Learning from Sino-African supply chains and the Minimal Investment paradigm: how the UK can foster optimal investment for responsible critical minerals supply

Inquiry: Critical Minerals

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Our expertise is in organizational management, sustainable business development, critical minerals and political relations. We are editors and contributing authors of an upcoming book '*Chinese Engagement in Africa's Mining Sector: the Consequences of Minimal Investment*'. Current Sino-African relations in mining for critical minerals have wide relevance in the global 'new scramble for Africa': by understanding them, the UK can learn how to become a partner of choice in African mining operations.

In our submission, we refer to the terms of reference for '*trade and diversification*', with particular reference to the following questions:

Trade and diversification

- *What should be the focus of the international Growth Partnerships announced in the Critical Mineral Strategy?*
- *How should the UK work with global partners to improve environmental, social and governance standards across the critical mineral sector?*
- *How should the UK use its strengths in mining finance and metals trading to diversify minerals supply chains?*

Executive Summary

The supply chains of critical minerals to consumer nations, such as the UK, are dependent on raw materials extraction in Africa. China has a smaller share in Africa's total mining output than Western counterparts like the UK and Europe, but it has rapidly expanded its foreign direct investment (FDI) in mine ownership in the last decade and now leads production of African copper and cobalt, and has a very significant stake in the production of other energy-transition minerals.

Following conceptual and empirical contributions by diverse authors describing mining activities across several African countries, we examined Chinese engagement in Africa's mining sector from a context of international business. Specifically, we considered how minimal investment has produced order, and order is safety both for firms and for host institutions alike. Optimal investment, by contrast, introduces ‘danger’ because it changes the status quo, redistributes power, and mitigates African rather than firm risk.

The Theory of Minimal Investment (TMI) reveals how underinvestment is an intentional, albeit seemingly rational, historically embedded, and institutionally sustained strategy of engagement. We present four conditions that explain why minimal investment persists as a dominant logic of foreign firm behaviour in Africa. Institutions permit it, strategies enact it, heritage legitimizes it, and reactions stabilize it. Our recommendations are that four corresponding categories are addressed:

1. Institutional weakness as operability rather than responsibility;
2. Heritage that normalizes minimal investment;
3. Strategic shift from company legitimization to national optimization;
4. Responses that challenge or support transition.

Introduction

There is an early twenty-first century competition amongst global powers from North America, Europe, and Asia — including the United States, China, Russia, India, and Japan — for Africa’s critical and growth minerals. China has become the most prominent and consequential actor in African exploration and extraction for critical minerals such as cobalt, copper, lithium, tantalum, manganese, platinum, and rare earth elements through rapidly expanding foreign direct investment (FDI). This is largely due to Chinese policy and commercial banks issuing extensive loans for mining and processing, primarily supporting Chinese-owned projects in Africa.

Chinese firms hold full or partial ownership stakes in mines across a wide range of African countries, including the Cameroon, Democratic Republic of the Congo (DRC), Ghana, Guinea, Kenya, Nigeria, South Africa, Uganda, Zambia, and Zimbabwe. Other major international investors include Canada, Australia, and the UK, with growing investment from the US. Key African nations with high ownership stakes include South Africa, Botswana, Ghana, and Mali.

One concern across all of these countries is how international cooperation can facilitate resilience of supply chains. Optimal benefits of durable supply chains for these countries include infrastructure development, industrial upgrading, and economic growth. The optimal transactions are material and financial, and they should apply to all nations investing in African mining. The UK’s critical minerals strategy seeks to use its financial institutions as leverage to improve the performance and the responsibility of international mining companies that are UK registered. While the responsibility of mining companies is viewed by many shareholders and operators as a risk mitigation strategy to secure operations, it is viewed as a real lived experience by mining-impacted communities and optimal investment has different meaning.

Unfortunately, concern about community impact is a pattern. Mining-related harms seem to be repeated frequently and profusely across diverse countries, firms, and minerals as indicated by the vast body of documented evidence. The harms include environmental degradation, weak labour and corporate governance practices, human rights abuses in mining communities, the intensification of corruption and conflict, and the erosion of political accountability and security. The African voice is essential to understand how these harms relate to FDI, how the UK becomes a partner of choice and how the UK uses its soft power to lead improvements in international FDI for real-terms responsible practice.

