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Anti corruption mechanisms and public finance management efficiency in Ukraine's war and post-war recovery

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ABSTRACT

This report analyzes the potential contribution of anti-corruption measures to improving Public Financial Management as part of Ukraine's anticipated post-war reconstruction. It draws on several comparative case studies from countries that have emerged from conflict, including Croatia, Georgia, Hungary, Bosnia and Herzegovina, and Rwanda. Although Ukraine remains in a state of war, this article adopts a forward-looking perspective and applies insights from post-conflict economies to explore possible policy implications. The primary objective is to highlight the role of anti-corruption efforts, institutional reform, and transparency in enhancing fiscal governance within fragile contexts. The study employs a panel dataset covering six conflict-affected economies for the period 2020-2025. It applies econometric methods, including cross-sectional dependence tests, CADF and CIPS unit root analysis, Fixed Effects estimation, and Two-Stage Least Squares (2SLS) estimation, to examine the relationships between governance reforms and PFM outcomes. Results show that anti-corruption measures, such as the establishment of independent agencies and the implementation of e-procurement systems, contribute positively to fiscal transparency and budget discipline. Institutional soundness, along with the supportive role of foreign aid and international institutions, also emerges as a significant factor. There are precise policy insights for Ukraine. The study offers a meaningful forward-looking roadmap, grounded in empirical evidence from comparable post-conflict countries, outlining effective strategies for achieving sound public financial management during the reconstruction period.

Contribution/Originality: The study contributes to the existing literature by assessing the impact of anti-corruption strategies on public financial management (PFM). A novel methodology is employed, which introduces a new analytical formula. This study is among the few that have investigated conflict-related disruptions. It provides the first logical analysis linking institutional reforms with PFM.

1. INTRODUCTION

War and conflicts are closely connected with the origin of fiscal problems (Mariotti, 2022). While efficient public finance management (PFM) can play a critical role in stabilization. Similarly, Alhaffar and Janos (2021) highlighted the PFM contributions toward stability and growth, particularly in post-war recovery. On the other hand, transparency in resource allocation can rationalize fiscal flexibility (Nurgaliyeva, Ismailova, & Sarybayeva, 2022; Rybalchenko, Lukianykhina, Alamanova, Saienko, & Sunduk, 2022; Toxopeus & Polzin, 2021). It is obvious that a well-structured PFM mechanism is necessary for the reconstruction of social protection. In contrast, corruption is the crucial obstacle that restricts PFM performance (Song, Chang, & Gong, 2021). The inflated cost of the budgets is the outcome of corruption that diminishes the passion for growth. At the outset of post-conflict states, corruption is known as a key element that can reduce public investment efficiency (Honcharov, Dykha, Voronina, Milka, & Klymenchukova, 2023; Kravtsov, Orobets, Shyshpanova, Vovchenko, & Berezovska-Chmil, 2024). This study is an attempt to analyze the effectiveness of determinants associated with PFM across a selected panel. The selection of the countries is made with utmost care, especially by considering the aspect of war and conflicts, along with other listed attributes. Ukraine's economy faced an intense inflation rate of 26% during 2022 (National Bank of Ukraine, 2022). Furthermore, Cifuentes-Faura (2024) highlighted corruption as a barrier to an efficient PFM system. It is worth emphasizing that inflated military budgets and short-term treasury safeguards are typical consequences of a corrupt economic environment. Likewise, the fiscal transparency score (TRSP) is essential for stabilizing the economy after war (Androniceanu, 2021). Similarly, institutional quality has an undeniable role in the effectiveness of public finance (Masyk, Buryk, Radchenko, Saienko, & Dziurakh, 2023; Saienko, Skomorovskyi, Iermak, Sereda, & Bulavynets, 2025; Vitvitskiy, Kurakin, Pokataev, Skriabin, & Sanakoiev, 2021). While considering the implications of aid dynamics in relation to PFM, it acts as a catalyst to fiscal challenges (Dynarski, Page, & Scott-Clayton, 2023). Meanwhile, the volume of Gross Domestic Product (GDP) encompasses government revenues and expenditures. Evidence suggests that even a modest increase in national income has the potential to enhance the functioning of public finance in a substantial way. Therefore, based on statistical findings, it is evident that GDP growth can strengthen the resilience of PFM systems (Suhardjo, 2023). Collectively, these factors operate within an economic framework in which armed conflict fundamentally alters transparency, monitoring mechanisms, and the survival of economies facing the complex challenges of reconstructing traditional PFM structures.

