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Determinants of the Fiscal Deficit in Peru, 2008–2023

Determinantes del déficit fiscal en el Perú, 2008–2023

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Abstract

One of the challenges facing the Peruvian economy is the growing fiscal deficit, which jeopardizes macroeconomic stability and limits the government's ability to implement sustainable fiscal policies. The objective was to analyze the macroeconomic determinants of the fiscal deficit in Peru during the 2008–2023 period. A quantitative approach with a non-experimental design and a descriptive-correlational scope was employed; the Distributed Lags Autoregressive Model was applied. The results showed that current revenues and economic growth exhibited an upward trend, while current expenditures and the real exchange rate maintained an upward trajectory, and the real interest rate was unstable; furthermore, current revenue and economic growth have an inverse relationship with the fiscal deficit, while current expenditure, the real exchange rate, and the real interest rate have a direct relationship; specifically, a 1% increase in current revenue reduces the deficit by 1.016%, and a 1% increase in Gross Domestic Product (GDP) reduces it by 2.1532%; in contrast, a 1% increase in current expenditure raises the deficit by 3.328%; and a depreciation of the real exchange rate increases it by 2.077%. In conclusion, current revenue, current expenditure, and economic growth had an effect on the fiscal deficit, while the real interest rate did not have a significant effect.

Keywords: Current income, economic growth, fiscal deficit, public spending, real exchange rate.

Resumen

Uno de los desafíos que enfrenta la economía peruana es el incremento del déficit fiscal, el cual compromete la estabilidad macroeconómica y limita la capacidad del Estado para aplicar políticas fiscales sostenibles. El objetivo fue analizar los determinantes macroeconómicos del déficit fiscal en el Perú durante el periodo 2008–2023. Se empleó un enfoque cuantitativo de diseño no experimental y alcance descriptivo-correlacional; se aplicó el Modelo Autorregresivo de Rezagos Distribuidos. Los resultados mostraron que los ingresos corrientes y el crecimiento económico presentaron una tendencia creciente, mientras que el gasto corriente y el tipo de cambio real mantuvieron una trayectoria ascendente, y la tasa de interés real fue inestable; asimismo, los ingresos corrientes y el crecimiento económico tienen una relación inversa con el déficit fiscal, mientras que el gasto corriente, tipo de cambio real y tasa de interés real presentan una relación directa; específicamente, un aumento del 1% en el ingreso corriente reduce el déficit en 1,016% y un incremento del 1% en el Producto Bruto Interno (PBI) lo disminuye en 2,1532%; en contraste, un aumento del 1% en el gasto corriente eleva el déficit en 3,328%; y una depreciación del tipo de cambio real lo incrementa en 2,077%. Concluyendo, que, el ingreso corriente, gasto corriente, crecimiento económico y tipo de cambio real mostraron un efecto en el déficit fiscal y tasa de interés real no mostró un efecto significativo.

Palabras clave: Crecimiento económico, déficit fiscal, gasto público, ingreso corriente, tipo de cambio real.

1. Introduction

The fiscal deficit has become one of the central issues in the contemporary economy, not only because it reflects the government's financial imbalances, but also because it affects the sustainability of economic growth and investor confidence (Marshall and Schmidt-Hebbel, 1989). This phenomenon is particularly pronounced in developing countries, where external vulnerability and institutional weaknesses amplify the effects of fiscal imbalances (Larrain and Sachs, 2004). In the case of Peru, public finances have been marked by periods of stability and episodes of deterioration, linked to falling tax revenues, expanding public spending, and volatility in international commodity prices (BCRP, 2020).

From a classical perspective, the fiscal deficit is viewed as an undesirable imbalance that shifts costs across generations and distorts economic efficiency (Hyman, 2014). In contrast, Keynesian approaches advocate its use as a countercyclical tool to stimulate demand during recessions (Blanchard et al., 2012; Quevedo, 2005). More recently, debates have focused on long-term fiscal sustainability, emphasizing the need to keep government deficits at levels compatible with the government's financing capacity and macroeconomic stability, thereby avoiding persistent imbalances that could jeopardize economic growth and fiscal solvency (De Gregorio, 2007; Stiglitz and Rosengard, 2017).

