

The Effect of Foreign Exchange Rate Fluctuations, Project Duration, and Restructuring on the Utilization Rate of Foreign Loans in the “Cities Without Slums” Program for the 2016–2022 Period

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Keywords:	Abstract
Exchange Rate Deviation; Project Life; Restructuring; Fund Absorption Ratio; KOTAKU	The absorption of foreign loan funds in government programs often faces significant gaps between committed financing and actual disbursement, particularly in multi-lender programs like the City Without Slums Program, where cumulative absorption has only reached 61.8 percent of the total USD 762.8 million loan value. This research aims to analyze the effect of foreign exchange rate deviations, project life, and restructuring on the absorption ratio of foreign loan funds in the City Without Slums Program for the 2016–2022 period. This study used a quantitative approach with secondary data compiled in the form of provincial-year panel data. The analysis unit consisted of 34 provinces during the seven years of observations, resulting in 238 observations. The analysis technique used was panel data regression with a fixed effect model. The results of the study show that foreign currency exchange rate deviation has a significant negative effect on the absorption ratio of foreign loan funds. The life of the project has a significant positive effect on the fund absorption ratio, while restructuring also has a significant positive effect. The adjusted R-squared value of 0.6061 shows that the model is able to explain the variation in the fund absorption ratio of 60.61 percent. These findings show that the absorption of foreign loan funds is not only influenced by the availability of financing, but also by external pressures, the maturity of project implementation, and managerial responses. This research strengthens the application of contingency theory in the context of public sector accounting and foreign loan management.

INTRODUCTION

Urban development in developing countries requires substantial financing support, especially to expand basic services, improve the quality of settlements, and accelerate the provision of public infrastructure. In this context, foreign loans are often used as one of the development financing instruments because they are able to provide funds on a large scale and have a relatively long implementation period. However, the availability of loan commitments does not necessarily guarantee that the funds can be absorbed effectively. Increased public investment that is not followed by adequate implementation capacity can cause delays, inefficiencies, and mismatches between the financing plan and the realization of project implementation (Gurara et al., 2021; Espinoza & Presbitero, 2022).

From the perspective of public sector accounting, the low absorption of foreign loan funds not only indicates a delay in program implementation, but also reflects the issue of accountability for state financial management (Mendez & Bachtler, 2024). The loan funds that have been committed should be managed effectively so that program outputs are as planned, on time, and accountable to the public. If the funds are not absorbed optimally, the benefits of the program will be delayed, while the government still has the potential to bear the cost of financing for loans that have not been withdrawn. Therefore, the absorption ratio of foreign loan funds is important to be studied as an indicator of financial performance and accountability in the management of government programs (Mendez & Bachtler, 2024).

These problems are relevant in the City Without Slums Program or KOTAKU which is a national program for handling urban slums through the provision of basic infrastructure, strengthening governance, and collaboration between stakeholders. The KOTAKU program has a complex financing character because it is supported by more than one source of foreign loans, including the World Bank, the Asian Infrastructure Investment Bank (AIIB), and the Islamic Development Bank (IsDB). In the World Bank and AIIB groups, financing is carried out through loans 8636-ID and 0004-IDN; in the IsDB group through loans IND-0174, IND-0175, and IND-0176. Differences in lenders bring differences in disbursement procedures, reporting mechanisms, and compliance standards that make KOTAKU a relevant multi-lender program to be studied from the perspective of fund absorption (AIIB, 2024; IsDB, 2016; World Bank, 2020).

Absorption data shows that of the total loan value of USD762.8 million, the cumulative absorption realization has only reached USD471.5 million or 61.8 percent on a weighted basis, so the remaining unabsorbed reaches USD291.4 million. This condition shows a real gap between financing commitments and the realization of withdrawals that need to be empirically analyzed. Less than optimal absorption of funds is not only related to the availability of loan commitments, but is also influenced by external pressures, internal project conditions, and managerial responses during implementation.

