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Curbing Year-End Spending Spikes: Impact Analysis of the Pre-Financing Policy in Non-Tax Revenue-Funded Work Unit

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Abstract

Background: Year-end spending spikes (YESS) remain a persistent fiscal governance challenge. Under previous regulations, PNBP-funded work units faced liquidity constraints that delayed budget execution. PMK 110/PMK.05/2021 addressed this issue by introducing a pre-financing mechanism that enabled earlier budget implementation.
Objective: This study evaluated the causal impact of the pre-financing policy under PMK 110/PMK.05/2021 on accelerating public budget execution and mitigating year-end spending spikes.
Methods: Using an unbalanced panel of 15,195 observations from 3,660 Non-Tax State Revenue spending units, this study employed a Window-Exclusion Difference-in-Differences (DiD) design with two-way fixed effects as the causal identification strategy. The analysis compared the 2019 baseline with the 2022–2025 post-implementation period while excluding the pandemic years of 2020–2021.
Results: The empirical results revealed that liquidity relaxation significantly increased the Front-Loading Spending Index, with benefits observed exclusively among centralized-scheme units, small-budget entities, and essential services. A quarterly decomposition analysis confirmed a symmetrical structural transformation, in which the policy substantially reduced Quarter IV spending accumulation by 7.37 percentage points and redistributed the same proportion to earlier quarters. Conversely, administrative rigidities, particularly early-year budget blocking and frequent revisions, structurally decelerated budget absorption.
Conclusion: The findings suggest that the pre-financing scheme should be considered for extension to non-centralized units, particularly medium-budget entities. They also highlight the need to accelerate early-year budget unblocking and improve planning quality to minimize budget fluctuations caused by frequent revisions.

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INTRODUCTION

The modern public financial management paradigm, under the New Public Management (NPM), demands a shift from mere procedural compliance toward managerial flexibility oriented toward outcomes (Hood, 1991). This doctrine emphasizes the importance of granting public managers broader discretion ("let managers manage") in resource management, including budgeting, to achieve optimal allocative efficiency.

However, when this principle is translated into the context of fiscal policy, specifically at the stage of budget execution—a palpable academic paradox or tension emerges. On one hand, effective fiscal policy requires accelerated execution to ensure that the budget's counter-cyclical function and the economic multiplier effect are realized promptly. On the other hand, Weberian

state financial management regimes continue to demand high accountability standards, rigorous administrative procedures, and the principle of prudentiality to prevent budgetary leakage (Francesco & Alford, 2020).

The phenomenon of rigid budget execution mechanisms is most clearly manifested in work units (*Satuan Kerja*) that manage Non-Tax State Revenue (PNBP). Unlike work units funded by Pure Rupiah (*Rupiah Murni*), which enjoy allocation certainty from the beginning of the fiscal year, PNBP-managing units, particularly prior to 2022, faced structural liquidity constraints due to the implementation of a post-funding disbursement mechanism. Under the legacy regulatory regime for PNBP maximum disbursement (PMK 190/PMK.05/2012), a unit's spending authority was strictly limited by the amount of revenue already deposited into the state treasury. Consequently, these units were trapped in a cycle of "waiting for revenue inflows" before they could execute their programs.

To mitigate the rigidity of the PNBP regime, the Ministry of Finance introduced Regulation No. 110/PMK.05/2021 about Procedures for Determining the Maximum Disbursement of PNBP. This policy fundamentally alters the incentive structure by introducing a "Pre-financing Mechanism." Unlike the full autonomy of BLUs, PNBP-funded work units must still deposit receipts into the treasury. However, the policy decouples spending authority from real-time deposits. It allows work unit to access liquidity in staged maximum disbursements (*MP*), up to 60% of their annual ceiling at the start of the year, regardless of current revenue realization.

To contextualize the urgency of the Pre-financing Policy (PMK 110/PMK.05/2021), it is essential to examine the baseline spending behavior of Indonesian public agencies prior to the reform. Figure 1 presents the average quarterly spending realization across three distinct work unit types. The data shows a striking structural rigidity.PNBP-funded work units exhibit extreme back-loading, with nearly 50.2% of their annual budget realized in the fourth quarter (Q4). This trajectory closely mirrors that of the Public Service Agencies (*Badan Layanan Umum*/BLU) which realize 46,3% in Q4. Conversely, purely Treasury-funded/RM-funded units exhibited a more even distribution, though also back-loaded, as spending remained concentrated in Q4 (approximately 35%), although the distribution was comparatively more even across quarters due to the certainty of appropriation-based funding.

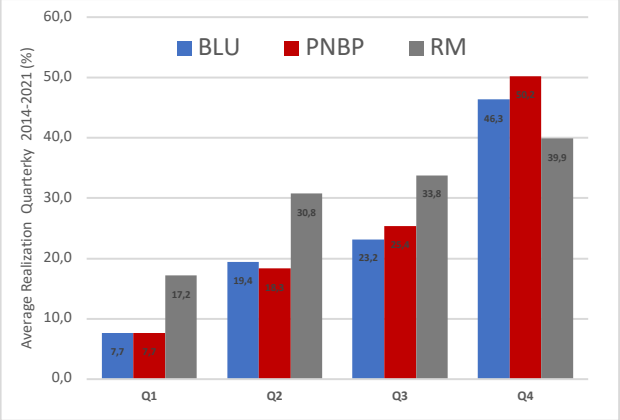

Figure 1. Average Quarterly Budget Realization by Agency Funding Type 2014–2021 (Pre-Policy)
Source: Processed by the authors

To empirically validate the impact of this bottleneck, we also conducted a correlation analysis between the percentage of revenue realization and expenditure realization in the first quarter using the same 2019–2021 preliminary dataset (N = 4,442). The results demonstrate a statistically significant positive relationship, yielding a Spearman rank correlation coefficient of 0.2516 ($p<0.01$) and a Pearson correlation of 0.2363 ($p<0.01$). The Spearman rank correlation coefficient provides a robust statistical measure that effectively accounts for the potential outliers inherently found in public finance data (Croux & Dehon, 2010).

By utilizing this resilient metric, our preliminary analysis econometrically confirms the 'spending follows revenue' constraint. Specifically, it implies a synchronized behavior where work

units capable of accelerating their PNBP collection in Q1 concurrently exhibit higher expenditure execution. Conversely, the vast majority of work unit suffering from sluggish Q1 revenue collection are structurally incapacitated from executing their budgets early, thereby cementing the liquidity trap and delaying the economic multiplier effect of government spending at the start of the fiscal year (Moedy & Ling, 2024). Building upon this compelling preliminary evidence, this study strategically utilizes historical Q1 revenue absorption patterns as the fundamental baseline to construct the quasi-experimental design. Consequently, spending units with a historically low early-year revenue profile are designated as the treatment group, the principal beneficiaries of the liquidity relaxation, while those with inherently high early-year revenue effectively serve as the natural control group.