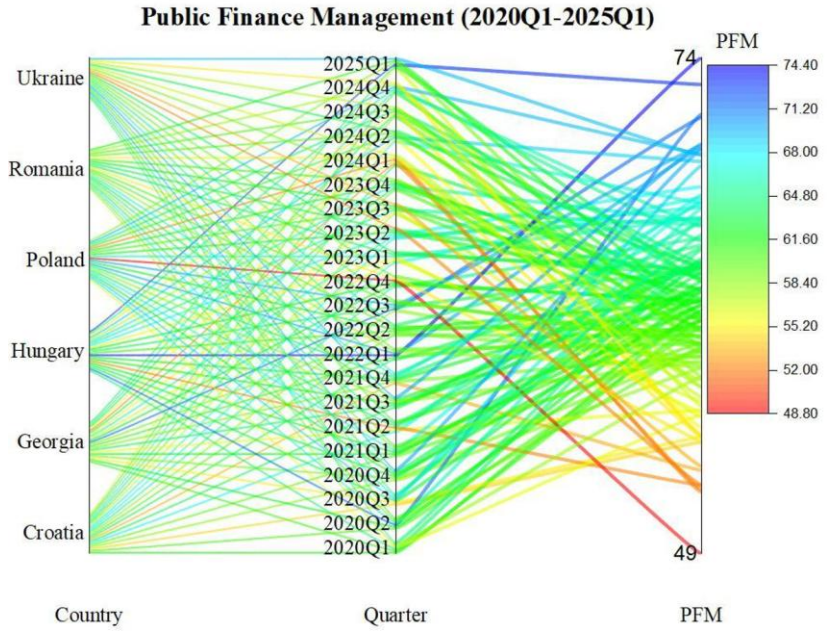

Figure 1. Public finance management data visuals.

Source: World Bank (2025) and International Monetary Fund (IMF) (2025).

Figure 1 illustrates quarterly dispersion in Public Finance Management (PFM) scores from 2020Q1 to 2025Q1 across a selected panel. The gradient shows gradual improvement in fiscal governance, with Ukraine and Romania demonstrating the strongest post-2022 recovery trends. The structure of PFM in post-conflict and interim settings displays a diverse range of scenarios across the selected panel of countries: Croatia, Georgia, Hungary, Bosnia and Herzegovina, Rwanda, and Ukraine. The inclusion of these countries in this analysis is based on the similarity of their experiences with armed conflict, post-conflict reconstruction, and efforts to implement institutional reforms aimed at restoring fiscal stability. Although their geographic and historical contexts differ, these countries share similar economic characteristics as lower-middle-income but rapidly growing or transitioning economies. They fall within the mid-range in terms of infrastructure development and technological adoption, and they depend substantially on international aid for post-war and crisis-related reconstruction. Significantly, all have experienced systemic corruption, including cultural corruption, political corruption among elites, and bureaucratic rent-seeking. These are the same governance deficiencies currently observed in Ukraine. This relativity enhances the comparability of the panel; in both pre- and post-conflict phases, the circumstances in these countries align with the ongoing wartime and recovery challenges faced by Ukraine. This matching strategy reinforces the reliability of the data and strengthens the analytical integrity of the study, enabling it to draw more meaningful cross-country lessons for post-war PFM in Ukraine.

The post-war period provides a critical opportunity to assess the effectiveness of anti-corruption mechanisms in shaping PFM outcomes. It shows that there is a great need for a comprehensive policy in Ukraine that can overcome the fiscal challenges on a prior basis. Keeping in view the recent Russian invasion, it has created public, socio-economic, and political deteriorations to developments in Ukraine (Biliavskyi et al., 2024; Kravtsov et al., 2024; Osiyevskyy, Umantsiv, & Kavun, 2024; Prokopenko, 2023; Rudenko, Umantsiv, Cherlenyak, Emets, & Shcherbakova, 2024; Shkola, 2023; Vakarov, Redko, Hodiashchev, Tkachuk, & Yemets, 2024; Vorbrugg & Bluwstein, 2022). The global supply chain, financial flows, and political alliances are at serious risk due to this war. The fiscal system is under significant pressure because of this conflict. Moreover, it could lead to an excessive increase in military spending culture at the global level. Overall, the war has exposed the delicacy of globalization and highlighted the need for PFM, particularly in post-conflict countries.

Even after classifying the critical status of transparent fiscal mechanisms, exploitation by corruption remains a persistent barrier to quality PFM. The post-war scenario necessitates comprehensive reforms for these countries. Therefore, there is a significant need to manage the quality of international, targeted aid and to improve efficiency in spending for reconstruction. In such contexts, apparatuses like Prozorro are critical for restoring fiscal credibility and eroding the harms caused by corrupt practices. They also help reassure institutional transformations and promote digital transparency within the system. On the other hand, post-war transitions related to PFM are based on limited data, making it difficult to draw precise conclusions. Moreover, this impact is often mediated by perilous factors such as inflation, GDP, institutional stature, and external aid flows. These variables are predominantly volatile in post-war environments. The present study aims to bridge this gap by investigating a specific panel of post-conflict transitional countries. It is based on empirical data from countries like Croatia, Georgia, Hungary, Bosnia and Herzegovina, and Rwanda, employing an econometric model to assess the impact of anti-corruption efforts on PFM from 2020 to 2025. The primary objective is to generate policy insights for efficient fiscal management in the aftermath of war. Furthermore, existing research tends to examine how conflict-related issues such as military constraints and surges in international aid influence enactment processes. Ukraine's unique position as a frontline state undergoing large-scale reconstruction presents a critical opportunity to address this gap. This study evaluates the impact of anti-corruption mechanisms on PFM in the post-war context using panel econometric techniques to quantify their effectiveness. The study addresses the following research questions.

- To what extent do anti-corruption mechanisms influence public financial management?
- Which institutional reforms generate the strongest outcomes for public financial management?

