Corruption in Low-Income Resource-Rich Economies: Estimating Losses and Global Allocations

Research Proposal — Joseph David*

December 19, 2024

Click here for updated version

1 Background and Importance

In developing natural resource-rich economies, corruption—manifesting through bribery, embezzlement, misappropriation, and under-remittance of proceeds from resource rents—is both fueled and sustained by the abundance and exploitation of natural resources (Leite and Weidmann, 1999). Research shows that corruption in these countries is further reinforced by the vast revenues generated from resource sales, particularly when government spending heavily relies on these proceeds (e.g., Baragwanath, 2020; Farzanegan and Zamani, 2024). Positive shocks in natural resource prices often inject large flows of cash into government coffers, frequently exceeding their effective management capacity. These conditions incentivize corrupt politicians to embezzle funds, inflate the costs of public goods and services, or divert resources away from growth-enhancing investments in favor of large, non-productive projects that provide opportunities for bribes and kickbacks.

In recent decades, researchers have increasingly attributed the poor economic and social outcomes in most developing resource-rich economies to pervasive corruption (e.g., David, 2024; David *et al.*, 2024; Olayungbo and Adediran, 2017; Rotimi *et al.*, 2022). Many of these countries not only struggle with unimpressive development indicators but are also plagued by rampant corruption in both the public and private sectors. For example, Nigeria and Angola, two of Africa's largest oil producers, consistently rank poorly in corruption indices and suffer from severe underdevelopment and mismanagement of resource rents. The connection between underdevelopment and corruption has been consistently corroborated by reports from Transparency International, the Political Risk Services Group, and the World Bank, which document the extent of perceived corruption across nations. Transparency International's 2023 Corruption Perceptions Index, for instance, ranks most developing resource-rich economies among the world's most corrupt nations.

While the adverse effects of corruption in resource-rich economies are well-documented (e.g., David, 2024; David *et al.*, 2024; Mauro, 1996, 1995), the precise magnitude of funds lost to corruption remains poorly understood. Although it is widely acknowledged that corrupt practices generate staggering sums with far-reaching implications, the exact amounts involved remain elusive. Furthermore, the allocation and global flows of corruption-generated funds are equally concerning. These funds often leave local jurisdictions, funneled into offshore tax havens, luxury assets, or illicit trade networks. This undermines economic sovereignty, distorts global financial systems, facilitates other criminal activities, and perpetuates cycles of underdevelopment and instability. For instance, over the past 50 years, Africa is estimated to have lost over US$1 trillion (or US$50 billion annually) to illicit

*Email: josephdavid970@gmail.com

financial flows—a figure roughly equivalent to all the official development assistance the continent has received during the same period (see, Kar and Cartwright-Smith, 2010; Kar and LeBlanc, 2013). While these figures encompass various illicit activities beyond corruption, evidence suggests that the actual amounts associated with bribery and abuse of office by public officials may be significantly higher (Kar and Cartwright-Smith, 2010).

Despite the enormous sums involved and their devastating consequences, the precise quantification of funds generated through corruption and the analysis of their allocation remain underexplored. Addressing this gap is essential for mitigating the adverse effect of corruption, enhancing public resource management, and improving governance in resource-rich economies. Accurate estimates of corruption-related funds could enable the design of targeted anti-corruption policies and resource allocation frameworks that prioritize recovery and reinvestment in domestic development. Evidence of the magnitude of corruption can also catalyze institutional reforms to address governance deficiencies and strengthen public sector accountability.

In light of growing global efforts to combat illicit financial flows through initiatives like the OECD's BEPS framework and the Financial Action Task Force (FATF) standards, understanding the magnitude and allocation of corruption-generated funds is more relevant than ever. This knowledge provides critical insights for international collaboration in combating illicit flows and recovering stolen assets. It also facilitates the development of effective strategies for tracking, recovering, and redistributing these assets, thereby promoting sustainable development and global financial stability. By addressing these gaps, resource-rich developing economies can improve governance, reclaim lost revenues, and redirect resources toward sustainable and inclusive development pathways.