Although the accumulation of budget execution is frequently discussed in government governance practices, empirical studies that specifically and quantitatively evaluate government expenditure accumulation remain highly limited (Rausch & Wall, 2015). This literature limitation is particularly evident in the Indonesian context. Most previous studies have been exploratory and descriptive, aiming merely to identify the factors causing absorption delays (Negara et al., 2017; Saputri et al., 2021; Zaenudinsyah, 2016). These studies failed to isolate the impact of a specific policy intervention. This study fills this research gap by shifting from an exploratory approach to a causal inference approach. By employing a Difference-in-Differences evaluation of the pre-financing policy, this study critically challenges the basic premise of budget execution deregulation, especially in PNBP-funded work units.

This study seeks to answer three interconnected questions. First, does the implementation of the pre-financing policy through PMK 110/PMK.05/2021 causally impact budget acceleration in work units with historically slow receipt patterns? Second, amidst this liquidity relaxation, do inherent administrative frictions (such as early-year budget blocking policies, high frequency of DIPA revisions, budget volatility, output variation and capital expenditure intensity) continue to act as structural impediments that offset the policy's benefits? Finally, recognizing that policy impacts are rarely uniform, this study delves into a rigorous heterogeneity analysis to investigate its distributional effects. This allows the study to uncover precisely which classifications of Work Units (across disbursement schemes, budget scales, and public service sectors) have successfully leveraged this liquidity cushion, and conversely, which segments remain ineffectively impacted by the intervention.

Year-End Spending Spikes in Public Expenditure

The back-loading phenomenon in budget execution or the “Year-End Spending Spikes” (YESS) is where expenditure realization accumulates disproportionately in the last quarter or at the end of the fiscal year (Helmiwan et al., 2022; Liebman & Mahoney, 2017). YESS is not merely an administrative inefficiency issue; it creates significant macro-fiscal distortions, triggers rushed procurement, compromises service quality, and reduces the multiplier effect of government spending on economic growth (Baumann, 2019; Eichenauer, 2020; Liebman & Mahoney, 2017; Moedy & Ling, 2024). Quantitatively, Moedy (2024) estimate that a 1% increase in Q4 spending concentration reduces quarterly GDP growth by approximately 0.3 percentage points due to delayed input of public demand. Similarly, IMF estimates that compressed year-end spending reduces the fiscal multiplier from a potential 1.5 to approximately 0.7, significantly undermining the counter-cyclical effectiveness of government expenditure.

Global empirical research indicates that year-end surges are driven by flawed institutional incentives, such as the 'use-it-or-lose-it' rule. In the United States, government agencies show an expenditure increase of up to 4.9 times the average in the final week of the fiscal year (Liebman & Mahoney, 2017). Similar inefficiency patterns are also found in Latin America, despite the presence of strict audit mechanisms (Engel et al., 2023). Document persistent year-end spending surges in South Asian developing economies, YESS remains prevalent across Sub-Saharan African public sectors despite fiscal decentralization reforms. Digital treasury management systems can significantly reduce YESS by improving cash flow forecasting and real-time budget monitoring capabilities. In Indonesia, recent studies confirm that YESS is significantly driven by budget uncertainty, managerial risk aversion,

and empirical factors such as budget document (DIPA) revisions and budget blocking (Helmiwan et al., 2022; Siahaija, 2025).

The phenomenon of Year-End Spending Spikes (YESS) represents a fundamental failure in the implementation of New Public Management (NPM), which mandates result-oriented management and lean public governance (Hood, 1991). Within the NPM framework, YESS reveals a misuse of managerial flexibility, where organizations remain tethered to traditional bureaucratic incentives that prioritize quantitative budget absorption over qualitative performance. This systemic dysfunction directly undermines the 3 pillars of "value for money". Economy is compromised through rushed procurement that bypasses competitive market pricing; Efficiency is eroded as resources are deployed haphazardly under extreme time pressure; and Effectiveness is lost as macro-fiscal distortions and diminished service quality fail to generate meaningful public value or long-term outcomes for the citizenry (Nordiawan, 2009).

Incrementalism in Public Financial Management: Bridging Liquidity Constraints through Pre-Financing

The pre-financing policy (PMK 110/PMK.05/2021) can be viewed as a strategic effort to bridge the time lag between revenue realization (input) and the necessity of service delivery (output) by streamlining the disbursement process. From a public policy formulation perspective, the design of this mechanism broadly aligns with Charles Lindblom's theory of incrementalism. Lindblom posits a pragmatic "muddling through" approach, arguing that policies are rarely formulated through radical, comprehensive systemic overhauls due to policymakers' bounded rationality and the impossibility of calculating all potential risks. Instead, decisions rely on successive limited comparisons—small, step-by-step adjustments to existing systems (Lindblom, 2018).

PMK 110/PMK.05/2021 embodies this philosophy; rather than radically dismantling the entire Non-Tax State Revenue governance and treasury architecture (which could trigger systemic fiscal disruptions) a precise, incremental tweak was implemented. It maintains the existing budget document (DIPA) hierarchy but injects a targeted liquidity relaxation specifically at the most critical operational bottleneck: early-year cash constraints. Within the framework of public cash management theory, this pragmatic mechanism aims to maximize value for money by ensuring that public services operate effectively and efficiently, thereby aligning with the principles of quality spending (Helmiwan et al., 2022).

Under this incremental pre-financing mechanism, the determination of the Maximum Disbursement (*Maksimum Pencairan* or MP) is conducted through a multi-tier approach, divided into three main stages (DJPb, 2021). In Stage I, a maximum of 60% of the PNBP budget allocation can be disbursed, with applications starting as early as January. Crucially, during this first stage, the calculation of revenue realization for the current year is not yet required. Theoretically, Stage I serves as a potentially transformative policy instrument in the PNBP disbursement mechanism due to the inherent flexibility of its pre-financing benefits. Subsequently, Stages II and III introduce a more conditional, performance-linked framework. Although these later stages do not grant absolute upfront funding flexibility independent of contemporary receipts, they preserve a proportional pre-financing architecture. This tiering mechanism strategically balances continuous liquidity support with fiscal prudence, thereby mitigating the risk of expenditures exceeding real-time revenue collection in the event that annual revenue targets fail to materialize.