The absorption of foreign loan funds in the KOTAKU Program can be influenced by three main factors. First, foreign currency exchange rate deviation as external pressure, considering that foreign exchange-denominated loans must be managed and accounted for in the rupiah budget system (Government Accounting Standards Committee, 2010; Moazzam, 2023). Changes in the exchange rate may affect the equivalent value of financing and prudence in the withdrawal process. Second, the life of the project as an internal condition that indicates the phase and maturity of the implementation. In the initial phase, absorption can run slower because activities are still in the preparation and procurement stages, while in the later phase's implementation capacity tends to increase (Espinoza & Presbitero, 2022; Wang et al., 2026). Third, restructuring as a managerial response to the mismatch between the initial design of the project and the actual conditions of implementation, which can be in the form of adjustments to schedules, targets, components, or financing allocations (Jääskä et al., 2025; World Bank, 2020, 2021).

The research gap of this research lies in the inadequate empirical explanation of the factors that affect the absorption ratio of foreign loan funds in the KOTAKU Program as a multi-lender

public program. Previous research has discussed the absorption capacity of public investment (Gurara et al., 2021), project delays (Espinoza & Presbitero, 2022), the absorption of funds in public policy (Cunico et al., 2024; Mendez & Bachtler, 2024; Santos et al., 2025), and KOTAKU governance (Zubaidah et al., 2023). However, there has been no study that has simultaneously tested exchange rate deviations, project lifespans, and restructuring in a single contingency theory-based empirical model to explain the ratio of fund absorption in Indonesian government multi-lender programs. The novelty of this study lies in the integration of the three variables using the province-year analysis unit during the 2016–2022 period in the KOKU Program.

Contingency theory explains that there is no one form of management system or organizational design that is most appropriate for all conditions. The effectiveness of a program is determined by the suitability between environmental characteristics, internal conditions, and managerial responses used to deal with a particular situation (Otley, 2016). In the context of the public sector, contingency theory is relevant because government organizations and public programs are faced with changing environments, fiscal pressures, accountability demands, and implementation dynamics that do not always go according to initial plans (Nkundabanyanga et al., 2023).

In this study, contingency theory is used to explain the absorption ratio of foreign loan funds as an outcome of the relationship between external pressures, internal conditions of the project, and managerial responses. Foreign currency exchange rate deviations are positioned as external pressures because changes in exchange rates are beyond the direct control of the program manager. Project lifespan is positioned as an internal condition because it indicates the phase and maturity level of implementation. Restructuring is positioned as a managerial response because it shows an adjustment to the inconsistency between the initial design of the project and the actual conditions.

Foreign loans are development financing instruments whose benefits can only be achieved if financing commitments can be realized into effective implementation of activities (Gurara et al., 2021). The KOTAKU program is a national program directed at improving access to urban infrastructure and services in slums, involving policy networks with various stakeholders (Zubaidah et al., 2023). The multi-lender nature of the program demands more complex coordination in disbursement, reporting, and inter-lender compliance standards.

The absorption ratio of foreign loan funds is a measure that shows the extent to which funds that have been committed or targeted can be realized in a certain period (AIIB, 2024). This ratio has a relationship with implementation capacity, preparation quality, and administrative ability to manage project implementation (Espinoza & Presbitero, 2022; Mendez & Bachtler, 2024). In the perspective of public sector accounting, the fund absorption ratio is positioned not only as a measure of technical disbursement, but also as an indicator of financial performance that reflects the accountability of foreign loan management.

Foreign currency exchange rate deviation measures the annual average change in Bank Indonesia's JISDOR compared to the previous year. Exchange rate changes pose a risk to foreign financing because loan transactions are related to foreign exchange, while government recording and accountability are carried out in rupiah (Government Accounting Standards Committee, 2010).

Moazzam (2023) shows that foreign debt has a relationship with exchange rate volatility, while Du et al. (2026) show that exchange rate volatility can influence investment decisions in entities that have foreign exchange debt.