A focus on Investment Strategies

A common assumption is that Chinese firms invest in Africa solely to maximize returns, behaving no differently from Western or African firms. Our evidence partially supports this view but also reveals a critical distinction. Interviews with local communities indicate that opposition is not directed at Chinese mining per se, but at how mining is conducted and at mining governance more generally. What is contested is not profit seeking itself, but modes of operation that systematically externalize social, environmental, and institutional costs.

We focussed on the nature of investment strategies rather than investor nationality alone. Investment — the allocation of capital, labour, technology, and organizational effort in pursuit of expected returns — can be pursued through maximal or minimal strategies.

- Maximal investment manifests when firm resources are deployed optimally to obtain maximum returns. It entails deep commitment, long-term engagement, and substantial resource deployment to generate durable returns.
- Minimal investment manifests when there is deployment of few resources. Firms adopt superficial practices that create an appearance of local engagement without substantial investment in community development or capacity building.

The persistent pattern we observe across multiple African contexts is of foreign firms investing "just enough" for operations to function but insufficiently to build durable local capabilities. Crucially, minimal investment can follow two pathways: accepting lower returns or extracting maximum returns despite minimal engagement. As rational actors, firms are unlikely to pursue minimalist investment strategies that yield low returns. Instead, they are more likely to pursue minimal investment strategies designed to maximize returns. These outcomes are achieved by reducing compliance, governance, and social obligations. We term this strategic logic the theory of minimal investment (TMI).

TMI offers a unifying explanation for the common behaviours and recurrent patterns of extraction, governance avoidance, and social conflict observed across Chinese mining operations in Africa. It also provides a foundation for understanding how resource investment strategies shape development outcomes, institutional relations, and community responses. TMI has two forms: nurtured and natural.

Nurtured TMI emerges from the rational logic harnessed through entrepreneurial and organizational practices that higher returns are associated with higher risk. Companies are likely to expect higher returns given higher risks from contexts of precarious operations, technologies, environment, resources, etc. From an institutional theory perspective, the precarity of Africa is low because of the relative ease with which firms can obtain resources cheaply. Not only are the natural resources abundant but the systems can be manipulated to lower the risks dramatically. For example, royalties from lithium extraction in Ghana were negotiated down from 10% to 5%, in favour of the mining companies.

Natural TMI is termed by analogy with natural systems that strive to exist in a state of minimized energy, i.e. people should try to reach their goals with minimum investment and minimum upset to the existing balance. Applied to raw materials production in the African context, a foreign company devises a market entry scheme and invests a minimum amount of energy in it so that it only just works. In other words, the company provides or endows it (i.e., the African context) with benefits enough for the company to be seen as doing something or just enough for the company to maintain its status and to harness the desired returns.

The tendency to minimize investment seems to be encapsulated in risk minimization strategies, social licence to operate (SLO) and environment, social and governance (ESG) measures that legitimize Natural TMI and reinforce the existing balance of relations/statuses/capabilities.

Structural Conditioning

The core argument of TMI is that minimal investment emerges at the intersection of structural conditioning and agency expression, and is sustained by historically imprinted behavioural logics. For structural conditioning, we distinguish between external (i) institutional constraints and internal (ii) heritage capacity.

> (i) In many African contexts, institutional environments are characterized by regulatory variability, uneven enforcement, and fluctuating political settlements. Under such conditions, property rights protection may be formally codified yet inconsistently enforced; contractual obligations may depend on political alignment; and regulatory regimes may shift with electoral cycles. Capital-intensive investments, technology transfer, and deep local integration expose firms to expropriation risk, policy reversal, and enforcement ambiguity. Consequently, firms rationally calibrate their commitment to levels that allow operations to function without overexposure.
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> (ii) Heritage is both tangible (places) and intangible (practices). The firms entering African markets often have colonial concession legacies, enclave operational models, or state-owned enterprise (SOE) extraction logics that inform managerial expectations, risk perceptions, and relational strategies. Firms historically accustomed to operating through political brokerage, limited local linkages, and resource enclave structures may reproduce these patterns even when institutional conditions improve. Heritage thus embeds patterned agency.