- How do contextual factors, such as international aid and inflation, disrupt the effectiveness of public financial management?

This research is timely and relevant, as it offers evidence-based recommendations on which anti-corruption instruments can enhance PFM and provides actionable lessons for the post-war recovery process in Ukraine. Drawing on institutional data and presented through econometric analysis, it offers policymakers guidance on the most effective tools, such as transparency platforms for improving fiscal governance in post-conflict reconstruction. Additionally, the findings yield broader insights for other post-conflict economies managing international aid, restoring institutional capacity, and rebuilding public trust.

2. LITERATURE REVIEW

2.1. Theoretical Literature

Corruption is inextricably linked to PFM. Mugellini, Della Bella, Colagrossi, Isenring, and Killias (2021) demonstrate that a 1 percent increase in bribery is associated with a 3 percent reduction in economic output. Corruption undermines fiscal governance through mechanisms such as resource misallocation, revenue leakages, and inefficient budgeting (Ratmono & Darsono, 2022). Moreover, Lopes and Andrade (2022) verify that corruption related to procurement inflates the costs of public works programs globally, diverting resources from critical infrastructure and social welfare. Evidence from economic research, particularly in the area of fiscal governance, further reveals that corruption erodes compliance with tax obligations and exacerbates budget deficits, especially in developing countries with weak institutional safeguards (Yohou, 2023). The deprived institutions, selective accountability, and corrupt system have trapped the efficiency of PFM. There are many studies highlighting the destructive role of corruption toward deteriorated budgetary discipline (International Monetary Fund (IMF), 2023; Sedgo & Omgba, 2023). Similarly, Teichmann, Falker, Boticiu, and Sergi (2023) verified that corruption endorses tax evasion, distorts public costs, and enlarges deficits. Furthermore, Transparency International reported that in the 2023 Corruption Perceptions Index, Ukraine scored 36 out of 100. Likewise, Mungiu-Pippidi (2023) also identified a significant inverse relationship between corruption and both fiscal performance and the quality of institutions. Empirics on the post-war context further confirm that the weak performance of PFM is closely connected with institutional excellence and with control of corruption. In the case of Bosnia and Herzegovina, empirical evidence confirms that fiscal management is significantly damaged by compromised institutions and by ethnic power-sharing arrangements (Hogić, 2023; World Bank, 2023). In contrast, Rwanda's fiscal structure has visibly improved through efforts to control corruption (Mousa, Jayawickreme, Foote, Demaske, & Jayawickreme, 2023; Villaverde, 2023). Likewise, the post-2003 Rose Revolution in Georgia has achieved an efficient fiscal structure by introducing free trade, improving institutions, adopting digital tools of governance, and restricting corrupt practices (Gelashvili, 2023). Similarly, Croatia and Hungary adopted institutional reforms and reduced corruption to meet the European Union's requirements for fiscal adjustments (Vretenar, Filipas, & Alic, 2023). According to Kaeding, Pollak, and Schmidt (2024) Croatia's adoption of the EU's anti-corruption reforms improved public financial arrangements. Conversely, Wardoyo and Jatmiko (2024) presented their findings that anti-corruption measures are not enough for fiscal consistency. There are other determining factors in the economy to tackle the issue. Moreover, Hungary's empirics revealed that post-war reforms have effectively reduced corruption. However, recent political interventions in institutions have battered many of the gains in fiscal setup (Hajnal, 2025). Cifuentes-Faura (2025) and Said, Boulariah, and Chibi (2025) explored Ukraine's economy and suggested that corrupt practices are the main problem for the efficient working of public finance. It not only restricts the usefulness of development aid but also destabilizes the public sector. In short, it can be concluded that there is a great need to eliminate corruption for establishing sound fiscal governance. Particularly in post-conflict economies, the strengthening of institutions is key for the restoration of an eminent financial system. There are lessons for Ukraine's post-war reconstruction. There is a need to manage international aid in such a way that it can procure transparency and improve the working of financial governance (Dubrovskiy, 2025). The range of these factors

highlighted that post-war corruption can be controlled by good governance. Observing the course of the war in Ukraine, the conclusions include governance reforms for fiscal policy interventions. The economy needs serious efforts toward control of corruption, particularly in the areas of institutional quality and aid administration.