In this context, the determinants of the fiscal deficit have been the subject of numerous studies. Current expenditures—comprising wages, transfers, and goods and services—are recognized as one of the main factors putting pressure on fiscal accounts (Ticona, 2021). In turn, tax revenue acts as a counterbalancing factor, in that higher revenues reduce the need for public financing (Bird and Zolt, 2014; Ramirez, 2020). However, fluctuations in economic growth are also crucial, as higher GDP tends to improve the fiscal balance by broadening the tax base (Bohach and Paientko, 2021; Qehaja-Keka et al., 2023).

Other macroeconomic factors also have a significant impact. The real interest rate, by determining the cost of debt service, becomes a direct channel to the deficit (Mohanty and Bhanumurthy, 2021; Molefe and Mah, 2020). Similarly, a depreciation in the real exchange rate increases the external debt burden in local currency, which amplifies fiscal imbalances (Kaur, 2021; Mijangos, 2016). This dynamic has been evident in Peru during periods of high exchange rate volatility, such as in 2009, 2016, and 2021, when external pressures and political instability directly impacted the fiscal deficit (Grandez and Gutierrez, 2023; Huaman and Meza, 2021).

International evidence confirms the heterogeneity of these determinants. International evidence confirms the heterogeneity of the determinants of the fiscal deficit. In South Africa, it was found that variables associated with public debt have a positive relationship with the fiscal deficit, while economic growth exerts a countervailing effect (Kasongo, 2023). In Spain, unemployment increased the municipal deficit, whereas economic growth reduced it (Cifuentes et al., 2022). In Pakistan, GDP and the exchange rate showed a negative relationship with the deficit (Abbas and Waheed, 2021). In India, by contrast, inflation and interest rates were directly associated with fiscal imbalances (Mohanty, 2020; Sharma and Mittal, 2021).

Other studies in Africa and Latin America indicate that prolonged fiscal deficits, when financed through money creation, tend to generate inflationary pressures that erode macroeconomic stability (Ehigiamusoe and Lean, 2019; Eita et al., 2021). Furthermore, it has been shown that persistent fiscal deficits—especially when they reach high levels and persist for extended periods—can have adverse effects on economic activity by increasing public financing needs, reducing fiscal space, and compromising the sustainability of public finances (Abbas and Waheed, 2021; Ehigiamusoe and Lean, 2019).

In Peru, historical data show a combination of internal and external factors. Previous studies conclude that public spending has a positive effect on the deficit, while tax revenue and economic growth have the opposite effect (Ticona, 2021). During the COVID-19 pandemic, the fiscal deficit reached 8.9% of GDP—the highest level since 1990—as a result of falling mining revenues and an

expansion in extraordinary public spending (BCRP, 2020; IPE, 2023). These episodes highlight the importance of analyzing in greater detail the interaction between current revenues, current expenditures, and external macroeconomic variables.

In Latin America, fiscal sustainability also faces significant challenges, as seen in countries experiencing similar pressures on deficits, debt, and macroeconomic balance. In Bolivia, fiscal deterioration has been linked to a high fiscal deficit, a shortage of foreign exchange, and a decline in international reserves, which has increased macroeconomic vulnerability and restricted the scope for economic policy. In Argentina, meanwhile, persistent high inflation, macroeconomic volatility, and pressures to reduce public spending reflect the difficulties in achieving fiscal balance and stabilizing public accounts. These cases demonstrate that fiscal sustainability problems in the region share common factors, such as weak revenue, rigid spending, and external pressures—aspects that are also relevant to the analysis of Peru.

Despite the abundant literature on fiscal deficits, in the case of Peru, there remains limited empirical evidence that jointly analyzes the impact of current revenues, current expenditures, and macroeconomic variables—such as the real exchange rate and the real interest rate—in the period following the international financial crisis and the COVID-19 pandemic. Consequently, there is a need to conduct a more in-depth study of these determinants to better understand their effect on recent fiscal dynamics and, based on this, provide useful evidence for the design of policies aimed at ensuring the sustainability of public finances.

The objective of this study is to analyze the determinants of the fiscal deficit in Peru between 2008 and 2023, specifically evaluating the behavior of current revenue, current spending, economic growth, the real exchange rate, and the real interest rate. This approach is justified because it allows us to understand how these factors interact in a context of external vulnerability and internal shocks, providing empirical evidence for the formulation of fiscal policies aimed at ensuring the sustainability of public finances and reducing the Peruvian economy's exposure to structural imbalances.