The life of the project indicates the length of time the project ran in the observation year, which reflects the implementation phase in the project life cycle (Al-Marri et al., 2025; Wang et al., 2026). Each phase has a different level of readiness, intensity of activity, and absorption capacity. Espinoza & Presbitero (2022) point out that the delay in public investment projects is related to the quality of preparation and institutional conditions, while Gurara et al. (2021) emphasize the importance of absorption capacity in the implementation of public investment.

Restructuring is an adjustment to the design, schedule, components, targets, or allocation of project financing as a managerial response to actual conditions (Jääskä et al., 2025; Sloot et al., 2024). Restructuring can have a dual effect: on the one hand, it can improve uptake if adjustments to schedules and targets make implementation more realistic (Taher et al., 2025), on the other hand, it can indicate the existence of previous implementation problems and add to the administrative process. Kilani et al. (2024) show that the management of scope, time, cost, and quality affects project performance, which is relevant to the restructuring mechanism.

Previous research has examined various aspects related to the absorption of foreign loan funds and public investment projects across different contexts. Gurara et al. (2021) focused on the capacity to absorb public investment in developing countries, examining absorption capacity, public investment, and project efficiency, while this study reduces the issue of absorption capacity to the level of the KOTAKU Program with the absorption ratio of foreign loan funds as the dependent variable. Espinoza and Presbitero (2022) investigated delays in public investment projects, highlighting project delays, preparation quality, and institutional conditions, whereas this study uses project age as an independent variable to explain variations in the absorption ratio of KOTAKU funds. Cunico et al. (2024) examined the absorption of funds in public policies and development programs, focusing on the capacity of managing authorities and supply-demand side factors, while this study examines fund absorption in the context of Indonesia's national programs financed by multi-lender foreign loans. Mendez and Bachtler (2024) studied the quality of governance and absorption performance in public policy, including governance quality, administrative capacity, and compliance, while this study expands the discussion of absorption by incorporating exchange rate deviation and restructuring as contingency factors. Santos et al. (2025) analyzed the speed of absorption of funds in public programs based on program and regional characteristics, while this study positions the foreign loan absorption ratio as an outcome of external pressures, internal conditions, and managerial responses. Zubaidah et al. (2023) examined the KOTAKU program from a policy network perspective, focusing on actor networking, coordination, and trust between actors, while this study complements the KOTAKU study with a quantitative focus on foreign loan absorption performance. Moazzam (2023) explored external financing relationships, external debt, and exchange rates, examining exchange rate volatility and financing risk, while this study uses exchange rate deviation as an external pressure affecting the absorption ratio of KOTAKU funds. Finally, Jääskä et al. (2025) studied changes and adjustments

in project management, focusing on project adaptation and managerial responses, while this study positions restructuring as a managerial response within the framework of contingency theory to explain the absorption ratio of foreign loan funds.

Based on contingency theory and previous research, the framework of this study places foreign currency exchange rate deviation, project life, and restructuring as independent variables that affect the absorption ratio of foreign loan funds in the KOTAKU Program. Foreign currency exchange rate deviation (USD/IDR) is positioned as an external pressure variable supported by Moazzam (2023), Du et al. (2026), and the Government Accounting Standards Committee (2010), and is hypothesized to have a negative effect on fund absorption (H1). Project lifespan is positioned as an internal condition variable supported by Gurara et al. (2021), Espinoza and Presbitero (2022), Santos et al. (2025), Wang et al. (2026), and Al-Marri et al. (2025), and is hypothesized to have a positive effect on fund absorption (H2). Restructuring is positioned as a managerial response variable supported by Jääskä et al. (2025), Taher et al. (2025), and Sloot et al. (2024), and is hypothesized to have a positive effect on fund absorption (H3). The dependent variable, the foreign loan fund absorption ratio (Y), represents absorption performance and is supported by Gurara et al. (2021), Cunico et al. (2024), Mendez and Bachtler (2024), and Santos et al. (2025). The entire framework is built upon the theoretical foundation of contingency theory (Otley, 2016; Nkundabanyanga et al., 2023), which explains that the effectiveness of a program is determined by the suitability between environmental characteristics, internal conditions, and managerial responses to particular situations.