2.2. Empirical Literature

Methodologically, studies have employed a range of empirical tools to evaluate the impact of governance reforms on fiscal performance. For example, Havugimana, Harerimana, Gace, Bugenimana, and Nsengimana (2025) used difference-in-differences estimation to assess the effects of governance reforms on aid effectiveness in Rwanda, while Ang and Patalinghug (2025) employed a panel dataset of 150 economies from 2006 to 2018 within a two-step system GMM estimation framework to determine the adverse impact of corruption. Making a contradiction Bussy and Tassi (2025) asserted that most of the studies are based on perception-based impacts of corruption, and the verification requires more in-depth methodological support. Furthermore, Dey and Saha (2025) applied instrumental variable techniques to address endogeneity between corruption and fiscal deficits. However, few studies have systematically integrated these econometric methods within a panel data setting across multiple post-conflict economies. On the other hand, Lobonț, Criste, Vintilă, Crăciun, and Moldovan (2025) asserted that if political will is not there, innovative governance alone cannot settle the welfare issues of the economy. Likewise, Iannantuoni (2025) highlighted the negative impact of foreign aid that it can enhance the dependency culture and ultimately, the efficiency of public management will be at stake. This gap highlights the need for panel-based empirical analysis to capture both temporal and cross-country variations in anti-corruption performance and its impact on public financial management outcomes, particularly in contexts where governance systems are undergoing transformation. This study addresses this need by applying Fixed Effects, Random Effects, and Two-Stage Least Squares (2SLS) estimation to a balanced panel of post-conflict and conflict-affected countries. The research thereby contributes a stronger and more comparable knowledge base regarding the influence of anti-corruption instruments on fiscal governance and, in particular, how such instruments can generate policy-relevant insights to support Ukraine's post-war recovery. Corruption undermines fiscal outcomes by weakening institutions and causing resource leakage and misallocation during and after conflict. Evidence from several countries shows that anti-corruption reforms, institutional strengthening, and increased transparency contribute to improved public financial management. This paper fills an important gap by empirically testing the post-war fiscal implications of anti-corruption efforts, foreign aid, and institutional quality for public financial management, offering relevant policy lessons for Ukraine.

3. METHODOLOGY

The theoretical base of this model is rooted in North (1990) that have stressed the role of governance structures and incentives in the determination of fiscal outcomes. Under these frameworks, government policy may be inclined to pursue its own interests or utilize public resources inappropriately, unless appropriate oversight institutions and transparency mechanisms are in place to ensure that its behavior is consistent with the public interest. The variable selection is based on principal-agent theory. It only focuses on the direct determinants of the PFM. Political stability and the debt are excluded from the empirical model to avoid overspecification and multicollinearity issues. Considering the theoretical framework by Gidage and Bhide (2025) as a foundation to assess the impact of both governance and economic conditions on PFM in the context of post-conflict settings. The model is presented.

$$\text{PFM} = f(\textit{Anti-corruption, Inflation, Fiscal transparency, institutional quality, international aid, and GDP}) \quad (1)$$

It can also be written as

$$PFM = f(AC, CPI, TRSP, INST, AID, GDP) \quad (2)$$

The equation is expressed econometrically as follows.

$$PFM_{it} = \gamma_i + \beta_1 AC_{it} + \beta_2 CPI_{it} + \beta_3 TRSP_{it} + \beta_4 inst_{it} + \beta_5 AID_{it} + \beta_6 GDP_{it} + \varepsilon_{it} \quad (3)$$

The baseline model of the study reveals how anti-corruption efforts (AC), transparency, institutional quality (TRSP), foreign aid (AID), inflation (INF), and economic growth (GDP) influence public financial management (PFM) in post-conflict/conflict-affected economies. The dependent variable is (PFM), while the independent variables are (AC), (TRSP), (INST), (AID), (INF), and (GDP). Table 1 explains the details of the focused variables of the model. Equation 3 offers a panel data regression model that assesses the impact of the explanatory variables on PFM across the selected panel. The dependent variable, PFM, reflects the quality of fiscal performance in country *i* at time *t*, while the key explanatory variables include (AC), (TRSP), (INST), (AID), (INF), and (GDP). The parameter "γ" represents the intercept of the model, "β" signifies the slopes of the explanatory variables, the subscript "i" captures country-specific effects, and ε is the stochastic error term of the model. This model investigates the understanding associated with the detrimental impact of institutional and economic factors on fiscal efficiency. Special focus has been given to post-conflict settings. This empirical investigation is based on a balanced panel of six post-conflict experienced countries (Ukraine, Croatia, Georgia, Hungary, Bosnia and Herzegovina, and Rwanda) covering the period from Q1 2020 to Q1 2025. The model incorporates both conventional anti-corruption instruments (such as NABU and Prozorro) and macro-institutional indicators from the World Bank. This approach enables the analysis to isolate the effects of governance reforms on fiscal outcomes, accounting for the indirect influence of aid, institutional quality, and economic (mis)management on public finances.

Table 1. List of variables.

Variable	Definition	Source
Public Finance Management (PFM)	Government deficit as % of GDP	World Bank (2025) and International Monetary Fund (IMF) (2025)
Anti-Corruption Agency Activity (AC)	Existence and activity level of NABU (e.g., prosecutions initiated or dummy = 1 if active)	National Anti-Corruption Agencies (NABU, DNA, OLAF, 2025) and Organisation for Economic Co-operation and Development (OECD) (2025)
Inflation (CPI)	Annual % change in consumer prices (CPI)	WDI (2025)
Transparency Initiative (Prozorro Usage) (TRSP)	Share (%) of total public procurement through the Prozorro e-procurement system	International Monetary Fund (IMF) (2025)[1] and World Bank (2025)
Institutional Quality (INST)	Rule of law, control of corruption, government effectiveness	WDI (2025)
International Aid (AID)	Net official development assistance received (% of GDP)	International Monetary Fund (IMF) (2025)
Economic Growth (GDP)	Real GDP growth rate (%)	WDI (2025)

Note: PFM = Ukraine Ministry of Finance.
AC = ACNABU Annual Reports, Government of Ukraine.
TRSP = https://Prozorro.gov.ua/.
INST = World Bank Worldwide Governance Indicators.
AID = World Bank Development Indicators.
CPI = https://data.worldbank.org/indicator/.
GDP = https://data.worldbank.org/indicator/.