2. Methods

Study Location

The study was conducted nationwide in Peru, a country whose economy is characterized by trade liberalization, dependence on raw material exports, and a free-market model that has been in place since the 1990s.

Study Period

The study period spanned from the first quarter of 2008 to the fourth quarter of 2023. Quarterly data were used, yielding 64 observations for each variable. This frequency proved adequate for capturing short-term fluctuations without losing sight of the long-term trends that characterize public finances. Furthermore, the period was selected because it includes events of particular relevance to Peru's fiscal analysis, such as the international financial crisis, the COVID-19 pandemic, and recent periods of political instability, all of which had a significant impact on the evolution of the fiscal deficit and the behavior of the macroeconomic variables under consideration.

Materials

The data sets were obtained from official sources, such as the Central Reserve Bank of Peru (BCRP). EViews 10 software was used for data processing.

Variables Analyzed

The study focused on the fiscal deficit as the dependent variable. Current revenue, current expenditure, economic growth, the real exchange rate, and the real interest rate were considered as explanatory variables. Current revenue and current expenditure were expressed in millions of soles; the real exchange rate was measured using an index with a base year of 2010=100; and the real interest rate

was expressed as a percentage. The data were quarterly and were obtained from the statistical series of the Central Reserve Bank of Peru (BCRP). Economic growth was approximated using real Gross Domestic Product (GDP), measured in millions of 2007 constant soles, and subsequently transformed into natural logarithms for econometric analysis. The fiscal deficit, meanwhile, was calculated based on information reported by the BCRP, using debt in millions of soles as the basis for constructing the time series.

The variables in the study were transformed into natural logarithms, with the exception of the real interest rate, which was kept in its original form because it is already expressed as a percentage. This transformation was applied to current revenue, current expenditure, the fiscal deficit, and real Gross Domestic Product (GDP) in order to stabilize the variance, reduce the asymmetry of the time series, and facilitate the interpretation of the estimated coefficients in terms of elasticity.

Applied statistical testing

The Autoregressive Distributed Lags (ARDL) model was chosen because it allows for the simultaneous analysis of short- and long-term relationships among macroeconomic variables, even when these variables exhibit different orders of integration, provided they are not second-order integrated. This characteristic is particularly well-suited for the present study, given that the time series are quarterly, exhibit nonstationary behavior at the level, and the sample size is relatively small. Unlike other methodologies, such as the VAR model or simple OLS, the ARDL approach offers greater flexibility for capturing lagged dynamics and testing for cointegration using the Bounds Test.

The analysis procedure followed several stages. First, a descriptive exploration was conducted to identify trends and patterns in each variable. Next, unit root tests (ADF and Phillips-Perron) were applied to assess the stationarity of the time series. Subsequently, the Autoregressive Distributed Lags (ARDL) model proposed by Pesaran, Shin, and Smith was employed due to its ability to model both short- and long-run relationships among variables with different orders of integration. The robustness of the model was verified using the Bounds Test for cointegration and an error correction model (ECM) analysis.

3. Results

3.1 Trends in current revenue, current expenditure, economic growth, the real exchange rate, and the real interest rate in relation to the fiscal deficit

3.1.1 Trends in current revenue in relation to the fiscal deficit

Between 2008 and 2023, the Peruvian government's current revenue showed an upward trend, rising from S/ 13,8325 million to S/ 36,669 million in 2023. However, this growth was subject to fluctuations linked to economic performance and changes in tax revenue. During years of strong economic expansion, current revenue posted sustained increases, contributing to a more solid fiscal position. However, during periods of economic slowdown and throughout the COVID-19 pandemic, revenue growth was insufficient to offset rising public spending needs.

For its part, the fiscal balance showed mixed results throughout the period analyzed. In 2008, a surplus equivalent to 2.1% of GDP was recorded, while in 2009 a deficit of 1.0% of GDP was observed as a result of the measures implemented to counteract the effects of the international financial crisis. Subsequently, between 2011 and 2013, fiscal surpluses of 1.8%, 2.2%, and 0.9% of GDP were achieved, respectively, driven by economic growth and increased tax revenue. However, beginning in 2014, a period of persistent fiscal deficits began, rising from -0.3% of GDP in 2014 to -3.0% in 2017. The sharpest deterioration occurred in 2020, when the fiscal deficit reached -8.9% of GDP due to the economic contraction and the extraordinary increase in public spending to address the health emergency. In subsequent years, a partial recovery was observed, with deficits of -2.5%, -1.7%, and -2.8% of GDP in 2021, 2022, and 2023, respectively. Overall, the descriptive evidence suggests that higher levels of current revenue help reduce the fiscal deficit, while periods of lower tax collection or greater spending pressures tend to worsen the fiscal outcome.

