

“Fiscal consolidation, public debt, and growth in Jordan: Evidence from public and municipal finance indicators”

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FISCAL CONSOLIDATION, PUBLIC DEBT, AND GROWTH IN JORDAN: EVIDENCE FROM PUBLIC AND MUNICIPAL FINANCE INDICATORS

Abstract

The purpose of this study is to examine whether fiscal balance, revenue mobilization, and real economic growth are associated with annual changes in Jordan's public debt-to-GDP ratio during 2014–2024 and to interpret the implications for public and municipal finance. The study uses annual macro-fiscal data compiled from the IMF Regional Economic Outlook series hosted by FRED, World Bank indicators, the Central Bank of Jordan, and Ministry of Finance reports. It applies descriptive analysis, correlation analysis, and parsimonious ordinary least squares specifications, with all coefficients, p-values, diagnostic tests, and robustness checks interpreted cautiously because the usable regression sample after first differencing is very small. The results show that the public-debt ratio increased from 78.0% of GDP in 2019 to 88.0% in 2020 and remained above 90% during 2021–2024. Revenue excluding grants recovered from 20.1% of GDP in 2020 to 24.1% in 2024, but this recovery did not restore the debt ratio to its pre-pandemic path. In a short annual sample, the baseline regression suggests that fiscal balance is negatively associated with annual debt changes, while real GDP growth has the expected negative sign but weaker statistical significance. These results are indicative rather than causal and should be read together with debt-dynamics theory and Jordan's fiscal policy context. The findings are consistent with a cautious, growth-friendly consolidation approach, interpreted as an indicative policy implication rather than a direct causal estimate, that strengthens revenue administration, protects productive capital expenditure, manages utility-related guarantees, and improves municipal finance transparency.

Keywords

Jordan, fiscal consolidation, public debt dynamics, revenue mobilization and growth, short-sample evidence, public and municipal finance

JEL Classification

H63, H62, H72, C22

INTRODUCTION

Jordan's public finances operate under a demanding policy constraint. The state must finance basic services, social protection, infrastructure, water and electricity obligations, and local development while preserving macroeconomic stability in a small open economy exposed to regional shocks and dependent on external confidence. This makes fiscal consolidation more than a narrow budgetary exercise. It is also a question of how public resources are mobilized, allocated, and protected for development purposes.

The scientific problem is that an improvement in revenues or a return to positive growth does not necessarily translate into a sustained decline in the public debt ratio when deficits, interest costs, guarantees, arrears, and public investment needs remain binding. This problem is particularly important for public and municipal finance because central fiscal stress can reduce the fiscal space available for transfers, capital projects, maintenance, utilities, and local service delivery. In this setting, debt dynamics can become a local development problem even when borrowing decisions are made at the national level.

Jordan's post-pandemic experience illustrates this issue clearly. The economy recovered from the COVID-19 shock and domestic revenues improved, yet the public debt ratio stayed well above its pre-pandemic level. Although Jordan's public debt and fiscal reform agenda have been discussed in policy reports and selected studies, recent annual evidence linking fiscal balance, domestic revenue mobilization, growth, and changes in the debt ratio remains limited. The public and municipal finance implications are also under-examined because national fiscal stress is rarely connected explicitly to the budgetary space available for local services. The central question is therefore not whether consolidation is needed, but what type of consolidation can support debt sustainability without weakening growth, social protection, or municipal-service capacity.

1. LITERATURE REVIEW AND HYPOTHESES

Research on fiscal consolidation, public debt, and growth is especially relevant for small open and fiscally constrained emerging economies. These economies often face narrow tax bases, high import dependence, exposure to regional shocks, and strong reliance on external confidence. Jordan shares these characteristics, making the relationship between fiscal balance, revenue mobilization, growth, and debt dynamics an important public finance question rather than a purely macroeconomic accounting issue.

The growth effects of fiscal policy depend on how consolidation is designed. Productive expenditure can support long-run growth when it finances infrastructure, human capital, and institutional capacity (Barro, 1990; Easterly & Rebelo, 1993). However, expenditure can become less productive when it is poorly targeted, inefficiently implemented, or financed through distortionary instruments (Devarajan et al., 1996; Gupta et al., 2005; Kneller et al., 1999). For Jordan and comparable emerging economies, this means that deficit reduction should be evaluated not only by the size of the adjustment, but also by whether it protects expenditure that supports future growth.