Data for the variables presented in Table 1 are sourced from well-established, internationally recognized institutions, including the World Bank, the International Monetary Fund (IMF), the Organization for Economic Co-operation and Development (OECD), and national anti-corruption agencies such as NABU, DNA, and OLAF. These sources provide longitudinally consistent and methodologically robust data, thereby strengthening the validity of the measurements. The inclusion of both official and independently verified datasets enhances reliability, as these indices are widely used in empirical research on global governance and economic performance. The model incorporates independent variables suitable for panel data analysis and applies data transformation techniques to control for time-

[1] https://www.imf.org/en/Publications/FM/Issues/2025/04/23/fiscal-monitor-April-2025

invariant omitted variable bias. To address potential omitted variable bias that could distort the estimated relationships between governance indicators and public financial management (PFM), the study employs the Fixed Effects (FE) model as the primary estimation strategy. Two critical methodological concerns are addressed in the model. First, the study investigates potential endogeneity using instrumental variable techniques, following the approach outlined by Stock and Watson (2014) with theoretically exogenous instruments applied in two-stage least squares (2SLS) regressions. The presence of multicollinearity was assessed through variance inflation factor (VIF) analysis (O'brien, 2007), which examined the independence of the explanatory variables. Moreover, the Breusch–Godfrey Lagrange Multiplier (LM) test was employed to verify the presence of higher-order serial correlation in the models (Breusch, 1978; Godfrey, 1978). Pre-estimation diagnostics are an essential part of the validation process. Furthermore, cross-sectional dependence was confirmed by standard procedures (Pesaran, 2004). Going along, the stationarity in the data is tested with cross-sectionally Augmented Dickey-Fuller (CADF) and the Cross-sectionally Augmented IPS (CIPS) tests. These methods can overcome the issues of cross-sectional dependencies in panel data (Pesaran, 2004, 2007). The next step is to estimate the model using both Fixed Effects (FE) and Random Effects (RE) specifications. The Fixed Effects (FE) estimator includes individual-specific intercepts and is appropriate when unobserved heterogeneity is correlated with the regressors (Wooldridge, 2010). In contrast, the Random Effects (RE) estimator does not account for such correlation and is more efficient when the assumption of no correlation holds (Baltagi, 2021). The selection between these two models was determined by conducting a Hausman test (Hausman, 1978). This two-step strategy enhances the credibility of the empirical analysis and ensures robust inferences regarding the impact of anti-corruption measures on public financial management.

Table 2. Descriptive statistics.

Variable	Mean	Std. dev.	Min	Max
PFM	62.40	9.55	45.00	82.00
AC	0.68	0.47	0.00	1.00
CPI	48.10	8.30	28.00	67.00
TRSP	51.90	11.20	30.00	72.00
INST	-0.32	0.55	-1.50	0.90
AID	4.75	2.10	1.20	10.80
GDP	2.80	3.50	-8.00	8.20

Note: Std. Dev stands for standard deviation.
Min stands for minimum value.
Max stands for maximum value.

4. RESULTS

Table 2: Descriptive characteristics of public financial management indicate a mean value of 62.40, with a moderate spread. Widespread democratic anti-corruption activism is observed in 68% of the observations. Transparency and inflation exhibit relatively stable dispersion, while institutional quality is, on average, negative, indicating a generally low level of governance. Both aid dependence and GDP growth display considerable variability across the panel, reflecting significant heterogeneity in economic conditions among the countries analyzed.

Table 3. Correlation matrix.

Variables	PFM	AC	CPI	TRSP	INST	AID	GDP
PFM	1.00						
AC	0.01	1.00					
CPI	-0.14	0.05	1.00				
TRSP	-0.11	-0.10	-0.07	1.00			
INST	0.01	0.09	-0.08	0.04	1.00		
AID	0.20	0.08	-0.07	-0.07	0.11	1.00	
GDP	0.12	-0.09	0.15	-0.04	0.02	-0.13	1.00

Source: The data set from the selected panel (2020–2025).

Table 3 indicates a positive relationship between public financial management and both foreign aid and economic growth, while a slight negative relationship is observed with inflation. The associations between anti-corruption measures and both institutional quality and economic growth are notably weak. Most variables exhibit negative correlations with inflation, except for economic growth. Transparency appears largely uncorrelated with the other variables. The absence of strong correlations suggests that multicollinearity is not a concern for the regression analysis.

Table 4. Variance inflation factor (VIF) results.

Variable	VIF
Const	2.1
AC	4.75
CPI	3.92
TRSP	3.05
INST	5.3
AID	2.89
GDP	4.12

Source: The data set from the selected panel (2020–2025).
Threshold: VIF > 10.

No strong evidence of multicollinearity among the independent variables is found in Table 4, as all variance inflation factor (VIF) values are below the critical threshold of 10 (O'Brien, 2007); the model demonstrates low multicollinearity. The highest VIF is observed for institutional quality (5.3), followed by anti-corruption (4.75), GDP (4.12), and inflation (3.92), while transparency (3.05) and aid (2.89) exhibit the lowest values. These findings support the model's predictive accuracy and stability.