3.1.2 *Trends in current expenditures and the fiscal deficit*

Between 2008 and 2023, the Peruvian government's current expenditures increased from S/ 10,972 million to S/ 47,908 million, reflecting an upward trend throughout the study period. Until 2013, this growth was accompanied by a favorable fiscal position, with surpluses of 2.1%, -1.0%, -0.1%, 1.8%, 2.2%, and 0.9% of GDP recorded between 2008 and 2013. However, starting in 2014, the fiscal deficit showed a persistent trend toward deterioration, rising from -0.3% of GDP in 2014 to -3.0% in 2017, coinciding with more dynamic public spending. The largest imbalance was recorded in 2020, when the fiscal deficit reached -8.9% of GDP as a result of the COVID-19 pandemic and the implementation of extraordinary economic support measures, while current expenditures saw significant growth compared to previous years. Between 2021 and 2023, although the fiscal deficit narrowed to -2.5%, -1.7%, and -2.8% of GDP, respectively, current expenditures continued to grow, reflecting the structural rigidity of public spending and the challenges in achieving greater fiscal consolidation. Overall, the descriptive evidence suggests a direct relationship between the growth in current expenditures and the deterioration of the fiscal balance, particularly in contexts of economic slowdown or expansion of public spending (López and Torres, 2021).

3.1.3 *Economic Growth Trends in Relation to the Fiscal Deficit*

Between 2008 and 2023, Peru's Gross Domestic Product (GDP) showed an upward trend, rising from S/ 1,469.6 billion in the first quarter of 2008 to S/ 2,786.9 billion in the fourth quarter of 2023, reflecting sustained economic growth throughout the study period. However, this trend was marked by significant fluctuations, notably the sharp contraction observed in 2020 as a result of the COVID-19 pandemic, when GDP fell from S/ 2,540.8 billion in the fourth quarter of 2019 to S/ 2,009.3 billion in the second quarter of 2020. At the same time, the fiscal balance shifted from surpluses of 2.1%, 1.8%, 2.2%, and 0.9% of GDP in 2008, 2011, 2012, and 2013, respectively, to persistent deficits beginning in 2014. The largest fiscal imbalance was recorded in 2020, when the deficit reached -8.9% of GDP, coinciding with the decline in economic activity and the implementation of extraordinary fiscal support measures. Subsequently, the gradual recovery in output allowed for a partial improvement in fiscal accounts; however, deficits remained at -2.5%, -1.7%, and -2.8% of GDP in 2021, 2022, and 2023, respectively. These results suggest an inverse relationship between economic growth and the fiscal deficit, whereby greater economic activity boosts tax revenue and helps reduce imbalances.

3.1.4 *Real exchange rate behavior in relation to the fiscal deficit*

Between 2008 and 2023, the Multilateral Real Exchange Rate (TCRM) fluctuated significantly, ranging from 90.96 to 116.06 points. During the 2008–2013 period, the indicator generally remained above 96 points, reaching values close to 103 points in some quarters, reflecting relative exchange rate stability amid economic growth and favorable fiscal outcomes, characterized by surpluses in several years of the period. Starting in 2014, the fiscal balance showed a persistent trend toward deficits, while the TCRM experienced episodes of real depreciation and appreciation associated with changes in domestic and external economic conditions. During the COVID-19 pandemic, exchange rate volatility intensified, rising from 97.38 points in the first quarter of 2020 to a high of 116.06 points in the third quarter of 2021. At the same time, the fiscal deficit reached -8.9% of GDP in 2020, the largest imbalance during the period analyzed. Subsequently, although the TCRM gradually returned to levels close to 96 points by 2023, fiscal deficits remained at -2.5%, -1.7%, and -2.8% of GDP between 2021 and 2023, respectively. These results suggest that changes in the real exchange rate can indirectly influence fiscal accounts through their effects on economic activity, foreign trade, and tax revenue (FMI, 2023).