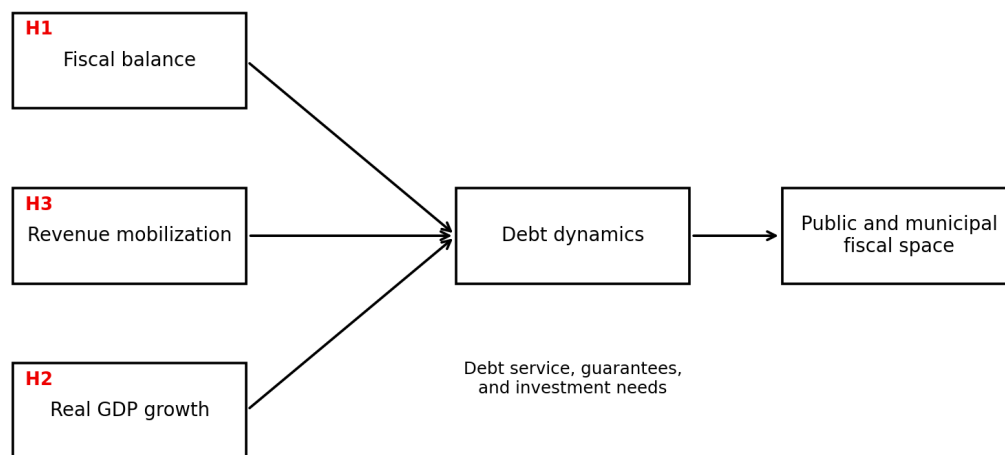
Debt-dynamics theory places the fiscal balance, growth, interest costs, and stock-flow adjustments at the center of sustainability analysis. Escolano (2010) explains that debt ratios respond mechanically to the primary balance and growth, while Bohn (1998) emphasizes the fiscal reaction needed to keep debt sustainable over time. High debt may be manageable under favorable financing conditions (Blanchard, 2019), but it becomes more restrictive when deficits persist, refinancing costs rise, or contingent liabilities materialize. This is particularly relevant to Jordan because

public debt, guaranteed obligations, and utility-related fiscal risks can restrict the fiscal room available for capital spending and service delivery.

The consolidation literature distinguishes between durable adjustment and expenditure compression that weakens recovery. Alesina and Ardagna (2010) and Alesina et al. (2019) argue that the composition of adjustment matters, while Guajardo et al. (2014) caution that austerity can be contractionary when it reduces demand and investment. Fiscal multipliers also differ across openness, financing conditions, exchange-rate regimes, and the state of the business cycle (Hemming et al., 2002; Ilzetzki et al., 2013). For Jordan, these findings point toward credible but growth-friendly consolidation that improves revenue administration, raises spending efficiency, and protects high-return investment.

Domestic revenue mobilization is central to the Jordanian case. Stronger domestic revenue can reduce reliance on borrowing and grants, but revenue gains do not automatically lower debt when interest payments, current spending pressures, arrears, or guarantees absorb additional resources. In emerging and developing economies, compliance, digital tax administration, risk-based audits, and broader tax bases are usually more sustainable than repeated increases in statutory rates. This approach is consistent with Jordan's public financial management reforms and recent IMF program documents (IMF, 2024a, 2024b, 2024c; Ministry of Finance, 2022, 2024a).

Public and municipal finance literature provides the service delivery channel through which national fiscal stress can affect citizens. Fiscal federalism theory argues that local governments may deliver services more effectively when responsibilities, financing, and accountability are aligned (Musgrave, 1959; Oates, 1972; Tiebout, 1956). Yet decentralization



Note: The framework shows the empirical channels tested in the paper and the contextual policy channel connecting national debt dynamics to public and municipal finance. The municipal-finance channel is interpreted conceptually and is not directly estimated with municipal-level data.

Figure 1. Conceptual framework

can weaken service delivery if local governments receive responsibilities without predictable revenues or transparent transfer systems (Bahl & Bird, 2018; Shah, 2006; Ter-Minassian, 1997). In Jordan, this channel is conceptually important because municipal and governorate-level development depends heavily on central budget space, transfers, capital allocations, and the financial position of public utilities (Ministry of Finance, 2017).

Jordan-specific evidence supports the relevance of these channels while leaving room for further analysis. Al-Masaeed and Tsaregorodtsev (2018) and Alkasasbeha et al. (2018) show that fiscal-policy variables are linked to growth outcomes in Jordan, while Tzannatos and Saif (2023) focus directly on the sustainability of Jordan's public debt. Al Hayek (2024) finds that public debt moderates the relationship between government revenues and capital expenditures, implying that debt pressure can prevent revenue gains from translating into investment. Recent World Bank work also emphasizes that taxes, transfers, and public spending affect poverty and inequality in Jordan, so consolidation must be designed with social outcomes in mind (Rodriguez & Wai-Poi, 2024; World Bank, 2021, 2024).

The literature therefore suggests that fiscal balance, growth, and revenue mobilization are jointly relevant for debt dynamics, while municipal finance provides a policy channel rather than a directly tested empirical channel. The gap addressed here is the lack of a

focused recent analysis of how Jordan's annual fiscal balance, domestic revenue, and real growth are associated with changes in the public debt ratio during the post-pandemic period, and how those indicative associations should be interpreted for public and municipal finance.

The purpose of this study is to examine whether fiscal balance, revenue mobilization, and real economic growth are associated with annual changes in Jordan's public debt-to-GDP ratio during 2014–2024 and to interpret the policy implications for public and municipal finance with appropriate caution (Figure 1). The hypotheses are as follows:

- H1: A stronger fiscal balance is associated with a lower annual increase in Jordan's public debt-to-GDP ratio.*
- H2: Higher real GDP growth is associated with a lower annual increase in Jordan's public debt-to-GDP ratio.*
- H3: In an expanded robustness specification, higher revenue excluding grants is associated with a lower annual increase in Jordan's public debt-to-GDP ratio.*

Because the usable regression sample contains only 10 observations, H3 is evaluated solely in a supplementary robustness specification and is excluded from the baseline model to preserve degrees of freedom.