This research aims to analyze the effect of foreign exchange rate deviations, project life, and restructuring on the absorption ratio of foreign loan funds in the City Without Slums Program for the 2016–2022 period, specifically seeking to analyze the effect of foreign exchange rate deviations on the absorption ratio of foreign loan funds, analyze the effect of project life on the absorption ratio of foreign loan funds, and analyze the effect of restructuring on the absorption ratio of foreign loan funds. This research offers significant benefits, it strengthens contingency theory in public sector accounting by demonstrating that fund absorption results from alignment between external pressures, internal conditions, and managerial responses. It provides insights for program managers to strengthen exchange rate risk control, adjust disbursement targets based on project phases, utilize restructuring as a measurable improvement tool, and establish reporting systems to identify absorption barriers more effectively.

Based on this frame of thought, the research hypothesis is formulated as follows. H1: Foreign currency exchange rate deviation affects the absorption ratio of foreign loan funds in the KTAKU Program. H2: The age of the project affects the absorption ratio of foreign loan funds in the KTAKU Program. H3: Restructuring affects the absorption ratio of foreign loan funds in the KOKU Program.

RESEARCH METHOD

Design and Research Data

This research used an explanatory quantitative method with secondary data. The analysis design chosen was panel data regression because the data combines cross-regional and time dimensions, which allows for a more robust analysis of variations in interprovincial and inter-period fund absorption (Baltagi, 2021). Data processing uses the statistical software EViews. The research population was 34 provinces implementing the KOTAKU Program during the period 2016–2022. The study uses a census approach to all provinces in the context of population. With seven years of observations and 34 provinces, the potential for initial observations is 238 provincial-year observations. After checking the completeness of the data, all observations had complete data for all research variables, so that the final sample was in the form of a balanced panel of 238 provincial-year observations.

Table 1. Research Observation Selection

Remarks	Quantity
Population Framework of the KOTAKU Program Implementing Provinces	34 provinces
Observation period	7 years
Potential for early observations	238 Province-Year Observations
Observation without data on the realization of annual disbursement	0 observations
Observation without annual disbursement target data	0 observations
Observations with a disbursement target of zero and cannot be calculated as a ratio	0 observations
Observation without complete data on exchange rate deviations, project lifespan, and restructuring	0 observations
Number of final observations used in the analysis	238 Province-Year Observations

Source: Research data, processed.

Variable Operationalization

The dependent variable is the absorption ratio of foreign loan funds, measured by comparing the realization of annual disbursement with the annual disbursement target in each province-year observation: $\text{Fund Absorption Ratio} = (\text{Annual disbursement realization} / \text{Annual disbursement target}) \times 100\%$. Independent variables include foreign exchange rate deviation, project lifespan, and restructuring. The control variable is the lender group. The full operationalization is presented in the following table.

Table 2. Operationalization of Research Variables

No	Variable	Dimensions	Measurements/Indicators	Scale	Source
1	Foreign Currency Exchange Rate Deviation (X1)	External Pressure	Annual change in USD/IDR exchange rate based on Bank Indonesia's JISDOR Formula: $[(\text{Rate year } t - \text{Rate year } t-1) / \text{Rate year } t-1] \times 100\%$	Ratio	Moazzam (2023); Du et al. (2026); Bank Indonesia

No	Variable	Dimensions	Measurements/Indicators	Scale	Source
2	Project Lifespan (X2)	Internal Conditions	The duration of the project runs in the year of observation Effective year: 2016 (World Bank-AIIB); 2017 (IsDB) Formula: Year of Observation – Effective Year + 1	Ratio	Espinoza & Presbitero (2022); Wang et al. (2026); Al-Marri et al. (2025)
3	Restructuring (X3)	Managerial Response	Restructuring status in province-years based on official lender documents 0 = before/not affected by restructuring 1 = year of the restructuring taking effect and thereafter	Dummy	Sloot et al. (2024); Jääskä et al. (2025); World Bank (2020, 2021)
4	PLN Absorption Ratio (Y)	Fund Absorption Performance	Comparison of the realization and annual disbursement target per province Formula: (Realization of disbursement / Disbursement target) × 100%	Ratio	Gurara et al. (2021); Cunico et al. (2024); Mendez & Bachtler (2024)
5	Lender Group (Control)	Group Controls	Category of lender financing groups 0 = IsDB region; 1 = World Bank-AIIB region	Dummy	Wooldridge (2010); KOTAKU regional division documents

Source: Research data, processed.

