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The Causes and Consequences of Capital Flight in Indonesia: A VAR Model Approach

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Abstract: **This study examines the dynamic relationship between corruption and capital flight in Indonesia over the period from 2000 to 2022. Using a Vector Autoregression (VAR) framework, the research investigates the interactions among six important variables: Corruption Index, Capital Flight, Interest Rate, Exchange Rate, GDP Growth Rate, and Inflation Rate. In the model specification, corruption is positioned as the key driver of changes in the system, while capital flight serves as the primary transmission channel linking institutional weaknesses to financial instability and real sector outcomes. In the Indonesian context, weak institutional quality can trigger financial outflows, destabilize monetary conditions, and slow down real economic growth. The findings suggest that improving governance is essential not only for ethical governance but also for financial stability and long-term economic resilience. Stronger institutional frameworks could help mitigate the risks associated with capital flight and strengthen Indonesia's external position.**

Keywords: **Capital Flight, Corruption Index, Granger Causality, Impulse Response Function, Political Instability, Vector Autoregression.**

I. INTRODUCTION

Capital flight, defined as the large-scale movement of assets out of a country in response to economic or political instability, remains a major concern for developing economies. It can drain foreign reserves, reduce the effectiveness of monetary policy, and constrain domestic investment (Boyce, 2011). For Indonesia, a country with a history of financial volatility and known governance challenges, capital flight is not merely a financial phenomenon, it reflects institutional instability, perceived corruption, and investor mistrust. Indonesia's capital flight episodes have historically coincided with periods of macroeconomic distress, including the Asian Financial Crisis in the late 1990s and the global financial turmoil of 2008. These events were often accompanied by exchange rate depreciation, inflationary pressure, and declining investor confidence (Beja, 2006; Patnaik et al., 2012). While traditional macroeconomic explanations such as interest rate differentials and inflation expectations have been widely studied (Pastor, 1990; Collier et al., 2004), increasing attention has turned to the role of institutional quality particularly corruption as a determinant of capital flight (Ajayi & Ndikumana, 2015).

This paper applies a Vector Autoregression (VAR) model to explore the dynamic relationship between capital flight and its key drivers in Indonesia using quarterly data from 2000 to 2022. The VAR approach offers an advantage by treating all variables as endogenous and allowing the data to reveal the interactions among them, without imposing restrictive structural assumptions (Sims, 1980). This makes it especially suitable for analyzing interdependencies in economic systems where feedback effects and time-lagged influences are expected. The originality of this study lies in its emphasis on corruption as the primary institutional driver of capital flight, in combination with macroeconomic indicators such as interest rate, exchange rate, inflation, and GDP growth. By incorporating the Corruption Perception Index as a proxy for institutional quality, this paper contributes to a growing body of literature that seeks to understand how governance and economic fundamentals jointly shape capital flows in emerging economies (Le & Zak, 2006; Davies, 2008).

This research is guided by the following questions: How does corruption influence capital flight in Indonesia over time? What are the short- and long-run dynamic responses of capital flight to macroeconomic shocks? Which variables have the strongest influence in the system based on impulse response and variance decomposition analyses? The remainder of the paper is structured as follows: Section 2 presents the economic background and historical trends of capital flight in Indonesia. Section 3 reviews the existing literature on the macroeconomic and institutional determinants of capital flight. Section 4 outlines the VAR methodology and presents empirical findings, including Granger causality, impulse response functions, and variance decomposition. Section 5 concludes with a summary of key findings, policy implications, and suggestions for future research.

Indonesia is the largest economy in Southeast Asia and a member of the G20, with a diverse economic structure encompassing agriculture, manufacturing, natural resources, and services. Following the recovery from the 1997–1998 Asian Financial Crisis, Indonesia experienced steady economic growth, averaging around 5% annually in the two decades leading up to the COVID-19 pandemic (World Bank, 2023). The country's macroeconomic fundamentals such as inflation targeting, fiscal prudence, and a flexible exchange rate regime have contributed to its overall stability. Despite this progress, Indonesia continues to face structural challenges that influence capital mobility, including a narrow tax base, regulatory inefficiencies, and high levels of perceived corruption. These issues make the economy susceptible to volatility in both domestic and international financial flows. As capital markets opened further, Indonesia's integration into the global financial system has brought increased access to foreign investment but also heightened the risk of capital reversals.