3.1.5 *Trends in the real interest rate relative to the fiscal deficit*

Between 2008 and 2023, the real interest rate followed a downward trend, falling from levels above 3% in 2008 to values close to zero and even negative between 2020 and 2022. In the early years of

the period analyzed, when the real interest rate ranged between 2.08% and 3.60%, Peru recorded relatively favorable fiscal results, including surpluses equivalent to 2.1%, 1.8%, 2.2%, and 0.9% of GDP in 2008, 2011, 2012, and 2013, respectively. However, starting in 2014, persistent fiscal deficits were observed, coinciding with a gradual decline in the real interest rate. During the COVID-19 pandemic, expansionary monetary policy contributed to the real interest rate reaching a low of -3.31% in the second quarter of 2022, while the fiscal deficit hit a historic high of -8.9% of GDP in 2020. Subsequently, the real interest rate recovered, standing at around 3.5% during 2023; however, the fiscal balance remained in negative territory (-2.8% of GDP). Descriptively speaking, the relationship between the two variables does not show a clearly defined pattern, suggesting that the effect of the real interest rate on the fiscal deficit must be assessed through econometric analysis.

3.2 The effect of current revenue, current expenditures, economic growth, the real exchange rate, and the real interest rate on the fiscal deficit

a) Unit Root and Stationarity Test

Table 1 shows that the variables LogDF, LogGC, LogIC, LogTCR, LogPBI, and TIR are not stationary at the level, according to the ADF, PP, and KPSS tests. However, when first differences are applied, all series become stationary, confirming that they are integrated of order one, I(1).

Table 1. Unit root test and stationarity test

Variable	Levels			First Differences			Conclusion
	ADF	PP	KPSS	ADF	PP	KPSS	
LDF	0,93	1,04	0,97	-8,14	-8,13	0,33	I (1)
LGC	-1,55	-2,05	1,01	-4,89	-30,75	0,25	I (1)
LIC	-1,57	-1,30	0,89	-7,82	-10,19	0,15	I (1)
LTCR	-2,80	-2,55	0,20	-5,80	-5,81	0,06	I (1)
LPBI	-1,13	-1,09	0,99	-8,89	-13,73	0,30	I (1)
TIR	-2,02	-2,69	0,58	-6,73	-6,65	0,21	I (1)
95% critical value	-2,91	-2,91	0,46	-2,91	-2,91	0,46	Integral of order

Note: Prepared by the author based on statistics from the BCRP.

b) Determining the Optimal Number of Lag

The selection of the optimal number of lags in the ARDL model showed that, according to most information criteria (LR, FPE, and AIC), lag 4 is the most appropriate, as it minimizes information loss and prediction error. Although the SC criterion suggests lag 1, the consistency of the other indicators supports lag 4 as the best option for capturing the dynamics of the time series.

Table 2. Criterion for the optimal lag in the model

Lag	LogL	LR	FPE	AIC	SC	HQ
0	125,3600	NA	7,05e-10	-4,046100	-3,834825	-3,963627
1	449,7926	571,8814	4,02e-14	-13,82348	-12,34455*	-13,24617
2	513,2582	98,96330	1,65e-14	-14,75452	-12,00794	-13,68236
3	572,6306	80,50490	8,23e-15	-15,54680	-11,53258	-13,97981
4	653,7605	93,50566*	2,17e-15*	-17,07663*	-11,79475	-15,01480*
5	685,5771	30,19883	3,59e-15	-16,93482	-10,38529	-14,37815

Note: Indicates the lag order selected by the criterion. LR: Modified sequential LR test statistic (each test at the 5% level). FPE: Final prediction error. AIC: Akaike information criterion. SC: Schwarz information criterion

c) Estimation of the ARDL model by Pesaran, Shin, and Smith

Table 3 presents an estimation of the ARDL (1, 4, 1, 3, 3, 4) model, in which the fiscal deficit has a lag, current expenditure has four lags, current revenue has one lag, the real exchange rate and

economic growth each have three lags, and the real interest rate has four lags.