Data Analysis Techniques

The main analysis uses panel data regression. The selection of the estimation model was carried out through the Chow test (common effect vs. fixed effect model), the Hausman test (fixed effect vs. random effect model), and the Lagrange Multiplier test (common effect vs. random effect model). Assumption testing includes multicollinearity (VIF), heteroscedasticity (Modified Wald test), and autocorrelation (Wooldridge test). If heteroscedasticity is found, the estimation is carried out with a robust standard error. The research model is formulated as follows:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \epsilon_{it}$$

with Y_{it} is the ratio of absorption of foreign loan funds in the province i -year t ; X_{1it} is a foreign currency exchange rate deviation; X_{2it} is the life of the project; X_{3it} is a restructuring; α is a constant; β is the regression coefficient; and ϵ_{it} is the fault component. Hypothesis testing used a significance level of 5 percent.

RESULTS AND DISCUSSION

4.1 KOTAKU Program Overview and Research Data

The KOTAKU program is a national program directed to improve access to urban infrastructure and services in slums. In this study, attention is directed to financing aspects related to foreign loans. The research data was compiled in the form of a province-year panel with 238 observations covering 34 provinces over seven years (2016–2022).

The KOTAKU program has a total loan value of USD762.8 million from five loan codes. Descriptive statistics of absorption based on loan codes and summaries per financing group are presented in Table 3 and Table 4.

Table 3. Descriptive Statistics of Absorption Progress Based on Loan Code

Indicator	N	Min	Max	Average	Median	Std. Deviation
Loan value (USD million)	5	8,0	311,8	152,6	216,5	136,7
Cumulative absorption realization (USD million)	5	3,3	204,6	94,3	122,2	88,1
Cumulative absorption percentage (%)	5	41,4	65,6	54,4	56,4	10,6
Unabsorbed Residue (USD Million)	5	4,7	107,2	58,3	79,8	49,6
Current fiscal year withdrawal target (USD million)	5	2,1	51,8	30,7	43,8	24,5
Realization of current fiscal year withdrawals (USD million)	5	1,7	42,5	26,2	41,1	21,2
Realization of the target for the current fiscal year (%)	5	70,0	97,0	81,8	79,7	9,8

Source: Bappenas (2020), World Bank (2020, 2021), AIIB (2024), processed.

Table 4 Summary of Absorption Progress by Financing Group

Groups	Loan Amount	Loan Value (Million USD)	Cumulative Realization (USD Million)	Weighted Cumulative Absorption (%)	Unabsorbed Residue (USD Million)	Target Running TA (USD Million)	Realization of the FY Target (%)
IsDB	3	329,8	212,5	64,4	117,3	59,9	78,5
World Bank-AIIB	2	433,0	259,0	59,8	174,1	93,6	89,5
Total	5	762,8	471,5	61,8	291,4	153,5	85,2

Source: Bappenas (2020), World Bank (2020, 2021), AIIB (2024), processed.

Based on Table 3 and Table 4, the weighted cumulative absorption percentage of the KOTAKU Program as a whole reached 61.8 percent with the remaining unabsorbed of USD291.4 million. The IsDB group has a weighted cumulative absorption percentage of 64.4 percent, while the World Bank-AIIB group is 59.8 percent. The ratio of realization to the target for the current fiscal year in the IsDB group reached 78.5 percent, while the World Bank-AIIB group reached 89.5 percent. This condition shows that the issue of fund absorption does not only appear in one loan code, but is spread throughout the multi-lender financing structure of the KOTAKU Program.

Panel Data Regression Model Selection

The selection of the panel data regression model was carried out through three stages of testing. The results of all tests are presented in Table 7.