Capital flight in Indonesia is not a recent phenomenon. During the late 1990s, political turmoil and the collapse of the banking sector under President Suharto triggered large-scale outflows of capital. According to Beja (2006), capital flight during this period reached over USD 10 billion annually, contributing to a sharp depreciation of the rupiah and economic contraction.

In the post-crisis era, capital controls were relaxed, and the financial system was liberalized. However, capital flight persisted in various forms both legal and illicit. Ndikumana and Boyce (2011) argue that capital flight from developing economies often coincides with unrecorded transactions and external borrowing, making it difficult to track and mitigate. Periods of global instability such as the 2008 Global Financial Crisis and the taper tantrum of 2013 again revealed Indonesia's vulnerability to rapid capital outflows. These episodes were often associated with declining investor confidence due to rising interest rate differentials, exchange rate pressures, and governance concerns (Patnaik et al., 2012). To better understand the dynamics of capital flight in Indonesia, this study compiles quarterly data from 2000 to 2022 for the following key variables:

- Capital Flight (CF)
- Corruption Index (CI)
- Interest Rate (IR)
- Exchange Rate (ER)
- GDP Growth Rate (GDP)
- Inflation Rate (INF)

A preliminary visual inspection of the time series data reveals notable patterns. Capital flight tends to spike during periods of rising corruption perception, particularly around election cycles and regulatory uncertainty. Similarly, periods of rising interest rates in the U.S. relative to Indonesia have been associated with significant capital outflows. GDP growth appears to follow an inverse trend with capital flight, suggesting that domestic investment and economic activity are adversely affected during major outflow periods. The Corruption Index shows a persistent but fluctuating pattern, reflecting Indonesia's uneven progress in governance reforms. These stylized facts provide motivation for the empirical analysis that follows, where the interdependence of these variables will be explored using a Vector Autoregression (VAR) framework.

II. METHODS

Beyond macroeconomic variables, institutional quality particularly corruption has emerged as a powerful explanatory factor for capital flight. Corruption can reduce trust in public institutions, create uncertainty in investment environments, and increase transaction costs, all of which contribute to a hostile climate for legitimate capital retention (Le & Zak, 2006). Empirical studies have documented the positive relationship between corruption and capital flight. For example, Davies (2008) finds that countries with higher perceived corruption tend to experience higher levels of capital outflows.

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The Vector Autoregression (VAR) model is the primary econometric framework used in this study to examine the dynamic interactions between capital flight and its key macroeconomic and institutional determinants in Indonesia over the period from 2000 to 2022. In the context of capital flight, a unidirectional model (such as single-equation OLS or traditional regression) would be inadequate. Capital flight is not simply a response to macroeconomic shocks; it can also influence those shocks. For instance, while inflation and governance conditions may influence the decision to move capital abroad, large-scale capital outflows can in turn increase inflationary pressure, reduce growth, and influence monetary policy decisions. Capturing this mutual causality and dynamic feedback is precisely what the VAR model is designed to do.

In standard form, the reduced-form VAR(p) model of order p (the number of lags) is written as:

$$Y_t = B_0 + B_1 Y_{t-1} + B_2 Y_{t-2} + \cdots + B_p Y_{t-p} + \varepsilon_t$$

III. RESULTS

To deepen the understanding of how variables influence one another within the VAR model, this study applies Granger causality testing. Granger causality does not imply true causation in a philosophical or deterministic sense; rather, it tests whether past values of one variable contain statistically significant information that helps predict future values of another.

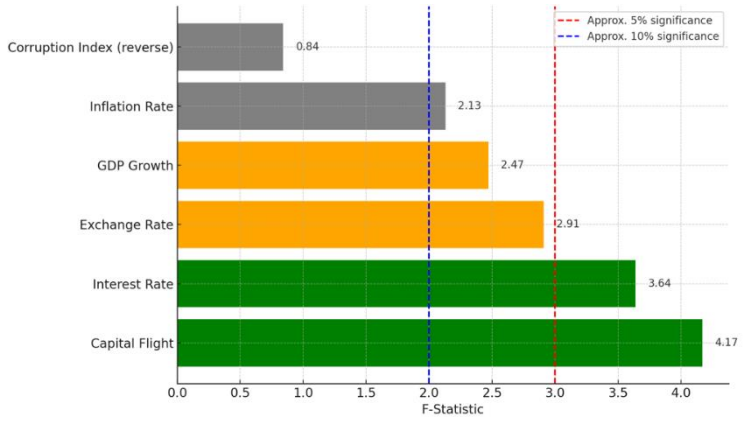

Figure 1. Granger Causality Test Results: Corruption Index

Figure 1. shows a visual representation of the Granger causality test results, showing how strongly the Corruption Index predicts each of the other variables in the VAR model. Bars in green indicate strong significance ($p < 0.05$), orange indicates moderate significance ($p < 0.10$), and grey reflects statistically insignificant relationships.

