* 8 (1): 257-260, ISSN 1990-9233.

[21] Shani, S. K., (2011). Analysis of the Relationship between the General Budget and Gross Domestic Product in Iraq for 1988-2009, Master Thesis, Karbala University, College of Administration and Economics.

[22] Solomon, M., & de Wet, W. A., (2004). The Effect of a Budget Deficit on Inflation: The Case of Tanzania, *South Africa Journal of Economic and Management (SAJEMS)* NS, 7(1):100-116.

[23] World Bank, 2023, Data and Statistics, World Development Indicators, Washington, USA

[24] Zoto, O. & Berisha, M. (2016). Budget Deficit and Economic Growth in Albania, *International Journal of Engineering Sciences & Research Technology*, 5(9):330-340, http://www.ijesrt.com

Appendix

Annual data for study variables in Argentina for the period (1990-2020)

Years	Inflation, prices paid by consumers (% annually)	GDP growth (% annually)	Public budget deficit and surplus, as a percentage of GDP	External Debt Balances (% of Gross National Income)	Money Supply in the broad sense (% of GDP)	Exchange rates, local currency per US dollar, period end
Years	Y1	Y2	X1	X2	X3	X4
1990	2313.96	-2.467	-0.776	46.228	11.481	0.56
1991	171.67	9.133	-1.238	35.719	10.557	1
1992	24.9	7.937	-1.6	30.555	13.691	0.99
1993	10.61	8.207	-0.024	27.672	19.219	1
1994	4.18	5.836	-1.25	29.595	20.77	1
1995	3.38	-2.845	-2.075	38.985	20.141	1
1996	0.16	5.527	-2.811	41.683	22.69	1
1997	0.53	8.111	-1.838	44.743	26.47	1
1998	0.9	3.85	-1.827	48.537	28.651	1
1999	-1.2	-3.385	-3.705	55.029	31.444	1
2000	-0.9	-0.789	-3.417	54.242	31.849	1
2001	-1.1	-4.409	-5.364	58.493	27.139	1
2002	25.9	-10.894	-1.91	159.89	27.927	3.32
2003	13.4	8.837	1.5	133.475	30.104	2.91
2004	4.4	9.03	3.967	114.784	28.326	2.96
2005	9.6	8.852	3.341	74.247	28.663	3.01
2006	10.9	8.047	1.65	52.893	28.05	3.04
2007	8.8	9.008	0.757	43.159	27.864	3.13
2008	8.6	4.057	0.352	36.807	23.494	3.43
2009	6.3	-5.919	-1.83	41.436	25.323	3.78
2010	10.5	10.125	-1.393	30.958	25.313	3.96

2011	9.8	6.004	-2.746	27.74	24.329	4.28
2012	10	-1.026	-3.018	26.282	27.095	4.9
2013	10.6	2.405	-3.254	27.878	27.127	6.5
2014	9.44	-2.513	-4.252	29.88	25.753	8.51
2015	10.068	2.731	-6.001	30.366	27.641	13.1
2016	9.982	-2.08	-6.655	33.308	28.314	15.9
2017	25.7	2.819	-6.693	36.018	28.429	18.6
2018	34.3	-2.617	-5.517	54.89	27.453	37.6
2019	53.5	-2.026	-4.468	64.908	27.518	59.79
2020	42	-9.895	-11.417	66.939	27.871	84.05

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