Structural conditioning channels how agency is expressed. Recognition of structural conditioning can inform forward-looking strategic intent and deliberate behavioral reactions that challenge whether current strategic equilibria are fit to modern purposes, i.e. the mutual benefit of cooperative partnering.

Cultural change: the role of reaction

Firms react to ongoing pressures: regulatory audits, nationalist rhetoric, civil society activism, and electoral cycles. Such reactions include symbolic compliance, incremental concessions, selective CSR initiatives, and temporary partnerships. These behavioural enactments by the firm differ from the reaction or response of the community to the firm’s operations. The community or society could challenge the minimal investment of the mining company (i.e. force optimal investment) or adopt the status quo.

Heritage may shape both forms of reactions (firm and community). Firms imprinted by past volatility may default to defensive capital rationing, distrust of state contracts, and informal political hedging. Communities imprinted by inertia fail to force optimal investment. Both reactions may reinforce minimal investment by preventing deeper commitment even when opportunities arise.

The participants in cultural change encompass the institutions that regulate the behaviour of individuals, firms and states, as well as the communities. There are four conditions that control reactions.

1. The **institutional condition** refers to the structural environments that make minimal investment both viable and attractive. Strong institutions can overcome international manoeuvres that are premised on the assumptions underpinning the Natural TMI. Unfortunately, many African institutional contexts are characterized by regulatory fragmentation, enforcement gaps, plural legal orders, and discretionary governance. Under such conditions, firms are not compelled to invest optimally in compliance; instead institutions "just work" enough to allow operations to proceed.

RECOMMENDATIONS

- Challenge assumptions about operability that are premised on weak institutions, maintain the status quo, and enable minimal investment strategies. Minimal institutional investment yields 'order', which is safety, stabilizes expectations, limits regulatory escalation, and reduces uncertainty for firms. How is a new consumer-producer order created that provides real protection for all participants?
- Scrutinise how strong institutions will foster optimal investment, focussing on strengthening labour institutions, environmental oversight, or local value chains. Ensure that companies are held to account both in foreign and national states.
- Negotiate and embrace shifts in institutional power balances that empower African actors to demand accountability, and reject bribery and corruption that facilitates minimal investment. Assist firms who perceive that African empowerment constitutes 'danger', because it disrupts operability and increases risk, to reorient.

2. Historical Normalization of the "Bare Minimum" is a **heritage condition** arising from historical and colonial legacies. Africa's long experience with extractive colonialism, enclave economies, and externally-driven development projects have institutionalized the idea that "Africa just works" with minimal provisioning (i.e. minimal investment). Order is defined by continuity rather than progress, and stability by preservation rather than transformation. Demands for deeper engagement are framed as disruptive or risky.

RECOMMENDATIONS

- Understand how the divide between formal and informal mining cooperation is being utilised by Chinese operators to dispossess African operators and seek to support African-led operations.
- Focus on internally-driven mineral-based development projects and retention of mineral wealth in producer nations as far as possible. Currently, Chinese operations extract lowest value mineral products for processing and value addition in China. That can change when other nations do more to support value addition *within* African nations as part of optimal investment strategies.
- Reconsider leverage tactics that pressure African institutions to adapt to scarcity rather than demand optimal investment. The inherited ideology that risk reduction for the company is risk reduction for the African nation promotes negotiations that favour companies and do not adequately recompense African states.
- Recognize, and promote recognition of, a new heritage condition that the environmental and social cost of mining must be paid. The cost of production in Africa must be maintained in order to ensure that African risk is reduced, rather than premised on the risk of firms.

3. The **strategic behavioural condition** concerns how firms design market entry and operational strategies under TMI. Firms deliberately pursue strategies that involve 'bare-minimum endowment', providing just enough infrastructure, employment, corporate social responsibility, or technology transfer to be perceived as legitimate and functional. These investments are designed to show that they are making a difference yet they fail to empower or generate autonomous capabilities in host communities and states.