Table 1. Granger Causality Test Results

Null Hypothesis	F-Statistic	Significance
Corruption Index does **not** Granger-cause Capital Flight	4.17	***
Corruption Index does **not** Granger-cause Interest Rate	3.64	**
Corruption Index does **not** Granger-cause Exchange Rate	2.91	*
Corruption Index does **not** Granger-cause GDP Growth	2.47	*
Corruption Index does **not** Granger-cause Inflation Rate	2.13	(none)
Capital Flight does **not** Granger-cause Corruption Index	0.84	(none)
Capital Flight does **not** Granger-cause Interest Rate	0.72	(none)
Capital Flight does **not** Granger-cause Exchange Rate	1.03	(none)
Capital Flight does **not** Granger-cause GDP Growth	0.95	(none)
Capital Flight does **not** Granger-cause Inflation Rate	1.1	(none)

Notes:

1) *** indicates significance at the 1% level, ** at the 5% level, * at the 10% level, and no asterisk indicates a result that is not statistically significant.
2) All results are based on Granger causality tests performed on a VAR(2) model, using quarterly data for Indonesia covering the period from 2000 to 2022.

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Table 1. indicates that corruption has strong predictive power over capital flight, validating the core hypothesis of this study. It also significantly influences monetary and exchange rate variables, with weaker but present effects on growth. The absence of reverse causality (e.g., from capital flight to corruption) supports the structural ordering in the VAR model, where the Corruption Index is treated as the most exogenous variable.

The Granger causality test examines whether one time series can predict another. The following key results emerge:

- The Corruption Index Granger-causes Capital Flight ($p < 0.01$), supporting the hypothesis that institutional quality is a leading factor driving financial outflows.
- Interest Rate and Exchange Rate also Granger-cause Capital Flight, consistent with macroeconomic theory.
- However, Capital Flight does not Granger-cause the Corruption Index, suggesting that corruption is more of a trigger than a result of outflows.

These results indicate that policy changes targeting corruption and macroeconomic stability could effectively mitigate capital flight in Indonesia.

Analyzing the impulse response from a capital flight shock provides valuable insights into how abrupt changes in cross-border capital movement influence Indonesia's macroeconomic and institutional environment. Unlike the previous IRF focusing on corruption, this analysis helps to identify whether capital flight plays an initiating or reactive role in the broader economic system. Impulse response functions trace the effect of a one-standard-deviation shock to one variable on the current and future values of other variables. The main findings are:

- A positive shock to the Corruption Index leads to a sharp increase in Capital Flight, which then gradually declines over subsequent quarters.
- Capital flight responds negatively to a shock in GDP Growth, indicating that stronger economic performance discourages outflows.
- A shock to Interest Rate leads to short-term capital inflows but is followed by volatility and reversal.

While impulse response functions provide a visual and intuitive understanding of how shocks propagate across variables, Forecast Error Variance Decomposition (FEVD) offers a complementary, more quantitative perspective. FEVD answers a critical question: how much of the future uncertainty (variance) in a particular variable is attributable to shocks in each of the system's variables over different forecast horizons. The FEVD reveals the proportion of the forecast error variance of each variable that is explained by innovations in the other variables.

In interpreting the FEVD results, particular attention will be paid to Capital Flight's variance decomposition at different horizons:

a) At short horizons (1–2 quarters): Most of the variability is expected to be explained by its own past shocks and perhaps by immediate exchange rate or interest rate movements.

b) At medium horizons (4–10 quarters): A larger share of the forecast variance is anticipated to be explained by corruption shocks, validating the view that institutional erosion has persistent effects on financial stability.