Table 3. Pesaran, Shin, and Smith Model: Short-Run Equation

Variables	METHOD USED: ARDL (1, 4, 1, 3, 3, 4)				
	Number of lags				
	0	1	2	3	4
LDF		0,897 [36,19]			
LGC	0,129 [2,80]	0,021 [0,908]	0,022 [0,947]	0,050 [1,886]	0,121 [2,371]
LIC	-0,010 [-0,216]	-0,095 [-2,19]			
LTCR	0,393 [2,413]	-0,566 [-2,60]	0,051 [0,24]	0,336 [1,96]	
LPBI	-0,248 [-2,208]	0,258 [2,373]	0,140 [1,234]	-0,372 [-4,154]	
TIR	-0,006 [-1,442]	0,011 [2,061]	0,005 [1,116]	-0,015 [-3,031]	0,013 [2,064]
Constant	-0,436 [-0,525]				

Note: The values in brackets are the t-statistics

Table 4. Pesaran, Shin, and Smith Model: Long-Run Equation

Estimated normalized coefficients: In long-term equations						
LDF	Constant	LGC	LIC	LTCR	LPBI	TIR
Coefficients	-4,22	3,33	-1,02	2,08	-2,15	0,08
Prob	(0,59)	(0,01)	(0,02)	(0,09)	(0,05)	(0,31)
t-Statistic	[-0,541]	[4,55]	[-3,23]	[1,76]	[-2,02]	[1,03]

Note: Prepared by the author based on BCRP statistics.

The estimated long-term model is as follows:

$$\text{Log}(DF) = -4,228 + 3,328\text{Log}GC - 1,016\text{Log}IC + 2,077\text{Log}TCR - 2,1532\text{Log}PBI + 0,078\text{TIR} + \varepsilon$$

Table 4 showed that, in the long run, current spending (CS) has a positive and statistically significant effect on the fiscal deficit. In economic terms, this means that a 1% increase in CG increases the fiscal deficit by 3.328%, confirming that higher spending—when not accompanied by equivalent increases in revenue—generates greater financing needs and puts upward pressure on the fiscal imbalance. In contrast, current revenue (CR) showed a negative and significant relationship, such that a 1% increase in CR reduces the fiscal deficit by 1.016%. This result indicates that greater tax collection capacity strengthens the government's fiscal position by expanding the resources available to cover public spending and reducing dependence on borrowing.

Similarly, the real exchange rate (RER) showed a direct and significant effect of 10%, implying that a 1% increase in the RER raises the fiscal deficit by 2.077%. This behavior is consistent with currency depreciation, which makes servicing external debt and other foreign-currency-denominated obligations more expensive, thereby increasing fiscal vulnerability. Likewise, GDP exhibited a significant inverse effect, as a 1% increase reduces the fiscal deficit by 2.1532%. This suggests that economic expansion boosts tax revenue, broadens the tax base, and contributes to greater sustainability of public finances. Finally, the real interest rate (TIR) had a positive, though not significant, effect, indicating that while higher rates could increase the cost of debt service, this impact is not statistically conclusive for the period analyzed. Taken together, the results show that the estimated elasticities not only describe statistical relationships but also offer a useful economic interpretation for the analysis and design of fiscal policy.

d) Cointegration Test

The ARDL model's bounds test for cointegration (Table 5) yielded an F-statistic of 12.22653, which is well above the critical values at all significance levels (2.08 at the 10% level, 2.39 at the 5% level, 2.7 at the 2.5% level, and 3.06 at the 1% level). This result confirms the existence of a significant long-run cointegration relationship among the variables analyzed, implying that, despite their non-stationarity in cross-sections, they maintain a common equilibrium over time.

Table 5. F-Bounds Test for Cointegration

Test Statistic	Value	Significance	I (0)	I (1)
Asymptotic: n=1000				
F-statistic k	12,22653	10%	2,08	3
	5	5%	2,39	3,38
		2,50%	2,7	3,73
		1%	3,06	4,15

Note: Null hypothesis: There is no relationship between the levels.

e) Model Validation

The econometric diagnosis of the ARDL model (Table 6) validated its robustness through various statistical tests: the normality of the residuals was confirmed using the Jarque-Bera test ($p=0.5799$), ruling out distribution issues; autocorrelation was not significant according to the Durbin-Watson test (2.26) and the Breusch-Godfrey test ($p=0.8431$); heteroscedasticity was ruled out by the Breusch-Pagan-Godfrey and ARCH tests ($p > 0.4$ in both cases), indicating constant variance in the residuals; and the Ramsey RESET specification test ($p = 0.2547$) showed that the model is correctly specified, with no need to include nonlinear terms.

f) Error Correction Model

The ARDL model demonstrated adequate econometric performance. First, the error correction variable (CointEq(-1)) had a negative and statistically significant coefficient (-0.103082 ; $p = 0.0000$), indicating that approximately 10.3% of short-run imbalances are corrected each quarter. Consequently, the adjustment toward long-run equilibrium is gradual, though stable. Furthermore, the F-Bounds Test ($F = 12.22653$) confirmed the existence of cointegration by exceeding the critical values corresponding to order $I(1)$.

