The Local Advantage: Firm Selection Under Weak Institutions*

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Abstract

According to standard theory, capital should flow to countries where it is scarce, yet such flows remain limited—a pattern known as the Lucas Paradox. We provide a microfoundation for this puzzle based on firm heterogeneity and weak institutions. While multinational firms are typically more productive than local competitors, preferential treatment for local firms can generate a "local advantage" in weak institutional environments. We formalize this mechanism in an entry model with heterogeneous firms and test it using a novel database of corporate ownership changes in the global mining sector. On average, output falls by 8% after local takeovers, reflecting a global multinational advantage. Under weak institutions, however, local takeovers increase output by 8%, reversing this pattern. Multinationals from weak-governance countries enter more and perform better in weakly-governed hosts, indicating institutional homophily. Finally, local firms in weak states generate larger economic spillovers, consistent with labor-intensive production due to elevated capital costs. Our findings show how weak institutions shape firm selection and performance, distorting the allocation of multinational production and limiting capital flows to low-income countries.

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1 Introduction

According to neoclassical economic theory, capital should earn higher returns where it is scarce, and therefore flow "downhill" from advanced to emerging economies. Yet investment flows from rich to poor countries remain limited, and the "Lucas Paradox" endures as a central puzzle in economic development (Lucas, 1990). Institutional quality has emerged as a leading explanation for the Lucas Paradox: countries with weak property rights, corruption, and poor rule of law receive less foreign investment (Göktan, 2015; Papaioannou, 2009; Alfaro et al., 2008; Wei, 2000).[1] Nevertheless, the micro-foundations of this institutional view remain under-explored: how does weak governance affect which types of firms invest and succeed in low-income countries? In this paper, we micro-found the Lucas Paradox by showing that weak institutions overturn the multinational productivity advantage, with important implications for the allocation of global production and capital flows.

Multinationals are typically more productive than local firms due to positive selection, as high entry costs mean only the most productive firms can profitably invest abroad (Helpman et al., 2004).[2] In places with weak institutions, however, firm selection may operate on a different margin—the ability to navigate corruption, institutional voids, and regulatory uncertainty (Rexer, 2024). Local firms may possess a comparative advantage in such contexts through political connections (Faccio, 2006; Khwaja and Mian, 2005) and tacit local knowledge (Allen, 2014; Sequeira and Djankov, 2014), while multinationals are constrained by home-country anti-corruption regulations (Christensen et al., 2023; Cuervo-Cazurra, 2006). These divergent selection pressures can generate a "*local advantage*": when institutions are sufficiently weak, local firms' ability to navigate corruption dominates multinationals' positively-selected technical productivity. As a result, multinationals invest less in weak-governance countries and, when they invest, produce less than local alternatives. These forces act as frictions against downhill capital flows, slowing global income convergence.

We formalize this mechanism in a heterogeneous firm entry model and test it empirically using data from the global mining industry. In our model, firms enter foreign markets based

[1]Other proposed explanations for the Lucas Paradox, based on cross-country data, include lower complementary factor endowments in low-income countries (Caselli and Feyrer, 2007), higher risk premia (Gerding et al., 2025), and geopolitical and cultural barriers (Pellegrino et al., 2025).

[2]Empirical evidence leveraging foreign-to-local acquisitions and divestments confirms this multinational productivity advantage (Javorcik and Poelhekke, 2017; Arnold and Javorcik, 2009).

on heterogeneous productivity draws, with multinationals facing higher entry costs that generate positive selection (Melitz, 2003; Helpman et al., 2004). Weak institutions introduce frictions—corruption, expropriation risk, political instability, red tape—which we model as a "governance tax" on profits. Critically, locals can reduce their effective tax burden through connections and insider knowledge, while multinationals cannot. This differential taxation yields two countervailing effects. Because entry conditions are less stringent, local firms become more negatively selected (the *selection effect*), lowering expected post-entry profits. However, locals also enjoy lower tax burdens conditional on entry (the *direct effect*), raising profits. When the direct effect dominates the selection effect, local advantage emerges.

Our model generates four testable predictions. First, when entry costs are high relative to corruption costs, multinationals outperform locals through positive productivity selection. Second, in weak states where the governance tax dominates, local firms' tax advantage may reverse the multinational productivity advantage. Third, multinationals from weakly-governed home countries face lower corruption costs in weakly-governed hosts, generating positive assortative matching on institutional quality, or *institutional homophily*. Fourth, local firms in weak states face elevated capital costs due to country risk premia, resulting in more labor-intensive production practices and larger employment spillovers around mines.