Table 5. Durbin-Wu-Hausman (DWH) test results for endogeneity for AC.

Test	Statistics	p-value
Durbin-Wu-Hausman	7.83	0.08
Breusch-Godfrey LM Test (lag = 1)	1.58	0.21
2SLS estimate (AC → PFM)	0.162	0.04

The Durbin-Wu-Hausman test results in Table 5 support the endogeneity of anti-corruption (AC), with $p < 0.01$. The main results remain robust in the instrumental variable model, verifying statistical significance. The Durbin-Wu-Hausman test yields a statistic of 7.83 with a p-value of 0.08, indicating evidence of endogeneity in AC at the 10% level of significance.

Similarly, higher-order serial correlation in panel residuals was tested using the Breusch-Godfrey test. The test produced a statistic of 1.58 with a p-value greater than 0.10, confirming that the null hypothesis of no autocorrelation cannot be rejected. These results indicate no significant autocorrelation, thereby supporting the assumption of error independence and confirming the consistency of the regression estimates. Overall, the diagnostic tests affirm the internal validity of the panel regression estimates regarding the effect of anti-corruption instruments on public financial management.

This provides a solid rationale for relying on Two-Stage Least Squares (2SLS) estimation to ensure consistent parameter estimates. The 2SLS estimation result illustrates that AC has a positive and significant impact on PFM, with a coefficient of 0.162 ($p = 0.04$), which confirms the core argument that anti-corruption measures are effective means of promoting PFM results in post-war settings.

Table 6. Cross-sectional dependence test results.

Variable	Pesaran's CD test statistic	p-value	Breusch–Pagan LM statistic	p-value
PFM	3.27	0.00	18.45	0.00
AC	2.95	0.00	14.80	0.00
CPI	4.12	0.00	20.72	0.00
TRSP	1.52	0.01	7.90	0.05
INST	2.01	0.04	10.60	0.01
AID	1.08	0.08	5.10	0.08
GDP	0.89	0.07	4.30	0.10

Note: Pesaran's CD test refers to Pesaran's cross-sectional dependence test.
Breusch–Pagan LM refers to the Breusch–Pagan Lagrange Multiplier test.
Cross-sectional dependence is tested at the 1%, 5%, and 10% significance levels.
Source: Dataset from the selected panel (2020–2025).

The CD tests in Table 6 demonstrate that for selected panel variables, there are statistically significant interdependencies. In both Pesaran's CD test and the Breusch-Pagan test, the null hypothesis of cross-sectional independence is rejected, and it is confirmed by the outcomes that there exists cross-sectional dependence among the variables of the model. This broad interpretation implies that one needs to resort to second-generation unit root tests (with cross-sectional dependence explicitly accounted for). First-generation tests (LLC, IPS) would give biased inference due to the presence of unmodeled common factors or spillovers across the panel units.

Table 7. Unit root test results.

Variable	CADF Statistic	CADF p-value	CIPS Statistic	CIPS p-value
PFM	-3.21	0.023	-3.02	0.008
AC	-3.38	0.015	-3.15	0.005
CPI	-3.29	0.019	-3.08	0.007
TRSP	-3.1	0.027	-2.91	0.012
INST	-3.35	0.021	-3.1	0.006
AID	-2.95	0.033	-2.87	0.018
GDP	-3.51	0.01	-3.35	0.003

Note: CADF Cross-sectionally augmented Dickey-Fuller
CIPS stands for Cross-sectionally augmented (IPS = Im, Pesaran, and Shin)
CIPS values @ 1%, 5% and 10% are-2.75, -2.5 and -2.34

The results of the unit root test in Table 7 reveal the stationarity of all variables at the level. The significance and resistance, as both the CADF and CIPS statistics reject the null hypothesis of a unit root. For each series, the test statistics are greater in magnitude than the corresponding critical values. This is strong evidence that all other variables are I(0), i.e., they are stationary without differencing. With this evidence, the use of standard panel models (fixed or random effects) with no danger of spurious regression is justified. Given the lack of unit roots, the use of the variables in levels for estimation is appropriate. Furthermore, there is a need to use the Hausman test to decide between fixed and random effects. In essence, the results support proceeding with panel regression diagnostics to determine which estimator will work best for the data.

Table 8. Fixed effect-Random effect test results.

Variable	FE Coef.	FE Std. Err.	RE Coef.	RE Std. Err.
AC	0.14	0.05	0.13	0.05
CPI	-0.09	0.03	-0.09	0.03
TRSP	0.06	0.04	0.06	0.04
INST	0.10	0.05	0.10	0.04
AID	0.07	0.03	0.07	0.03
GDP	0.12	0.04	0.11	0.03
Constant	2.37	0.61	2.22	0.59
R-squared (FE):	**0.72**			
R-squared (RE):	**0.69**			

Note: FE Coef stands for Fixed effect coefficient.
RE Coef stands for random effect estimator.
Std Err stands for standard errors.

Table 9. Hausman test result.

Test	Chi² Statistic	p-value
Hausman Test	9.85	0.04

Note: The Hausman test stands for the Hausman Specification Test.
The Hausman test indicates that the Fixed Effects model is more appropriate for this panel.