However, from a theoretical standpoint, incremental policy interventions are not immune to implementation gaps. Even a pragmatically designed incremental policy requires thorough alignment with the intrinsic budgetary characteristics and behavioral responses of the targeted spending units. This underscores the theoretical necessity of a formal policy evaluation to determine the extent to which an intervention achieves its intended objectives without generating unintended fiscal risks. This aligns with William N. Dunn's perspective on public policy analysis, which asserts that evaluation is an essential final phase in the policy cycle, particularly to assess performance, measure causal impacts, and determine whether a policy was implemented according to its original design (Agustina & Rahaju, 2021). Through this theoretical lens, evaluating the pre-financing mechanism is imperative to systematically examine whether this incremental liquidity cushion genuinely resolved the administrative bottleneck or inadvertently

shifted the structural fiscal risk.

Administrative Complexity as a Determinant of Budget Execution Delays

In the established literature of public financial management, budget execution is universally characterized by inherent bureaucratic frictions and administrative rigidities (Schick, 1998). As theorized by Liebman (2017), rigid procedural compliance and complex administrative chains inevitably create severe early-year execution bottlenecks, forcing a massive accumulation of expenditures in the final quarter of the fiscal year. This phenomenon is pervasive across diverse international contexts, as evidenced by consistent year-end spending spikes among European Economic Area (EEA) nations operating under traditional "use-it-or-lose-it" annual budgeting cycles. Such dynamics assert that delayed budget absorption is rarely a mere issue of liquidity availability; rather, it is a structural byproduct of operational complexity.

Within the Indonesian State Budget (APBN) framework, the structural inevitability of this accumulation was foundationally diagnosed by Zaenudinsyah (2016), identifying it as a systemic issue driven by an intricate web of administrative and planning bottlenecks. Building upon this, Agustin (2021) empirically validate that sluggish early-year absorption mechanically induces this year-end accumulation due to constraints across planning, execution, and procurement processes. This condition is further exacerbated by fiscal stress—a situation where entities face limited revenue generation to fund their activities—which has been proven to significantly contribute to low budget absorption (Fitri et al., 2025).

At the operational level, this administrative friction is strongly represented by the high frequency of budget document (DIPA) revisions. Repeated revisions reflect the chronic disparity between initial planning and on-the-ground realities Erlina (2017), structurally delaying budget execution until the revised legal documents are officially issued. Conversely, precise planning, characterized by detailed programmatic activities and minimal budget shifts, strongly determines the timeliness of fund drawdown (Yusuf & Muthi'ah, 2023).

Beyond planning issues, the characteristics of the expenditure type (particularly the intensity of capital expenditure) serve as an epicenter of friction during the execution phase. Empirical evidence from European public procurement demonstrates that year-end spending patterns are highly contingent on the type of contract, with rigid public works contracts exhibiting distinctly constrained execution dynamics compared to more flexible supplies and services. The complex nature of capital spending, which is heavily laden with strict procurement and bidding procedures, makes it highly susceptible to delays. Yunita (2018) assert that the stages of the procurement process, the rigidity of administrative requirements, payment flows, and the readiness of procurement personnel collectively dictate the success of budget absorption. This bureaucratic chain naturally creates a substantial time lag, causing capital expenditure realizations to be disproportionately withheld in the early months.

This operational-level complexity is often exacerbated by restrictive central policies, such as early-year budget blocking. Siahaija (2025) articulates this phenomenon as the Fiscal Diet Effect, wherein the existence of blocked budget allocations deprives work units of their operational flexibility, triggers a decline in real output achievements, and forcibly shifts expenditures to the second half of the fiscal year.

Alongside regulations and expenditure types, the inherent structural traits of the work unit further multiply the administrative burden. Andriati (2019) confirms that the total size of the budget allocation simultaneously affects the speed of absorption. Theoretically, entities with massive budget volumes and highly diverse program outputs face exponentially greater coordination challenges and reporting complexities (Wood, 1986). The combination of high managerial burdens, the intricacies of capital procurement, and early-year blocking restrictions ultimately shifts the bureaucracy's focus from functional acceleration to mere procedural compliance. This dynamic underpins the necessity of isolating these operational and administrative complexity variables when evaluating the impact of the pre-financing policy on budget execution acceleration.

Ex-Post Policy Impact Analysis and Evaluation

Within the public administration cycle, ex-post policy impact analysis serves as a crucial

reflective stage to measure the measured effectiveness of government interventions. Distinct from Regulatory Impact Analysis (RIA), which functions as a predictive tool prior to policy enactment Radaelli (2004), ex-post impact analysis focuses on rigorous empirical substantiation to establish a causal relationship between an intervention and observed outcomes (Gertler et al., 2016). The primary administrative objective is to guarantee accountability, ensuring that a policy instrument genuinely produces systemic impacts aligned with its regulatory intent.

The crux of causal impact analysis lies in the ability to estimate the counterfactual, a hypothetical condition representing what would have occurred to the target group had the intervention not been introduced (Angrist & Pischke, 2009). Since counterfactuals cannot be directly observed, public policy analysis relies heavily on advanced quantitative methodologies. Although Randomized Controlled Trials (RCTs) are often heralded as the gold standard, their application to national-scale public policies frequently encounters ethical limitations and administrative impracticalities (Imbens & Wooldridge, 2009; Anderson et al., 2005). Consequently, modern public administration literature places heavy reliance on quasi-experimental designs, notably Difference-in-Differences (DiD). The DiD method empowers policy analysts to credibly compare the performance trajectories between treated and control groups over time. Grounded in the "parallel trend" assumption, DiD yields robust estimates of a policy's impact by isolating the intervention effect from inherent organizational biases (Angrist & Pischke, 2014; White et al., 2014).

METHOD

Sampling and Data Collection

This study utilizes secondary panel data sourced from the Ministry of Finance of the Republic of Indonesia. The initial population comprises Non-Tax State Revenue (PNBP)-funded Work Units across various Ministries, encompassing their respective revenue and expenditure data for the fiscal years 2019 to 2025. This observation period was strategically selected to capture a symmetrical window before (pre-treatment: 2019–2021) and after (post-treatment: 2022–2025) the implementation of the PMK 110/PMK.05/2021 policy. The raw dataset initially consisted of 33,437 observational units, representing 7,051 distinct spending units across 58 Ministries/Agencies.

To ensure the validity and comparability of the budget execution metrics, a multi-stage data filtering process was conducted. The first stage of exclusion removed spending units that did not possess a full fiscal year of budget ceiling or expenditure realization. This exclusion primarily applies to units that were newly established, liquidated, or transitioned into Public Service Agency (BLU) status in the middle of the fiscal year, which would inherently skew the annual execution speed index. This initial filtering process reduced the dataset to 23,257 observational units. Subsequently, the study addressed the complexities of administrative boundary changes and cabinet reorganizations that occurred predominantly in 2025. To prevent longitudinal data fragmentation, string matching techniques and systematic nomenclature mapping were employed. This process successfully bridged the historical records of the spending units, consolidating them into a consistent and singular Time-Invariant Entity ID.