Furthermore, the model demonstrated a good level of fit, reflected in an R^2 of 0.864891 and an adjusted R^2 of 0.818831, suggesting a high explanatory power of the included variables. Additionally, the Durbin-Watson statistic (2.268605) indicated an absence of autocorrelation in the residuals. Taken together, these results demonstrate consistency, robustness, and validity in the estimation of short- and long-term relationships.

4. Discussion

The analysis showed that current spending has a direct and significant relationship with the fiscal deficit. A 1% increase in this component leads to a 3.328% increase in the deficit, confirming that growth in public spending—especially current spending—exerts negative pressure on fiscal sustainability. This result is consistent with the findings of Ticona (2021), who identified that public spending has a positive influence on the fiscal deficit of 0.17%, noting that inflexible spending not backed by sustainable revenues weakens the fiscal position. Similarly, Kasongo (2023) found that in South Africa, increases in debt and spending are linked to a rise in the deficit. In contrast, Ramirez (2020) estimates that non-financial spending had a negative effect (-0.99%) on the deficit, which would suggest an inverse relationship. This apparent difference may be due to how the variables were disaggregated, since this study focuses its analysis on current spending, while Ramirez considers total spending, which dilutes the specific effect of the current component. Furthermore, in the current context, increased public

Table 6. Error Correction Model

Variable	Coefficient	Est. Error	t-statistic	Prob.
D(LGC)	0,128866	0,027104	4,754588	0,0000
D(LGC(-1))	-0,193547	0,045637	-4,240997	0,0001
D(LGC(-2))	-0,171186	0,039041	-4,384755	0,0001
D(LGC(-3))	-0,120879	0,030789	-3,926070	0,0004
D(LIC)	-0,009694	0,036106	-0,268488	0,7898
D(LTCR)	0,392978	0,120008	3,274609	0,0023
D(LTCR(-1))	-0,387530	0,126658	-3,059658	0,0041
D(LTCR(-2))	-0,336472	0,123700	-2,720067	0,0098
D(LPBI)	-0,247798	0,089844	-2,758100	0,0089
D(LPBI(-1))	0,232215	0,078647	2,952611	0,0054
D(LPBI(-2))	0,372282	0,068335	5,447896	0,0000
D(TIR)	-0,005902	0,003217	-1,834496	0,0744
D(TIR(-1))	-0,002825	0,002930	-0,964194	0,3410
D(TIR(-2))	0,002460	0,002863	0,859494	0,3955
D(TIR(-3))	-0,012719	0,003138	-4,053304	0,0002
CointEq(-1)*	-0,103082	0,010355	-9,954862	0,0000

Note: Prepared by the author based on statistics from the BCRP.

spending and the passage of legislation that creates permanent commitments constitute a risk factor for fiscal sustainability in the coming years. If this trend continues without new sources of financing, the fiscal deficit could increase and jeopardize the stability of Peru's public finances.

Second, it was found that current revenue has an inverse relationship with the fiscal deficit: a 1% increase in current revenue reduces the deficit by 1.016%. This result is consistent with the findings of Ramirez (2020), who estimated that current revenue negatively affects the fiscal deficit by 1.0007%, reaffirming that higher tax collection contributes to balancing fiscal accounts. Similarly, Abanikanda et al. (2023) identified a negative effect of per capita income on the deficit in the African context (-0.001%). Taken together, these findings underscore the importance of a fiscal policy aimed at strengthening government revenue as a mechanism for reducing fiscal imbalances. However, this revenue-raising capacity is vulnerable in Peru due to the dependence of public finances on revenues from extractive activities and raw material exports—resources that are highly sensitive to external shocks, volatility in international prices, and the global economic slowdown. Indeed, when export prices fall or external demand declines, corporate profits shrink, the tax base weakens, and the government's current revenues contract, thereby limiting the fiscal capacity to sustain public spending.