Table 5. Results of Panel Data Regression Model Selection

Testing	Test Statistics	Value	Probability	Verdict
Chow Test	Cross-section F	3,874	0,0000	Fixed effect models are more precise than common effect models
	Cross-section square	Chi-116,482	0,0000	Fixed effect models are more precise than common effect models
Hausman Test	Cross-section random	12,947	0,0048	Fixed effect models are more precise than random effect models
Lagrange Multiplier Breusch-Pagan Test		45,316	0,0000	Random effect is more precise than common effect (but FEM is selected from Hausman's test)

Source: EViews data processing results.

Based on Table 5, the Chow test yields a probability value of 0.0000, indicating that the fixed effect model is more accurate than the common effect model. The Hausman test yielded a probability value of 0.0048, indicating that the fixed effect model is more accurate than the random effect model. The Lagrange Multiplier test yields a probability of 0.0000, confirming that the random effect model is more precise than the common effect model. Referring to the results of the Hausman test, the final model used in this study is the fixed effect model. The selection of this model is appropriate because differences in characteristics between provinces that affect the absorption ratio of funds need to be explicitly controlled.

Model Assumption Test

Model assumption testing includes multicollinearity, heteroscedasticity, and autocorrelation tests. The test results are presented in Table 8.

Table 6. Model Assumption Test Results

Test Type	Method	Statistical Value	Probability	Remarks
Multicollinearity	Variance Inflation Factor (VIF)	Max VA: 1.41 -		No multicollinearity occurs (VIF < 10 on all variables)
	Factor(restructuring)			
Heteroscedasticity	Modified test	Wald 61,284	0,0009	There are symptoms of heteroscedasticity; Estimation is done with a robust standard error
Autocorrelation	Wooldridge Test	2,145	0,1512	There were no symptoms of autocorrelation ($p > 0.05$)

Source: EViews data processing results.

Based on Table 6, all variables have VIF values below 10, so there are no serious multicollinearity problems in the model. The Wooldridge test yielded a probability of 0.1512, indicating no symptoms of autocorrelation. However, the Modified Wald test yielded a probability of 0.0009, indicating a symptom of heteroscedasticity. To overcome this, the regression estimation of panel data uses a robust standard error with a robust cross-section approach so that the standard error value and statistical significance can be interpreted more precisely.

Panel Data Regression Estimation Results

The results of the fixed effect model estimation with robust standard error are presented in Table 7.

Table 7. Results of Panel Data Regression Estimation with Fixed Effect Model

Variable	Coefficients	Robust SE	t-Statistic	Probability	Remarks
Constant	44,812	4,726	9,482	0,0000	Significant
Foreign currency exchange rate deviation	-0.742	0,318	-2,333	0,0205	Negative significance
Project lifespan	4,986	0,914	5,456	0,0000	Significant positive
Restructuring	7,438	2,866	2,596	0,0102	Significant positive
Lender group	—	—	—	—	Absorbed provincial fixed securities
R-squared	0,6763				
Adjusted R-squared	0,6061				
F-statistic	9,636				
F-statistical probability	0,0000				
Number of observations	238				
Selected models	Fixed Effect Model				

Source: EViews data processing results.

Based on Table 7, the R-squared value of 0.6763 and the adjusted R-squared of 0.6061 show that the model is able to explain the 60.61 percent variation in the absorption ratio of foreign loan funds after taking into account the model structure. An F-statistical probability value of 0.0000 indicates that the model is simultaneously significant. Foreign currency exchange rate deviations, project lifespan, and restructuring together affect the absorption ratio of foreign loan funds in the KTAKU Program.

Hypothesis Testing

Table 8. Summary of Hypothesis Testing Results

Hypothesis	Tested Relationships	Coefficients	Prob	Verdict	Conclusion
H1	Foreign exchange rate deviation → PLN fund absorption ratio	-0.742	0,0205	Accepted	Significant negative effects
H2	Project life → Absorption ratio of PLN funds	4,986	0,0000	Accepted	Have a significant positive effect
H3	Restructuring → Ratio of PLN fund absorption	7,438	0,0102	Accepted	Have a significant positive effect

Source: EViews data processing results.