2. METHODS

The empirical design is intentionally parsimonious because the study examines 11 annual macro-fiscal observations for one country over 2014–2024; after first differencing the public debt ratio, the usable regression sample falls to 10 observations.

The study adopts a quantitative and deductive design. It begins from debt-dynamics theory and public finance literature, defines the expected signs of the variables, and then examines the associations using annual observations for Jordan. The unit of analysis is the fiscal year. The study period covers the pre-pandemic years, the COVID-19 shock, and the post-pandemic recovery. The analysis is exploratory: OLS estimates, *p*-values, diagnostic tests, and robustness checks are used to summarize associations rather than to establish causal effects.

The primary data are annual macro-fiscal indicators from internationally comparable and national sources. Table 1 reports the variables, definitions, expected effects, and main source series used for replication. IMF Regional Economic Outlook series hosted by FRED provide the debt, fiscal-balance, and revenue indicators. The World Bank World Development Indicators provide the GDP growth series. The Central Bank of Jordan Annual Report 2024 is used to cross-check the macroeconomic context.

The Ministry of Finance Macro Fiscal Outlook Report, Jordan Debt Quarterly Report Q4 2024, and Public Financial Management Strategy 2022–2025 support the interpretation of debt management, guarantees, and the public financial management framework (Central Bank of Jordan, 2024; IMF, 2024b; FRED, 2026a, 2026b, 2026c; Ministry of Finance, 2022, 2024a, 2024b; World Bank, 2026). Because some recent observations may be preliminary or estimated, 2024 is interpreted with caution. Appendix B summarizes the interpretation cautions arising from differences in statistical coverage and definitions across these indicators.

The empirical procedure has four steps. First, the dataset is transformed into consistent annual percentages of GDP and the annual change in the debt ratio is calculated. Second, descriptive statistics and correlations are used to identify the main fiscal patterns. Third, the baseline regression examines whether fiscal balance and real GDP growth are associated with annual changes in the debt ratio. Fourth, diagnostic and robustness checks examine sensitivity to heteroscedasticity, the COVID-19 shock year, and the inclusion of revenue excluding grants. These checks are small-sample sensitivity exercises, not independent proof of model validity.

$$DDEBT_t = \beta_0 + \beta_1 BAL_t + \beta_2 GROWTH_t + \varepsilon_t. \quad (1)$$

Table 1. Variables and expected effects in the debt-dynamics model

Source: FRED (2026a, 2026b, 2026c) and World Bank (2026).

Variable	Symbol	Operational definition	Expected effect	Source
Public debt	DEBT	Total government debt for general government, % of GDP	Rises with deficits and weak growth	FRED/IMF REO; MoF
Change in debt	DDEBT	Annual first difference of public-debt-to-GDP ratio	Dependent variable	Calculated from DEBT
Fiscal balance	BAL	Central government net lending/borrowing, % of GDP	Negative coefficient expected	FRED/IMF REO
Growth	GROWTH	GDP growth (annual percent)	Negative coefficient expected	World Bank WDI; CBI
Revenue	REV	Total revenue excluding grants for general government, % of GDP	Negative coefficient expected in expanded robustness model	FRED/IMF REO

Note: The empirical indicators are drawn from four public annual series: Total Government Debt for General Government for Jordan (percent of GDP; FRED/IMF REO: JORGGDGDPGDPPT); Central Government Net Lending/borrowing (central government fiscal balance) for Jordan (percent of GDP; FRED/IMF REO: JORGCXCNLGDGPDPPT); Total Revenue, Excluding Grants, for General Government for Jordan (percent of GDP; FRED/IMF REO: JORGGRXGGDPGDPPT); and GDP growth (annual %) for Jordan (World Bank WDI: NY.GDP.MKTP.KD.ZG). FRED hosts the IMF REO series. The debt and revenue series use general-government coverage, whereas the fiscal-balance series uses central-government coverage; this difference is considered when interpreting cross-variable relationships. The growth and fiscal-policy context is cross-checked against the Central Bank of Jordan Annual Report 2024, the Ministry of Finance Macro Fiscal Outlook Report, the Jordan Debt Quarterly Report Q4 2024, and the Public Financial Management Strategy 2022–2025. Negative fiscal-balance values indicate deficits; therefore, a stronger fiscal balance means a movement toward a less negative or positive value.

where DDEBT is the annual change in the public-debt-to-GDP ratio, BAL is the fiscal balance, GROWTH is real GDP growth, and epsilon is the residual term. A negative coefficient on BAL is expected because a one-point improvement in the fiscal balance should reduce the annual debt increase. A negative coefficient on GROWTH is also expected because growth increases the GDP denominator and supports revenues. Revenue excluding grants is added only in an expanded robustness specification because the short sample does not support a heavily parameterized baseline model. All coefficient magnitudes and *p*-values are interpreted as indicative short-sample evidence rather than causal estimates.

The dataset used here is newly compiled for this analysis from public sources and has not been re-used previously. The full annual replication dataset is reproduced in Appendix A and is submitted with the manuscript as a supplementary spreadsheet. Because the empirical dataset consists of a short annual country series rather than a large micro-level dataset, Appendix A reports every transformed observation used in the calculations. This ensures immediate reproducibility while making clear that the empirical evidence is constrained by the small number of observations.