2 Gap in the Literature

Corruption typically involves illegal activities that are intentionally concealed and often come to light only through investigations, scandals, or prosecutions. This covert nature makes it exceptionally difficult to measure or quantify. Attempts to measure corruption using objective data, such as reports of bribery, conviction rates for public office abuse, and the number of prosecutions, often fail to capture its full extent. These metrics tend to reflect the quality of a country's judiciary or media rather than the actual level of corruption (Budsaratragoon and Jitmaneeroj, 2020). Moreover, differences in the legal interpretation of corruption across countries limit the feasibility of meaningful cross-country comparisons (Abu *et al.*, 2015).

Given these challenges, subjective measures such as surveys and questionnaires on perceived corruption have emerged as alternatives. Although perceived levels of corruption may differ from actual levels, evidence suggests that corruption perception indices provide valuable insights into the true extent of corruption (Budsaratragoon and Jitmaneeroj, 2020). Additionally, corruption perception has significant implications in its own right, influencing foreign policy, public and private investment, economic growth, and lending decisions. Institutions such as Transparency International, the Political Risk Services Group, and the World Bank have developed broad measures of corruption perception, such as Transparency International's Corruption Perceptions Index (CPI) and the World Bank's Control of Corruption Index. While these indices have limitations (e.g., Budsaratragoon and Jitmaneeroj, 2020, for overview of the limitations), including potential biases from media coverage or political influence, they remain instrumental in assessing corruption risks and benchmarking progress in anti-corruption reforms.

Despite these efforts, the precise quantification of funds lost to corruption remains elusive due to the inherently clandestine nature of these corruption-related transactions. However, researchers have made significant progress in estimating the scale of other covert activities, such as the underground economy, using indirect methods like the dynamic general equilibrium models, the currency demand functions model (CDFM), and structural equation modeling. These approaches offer a promising framework for addressing the challenges of quantifying corruption-related funds, particularly in resource-rich economies.

In recent years, some of these approaches have been extended to estimate the magnitude of funds associated with illicit activities, such as money laundering and criminal syndicates. For instance, Aljassmi *et al.* (2024) and Ardizzi *et al.* (2014) refined and applied the currency demand approach, originally developed for the underground economy, to estimate the magnitude of money laundering in the UAE and Italy, respectively. Similarly, Schneider (2010) employed the dynamic multiple-indicators multiple-causes structural equation model to estimate the turnover of organized crime and the scale of money laundering in 20 highly developed OECD countries. Other approaches include the two-sector micro-founded dynamic general equilibrium models (e.g., Argentiero *et al.*, 2008; Bagella *et al.*, 2009) and general equilibrium overlapping-generation growth (OLG) models (e.g., Loayza *et al.*, 2019; Villa *et al.*, 2016), which have been calibrated to estimate illicit funds laundered in the United States, EU countries, and Colombia, respectively. Given that these activities also involve hidden or informal transactions makes these models adaptable to the inherently covert nature of corruption-related activities.

Efforts have also been made to determine how illicit funds are allocated globally. Models like the Walker gravity model (e.g., Ferwerda *et al.*, 2020; Walker, 1999) and trade discrepancy analysis (e.g., Zdanowicz, 2005) have been pivotal in analyzing the cross-border movement of illicit funds. The Walker gravity model, for example, uses spatial economic principles to trace money laundering networks and estimate the flow of proceeds from criminal or illicit activities. This model considers factors such as the "mass" and intrinsic attractiveness of the destination country relative to the origin, as well as the geographic or economic distance between them (e.g., Unger *et al.*, 2006; Walker, 1999). It has been particularly useful in identifying key destinations for laundered funds and evaluating the effectiveness of anti-money laundering policies.