We test these predictions empirically using a panel dataset of 35,567 commercial mines spanning 162 countries between 2000 and 2022. The mining industry presents an ideal setting in which to identify the trade-offs of local versus multinational ownership. Sizable fixed capital and technology requirements generate plausible multinational efficiency advantage in the production process. At the same time, exposure to complex governance challenges in host countries (Blair et al., 2022) generates conditions in which local advantage may outweigh the technical efficiency of multinationals.[3]

To quantify local advantage, we employ two empirical strategies. First, we use high-dimensional fixed effects to estimate the impact of mining asset ownership transfers between multinational and local firms on mine production. These specifications control for mine fixed

[3]For example, Rexer (2024) shows how local oil companies in Nigeria are more effective than multinationals at leveraging connections with military elites and striking deals with local militia groups to reduce violence and increase oil production, despite exhibiting less efficient production. The Economist (2025) describes how multinational mining companies operating in Africa's Sahel region are disproportionately targeted by the region's newly ascendant military regimes with asset seizures, unpredictable tax increases, arrests targeting executives and employees, and extortion by state security forces. In contrast, local mining companies, especially those owned or aligned with political elites, face fewer expropriation risks.

effects as well as numerous sources of time-varying unobserved heterogeneity at country-year, commodity-year, and more spatially granular levels. Second, we estimate event-studies around multinational asset divestments to local firms, enabling evaluation of pre-trends and dynamics. For both approaches, we estimate average effects across the global sample, and then interact treatment with measures of host-country governance quality based on the World Governance Indicators database (World Bank, 2024) to measure heterogeneous effects of local ownership in varying institutional contexts.

Our identification strategies exploit within-mine variation in ownership type. While the assets owned by local firms may be non-randomly selected, we argue that the timing of multinational divestment is plausibly exogenous conditional on mine, country-year, and commodity-year fixed effects. Three pieces of evidence support this assumption. First, event studies reveal no significant differential pre-trends in output or other outcomes before ownership transitions. Second, divestment timing is uncorrelated with mine age or production lifecycle, ruling out systematic multinational exit at particular asset stages. Third, mines that experience ownership changes are statistically indistinguishable (both at baseline and in the run-up to divestment) from those that do not across observables including output, forest cover, urbanization, local GDP, population, air pollution, and distance to cities and ports.

Empirical results support the predictions of the model. First, for our global sample, we find that local firms produce less from the same assets than multinationals do. In our preferred specification, moving from fully multinational to fully local ownership reduces annual mine output by 8.3% on average, an economically meaningful contraction. This effect rises to 13.8% when we account for "effective" local ownership (i.e., whether local firms' parent companies are local). Furthermore, we find that mine output *decreases* in firm size for local firms and *increases* in firm size for multinationals, suggesting large multinationals are positively selected and enjoy economies of scale, while large local firms are negatively selected and may grow for reasons besides efficiency. These findings confirm a global multinational advantage in mining production.[4]

Second, we find that the multinational productivity advantage reverses in weakly gov-

[4]These results and those described in subsequent paragraphs are robust to inclusion of additional interacted fixed effects, time-varying fixed effects for more granular spatial administrative units, stacked difference-in-differences models, coarsened exact matching on baseline mine characteristics prior to event studies, binary treatment definitions using minimal and dominant share thresholds of local ownership, and varying output measurement assumptions.

erned states. In countries with institutional quality at the level of the DRC, Iraq, or Myanmar, locally-operated mines produce 8% *more* on average annually than they do when those same assets are operated by multinationals. Event studies reveal even larger long-run effects: twenty years after divestment from multinational to local ownership, mines in poorly-governed countries produce 27% higher output than non-divested mines, despite similar pre-divestment trends. In contrast, mines divested to local ownership in well-governed countries produce 35% less output twenty years after transfer. Moreover, this heterogeneity by governance is dynamic: the multinational advantage in mine output disappears in countries that see governance conditions worsen significantly between the 2000s and 2010s, while the local advantage disappears in countries that see governance improve significantly over this period.

Third, we find evidence of institutional homophily in multinational entry patterns. Poorly-governed countries tend to receive more multinational investment in mining from other poorly governed countries. As predicted, this institutional homophily corresponds to a comparative advantage for investors based in weak states. Multinationals from weakly-governed home countries perform better in weakly-governed hosts, converging to the local advantage. In host countries one standard deviation below the mean level of governance, multinationals from well-governed countries produce 12% less output than those from weak-governance origins. This assortative matching suggests that multinationals from corrupt countries possess comparative advantage in navigating weak institutions and/or are unconstrained by home-country anti-corruption regulations, operating more like local firms in these environments.

Fourth, consistent with our model's prediction that capital-constrained local firms adopt labor-intensive production practices, we find that locally-operated mines in weak governance settings generate greater economic spillovers than multinational mines. Using high-resolution geospatial data on night-time lights, land cover, air pollution, and georeferenced household surveys, we find that agricultural employment falls by 8.5% while non-agricultural wage employment rises 5.4% around locally-operated mines, relative to multinational ones. Land use shifts accordingly: agricultural land cover around locally-owned mines declines by 1.2% while urban land cover increases by 12.7% (from a lower baseline), consistent with urbanization clustering around mines that provide local employment opportunities. Night-light-derived GDP increases by 1%, despite lower mine-level output. However, these economic spillovers come at a cost: fine particulate matter (PM2.5) air pollution increases by 1.2%

following mine transfer to local operators, consistent with local firms' evasion of environmental regulations, use of lower-quality technology, or simply greater economic activity from labor-intensive production. Critically, all these spillover effects—employment shifts, GDP growth, urbanization, and pollution—are significantly larger in weakly-governed countries, where risk premia and capital costs are highest. The results suggest that divestment to local firms reduces the "enclave" characteristics of mineral extraction (Buur et al., 2013), spreading local benefits more widely and spurring structural transformation in the labor market.