3. RESULTS

Jordan's 2014–2024 fiscal profile reveals three broad patterns: the public-debt ratio rose sharply during the COVID-19 shock and remained elevated; revenue excluding grants recovered after 2020; and real GDP growth resumed but remained moderate. The analysis that follows first documents these patterns and then examines their indicative associations with annual debt changes. Because first differencing leaves only 10 regression observations, the coefficients, significance levels,

diagnostics, and robustness checks are interpreted throughout as small-sample associations rather than causal effects.

Table 2 reports the annual data profile, Figure 2 visualizes the main public-finance indicators, Tables 3–5 summarize descriptive statistics, distribution diagnostics, and correlations, Figure 3 illustrates the growth-debt-change association, and Tables 6–9 report the baseline regression, diagnostics, robustness checks, and indicative association summary.

Table 2. Jordanian macro-fiscal indicators, 2014–2024

Year	Revenue	Balance	Debt	Growth	DDEBT
2014	22.38	–8.48	75.01	3.38	
2015	21.07	–8.39	78.42	2.50	3.41
2016	21.80	–3.66	77.43	1.99	–0.99
2017	22.73	–3.57	75.66	2.47	–1.77
2018	22.55	–4.61	74.30	1.92	–1.35
2019	21.80	–5.83	78.02	1.75	3.71
2020	20.10	–9.07	87.95	–1.10	9.93
2021	22.28	–7.46	93.30	3.66	5.35
2022	23.38	–6.95	93.03	2.65	–0.27
2023	23.27	–7.21	92.81	2.88	–0.22
2024	24.09	–7.55	91.65	2.49	–1.16

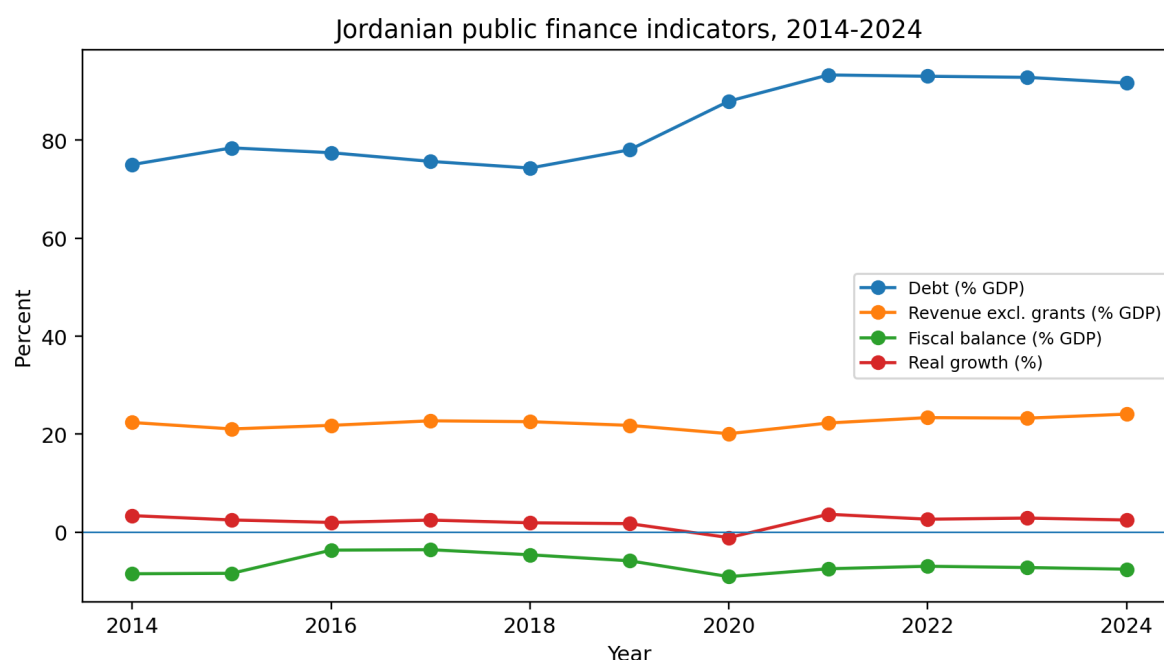
Note: Revenue, balance, debt, and growth are percentages. DDEBT is the annual change in the public-debt-to-GDP ratio in percentage points.

Table 2 shows that Jordan's public-debt ratio shifted upward after the pandemic shock. It was 78.0 percent of GDP in 2019, increased to 88.0 percent in 2020, reached 93.3 percent in 2021, and remained above 90 percent through 2024. Revenue excluding grants declined to 20.1 percent of GDP in 2020 but recovered steadily to 24.1 percent in 2024. The fiscal balance remained negative in every year, with deficits widening sharply in 2020 and remaining around 7 percent of GDP in the post-pandemic years. Growth returned to positive territory after 2020, but the debt ratio did not return to its earlier range.