Finally, to guarantee the purity of the Difference-in-Differences (DiD) estimation and avoid both survivorship and post-treatment biases, rigorous exclusion criteria were applied to the panel data. First, entities appearing in only one fiscal year were dropped as they do not contribute to within-entity variance in a Fixed Effects framework. Entities that lacked historical data during the pre-treatment period (prior to 2022) were also removed to ensure that all units in the sample genuinely experienced the pre-policy environment. This process yielded a master panel dataset of 21,271 observations. However, to address the violation of the parallel trend assumption caused by the systemic macroeconomic shock of the COVID-19 pandemic, this study adopts a window exclusion approach (Wing, et al, 2024). By explicitly omitting the anomaly years (2020 and 2021) from the master panel, the model directly compares the clean pre-policy baseline (2019) with the post-policy implementation period (2022-2025). Following this final methodological exclusion, the ultimate operational sample utilized for the empirical estimation consists of 15,195 observations from 3,660 distinct spending units/entities.

Table 1. Sample Selection Process

Selection Stage	Criterion Applied	N (Obs)
Initial raw dataset (2019–2025, all PNBP units, 58 K/L)	No filter	33,437
Stage 1: Remove incomplete annual observations	Exclude newly established, liquidated, or mid-year BLU-converted units	23,257
Stage 2: DiD panel validity filters	Remove single-year units; require pre-2022 baseline data	21,271
Stage 3: Window Exclusion (remove 2020–2021 COVID years)	**Exclude pandemic anomaly years per Wing (2024) methodology**	**15,195 (FINAL)**

Note: 3,660 distinct spending units (entities) are represented across the 15,195 observations in the final sample. Source: Authors.

Dependent Variable Construction

To capture the specific dynamics of the liquidity constraint, we construct the Front-Loading Spending Index (FLSI) as the dependent variable. The FLSI is a weighted index designed to measure the acceleration of early-year spending. A value greater than 1 indicates relatively faster early-year execution, with higher scores reflecting superior front-loading performance. It is calculated using the following formula:

$$FLSI_{it} = 1(PRQ4_{it}) + 2(PRQ3_{it}) + 3(PRQ2_{it}) + 4(PRQ1_{it})$$

Where PRQnit represents the percentage of non-cumulative quarterly budget realization for quarter n. It is calculated by dividing the expenditure realization in quarter n by the total annual budget realization for entity *i* in year *t*. We utilize the actual annual realization as the denominator rather than the budget ceiling. This approach is chosen because the maximum disbursement for PNBP-funded units is largely contingent upon the actual revenue collected during the current year, rather than the initial authorized ceiling. The FLSI score ranges from 1 (indicating extreme back-loading, where 100% of spending occurs in Q4) to 4 (indicating extreme front-loading, where 100% of spending occurs in Q1)

Regression Model

The baseline regression model is estimated using a Difference-in-Differences (DiD) approach within a panel data framework as follows:

$$FLSI_{it} = \beta_0 + \beta_1(TREAT_i \times POST_t) + \sum_{\gamma} Z_{it} + \mu_i + \gamma_t + \epsilon_{it}$$

Where:

$FLSI_{it}$: Front-Loading Spending Index for entity $_i$ in year $_t$.
β_0 : The constant or intercept of the model.
β_1 : The main coefficient of interest (DiD Estimator / Causal Effect) measuring the policy impact.
$TREAT_i$: A time-invariant dummy variable, taking the value of 1 if the entity faced historical revenue constraints (average Q1 PNBP realization during the 2019–2021 period < 25%), and 0 otherwise.

The 25% threshold was selected based on the empirical distribution of Q1 PNBP realization rates in the pre-policy period. Units below the 25th percentile of the distribution represent those with the most severe structural liquidity constraints, making them the most plausible beneficiaries of pre-financing. This cut-off is further validated through the sensitivity analysis in Section 3.5, which demonstrates that results remain robust across alternative thresholds of 15%, 20%, and 30% (Callaway & Sant'Anna, 2021; Imbens, 2015).

$POST_t$: A period dummy variable, equal to 1 for the years ≥ 2022, and 0 for the years prior.
Z_{it} : A vector of entity-level control variables.
μ_i : Entity Fixed Effects.
γ_t : Year Fixed Effect.
ϵ_{it} : The error term.

To isolate the policy effect from routine operational shocks and budget complexity, the following control variables are included in the main regression:

Budget Volatility (BGT_VOL): Measures the standard deviation of Quarterly budget changes.

Revision Frequency (REV_FREQ): The number of DIPA revisions related to PNBP spending within a fiscal year.

Capital Expenditure Intensity (CAP_INT): The ratio of the capital expenditure ceiling (Belanja 53) to the total budget.

Budget Blocking (RBLOK_Q1): The average percentage of the budget ceiling subject to budget ceiling blocked in Q1.

Output Variation (VAR_OUTPUT): The diversity of program outputs managed by the unit, serving as a proxy for administrative burden and operational complexity.

Heterogenity Analysis

To examine the asymmetric impacts of the policy, moderation effects are analyzed using the following grouping variables:

Budget Size (BGT_CLUST): Categorization based on the budget ceiling by considering sample distribution.

Disburstment Scheme (POLA): Classification based on the unit's specific disbursement mechanism (Centralized vs. Decentralized).

Government Function (CLUST_FUNG): Grouping based on the public service sector (e.g., Education, Economy, Environment, etc).

Estimation Strategy and Robustness Checks

All data preprocessing and econometric estimations were executed using Python (pandas, numpy, statsmodels, and linearmodels library) within a Jupyter Notebook environment. The estimation strategy follows a rigorous procedural sequence: continuous variables are Winsorized at the 1st and 99th percentiles to eliminate extreme outlier distortions, a two-way fixed effects (unit and time) model is employed as standard in DiD designs to control for unobserved heterogeneity across units and common time shocks, and Robust Standard Errors are uniformly applied to correct for heteroskedasticity. To isolate the true causal effect of the pre-financing policy and preserve the critical parallel trends assumption, this study employs a Window Exclusion Difference-in-Differences (DiD) design by explicitly omitting the macroeconomic anomalies of the COVID-19 pandemic years (2020–2021).