Table 9 reveals the selection of the Fixed Effects (FE) model as the best fit under the Hausman test criteria ($\chi^2 = 9.85$, $p = 0.04$). Results in Table 8 show that a one-point increase in the anti-corruption activity index is associated with a 0.14% improvement in PFM. This indicates that institutional anti-corruption measures, such as the autonomy and operational capacity of anti-corruption agencies, exert a significant influence on fiscal governance. These findings are consistent with those of Kopanchuk et al. (2021). The result highlights the importance of agency independence in strengthening accountability and avoiding inefficiencies in the allocation of public resources. In contrast, a 1-point increase in inflation is associated with a 0.9% decline in PFM. This outcome reflects the distortive impact of inflation on fiscal policy operations, as rising prices erode the real value of revenues, disrupt the public budget, and undermine fiscal credibility. This result aligns with Mihaljek (2023), confirming that inflation has a negative impact on fiscal management. However, strengthening transparency initiatives, such as the use of Prozorro, is also important for public finance management. Results show that a one-point increase leads to a 0.06% significant improvement in PFM. The results of the study also indicate that transparency has a significant positive impact on PFM, which aligns with the findings of Androniceanu (2021). Similarly, a one-point rise in institutional quality creates a 0.10% increase in PFM. This outcome clearly reveals the detrimental effect of institutional strength in managing public funds. The finding is consistent with Hepworth (2024). Moreover, a 1 pint increase in international aid endorses a 0.07% improvement in PFM. It also signifies that foreign aid can strengthen fiscal governance. This result is further supported by Khujamkulov (2024). Finally, the data show that a one-point increase in GDP boosts PFM by 0.12%. This outcome is in line with the recent findings of Alshubiri, Elheddad, and Alfar (2023).

Table 10. 2SLS regression result.

Time	Coefficient (2SLS)	Std. Error	p-value
AC (instrumented)	0.16	0.05	0.00
CPI	-0.09	0.03	0.00
TRSP	0.06	0.04	0.08
AID	0.07	0.03	0.01
GDP	0.12	0.03	0.00
Constant	2.28	0.59	0.00

Note: 2SLS stands for Two-Stage Least Squares (2SLS) regression estimation.
Std Err stands for standard errors.

Table 10 shows the outcomes of the Two-Stage Least Squares (2SLS) regression. This test is employed as a robustness check for the initial test. Empirical values indicate that the study addresses the potential issue of endogeneity in the estimation of Fixed Effects, particularly concerning the anti-corruption activity (AC) variable, by employing the 2SLS approach as an additional verification method. Furthermore, the analysis incorporates theoretically grounded and statistically valid instrumental variables. Specifically, the endogenous proxy variables for anti-corruption capacity, such as institutional quality (INST) measured by the World Bank's Rule of Law and Government Effectiveness indicators, are strongly correlated with the authority and independence of anti-corruption institutions such as NABU, while not being directly associated with short-term fluctuations in PFM performance.

5. DISCUSSION

Ukraine's post-war PFM environment will be shaped by three key factors: the impact of anti-corruption efforts, institutional robustness, and the administration of unprecedented levels of foreign assistance. Similarly, empirical outcomes support the argument that anti-corruption mechanisms significantly improve PFM. This result aligns with

the findings of Androniceanu (2021) and Kopanchuk et al. (2021), who also hold the view that serious anti-corruption efforts are the foundations of a strong public finance setup. The practical importance of digital instruments, particularly e-procurement systems, is also verified by Teichmann et al. (2023). These practical examples recommend how important it is to strengthen Ukraine's National Anti-Corruption Bureau (NABU) and expand the Prozorro system.

There is a great need to adopt these policy initiatives for the reconstruction and development of Ukraine's economy. Interestingly, this study also highlights that the impact of anti-corruption efforts can be controlled by institutional fragility. This finding is consistent with the work of Hogić (2023), focusing on the post-conflict era in Africa, who asserted that anti-corruption efforts can be restrained by weak institutional foundations. For Ukraine, this highlights the need not only for technical improvements but also for broader institutional reforms to ensure sustainable development. The statistical finding that transparency is positively associated with improved PFM aligns with Mungiu-Pippidi (2023), who argues that openness in public budgets fosters greater citizen trust and fiscal accountability.

However, some contradictory evidence exists. For example, Lopes and Andrade (2022) suggest that in contexts lacking local administrative capacity, transparency tools alone may not effectively reduce corruption. Therefore, in Ukraine, expanding the Prozorro system should be accompanied by targeted training and capacity-building at the local level to ensure these tools are translated into effective action. The results of this study also indicate that foreign aid has a positive impact on PFM outcomes. This is consistent with the findings of Dynarski et al. (2023) and Villaverde (2023) and others, who emphasize the potential for donor-led reforms to improve fiscal transparency when coupled with strong governance conditions. However, as evidenced by the case of Bosnia, aid that is not aligned with internal reforms may have a limited impact.