Table 3. Descriptive statistics for the annual fiscal dataset

Variable	N	Mean	Std. dev.	Minimum	Maximum
Revenue	11	22.315	1.114	20.104	24.093
Balance	11	–6.616	1.932	–9.069	–3.567
Debt	11	83.416	8.188	74.302	93.300
Growth	11	2.236	1.251	–1.103	3.656
DDEBT	10	1.664	3.837	–1.775	9.935

Note: DDEBT has ten observations because the first year is lost when the debt ratio is first differenced.



Note: The figure plots public debt, revenue excluding grants, fiscal balance, and real GDP growth as annual percentages.

Figure 2. Jordanian public finance indicators, 2014–2024

The descriptive results in Tables 3–5 indicate persistent fiscal pressure. The average debt ratio was 83.4 percent of GDP and the average fiscal balance was –6.6 percent of GDP. The average annual debt change was 1.66 percentage points, but the maximum annual increase reached 9.93 percentage points in 2020. The correlation matrix provides preliminary context: the annual change in the debt ratio is negatively correlated with fiscal balance (–0.673), real growth (–0.573), and revenue

excluding grants (–0.772). These associations are consistent with the expected debt-reducing roles of stronger balance, growth, and revenue, but they are descriptive and do not imply causality.

Within the full short-sample specification, the baseline model is consistent with the expected direction of *H1*. The coefficient on fiscal balance is –1.138 and has a *p*-value of 0.044, but this statistic should be interpreted with extreme caution because the sample

Table 4. Distribution diagnostics for the annual variables

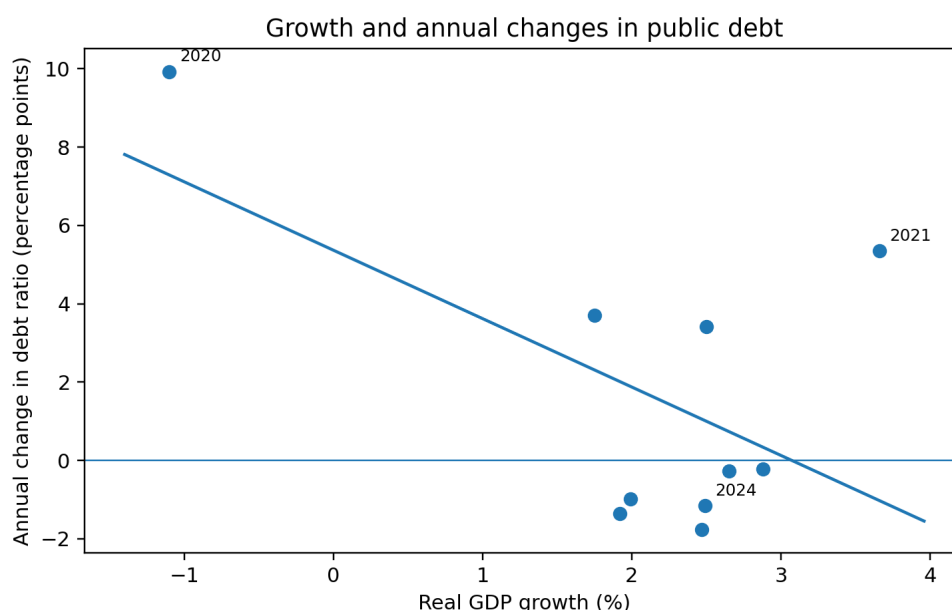
Variable	Skewness	Kurtosis	Shapiro–Wilk W	p-value
Revenue	–0.397	–0.244	0.978	0.953
Balance	0.498	–1.115	0.905	0.214
Debt	0.195	–1.797	0.804	0.011
Growth	–1.746	2.850	0.791	0.007
DDEBT	1.050	–0.007	0.834	0.037

Note: The diagnostics are used as small-sample checks and are not treated as stand-alone evidence of causality.

Table 5. Correlation matrix for fiscal indicators and annual debt changes

Variable	Revenue	Balance	Debt	Growth	DDEBT
Revenue	1.000	0.224	0.325	0.645	–0.772
Balance	0.224	1.000	–0.476	0.109	–0.673
Debt	0.325	–0.476	1.000	0.051	0.231
Growth	0.645	0.109	0.051	1.000	–0.573
DDEBT	–0.772	–0.673	0.231	–0.573	1.000

Note: Negative values in the Balance column are deficits. The correlations are descriptive and do not imply causality.



Note: The labeled observations highlight the pandemic shock and selected post-pandemic years.

Figure 3. Real GDP growth and annual changes in the public-debt ratio

Table 6. Baseline OLS results for annual changes in the public-debt ratio

Variable	Coefficient	Std. error	t-statistic	p-value
Constant	-2.784	3.729	-0.747	0.480
Balance	-1.138	0.464	-2.454	0.044
Growth	-1.352	0.712	-1.898	0.100

Note: Dependent variable: DDEBT. Fiscal balance is measured as central government net lending/borrowing; negative values indicate deficits. Coefficients and p-values are interpreted cautiously because the regression sample contains 10 observations.