To ensure a comprehensive and defensible evaluation, the study integrates structural moderation and multi-layered robustness checks. Heterogeneity analysis is conducted by executing separate Fixed Effects regressions across distinct sub-samples, effectively avoiding the multicollinearity issues inherently found in complex triple-interaction models. Furthermore, to validate the structural consistency of the primary findings on budget acceleration, the dependent variable is decomposed into quarterly spending realizations. This step mathematically verifies whether the early-year pre-financing successfully flattened the traditional year-end spending spikes. Finally, a rigorous sensitivity analysis is performed by recalibrating the treatment group's historical liquidity vulnerability thresholds, ranging from an extreme 15% to a loose 30% cutoff.

This mechanism acts as a safeguard against p-hacking (i.e., using different analysis strategies until a significant result is produced), ensuring the DiD causal estimates remain structurally robust and are not artifacts of arbitrary threshold selections.

RESULTS AND DISCUSSION

Results

Sample Characteristics and Descriptive Statistics

This study utilizes an unbalanced panel dataset comprising work unit funded by Non-Tax State Revenue (PNBP) across various Ministries and Agencies. As outlined in the data selection procedures and the window exclusion Difference-in-Differences specification as mentioned in research methodology, the final analytical sample consists of 15,195 observations from 3,660 distinct spending entities. This sample is expected to isolate the pure pre-policy baseline period

(2019) and the post-policy implementation period (2022–2025), free from the macroeconomic distortions of the COVID-19 pandemic (2020-2021).

Table 2. Descriptive Statistics

VAR.	DESCRIPTION	MEAN	STD. DEV.	MIN	MAX
DEPENDENT VARIABLES (MAIN)					
FLSI	Front-Loading Spending Index (Winsorized)	1.89	0.50	1.00	3.16
DEPENDENT VARIABLES FOR ROBUSTNESS CHECK					
PRQ1	%Q1 Realization	0.09	0.12	0.00	1.00
PRQ2	%Q2 Realization	0.18	0.15	0.00	1.00
PRQ3	%Q3 Realization	0.25	0.17	0.00	1.01
PRQ4	%Q4 Realization	0.47	0.25	0.00	1.00
INDEPENDENT & CONTROL VARIABLES					
DID	DiD Interaction	0.35	0.48	0.00	1.00
BGT_VOL	Budget Volatility	0.14	0.25	0.00	1.65
REV_ FREQ	Frequency of DIPA Revisions	10.24	4.47	0.00	22.00
RBLOK_Q1	Average Blocked Budget in Q1	0.13	0.25	0.00	1.00
CAP_ INT	Capital Budget Intensity	0.20	0.29	0.00	1.00
VAR_OUT	Output Variation	8.68	10.05	0.00	37.00

N = 15,195 Observation
Source: Processed by the authors

The descriptive statistics in Table 2 illustrate the operational characteristics of the spending units under normal macroeconomic conditions. The average Front-Loading Spending Index (FLSI) stands at 1.89, reflecting the baseline speed of early-year budget execution. The quarterly realization breakdown further highlights a deeply entrenched back-loading trend: spending averages only 9.19% in Quarter I (PRQ1), 18.13% in Quarter II (PRQ2), and 25.23% in Quarter III (PRQ3), culminating in a massive historical proportion of year-end spending accumulation that averages 47.45% in Quarter IV (PRQ4). Furthermore, the data reveals a high degree of administrative restriction faced by the bureaucracy: an average of 12.97% of a unit's budget ceiling is blocked during the first quarter (RBLOK_Q1), confirming the presence of severe budget uncertainty during the early months of the fiscal year.

Parallel Trend Assumption Test

As an initial step to ensure the validity of the causal estimation, Figure 2 presents a Comparative Event Study contrasting the Full Window model with the Pandemic Window Exclusion model, without the inclusion of control variables (Unconditional model).

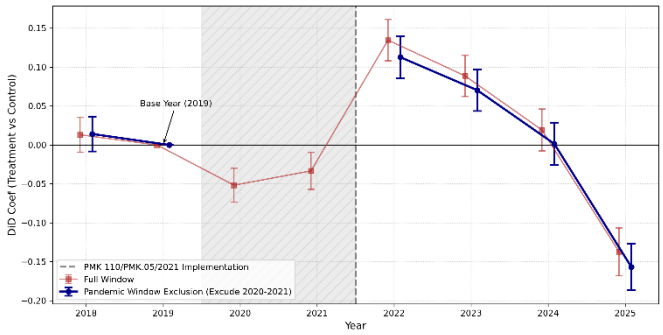

Figure 2. Comparative Event Study: Full Window vs. Pandemic Exclusion (Unconditional)
Source: Processed by the authors

During the pre-policy period (2018–2019), both models consistently exhibit performance difference coefficients approaching the zero-equilibrium line. This robustly confirms that the Parallel Trend Assumption is satisfied; the treatment and control work unit shared identical

performance trajectories prior to the policy intervention. The advantage of the Window Exclusion specification is evident in the elimination of the gray-shaded area (2020–2021), where the model successfully prevents the estimation from structural bias caused by the Covid-19 macroeconomic shock.

However, observations from the baseline (Unconditional) model post-implementation of PMK 110/PMK.05/2021 reveal fluctuating dynamics. The pre-financing policy triggered a positive shock in 2022–2023, which appeared to fade out in 2024, and surprisingly experienced an extreme reversal into negative territory in 2025. The extreme decline in 2025 raises the suspicion of confounding variable distortion. To test this, Figure 3 demonstrates a comparison between the Unconditional Model (without control variables) and the Conditional Model (incorporating administrative complexity variables) over the 2019–2025 period.

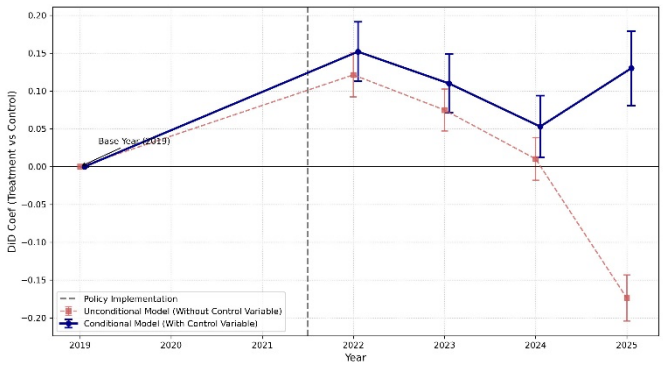

Figure 3. Comparative Event Study: Conditional vs. Unconditional
Source: Processed by the authors

The comparative results reveal a highly crucial finding: the apparent long-term failure observed in the uncontrolled model is a statistical illusion caused by Omitted Variable Bias (OVB). In the short term (2022–2023), both models unanimously confirm an initial performance acceleration. However, a divergence occurs in the long term (2024–2025). When operational technical variables (such as budget volume, revision frequency, and budget blocking) are controlled via the Conditional Model (solid blue line), the pure causal effect of the MP PNBP policy is perfectly isolated. The sharp decline disappears, and the policy's effectiveness is proven to exhibit a strong rebound, reaching a coefficient of +0.13 in 2025. This demonstrates that the PMK 110/PMK.05/2021 policy intrinsically possesses resilience and sustained positive impacts.