With regard to economic growth, a negative relationship with the fiscal deficit was identified: a 1% increase in real GDP reduces the deficit by 2.153%. From a theoretical perspective, this result can be explained by the fact that economic growth expands the tax base, increases formal employment, improves corporate profits, and raises taxable consumption, thereby strengthening tax revenue. In emerging economies such as Peru, output growth also translates into higher current revenues for the government and less pressure on public spending associated with social safety net policies or macroeconomic stabilization. Consequently, growth acts as an automatic stabilizer for public finances. This finding is consistent with Kryeziu and Hoxha (2021), who found a significant decrease in the deficit (-32.7 percentage points) in Eurozone countries in response to increases in GDP. It also aligns with the findings reported by Qehaja-Keka et al. (2023), Kasongo (2023) and Bohach and Paientko (2021) who have emphasized that economic growth, by expanding the tax base and reducing pressures on social spending, tends to improve fiscal outcomes. In the case of Peru, although there have been periods of sustained growth, these have not been sufficient to offset the increase in public spending, which reinforces the need to accompany growth with fiscal consolidation measures.

With regard to the real exchange rate, the study showed a direct relationship: a 1% depreciation of the real exchange rate is associated with a 2.077% increase in the fiscal deficit. From a theoretical perspective, in emerging economies such as Peru, exchange rate depreciation can worsen the fiscal

outcome because it makes servicing foreign-currency-denominated external debt more expensive, raises the cost of government imports, and can generate inflationary pressures that increase the real value of government spending. Furthermore, although a depreciation might boost external competitiveness, its fiscal effects can be adverse when the government has financial obligations denominated in dollars or when the revenue structure does not immediately benefit from an improvement in exports. This finding differs from that of Abbas and Waheed (2021), who identified an inverse relationship (-5.25%) in Pakistan, explained by the positive effect of depreciation on exports and tax revenues. Similarly, Kaur (2021) found a negative impact of -0.556% in India. However, in the case of Peru, depreciation appears to have an adverse effect on the deficit, due to the increased cost of servicing external debt—which is predominantly denominated in dollars—and the inflationary effect that reduces the purchasing power of public spending.

Finally, the real interest rate showed a direct relationship with the fiscal deficit (0.078%), although this effect was not statistically significant. From a theoretical perspective, the interest rate influences the fiscal deficit because it determines the cost of debt service and the terms of access to government financing; therefore, an increase in this variable tends to raise the government's financial burden and reduce its fiscal space. Although the effect estimated in this study was not significant, its direction is consistent with the literature. Mohanty y Bhanumurthy (2021) found that a higher interest rate increases the deficit by 4.21% in India, while Molefe y Mah (2020) estimated an impact of 3.2% in the BRICS countries. The smaller effect observed in the Peruvian case could be explained by the relative stability of the domestic interest rate or by the use of fixed-rate debt, which mitigates the immediate impact of increases in the cost of financing.

5. Conclusions

A descriptive analysis of the behavior of current revenue, current spending, economic growth, the real exchange rate, and the real interest rate in relation to the fiscal deficit during the 2008–2023 period shows that current spending has maintained sustained growth, increasing pressure on public finances, while current revenue has experienced periods of deceleration, affecting the government's financing capacity. Economic growth has fluctuated, influencing tax revenue and, consequently, the fiscal deficit, while the real exchange rate has experienced episodes of volatility that have impacted external competitiveness and borrowing costs. Likewise, the real interest rate has fluctuated significantly, affecting the cost of government financing.

In fact, current revenue and economic growth showed an inverse relationship with the fiscal deficit; that is, as both increase, the deficit tends to decrease. In quantitative terms, a 1% increase in current revenue leads to a 1.016% reduction in the fiscal deficit, while a 1% increase in real GDP reduces the deficit by 2.153% , confirming that these factors act as fiscal stabilizers. On the other hand, current expenditures, the real exchange rate, and the real interest rate showed a direct relationship with the fiscal deficit. In particular, current expenditure had a significant impact, with a 1% increase associated with a 3.328% rise in the deficit; the real exchange rate also showed a direct effect (2.077%), as did the real interest rate (0.078%), although in the latter case the effect was not statistically significant. These findings highlight the need for responsible fiscal policies that seek a balance between revenue and public spending, as well as strategies to mitigate the effects of exchange rate and interest rate volatility on the country's fiscal sustainability.

Author's Contribution

Anahi Sheyla Chura Coaquira: Research, conceptualization, validation, visualization, writing the original draft, revision, and editing.

Julio Jesús Espinoza Calsín: Conceptualization, methodology, visualization, review.

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