Table 7. Baseline model fit and diagnostic tests

Statistic	Value	Interpretation
Observations	10	Regression sample after first differencing
R-squared	0.639	Short-sample in-sample fit measure; not predictive or causal evidence
Adjusted R-squared	0.536	Adjusted for degrees of freedom in a very small sample
F-statistic p-value	0.028	Joint association in the full short-sample specification
Durbin-Watson	1.550	Residual autocorrelation diagnostic; interpreted cautiously
Jarque-Bera p-value	0.832	Residual normality diagnostic; low power in small samples
Shapiro-Wilk residual p-value	0.854	Residual normality diagnostic; low power in small samples
Breusch-Pagan p-value	0.141	Heteroscedasticity diagnostic; low power in small samples
Breusch-Godfrey p-value	0.728	One-lag serial-correlation diagnostic; low power in small samples
VIF: Balance	1.054	Collinearity diagnostic for the baseline specification
VIF: Growth	1.054	Collinearity diagnostic for the baseline specification

Note: The tests are reported as small-sample diagnostics and should not be treated as conclusive evidence of model validity. VIF values do not indicate severe multicollinearity in the baseline specification.

contains only 10 observations. Because fiscal balance is measured so that deficits are negative, the sign suggests that a one-percentage-point improvement in the balance is associated with a lower annual increase in the debt ratio. *H2* receives only weak directional support: the coefficient on real GDP

growth is negative (−1.352), which is economically consistent with debt-dynamics theory, but the *p*-value is 0.100 and the evidence is weak in this short sample. The *R*-squared and joint *F*-test describe fit within the sample and should not be read as proof of a stable causal relationship.

Table 8. Robustness and sensitivity checks for the debt-change regressions

Check	Variable	Coefficient	Std. error	p-value	R-squared
HC1 robust SE	Balance	−1.138	0.354	0.015	0.639
HC1 robust SE	Growth	−1.352	0.770	0.123	0.639
Excluding 2020	Balance	−0.691	0.598	0.292	0.305
Excluding 2020	Growth	0.628	1.865	0.748	0.305
Adding revenue	Balance	−1.022	0.327	0.020	0.849
Adding revenue	Growth	−0.117	0.657	0.864	0.849
Adding revenue	Revenue	−2.033	0.706	0.028	0.849

Note: The checks assess sensitivity to robust standard errors, the pandemic shock year, and the inclusion of revenue excluding grants. They are exploratory because the degrees of freedom are very limited.

The robustness checks in Table 8 add three cautious observations. First, HC1 robust standard errors preserve the negative fiscal balance association in the full sample, while the growth coefficient remains negative but not strongly significant. Second, excluding 2020 weakens the explanatory power and renders the fiscal balance coefficient statistically insignificant, showing that the pandemic shock year is highly influential. Third, the specification that adds revenue excluding grants has a higher *R*-squared of 0.849, and the revenue coefficient is negative with a *p*-value of 0.028. This pattern is consistent with the expected direction of *H3*, but it should be read only as indicative evidence from a highly parsimonious expanded specification with very limited degrees of freedom and not as a definitive robustness result.

4. DISCUSSION

In the full short-sample specification, fiscal balance appears to be the most relevant predictor of annual changes in Jordan's debt ratio. This is consistent with debt-dynamics theory, which treats the fiscal balance as a central driver of borrowing needs (Bohn, 1998; Escolano, 2010), and with the

fiscal space literature, which warns that persistent deficits can create fiscal fatigue at high debt levels (Ghosh et al., 2013). However, the sensitivity check excluding 2020 weakens this relationship, so the result should not be described as universally stable or causal.

The growth result is directionally consistent with previous evidence but statistically weaker. The negative coefficient agrees with studies linking stronger growth to more favorable debt dynamics (Afonso & Jalles, 2013; Panizza & Presbitero, 2014; Woo & Kumar, 2015). In this study, however, the coefficient is weakly significant in a ten-observation regression affected by a major pandemic shock. The cautious interpretation is that growth supports debt dynamics, but moderate growth of around 2.5 to 3 percent may not be sufficient to offset persistent fiscal deficits and high interest obligations.

The revenue result should also be interpreted carefully. Revenue excluding grants improved after 2020, and the expanded robustness specification shows a negative association with annual debt changes. This is consistent with the Ministry of Finance and IMF emphasis on revenue adminis-

Table 9. Indicative association summary

Hypothesis	Expected relationship	Indicative short-sample evidence	Indicative assessment
<i>H1</i>	Fiscal balance is expected to reduce annual debt increases	Balance coefficient = −1.138; <i>p</i> = 0.044 in the full short sample	Consistent with expected direction
<i>H2</i>	Growth is expected to reduce annual debt increases	Growth coefficient = −1.352; <i>p</i> = 0.100	Weak directional evidence
<i>H3</i>	Revenue excluding grants is expected to reduce annual debt increases only in the expanded specification	Revenue coefficient = −2.033; <i>p</i> = 0.028 in the expanded specification	Consistent with expected direction, with strong caution

Note: The assessments combine coefficient direction, statistical evidence, and the limitations of a very short annual sample. They should be interpreted as exploratory association evidence rather than causal hypothesis tests.