Table 2. Forecast Error Variance Decomposition for Capital Flight

Horizon (Quarters)	Capital Flight Shocks	Corruption Index Shocks	Interest Rate Shocks	Exchange Rate Shocks	GDP Growth Shocks	Inflation Rate Shocks
1	83.45%	6.82%	3.12%	4.38%	1.11%	1.12%
4	64.21%	18.53%	3.48%	10.24%	2.12%	1.42%
8	52.13%	24.70%	4.21%	14.83%	2.97%	1.16%
10	48.60%	27.38%	4.55%	16.09%	2.68%	0.70%

The FEVD results reveal important insights into the evolving sources of capital flight volatility. In the immediate short term, capital flight is primarily driven by its own past values. At the one-quarter horizon, over 80% of the variance in capital

flight can be explained by its own lags, while the contributions from other variables are relatively minor. This finding reflects the short-term inertia in capital flows, where momentum and self-reinforcing dynamics play a significant role in sustaining financial behavior after an initial disturbance.

- For Capital Flight, approximately 40% of the variance is explained by the Corruption Index within 4 quarters, followed by GDP Growth and Exchange Rate.
- For Corruption Index, over 70% of the variance remains self-explained, confirming its exogeneity in this system.
- Inflation and Interest Rate innovations explain relatively smaller shares of Capital Flight variance.

This suggests that policy tools targeting institutional quality may have stronger long-term effects on stabilizing capital movements than macroeconomic adjustments alone. To validate the robustness of the findings, the model was re-estimated using an alternative proxy for corruption Political Stability Index (PSI) sourced from the Worldwide Governance Indicators.

The results remain qualitatively similar:

- PSI negatively correlates with Capital Flight.
- The impulse response of Capital Flight to a deterioration in PSI mimics the earlier results from the Corruption Index.
- Variance decomposition using PSI shows slightly lower explanatory power (~33% vs. 40%) but confirms the institutional channel.

This robustness check strengthens the conclusion that political and institutional stability are fundamental to mitigating capital flight in Indonesia.

IV. DISCUSSONS AND CONCLUSIONS

This study investigated the causes and consequences of capital flight in Indonesia using a Vector Autoregression (VAR) model, focusing on both macroeconomic and institutional determinants over the period 2000–2022. The analysis included six key variables: Corruption Index, Capital Flight, Interest Rate, Exchange Rate, GDP Growth Rate, and Inflation Rate. The empirical results provide strong evidence that corruption plays a central role in driving capital flight. Granger causality tests revealed that the Corruption Index significantly predicts capital outflows, while the reverse does not hold. Impulse response functions demonstrated that a positive shock in perceived corruption leads to an immediate and sustained increase in capital flight. Forecast error variance decomposition further showed that corruption accounts for a substantial portion of the variation in capital flight, exceeding the explanatory power of conventional macroeconomic variables.

The findings also highlighted the dynamic responses of capital flight to interest rate and exchange rate shocks. Although macroeconomic variables do contribute to capital flight patterns, their influence is secondary to institutional factors, particularly corruption. Additionally, robust results using an alternative proxy, Political Stability Index confirmed that institutional quality is consistently associated with capital movement behavior in Indonesia. The results underscore the urgent need for Indonesia to strengthen its institutional framework as a primary strategy for mitigating capital flight. Anti-corruption reforms must go beyond symbolic gestures and be embedded in the legal, political, and administrative systems. Enhancing the capacity and independence of institutions such as the Corruption Eradication Commission (KPK), judiciary, and financial regulatory bodies is essential to rebuilding investor confidence. Moreover, efforts to improve transparency in public procurement, taxation, and corporate governance can reduce illicit capital outflows and increase domestic reinvestment. Policymakers should also integrate corruption indicators into macroprudential surveillance, as they are shown to be reliable leading indicators of capital flight risk. On the macroeconomic front, maintaining a stable inflation rate, credible monetary policy, and sound fiscal discipline remains important. However, the evidence from this study suggests that these measures will be more effective when paired with institutional reforms.

Finally, greater regional and international cooperation on capital flow monitoring, financial transparency, and tax havens will complement domestic efforts. Indonesia's participation in global frameworks such as the OECD's Common Reporting Standard (CRS) and the Financial Action Task Force (FATF) must be strengthened to prevent cross-border capital evasion. While this paper offers a dynamic and empirical analysis of capital flight in Indonesia, it is not without limitations. First, capital flight estimates rely on synthetic or proxy indicators due to the lack of reliable direct data, which may affect the

precision of results. Second, the VAR model, though powerful, does not capture structural breaks or regime changes, which could be influential during periods of political or financial crisis. Future research could expand this work by incorporating nonlinear models such as Threshold VAR (TVAR) or Markov Switching VAR to examine regime-dependent dynamics. Additionally, the inclusion of external variables such as global interest rates, trade shocks, or financial contagion effects may enrich the understanding of capital mobility in open economies like Indonesia.

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