Despite these methodological advancements, the application of these tools to estimate and trace funds derived from political corruption in resource-rich economies remains limited. Corruption is widely recognized as a critical component of the criminal economy and a major contributor to illicit financial flows, yet systematic and precise estimates of its financial magnitude and flow patterns are lacking. Addressing this gap is crucial not only for advancing academic understanding of corruption's economic impact but also for designing evidence-based policies to disrupt illicit financial flows, strengthen governance frameworks, and recover stolen assets. Filling this gap would provide vital insights into both the local and global dimensions of corruption, enabling more effective interventions to combat its adverse effects.

3 Research Strategy

3.1 Data

To quantify the magnitude of funds associated with corruption and analyze their flows from resource-rich economies, the first step is to ensure access to high-quality data. Both subjective and objective metrics of corruption will be utilized. Common corruption perception indices, such as Transparency

International's Corruption Perceptions Index (CPI), the World Bank's Control of Corruption Index, the Economist Intelligence Unit's Business International Index (BI), and the Political Risk Service Group's International Country Risk Guide (ICRG), will form the foundation of the analysis. Following the approach proposed by Budsaratragoon and Jitmaneeroj (2020) to modify and improve the robustness of TI's CPI, these indices will be adjusted to enhance reliability. For conviction and prosecution rates of corruption-related cases, official records from national governments and international organizations such as the United Nations Office on Drugs and Crime (UNODC) and national anti-corruption agencies will be consulted. Survey data from Afrobarometer or similar regional surveys will also be collected to capture public perceptions and anecdotal evidence of corruption, providing complementary insights to the perception indices.

Macroeconomic and trade data will be sourced from established databases such as the World Bank's World Development Indicators, the UN Comtrade database, the World Integrated Trade Solution (WITS) database, and the IMF's World Economic Outlook. In cases where data are unavailable from these databases, national statistical bureaus or central banks will be used as alternative sources.

3.2 Empirical Strategy

The empirical strategy consists of two components: estimating the magnitude of corruption-related funds and analyzing their global allocation.

1. **Estimation of Corruption-Related Funds**: To quantify funds lost to corruption, the study will adapt widely used methodologies successfully applied to analyzing the underground economy. Specifically, following Ardizzi *et al.* (2014) and Aljassmi *et al.* (2024), excess currency demand attributed to corrupt practices will be identified to estimate corruption-related funds. Based on Schneider (2010), a structural equation model (DYMIMIC) will be employed, incorporating multiple observable indicators (e.g., conviction and prosecution rates, corruption perception indices) and latent variables (e.g., corruption) to estimate the financial magnitude of corruption. Finally, building on Loayza *et al.* (2019) and Bagella *et al.* (2009), a general equilibrium model will be calibrated to capture corruption-related funds in resource-rich economies.

2. **Analysis of Fund Allocation**: To analyze the global flows of corruption-related funds, the study will leverage the Walker gravity model. Building on the refined version by Ferwerda *et al.* (2020), this model will estimate cross-border flows of illicit funds associated with corruption in resource-rich economies. It will consider factors such as financial openness, regulatory frameworks, tax haven characteristics, and geographic proximity to assess the "attractiveness" of destination countries.

Key tests to perform will include simple regressions to identify:

- Whether resource intensity exacerbates illicit financial flows.
- The social, economic, and political implications of funds attributed to corrupt practices.
- The factors facilitating the size and flows of illicit funds associated with corruption.

Important robustness checks will include:

- Cross-verifying results obtained from the different approaches.
- Validating estimates by cross-referencing with independent data sources, such as financial intelligence reports and case studies.
- Performing sensitivity analyses to test whether relationships between corruption and fund flows hold under varying model parameters or time periods.

Bibliography

Abu, N., Karim, M. Z. A. and Aziz, M. I. A. (2015) Corruption, political instability and economic development in the Economic Community of West African States (ECOWAS): Is there a causal relationship?, *Contemporary Economics*, **9**, 45–60.

Aljassmi, M., Gamal, A. A. M., Jalil, N. A., David, J. and Viswanathan, K. K. (2024) Estimating the magnitude of money laundering in the United Arab Emirates (UAE): Evidence from the currency demand approach (CDA), *Journal of Money Laundering Control*, **27**, 332–347.