Table 10. Relationship between this study and previous evidence

Finding	Related evidence	Relationship	Interpretation
Fiscal balance appears central in the full short-sample specification	Escolano (2010), Ghosh et al. (2013), Bohn (1998)	Consistent with	Consistent with debt-dynamics theory, but sensitive to excluding 2020
Growth has a debt-reducing sign but weak short-sample significance	Afonso and Jalles (2013), Panizza and Presbitero (2014), Woo and Kumar (2015)	Partly consistent with	Growth is theoretically relevant to debt dynamics, but the short sample limits statistical confidence
Revenue recovery is associated with lower debt changes in the expanded specification	IMF (2024b, 2024c), Ministry of Finance (2024a)	Consistent with	Revenue administration should be linked to expenditure prioritization and debt management
Debt pressure can conceptually constrain capital expenditure and local development	Al Hayek (2024), Bahl and Bird (2018)	Conceptually extends	Municipal fiscal space is a policy implication, not a directly estimated result
Consolidation should protect social outcomes	Rodriguez and Wai-Poi (2024), World Bank (2021, 2024)	Consistent with	Debt reduction should not weaken poverty reduction, targeted transfers, or service delivery

Note: The table summarizes the relationship between the indicative short-sample findings and earlier evidence, while recognizing that the municipal finance channel is interpreted conceptually rather than estimated directly.

tration and domestic resource mobilization (IMF, 2024b, 2024c; Ministry of Finance, 2024a). Yet the descriptive evidence shows that the debt ratio remained high even as revenue recovered. The implication is not that revenue alone ensures debt sustainability, but that revenue gains should be linked to expenditure prioritization, arrears control, and debt management.

These findings complement Al Hayek (2024), who shows that public debt moderates the relationship between revenues and capital expenditures in Jordan. The present results focus on annual debt changes and provide short-sample evidence consistent with a broader public finance mechanism: deficits raise debt; high debt raises debt-service pressure and reduces flexibility; and reduced flexibility can limit the ability of revenue gains to support capital expenditure. This mechanism is relevant for infrastructure and municipal development, but it is not directly tested with municipal-level data in this study.

The public and municipal finance implications should therefore be read as policy interpretations and conceptual extensions rather than direct empirical findings. Fiscal federalism literature argues that local service delivery requires adequate and predictable financing (Bahl & Bird, 2018; Oates, 1972; Shah, 2006; Ter-Minassian, 1997). In Jordan, municipalities and governorates depend on central allocations, transfers, capital budgets, and the

fiscal condition of public utilities. When national debt service and contingent liabilities absorb resources, local roads, waste services, water projects, maintenance, and development initiatives may face pressure. This makes debt sustainability relevant to service delivery, although the present model does not estimate municipal transfers, arrears, local revenue, or municipal expenditure.

The social dimension is also important. Fiscal consolidation can become politically fragile if it weakens targeted transfers or essential services. Evidence on Jordan indicates that fiscal policy affects poverty and inequality through taxes, transfers, and social spending (Rodriguez & Wai-Poi, 2024; World Bank, 2021). This is consistent with broader evidence that health and social expenditure reforms must protect access and efficiency rather than simply compressing budgets (Clements et al., 2012). These relationships are synthesized in Table 10, which is included in the Discussion to show where the short-sample findings are consistent, partly consistent, or conceptually aligned with previous evidence.

Drawing on the regression patterns, debt-dynamics theory, broader public finance literature, and Jordan's fiscal and institutional context, an illustrative policy implication is that Jordan should communicate fiscal consolidation as a public financial management reform rather than as a narrow deficit target. The budget should explain how

deficits, debt service, guaranteed debt, and growth assumptions affect capital expenditure and municipal transfers. To avoid overstating the short-sample OLS results, detailed implementation pri-

orities are treated as illustrative policy guidance derived from the combined evidence base and are placed in Appendix C rather than in the main discussion.

CONCLUSION

This study aimed to assess Jordan's fiscal balance, revenue mobilization, real GDP growth, and public-debt dynamics over 2014–2024, examine the indicative associations among them, and interpret their implications for public and municipal finance.

The results lead to three cautious conclusions. First, Jordan's debt ratio moved to a higher range after the COVID-19 shock and did not return to its pre-pandemic path by 2024. Second, fiscal balance is the strongest predictor in the full short-sample specification, but the association becomes statistically insignificant when 2020 is excluded. Third, growth and revenue mobilization are important but should not be treated as substitutes for fiscal balance improvement. Growth has the expected debt-reducing sign but weaker statistical significance, while revenue excluding grants becomes significant only in a highly parsimonious expanded specification with very limited degrees of freedom.

The policy conclusion, interpreted cautiously, is that a growth-friendly consolidation strategy is advisable only when the short-sample evidence is read together with debt-dynamics theory, prior literature, and Jordan's policy context. This means strengthening revenue administration without relying mainly on higher tax rates, protecting high-return capital expenditure, improving the management of guaranteed debt and utility-related fiscal risks, safeguarding targeted social protection, and improving the transparency of municipal finance. Debt sustainability should be linked to service delivery because national fiscal stress can affect municipal transfers, infrastructure maintenance, and local development.

The main limitation of the study is that the analysis is based on a very short annual time series; therefore, the findings should be interpreted as indicative short-sample evidence rather than causal estimates. Future research should extend this analysis in three directions. First, a longer dataset could distinguish interest-growth effects, stock-flow adjustments, grants, and primary balances more precisely. Second, a municipality-level fiscal panel would allow direct testing of the local finance channels identified in this paper. Third, scenario simulations could examine how different consolidation paths affect debt, growth, capital expenditure, and social protection outcomes under alternative regional and financing conditions.