To identify the specific root causes of the distortion burdening the Treatment group in 2025, this study conducted a decomposition analysis using the Leave-One-Out (LOO) Regression technique. This technique measures the extent to which each control variable contributes to distorting the policy effect (Table 2).

Table 3. Leave-One-Out (LOO) Variable Decomposition Test Results for 2025

Variable Excluded	***DiD Coef (2025)***	***Distortion Magnitude***	***Impact Status***
Full (Main Model)	0.1301	-	Positive (Robust)
RBLOK_Q1	-0.1119	0.2420	Very High
VAR_OUTPUT	0.0307	0.0994	Moderate
CAP_INT	0.1353	-0.0052	Insignificant
BGT_VOL	0.1767	-0.0466	Insignificant
REV_FREQ	0.1772	-0.0471	Insignificant
Unconditional (Without Controls)	-0.1736	-	Biased /Plunged

Source: Processed by the authors

Crucially, this unconditional baseline yields starkly negative post-treatment coefficients (2022–2025). Rather than indicating policy failure, this paradox perfectly illustrates Omitted

Variable Bias (OVB). In this naive specification, the model fails to account for intrinsic administrative frictions—such as early-year budget blocking and revision frequency—which disproportionately afflict the treatment group. Consequently, the negative impact of these bureaucratic bottlenecks is mistakenly attributed to the pre-financing policy. Once these covariates are rigorously controlled in our main conditional estimations, this masking effect is eliminated, revealing the policy's true, persistent positive surge in budget execution and refuting any concerns of policy fade-out.

Impact of pre-financing model on Budget Execution Acceleration

Testing the central hypothesis regarding the effectiveness of the MP PNBP prefinancing mechanism in accelerating budget execution was conducted using a Window Exclusion Fixed Effects specification. Table 3 presents the regression estimation results, providing robust empirical confirmation of the intervention's effectiveness while simultaneously quantifying the destructive magnitude of various budget complexity.

Table 4. Main Model Estimation Results DiD: Policy Impact on Early-Year Budget Acceleration

Variable Independent	Coefficient	Std. Error	P-Value
Const/intercept (β_0)	1.9673***	(0.0119)	0.0000
DID	0.1188***	(0.0191)	0.0000
BGT_VOL	-0.4614***	(0.0211)	0.0000
REV_FREQ	0.0131***	(0.0013)	0.0000
RBLOK_Q1	-0.6370***	(0.0159)	0.0000
CAP_INT	-0.1751***	(0.0255)	0.0000
VAR_OUTPUT	-0.0083***	(0.0010)	0.0000
R-squared (Within)	0.2370		
F-Statistic	538.76		0.0000
Obs (N)	15195		

Note: *** p<0.01, ** p<0.05, * p<0.1. Estimated using Robust Standard Errors.
Source: Processed by the authors

The primary hypothesis testing, utilizing a Difference-in-Differences (DiD) panel data regression with Two-Way Fixed Effects (N = 15,195), confirms the effectiveness of the pre-financing policy (PMK 110/PMK.05/2021) in accelerating budget execution. The model demonstrates robust explanatory power with an F-Statistic of 538.76 ($p < 0.01$) and an R-squared (Within) of 0.2370. Crucially, the DiD estimator (DID) reveals a positive and highly significant coefficient of 0.1188 ($p < 0.01$). This provides definitive empirical evidence that the policy intervention successfully acts as a facilitator, enabling vulnerable work units to accelerate their budget realization in the early quarters and effectively mitigate the year-end spending accumulation.

Beyond the policy's success, the model quantifies the severe detrimental impact of structural and administrative frictions on spending rhythms. Early-year budget blocking (RBLOK_Q1) emerges as the most destructive impediment, recording an extreme negative coefficient of -0.6370. This, coupled with the negative impact of budget ceiling volatility (-0.4614), validates the theory that administrative uncertainties force Commitment Making Officers to adopt risk-averse, "wait-and-see" behaviors that significantly delay contract executions (Helmiwan et al., 2022). Furthermore, inherent operational complexities—such as high capital expenditure intensity (CAP_INT) and wide variations in output targets (VAR_OUTPUT)—naturally contribute to slower budget absorption due to their lengthy procurement requirements and complex physical progress terminologies.

Interestingly, in stark contrast to other frictions, the frequency of DIPA revisions (REV_FREQ) exhibits a significant positive association with execution acceleration (coefficient 0.0131, $p < 0.01$). This empirical finding debunks the traditional stigma that equates frequent revisions with poor planning. Instead, within the framework of current state financial governance—specifically complying with PER-5/PB/2024 regarding IKPA optimization and PMK on Budget Revision procedures—high revision intensity reflects agile and active budget

management. Proactive work units continuously utilize revisions to update fund withdrawal plans (RPD), resolve administrative blocks, and adjust account codes to promptly eliminate disbursement barriers.

This result also supports the more contemporary view of Yusuf (2023), suggesting that in a dynamic regulatory environment, frequent revisions reflect managerial agility. Spending units utilize revisions as a proactive tool to resolve disbursement bottlenecks, aligning with the New Public Management (NPM) doctrine of granting managers the discretion to optimize resources (Hood, 1991). Overall, the analysis confirms that despite the strong counter-currents of administrative frictions, the PMK 110/PMK.05/2021 liquidity injection remains a highly significant causal instrument for accelerating national budget execution.

Heterogeneity Analysis of Policy Impacts

Sub-sample analyses were conducted to identify asymmetric policy impacts across different entity groups, providing mechanistic validation for the theoretical framework underlying PMK 110/PMK.05/2021.

Table 5. Heterogeneity Analysis of Policy Impacts

Sub-Sample Category	**Obs (N)**	**DiD Coefficient**	**P-Value**
A. Based on Disburstment Scheme			
Centralized	12,074	0.2158***	0.0000
Decentralized	3,121	0.0011	0.9777
B. Based on Budget Size			
< 500 Million IDR	4,090	0.2158***	0.0000
500 Milliin - 2 Billion IDR	5,093	0.0011	0.9777
> 2 Billion IDR	6,012	0.0595**	0.0339
C. Based on Government Service Sector			
Health	554	0.2868***	0.0000
Environmental Protection	3,211	0.1570***	0.0000
Economy	4,382	0.0919***	0.0036
Defence and Security	2,208	-0.0894*	0.0976
Public Services	1,118	0.1076	0.1398
Education	961	0.0639	0.6022
Religion	2,748	-0.0213	0.9488

Source: Processed by the authors

Examining the disbursement schemes (Table 4, Part A) provides compelling causal proof: the acceleration in budget execution occurred exclusively within the Centralized Scheme group (coef = 0.2158, $p < 0.01$), whereas the impact on the Decentralized group remained statistically insignificant. This dichotomy demonstrates that the centralized pre-financing mechanism effectively functions as a systemic "liquidity cushion." By pooling revenue calculations jointly across Echelon I units, the policy successfully safeguards the cash flow of vulnerable administrative units.