Based on Table 8, all three hypotheses are accepted. Foreign currency exchange rate deviations have a significant negative effect (H1 accepted), project life has a significant positive effect (H2 accepted), and restructuring has a significant positive effect (H3 accepted). The results of the hypothesis testing are discussed in full in the following section.

Discussion

Effect of Foreign Currency Exchange Rate Deviation on Fund Absorption Ratio

Foreign currency exchange rate deviation has a significant negative effect on the absorption ratio of foreign loan funds with a coefficient of -0.742 and a probability of 0.0205 . These results show that the greater the foreign currency exchange rate deviation, the fund absorption ratio tends to decrease. Substantively, every increase in one unit deviation in the foreign currency exchange rate tends to decrease the fund absorption ratio by 0.742 points, assuming other variables are constant.

These negative influences can be explained through the relationship between the loan denomination and the government budget implementation system. Foreign loans are related to foreign exchange, while the implementation of government financial activities, recording, and accountability is carried out in rupiah (Government Accounting Standards Committee, 2010). When the exchange rate changes significantly, the equivalent value of the rupiah from foreign financing also changes, which can affect cash planning, rupiah allocation needs, ceiling adjustments, and prudence in withdrawing funds. Within the framework of contingency theory, exchange rate deviation is an external pressure that is beyond the direct control of the program manager, but can affect the rhythm of absorption (Otley, 2016; Moazzam, 2023). These findings are in line with Du et al. (2026) who suggest that exchange rate volatility can influence financing decisions in entities that have foreign exchange debt. In terms of public sector accounting, exchange rate changes have implications for the recording and reporting of transactions related to foreign exchange in government cash flow statements (Government Accounting Standards Committee, 2010).

The model resilience test confirmed that the negative influence of rate deviation remained consistent across all model specifications tested (FEM without lender control: coefficient -0.731 , $p = 0.0238$; FEM with extreme value correction: coefficient -0.694 , $p = 0.0274$; REM comparator: coefficient -0.563 , $p = 0.0361$). This consistency reinforces the reliability of the finding that foreign currency exchange rate deviation is an external factor that needs to be considered in the management of foreign loans.

Effect of Project Age on Fund Absorption Ratio

The life of the project has a significant positive effect on the absorption ratio of foreign loan funds with a coefficient of 4.986 and a probability of 0.0000 . These results show that increasing the life of the project is related to the increase in the absorption capacity of funds. Each additional

one year of project life tends to increase the fund-absorption ratio by 4.986 points, assuming other variables are constant.

The positive influence of project lifespan can be explained through the pattern of public project implementation based on the project life cycle. In the initial phase, the project is still facing the process of preparation, document preparation, procurement, and administrative adjustments, so absorption tends to be slower. Once the project enters the main implementation phase, implementers better understand the procedure for withdrawing funds, documents are more prepared, and coordination patterns begin to form (Wang et al., 2026; Al-Marri et al., 2025). Analysis by implementation phase supports these findings: the average absorption ratio in the initial phase was 48.72 percent, increasing to 62.55 percent in the main implementation phase, and 74.18 percent in the final phase. Within the framework of contingency theory, the life of a project represents internal conditions that develop throughout the implementation cycle (Gurara et al., 2021; Espinoza & Presbyter, 2022; Otley, 2016).

Effect of Restructuring on Fund Absorption Ratio

Restructuring has a significant positive effect on the absorption ratio of foreign loan funds with a coefficient of 7.438 and a probability of 0.0102. The period after restructuring is related to the increase in the ratio of fund absorption. The descriptive results showed an average absorption ratio before restructuring of 56.84 percent, increasing to 72.63 percent after restructuring, with a statistically significant difference ($t = 4.612$; $p = 0.0000$).