AUTHOR CONTRIBUTIONS

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Writing – review & editing: Khaled Bataineh.

DATA AVAILABILITY STATEMENT

The full annual replication dataset used in this study is reproduced in Appendix A and is submitted as a supplementary spreadsheet with the manuscript. The dataset contains all transformed annual macro-fiscal indicators used in the descriptive statistics, correlation matrix, OLS regressions, diagnostic tests, robustness checks, and appendix tables. The original data sources are publicly available: Total Government Debt for General Government for Jordan (FRED/IMF REO: JORGGDGDGPDPPT), Central Government Net Lending/borrowing (central Govt Fiscal Balance) for Jordan (FRED/IMF REO: JORGCXCNLGDGPDPPT), Total Revenue, Excluding Grants, for General Government for Jordan (FRED/IMF REO: JORGGRXGGDPDPPT), GDP growth (annual %) for Jordan (World Bank WDI: NY.GDP.MKTP.KD.ZG), Central Bank of Jordan Annual Report 2024, Ministry of Finance Macro Fiscal Outlook Report, Ministry of Finance Jordan Debt Quarterly Report Q4 2024, and Ministry of Finance Public Financial Management Strategy 2022–2025. The dataset has not been used in an earlier study by the author.

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APPENDIX A. Regression dataset

Table A1. Dataset used in the baseline regression model

Year	DDEBT	Balance	Growth	Revenue	Debt
2015	3.410	−8.390	2.500	21.070	78.420
2016	−0.990	−3.660	1.990	21.800	77.430
2017	−1.770	−3.570	2.470	22.730	75.660
2018	−1.350	−4.610	1.920	22.550	74.300
2019	3.710	−5.830	1.750	21.800	78.020
2020	9.930	−9.070	−1.100	20.100	87.950
2021	5.350	−7.460	3.660	22.280	93.300
2022	−0.270	−6.950	2.650	23.380	93.030
2023	−0.220	−7.210	2.880	23.270	92.810
2024	−1.160	−7.550	2.490	24.090	91.650

Note: The first original observation is excluded from the regression because DDEBT is a first difference.

APPENDIX B. Variable interpretation cautions

Debt ratios can differ across sources because statistical definitions vary between gross debt, net debt, central-government debt, general-government debt, and debt excluding Social Security Investment Fund holdings. This paper uses internationally comparable debt and revenue ratios for the empirical model, a central-government fiscal-balance series for the balance variable, and Ministry of Finance reports for institutional interpretation. The distinction is important for replication and for avoiding direct comparisons with national debt definitions that use different coverage.

Table B1. Interpretation cautions for the main variables

Item	Use in the article	Interpretation caution
Debt ratio	Comparable general-government debt measure for the model	May differ from national net debt, central-government debt, or debt excluding Social Security Investment Fund holdings
Fiscal balance	Central government net lending/borrowing as percent of GDP	Negative values represent deficits; coverage differs from the general-government debt and revenue series
Revenue	General-government domestic revenue capacity indicator	Excludes grants that depend partly on donor decisions and appears only in the expanded robustness specification
Growth	Growth channel in debt dynamics	Affected by fiscal policy, external shocks, and denominator effects
DDEBT	First difference of the debt ratio	The first original year is lost; the regression sample contains 10 observations

Note: The cautions reduce the risk of misreading fiscal indicators that have different statistical conventions and reinforce the short-sample interpretation of the results.

APPENDIX C. Illustrative policy priorities

Table C1. Illustrative policy priorities derived from the combined evidence base

Area	Illustrative policy priority	Relevant institutions	Monitoring indicator	Horizon
Revenue	Strengthen risk-based audits, e-services, and taxpayer support	Income and Sales Tax Department; Ministry of Finance	Revenue excl. grants; arrears	Short to medium term
Debt and guarantees	Continue integrating direct and guaranteed debt in fiscal risk reporting	Ministry of Finance; NEPCO; WAJ	Guaranteed debt; risk coverage	Short term
Capital spending	Prioritize protection of high-return infrastructure and maintenance projects	Ministry of Finance; line ministries; municipalities	Execution rate; project completion	Medium term

Table C1 (cont.). Illustrative policy priorities derived from the combined evidence base

Area	Illustrative policy priority	Relevant institutions	Monitoring indicator	Horizon
Municipal finance	Continue improving publication of comparable municipal revenue, transfer, arrears, and service data	Ministry of Local Administration; municipalities	Data coverage; transfer predictability	Medium term
Social protection	Continue improving targeting, monitoring, and evaluation of transfers	National Aid Fund; Ministry of Social Development	Coverage; poverty impact	Short to medium term
Budget communication	Add or clarify a simple debt-dynamics explanation to citizen budget documents	Ministry of Finance	Publication quality; stakeholder use	Short term

Note: The matrix is an illustrative policy extension that synthesizes the short-sample evidence with debt-dynamics theory, prior public finance literature, and Jordan's fiscal policy context. It should not be interpreted as direct empirical evidence from the OLS model or as regression-derived prescriptions.