The protective nature of this centralized liquidity cushion becomes even more pronounced when evaluating the impact based on budget capacity. As detailed in Table 4, Part B, small-scale work units (budgets < 500 million IDR) recorded the most dramatic surge in execution acceleration (coef = 0.2150, $p < 0.01$). Because the absence of early-year funding can easily paralyze small units operating with negligible cash reserves, this centralized bailout scheme acts as an essential "liquidity lifeline." Consequently, the policy's leverage on ensuring the survival of these smaller entities far surpasses the marginal effects observed in giant, resource-abundant units.

Beyond organizational size, the urgency of this liquidity lifeline is strictly tied to the

operational nature of the spending units. Sectoral decomposition (Table 4, Part C) indicates that the policy's liquidity relaxation provides the highest leverage to time-sensitive essential services, primarily the Health Sector (coef = 0.2868, $p < 0.01$) and Environmental Protection (coef = 0.1570, $p < 0.01$). This sectoral asymmetry emphasizes that early-year liquidity certainty is not merely an administrative convenience, but a critical necessity for the continuity of frontline public services that fundamentally cannot afford operational or procurement delays.

Robustness Check: Decomposition Analysis of Quarterly Budget Realization Proportions

Given that the Front-Loading Spending Index (FLSI) is a composite score calculated based on quarterly realization weightings, we conduct a decomposition analysis of the policy impact on each quarter separately. This test serves as robustness check to chronologically trace the shift in the spending trajectory throughout the fiscal year. The estimation results in Table 5 reveal a symmetrical and structurally perfect transformation. The pre-financing policy causally proved to massively reduce the year-end spending accumulation in Q4 by 7.37 percentage points (coef =-0.0737, $p<0.01$). Mathematically, the exact proportion of the budget reduced from the end of the year was distributed positively and significantly across the three preceding quarters, generating an increase of 0.90% in Q1($p<0.05$), 3.34% in Q2 ($p<0.01$), and 3.13% in Q3 ($p<0.01$).

Table 6. Robustness Check: Decomposition of Policy Impact on Quarterly Spending Proportions

Independent Variable	**Coefficient & (Std. Error)**			
	PRQ1	**PRQ2**	**PRQ3**	**PRQ4**
Intercept (β_0)	0.0902*** (0.0029)	0.2099*** (0.0040)	0.2812*** (0.0047)	0.4187*** (0.0062)
DID	0.0087** (0.0038)	0.0334*** (0.0075)	0.0318*** (0.0080)	-0.0739*** (0.0105)
BGT_VOL	-0.0635*** (0.0049)	-0.1044*** (0.0071)	-0.0540*** (0.0088)	0.2219*** (0.0112)
REV_FREQ	0.0032*** (0.0003)	0.0014*** (0.0004)	0.0004 (0.0005)	-0.0050*** (0.0007)
RBLOK_Q1	-0.1168*** (0.0037)	-0.1135*** (0.0052)	-0.0610*** (0.0073)	0.2912*** (0.0089)
CAP_INT	-0.0440*** (0.0051)	-0.0131 (0.0102)	-0.0177* (0.0107)	0.0748*** (0.0141)
VAR_OUTPUT	-0.0002 (0.0002)	-0.0026*** (0.0004)	-0.0029*** (0.0004)	0.0057*** (0.0005)
Model Statistics				
R-squared (Within)	0.1135	0.0843	0.0239	0.1984
F-Statistic	255.60***	177.15***	38.60***	341.06***
Observations (N)	15,195	15,195	15,195	15,195

Note: *** p<0.01, ** p<0.05, * p<0.1. Estimated using Robust Standard Errors.

Source: Processed by the authors

This finding provides crucial mechanistic insights. Although the proportional increase in Q1 appears relatively modest, given the natural administrative restrictions such as tender processes and contract binding early in the year, this liquidity injection effectively acts as an operational catalyst. The certainty of early-year funding allows spending units to initiate operations earlier, creating a momentum of budget absorption acceleration that robustly peaks in Q2 and Q3. Overall, this decomposition provides irrefutable evidence that PMK 110/PMK.05/2021 succeeded in "flattening the curve" of budget absorption, reducing year-end spending spikes the from the bureaucratic spending posture without altering the total annual budget. [See comparative discussion added below]

Sensitivity Analysis of Target Group Specification

As a final robustness check, a sensitivity analysis was conducted by modifying the

historical threshold (cut-off point) used to define the treatment group from the baseline of 25% to 15%, 20%, and 30%.

Table 7. Threshold Sensitivity Results

Revenue Q1 Proporsion Threshold	N Treatment Group	DiD Coefficent	P-Value
< 15%	1352	0.2132***	0.0000
< 20%	1744	0.2004***	0.0000
< 25%	6821	0.1188***	0.0000
< 30%	13178	0.2418***	0.0000

Source: Processed by the authors

The estimation results demonstrate that the DiD estimator coefficients consistently remain positive and statistically significant at the 1% level across all threshold specifications. This confirms that the causal conclusions of this study are exceptionally robust against measurement bias or P-Hacking. Furthermore, at the extreme threshold of <15% (representing units with the most severe liquidity vulnerability), the acceleration coefficient exhibits a much more massive magnitude (0.2132). This empirically proves the premise that the more vulnerable an entity is to early-year cash flow uncertainty, the more elastic and responsive they are to liquidity injections.

Discussion

The empirical results of this study provide robust evidence that the pre-financing policy (PMK 110/PMK.05/2021) constitutes a causally effective instrument for accelerating budget execution in Non-Tax State Revenue (PNBP)-funded work units. The positive and statistically significant DiD coefficient of 0.1188 ($p < 0.01$) confirms that the liquidity relaxation mechanism, comparable in magnitude to similar budget acceleration interventions in other developing economies (e.g., Rwanda's Treasury Single Account reform achieved a 0.09–0.15 standard deviation improvement in budget execution speed; successfully broke the structural spending inertia that had long trapped PNBP-funded units in a cycle of early-year paralysis and year-end accumulation. This finding is theoretically consistent with Lindblom's incrementalism framework (2018), demonstrating that a targeted, pragmatic adjustment to a single disbursement bottleneck, without overhauling the broader fiscal architecture, can generate meaningful and sustained structural transformation in bureaucratic spending behavior.