Policymakers in Ukraine must ensure that donor support is conditional upon clearly defined governance outcomes, so that external assistance and good governance reinforce one another in a sustainable cycle of reform and support. The negative relationship between inflation and PFM performance identified in this study supports previous findings by Mihaljek (2023), who demonstrated that inflation undermines fiscal stability and erodes the predictability of public revenues. This result serves as a further warning to Ukrainian fiscal authorities to prioritize inflation neutrality in post-war financial planning. Similarly, the positive correlation between economic growth and PFM outcomes is consistent with the findings of Alshubiri et al. (2023), who argue that a growing economy enhances the state's revenue-generating capacity, often overlooking the importance of institutional reform. However, as the experiences of Croatia and Hungary demonstrate, economic growth alone cannot reduce corruption without concurrent institutional reforms. Therefore, growth strategies in Ukraine must be complemented by governance improvements.

This study has certain limitations, particularly the restricted availability of post-2022 data due to the ongoing conflict. It is an attempt to cover both during and post-war fiscal problems of Ukraine. While it becomes a challenge to discuss the existing issues associated with the core factors of the war, the estimations and measurements are quite questionable under this conflicted environment. Nonetheless, including this timespan is essential to understanding the realistic standing of anti-corruption reforms in Ukraine. Although the panel data approach offers valuable insights, the reduced sample size during wartime may obscure more nuanced interactions between conflict dynamics and institutional variables such as anti-corruption effectiveness and aid absorption. For policymakers, the paper provides both a theoretical foundation and empirical evidence that post-war fiscal recovery must be multidimensional. It should include comprehensive anti-corruption reforms, transparent digital systems, effective deployment of donor support, and the maintenance of macroeconomic stability. Drawing on comparative lessons from the selected panel of countries, the study highlights that while technical tools are essential, it is ultimately political will, institutional capacity, and policy coherence that will determine success.

6. CONCLUSION AND POLICY RECOMMENDATIONS

6.1. Conclusion

The purpose of this research was to identify the key institutional and economic drivers influencing public financial management (PFM) in post-war and war-affected contexts, with a particular focus on anti-corruption frameworks, transparency mechanisms, and the macroeconomic environment. The panel data analysis, based on six countries (Ukraine, Croatia, Georgia, Hungary, Bosnia and Herzegovina, and Rwanda), demonstrates that efficient anti-corruption agencies and high institutional quality consistently produce positive outcomes in fiscal governance. In contrast, inflation has emerged as a major negative factor in unstable post-war settings. The analysis also confirms a positive relationship between economic growth and foreign aid in improving fiscal performance. It can be concluded that limited corruption and stable institutions are essential for effective public financial management (PFM). In anticipation of Ukraine's post-conflict recovery, my empirical findings, supported by specification tests and robustness checks, provide a sound empirical foundation on which actionable policy advice for Ukraine can be developed.

6.2. Policy Recommendations

Based on the empirical results and comparative analysis of other countries' experiences, the following evidence-based recommendations are proposed for Ukraine's post-war recovery.

Preserve and strengthen NABU's operational independence to enable effective prosecution of high-level corruption, as demonstrated by Georgia's successful post-conflict reforms. Expand and institutionalize Prozorro-based e-procurement systems at the municipal and oblast levels, drawing on Rwanda's effective use of digital platforms to enhance fiscal transparency and reduce aid misuse. Tie international aid disbursements to quarterly governance and fiscal audits, since Rwanda's experience indicates that donor support is most effective when aligned with transparent and accountable institutions. Ensure coordination between monetary and fiscal policy to prevent inflation from undermining fiscal sustainability, as seen in Bosnia, where inflationary pressures weakened efforts to consolidate the national budget.

6.2.1. Actionable Policy Recommendations for Ukraine

Develop a monitoring mechanism for local procurement based on the Prozorro system to enhance fiscal transparency in municipal and oblast-level spending, particularly in infrastructure reconstruction. Preserve the budgetary and operational independence of NABU (National Anti-Corruption Bureau of Ukraine) throughout the post-aid transition period to ensure the agency continues to function effectively and without political interference after donor support ends.

6.3. Future Research Priorities

Several critical areas that remain unaddressed in the context of post-2025 recovery warrant further attention in future research. A longitudinal perspective will be essential to track the gradual evolution of emergency procurement mechanisms into permanent public financial management (PFM) institutions. Although digital platforms such as Prozorro have seen widespread adoption, their effectiveness remains a vital area of inquiry. This should be explored through high-quality mixed-methods research, including vendor surveys and ethnographic studies of procurement practices. Comparative research on war-to-peace transitions in countries such as Ukraine, Bosnia, and Rwanda may offer insights into how anti-corruption agencies adapt their oversight functions during reconstruction. Experimental studies could also test emerging tools, such as blockchain-based monitoring of municipal expenditures in conflict-affected oblasts like Kharkiv and Mykolaiv. In addition, network analysis may uncover how ad hoc wartime volunteer organizations can be institutionalized as resilient, corruption-resistant channels for postwar reconstruction aid. The available evidence clearly shows that institutional quality and anti-corruption infrastructure form the essential foundation of Ukraine's fiscal future. As the pace of reconstruction accelerates, the application of these principles to

every hryvnia spent will determine whether recovery builds resilience or merely reproduces the vulnerabilities of the pre-war era. This study provides an empirical blueprint; it is now up to Ukraine's political leadership to operationalize the institutional framework.

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