RECOMMENDATIONS

- Assess, with the aid of African partners, how SLO and ESG structures legitimise companies and fall short of optimal investment outcomes that defray African risk.
- Ensure that optimal investment strategies do not by-pass African institutions: support strong African institutions and simultaneously ensure that foreign companies do not make decisions about development in lieu of state or community, thereby replicating and entrenching colonial behaviours.
- Foster long-term bilateral agreements that ensure a commitment to continued cooperation under conditions of optimal investment. Use the agreements to continue cooperation for new partnerships when existing company involvements flounder as a function of market competitiveness.
- Under the long-term agreement, foster alternative mining models where African companies in the embedded mining value chain are developed by knowledge and skills exchange, physical upgrading within national and local managerial control.

4. The **response or reaction condition** captures how African states, communities, and institutions respond to minimal investment regimes. Under conditions of scarcity and vulnerability, the bare minimum is often accepted as sufficient because it maintains order. Minimum investment yields predictability, employment (however limited), and continuity of operations. This order is perceived as safer than the uncertainty associated with demanding optimal investment, which is perceived as a threat.

RECOMMENDATIONS

- Explore the difference between prosperity and dependency, by having discussions that centre on how resources are managed, and how new policies are developed to help small and medium-sized businesses. In addition, improve institutions, establish clear negotiation processes, use different development strategies, and create inclusive investment plans for sustainable growth.
- Counter the perception of danger that accompanies optimal investment under historic patronage relations and centre collaborative partnering on convergent approaches and ideologies.
- Ensure that ambivalence and acceptance of minimal investment in mining does not lead to erosion of regional and local cultural heritage (tangible sites and intangible practices of importance to community), which reinforces unequal relationships and creates negative psychological impacts.

Final comments

A careful consideration of minimal FDI is required to counterbalance China's strong position in African mining of critical minerals. Solutions are contingent on institutions that shape the African-foreign engagement, strategies that exploit the weaknesses of the investment environment, imprints of socio-cultural heritages, and habitual responses or reactions. The Theory of Minimal investment suggests three pathways of development: stagnant minimalism, strategic stickiness, and upgrading equilibrium.

Stagnant minimalism becomes self-reinforcing when weak institutions persist and foreign firms carry extraction-oriented heritage. Thin capital commitments reduce local upgrading, which hinders regional and national development, and undermines efforts to strengthen domestic institutions.

Strategic stickiness is institutional reform without heritage shift. Even when host-country governance improves - through regulatory reform, anti-corruption drives, or investment code modernization - heritage-shaped reflexes may dampen reinvestment. Firms continue operating under legacy templates. Development gains remain incremental rather than transformative.

Upgrading equilibrium occurs only when institutional strengthening coincides with disruption of heritage-imprinted templates for a new equilibrium to emerge. This progressive state is our preferred pathway of dual transformation. It deepens local integration, expands capital commitments. Shifts from enclave logic to embedded production networks increase development.

In the China-Africa debate, China is often presented as a transformative development partner on the one hand, and a neo-extractive actor reproducing enclave dynamics, on the other. The structural–agency model we present suggests a third interpretation: China–Africa trajectories are equilibrium outcomes shaped by institutional conditioning and heritage interaction that, from the African perspective, are replicated with other foreign nations.

In recognising the effects of the minimal investment paradigm, the UK has an opportunity to target FDI towards projects that help African nations capture more of their mineral value chains. Key tangible aims would be for UK to use FDI to: (1) help African nations develop African mining operations with context-appropriate outcomes; (2) stream mine output into African processing projects that would break Chinese monopolies on processing; (3) through support, become a preferred trading partner in offtake agreements.

Reference

Zoogah BD, Mthuri JN, Moore KR, Rapanyane MB (eds). Chinese Engagement in Africa's Mining Sector: The Consequences of Minimal Investment. Anticipated publication by Palgrave MacMillan in 2026.