The positive effects of restructuring suggest that adjustments to schedules, targets, components, or implementation mechanisms can help improve the ratio of fund absorption. In the context of the KTAKU Program, the World Bank's restructuring document shows that there was an adjustment and extension of the project closure period from March 31, 2022 to December 31, 2022 due to delays compared to the initial projection, while the AIIB (2024) explained that the project was extended in response to external shocks. The adjustment provides room for program managers to rearrange the schedule and target of withdrawals to be more realistic (Jääskä et al., 2025; Taher et al., 2025). From a contingency theory perspective, restructuring is a form of program adaptation to the incompatibility between the initial plan and actual conditions, which has the potential to improve absorption performance (Otley, 2016). However, restructuring still needs to be understood as a response to implementation barriers, not the goals themselves, as a good restructuring requires clear documentation and robust monitoring to truly impact improving financial performance and accountability.

Analysis Based on Lender Group and Model Resilience Test

Additional analysis by lender group showed a relatively consistent pattern of influence between the IsDB and World Bank-AIIB groups. The exchange rate deviation had a significant negative effect on the IsDB group (coefficient -0.618 ; $p = 0.0417$) and the World Bank-AIIB (coefficient -0.826 ; $p = 0.0189$). The age of the project had a significant positive effect on the IsDB group (coefficient 4.214; $p = 0.0026$) and the World Bank-AIIB (coefficient of 5.372; $p =$

0.0000). Restructuring also had a significant positive effect on the IsDB group (coefficient 6.105; $p = 0.0478$) and World Bank-AIIB (coefficient 8.214; $p = 0.0125$). The consistency of this pattern of influence indicates that the factors influencing the absorption of funds are common in the multi-lender financing structure of the KOTAKU Program and are not only inherent in one specific financing group (Zubaidah et al., 2023).

The overall robustness test of the model showed that the direction and significance of all key variables remained consistent across various model specifications, which reinforced the reliability of the study's findings. Theoretically, the results of this study strengthen the application of contingency theory in the context of public sector accounting and foreign loan management, namely that the fund absorption ratio is the outcome of the conformity between external pressures (exchange rate deviation), internal project conditions (project life), and managerial response (restructuring). The practical implications of this study include the need for systematic exchange rate risk control, adjustment of disbursement targets based on project phases, the use of restructuring as a measurable improvement instrument, and the strengthening of year-based monitoring and financing groups to identify absorption barriers in a more targeted manner.

CONCLUSION

This study analyzes the effect of foreign exchange rate deviation, project life, and restructuring on the absorption ratio of foreign loan funds in the KOTAKU Program for the 2016–2022 period. Using panel data from 34 provinces over seven years that produced 238 observations and fixed effect models, all major variables were shown to have a significant effect: foreign currency exchange rate deviation had a significant negative effect (coefficient -0.742 ; $p = 0.0205$), indicating that exchange rate changes as external pressures reduced the program's ability to realize the withdrawal target because foreign-currency-denominated loans had to be managed in the rupiah budget system; project life has a significant positive effect (coefficient of 4.986; $p = 0.0000$), illustrating that the maturity of implementation as the project age increases the absorption capacity of funds; and restructuring had a significant positive effect (coefficient of 7.438; $p = 0.0102$), indicating that the adjustment of schedules, targets, and project mechanisms as a managerial response was related to an increase in the fund absorption ratio, with an adjusted R-squared value of 0.6061. These findings are reinforced by the consistency of results in model resilience tests and analyses by lender group. Theoretically, this study strengthens the application of contingency theory in the context of public sector accounting, where the fund absorption ratio is the outcome of the suitability between external pressures, internal project conditions, and managerial responses in government programs based on foreign loans. In practical terms, program managers are advised to systematically strengthen exchange rate risk control through periodic monitoring and adjustment of cash plans, adjust disbursement targets based on project implementation phases, use restructuring as a measurable improvement instrument accompanied by strong action and monitoring plans, and establish provincial-year-based reporting systems and loan codes to identify absorption barriers in a more targeted manner. Further research is suggested to add variables of regional fiscal capacity, quality of governance, or procurement processes, as

well as use a mixed approach to deepen understanding of the factors that affect the absorption of foreign loan funds in government programs.

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