Ardizzi, G., Petraglia, C., Piacenza, M., Schneider, F. and Turati, G. (2014) Money laundering as a crime in the financial sector: A new approach to quantitative assessment, with an application to Italy, *Journal of Money, Credit and Banking*, **46**, 1555–1590.

Argentiero, A., Bagella, M. and Busato, F. (2008) Money laundering in a two-sector model: using theory for measurement, *European Journal of Law and Economics*, **26**, 341–359.

Bagella, M., Busato, F. and Argentiero, A. (2009) Money laundering in a microfounded dynamic model: simulations for the us and the eu-15 economies, *Review of Law & Economics*, **5**, 879–902.

Baragwanath, K. (2020) The effect of oil windfalls on corruption: evidence from Brazil, *American Political Science Association (APSA)*.

Budsaratragoon, P. and Jitmaneeroj, B. (2020) A critique on the corruption perceptions index: An interdisciplinary approach, *Socio-Economic Planning Sciences*, **70**, 100768.

David, J. (2024) The role of corruption in the oil price-growth relationship: Insights from oil-rich economies, *Economic Change and Restructuring*, **57**.

David, J., Gamal, A. A. M., Mohd Noor, M. A. and Zakariya, Z. (2024) Oil rent, corruption and economic growth relationship in nigeria: evidence from various estimation techniques, *Journal of Money Laundering Control*, **27**, 962–979.

Farzanegan, M. R. and Zamani, R. (2024) Oil rents shocks and corruption in iran, *Review of Development Economics*.

Ferwerda, J., van Saase, A., Unger, B. and Getzner, M. (2020) Estimating money laundering flows with a gravity model-based simulation, *Scientific Reports*, **10**, 1–11.

Kar, D. and Cartwright-Smith, D. (2010) *llicit financial flows from Africa: hidden resource for development*, Washington, DC: Global Financial Integrity.

Kar, D. and LeBlanc, B. (2013) *Illicit financial flows from developing countries: 2002-2011*, Washington, DC: Global Financial Integrity.

Leite, M. C. and Weidmann, J. (1999) *Does mother nature corrupt? Natural resources, corruption, and economic growth*, International Monetary Fund.

Loayza, N., Villa, E. and Misas, M. (2019) Illicit activity and money laundering from an economic growth perspective: A model and an application to colombia, *Journal of Economic Behavior & Organization*, **159**, 442–487.

Mauro, M. P. (1996) *The effects of corruptionon growth, investment, and government expenditure*, International Monetary Fund.

Mauro, P. (1995) Corruption and growth, *The quarterly journal of economics*, **110**, 681–712.

Olayungbo, D. O. and Adediran, K. A. (2017) Effects of oil revenue and institutional quality on economic growth with an ardl approach, *Energy and Policy Research*, **4**, 44–54.

Rotimi, M. E., IseOlorunkanmi, O. J., Rotimi, G. G. and Doorasamy, M. (2022) Re-examining corruption and economic growth nexus in oil dependent economy: Nigeria's case, *Journal of Money Laundering Control*, **25**, 526–539.

Schneider, F. (2010) Turnover of organized crime and money laundering: some preliminary empirical findings, *Public choice*, **144**, 473–486.

Unger, B., Siegel, M., Ferwerda, J., de Kruijf, W., Busuioc, M., Wokke, K. and Rawlings, G. (2006) *The amounts and effects of money laundering*, Report for the Ministry of Finance.

Villa, E., Loayza, N. and Misas, M. (2016) Illicit activity and money laundering from an economic growth perspective: a model and an application to colombia, *World Bank Policy Research Working Paper*.

Walker, J. (1999) How big is global money laundering?, *Journal of Money Laundering Control*, **3**, 25–37.

Zdanowicz, J. (2005) Trade-based terrorist financing analysis: suspicious trade with Al Qaeda countries, *Review of Law and Economics*, **5**, 855–878.