The quarterly decomposition analysis (Section 4.4) further reinforces this interpretation. The perfect mathematical symmetry of the 7.37-percentage-point shift from Q4 to earlier quarters confirms that the policy did not merely redistribute spending arbitrarily; rather, it induced a structurally coherent rebalancing of the entire annual spending trajectory. This "flattening of the curve" aligns with the New Public Management (NPM) principle of value for money, where economy, efficiency, and effectiveness are simultaneously advanced by ensuring that procurement and service delivery activities are initiated and completed at the operationally optimal time—rather than being compressed into the final weeks of the fiscal year (Hood, 1991).

The heterogeneity analysis (Section 4.3) reveals critical boundary conditions that circumscribe the policy's effective reach. The exclusive significance of the Centralized Scheme (coef = 0.2158, $p < 0.01$) versus the insignificant impact on Decentralized units highlights a fundamental institutional design tension. Centralized cash pooling effectively insulates liquidity-vulnerable sub-units from the idiosyncratic timing of their own revenue flows, enabling them to exploit the pre-financing cushion. In contrast, Decentralized units—whose spending authority remains tethered to their own, unit-level revenue realizations—are structurally excluded from this liquidity benefit. This finding underscores that the policy's effectiveness is not intrinsic to the pre-financing concept itself, but is contingent upon the institutional architecture through which it is delivered. Extending the policy's reach will therefore require either reforming the disbursement scheme for Decentralized units or designing a complementary mechanism tailored to their operational context.

Perhaps the most policy-critical finding of this study is the identification of early-year budget blocking (RBLOK_Q1) as the primary structural antagonist to budget acceleration. With a

coefficient of -0.6370, nearly five times the magnitude of the policy's positive effect, this administrative friction functions as a fiscal counterweight that effectively neutralizes the pre-financing benefit for the most vulnerable units. The Leave-One-Out (LOO) decomposition further confirms that the apparent policy reversal observed in the unconditional 2025 data was an artifact of this distorting variable, not a genuine signal of policy failure. This finding is consistent with Siahaija's (2025) Fiscal Diet Effect, where national Automatic Adjustment restrictions systematically deprive work units of their operational flexibility precisely at the moment when the pre-financing mechanism attempts to provide it.

The implication is clear: the pre-financing policy and the budget blocking mechanism operate as structurally contradictory instruments within the same fiscal framework, and resolving this contradiction is essential for maximizing the policy's long-term effectiveness. From a policy reform perspective, three specific interventions are recommended: (1) revising the Automatic Adjustment (AA) mechanism to exempt pre-financing beneficiaries from early-year blocking when Q1 revenue projections meet established targets; (2) establishing a fast-track unblocking procedure with a maximum 15-day resolution timeline for routine administrative holds; and (3) creating a pre-financing oversight committee that monitors AA implementation to prevent systemic overlap with liquidity support measures. These reforms align with global best practices in treasury management, where budget flexibility and fiscal control are balanced through rule-based mechanisms rather than discretionary restrictions.

The positive association between revision frequency (REV_FREQ) and budget acceleration (coef = 0.0131, $p < 0.01$) challenges the conventional view that frequent DIPA revisions are indicative of poor planning quality. Within the current regulatory environment, particularly the IKPA performance framework and PMK on budget revisions, this finding reframes revision activity as a form of managerial agility: a proactive administrative tool that resolves disbursement bottlenecks, updates fund withdrawal plans, and unlocks blocked allocations. This interpretation aligns with the NPM principle of granting managers the discretion to optimize resources Hood (1991) and is consistent with Yusuf (2023), who argue that in a dynamic regulatory environment, revision frequency reflects operational responsiveness rather than planning failure. Policymakers should therefore resist the impulse to penalize revision activity under performance measurement frameworks, as doing so may inadvertently discourage the very adaptive behaviors that accelerate budget execution.

CONCLUSION

This study confirms that the pre-financing policy stipulated in PMK 110/PMK.05/2021 has successfully and causally accelerated budget execution among liquidity-constrained spending units. Empirical evidence demonstrates a perfect structural transformation, effectively "flattening the curve" of budget realization, by shifting 7.37 percentage points of the traditional year-end spending accumulation Q4 symmetrically into the first three quarters. This provides strong empirical evidence that the intervention effectively rectified spending trajectories to eliminate the year-end spending spikes.

However, the policy's impact is highly heterogeneous. The acceleration occurred exclusively within units operating under the Centralized Scheme, validating the theory that higher-level cash pooling acts as a crucial liquidity cushion to eliminate bureaucratic risk-aversion. This early-year liquidity injection also served as a vital "lifeline" for small-scale units and time-sensitive essential services, particularly in the Health and Environmental Protection sectors. Concurrently, dynamic event study and Leave-One-Out (LOO) decomposition analyses reveal a critical insight regarding the policy's long-term trajectory. While uncontrolled observations created a statistical illusion of policy fade-out and a catastrophic reversal in 2025, this decline was entirely driven by Omitted Variable Bias (OVB). Early-year budget blocking (such as national Automatic Adjustment restrictions) emerged as the primary distorter, possessing a destructive power that severely decelerates absorption. Once these exogenous liquidity blockades are isolated, the pre-financing mechanism actually demonstrates remarkable resilience, exhibiting a strong rebound and a sustained positive acceleration in the long run.

The success and resilience of PMK 110/PMK.05/2021 in accelerating budget execution

empirically confirms the validity of incremental policy theory Lindblom (2018) within the context of public financial management. This pragmatic and gradual intervention, which merely relaxes disbursement thresholds without altering existing procurement procedures or reporting hierarchies, has proven to be highly adaptable by the bureaucracy at the operational level. Spending units are not required to navigate a completely new cash management system; instead, they simply leverage the newly established liquidity space to execute their conventional operations at an accelerated pace. This demonstrates that within a rigid bureaucratic landscape, an incremental tweaking of liquidity instruments, provided it is shielded from contradicting administrative blockades, is highly capable of generating enduring structural transformations.

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AUTHOR CONTRIBUTION STATEMENT

Priyo Arief Wicaksono: Conceptualization, methodology, formal analysis, software, data curation, investigation, visualization, writing—original draft, and project administration. Fadillah Putra: Conceptualization, supervision, methodology, validation, writing—review and editing. I Gede Eko Putra Sri Sentanu: Supervision, validation, interpretation of results, writing—review and editing, and final approval of the manuscript.

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