Taken together, our results provide robust evidence that a global multinational productivity advantage in mining reverses in weakly governed places. This reversal emerges consistently across multiple identification strategies, strengthens over time in event studies, responds dynamically to within-country governance changes, and manifests in employment, urbanization, and environmental outcomes around mines. These findings demonstrate that institutions fundamentally shape firm selection, with implications for sectoral productivity, FDI flows, and economic development.

1.1 Related literature and contributions

This paper contributes to four literatures. First, we make both theoretical and empirical contributions to the literature on multinational firm performance and FDI flows. Previous studies have established that multinationals are typically more productive than local firms (Javorcik and Poelhekke, 2017; Antràs and Yeaple, 2014), benefiting from economies of scale and scope, access to technology and capital, and superior management practices (Bloom and Van Reenen, 2010). Moreover, FDI by multinational firms generates positive spillovers through innovation (Guadalupe et al., 2012), knowledge transfer (Javorcik, 2004), and job creation (Toews and Vézina, 2022). Multinationals that opt to enter high-cost-of-entry markets are further positively selected on productivity (Chen and Moore, 2010). Despite these advantages, FDI does not flow to developing countries to the extent predicted by neoclassical theory—the Lucas Paradox (Lucas, 1990; Pellegrino et al., 2025; Alfaro et al., 2008).[5] Weak institutions

[5] Coppola et al. (2021) reconstruct financial linkages between subsidiaries and corporate parents to show that capital flows to developing countries are substantially larger than country-level statistics suggest, demonstrating how firm-level analysis can yield novel insights masked by country-level aggregates. Even if capital flows are larger than previously understood, however, they may not promote convergence if local advantage prevails in weak-governance environments.

provide one explanation: if multinationals are constrained in corrupt environments, expected returns to FDI fall (Javorcik and Wei, 2009; Wei, 2000; Henisz, 2000). We formalize this intuition using a Melitz-style model, showing that institutional quality determines which margin dominates: productivity in well-governed markets versus ability to navigate corruption in weakly governed markets. Empirically, we provide the first asset-level, global evidence on local versus multinational performance across heterogeneous governance contexts, revealing that institutions fundamentally shape firms' comparative advantage along lines consistent with standard theories of heterogeneous firms.

Second, we contribute to the literature on how firms navigate corruption and state weakness. While numerous studies document corrosive effects of corruption on economic activity (Colonnelli and Prem, 2021; Kaufmann et al., 1999; Shleifer and Vishny, 1993), some evidence suggests that corruption may arise as a second-best equilibrium, "greasing the wheels" of commerce when formal institutions fail (Méon and Weill, 2010). Theoretically, we model corruption as differential taxation (Svensson, 2003; Fisman and Svensson, 2007) and derive conditions under which local advantages in navigating corruption can dominate multinational productivity advantages. Local firms are able to reduce their effective tax rates by leveraging knowledge of local conditions, connections with local elites (Fisman, 2001), and legal flexibility to bend the rules or exploit institutional voids (Rexer, 2024; Palepu and Khanna, 1998). We make three novel empirical contributions to this literature. First, we show that firms' ability to navigate or exploit institutional weakness generates local advantage in production, in line with the "greasing the wheels" theory of corruption. Second, we show that multinationals from corrupt countries perform like locals in corrupt host countries, suggesting experience with weak governance is a transferable skill across markets. Third, we show that economic gains and environmental damages are largest around locally-operated mines in weakly governed places, revealing a mechanism through which institutions shape extractive firms' linkages, and consequently local development more broadly.

Third, we provide new global evidence on how market structure and institutional quality interact to shape the subnational impacts of resource extraction (Berman et al., 2017; Jacobsen and Parker, 2016; Cust and Poelhekke, 2015; Aragón and Rud, 2013) and the local resource curse more broadly (Armand et al., 2020; Robinson et al., 2006). We show that ownership structure is a fundamental driver of the local economic and environmental impacts of mining, and provide a theoretical foundation for this pattern driven by differential selection pressures and access to capital markets for local versus multinational firms. Our results reveal that spillovers generated by local firms are concentrated in weak governance countries, indicating that corruption and weak regulations enable firms to expand production and employment, but at an environmental cost.

Finally, we inform ongoing policy debates over local content requirements. These policies are particularly prominent in extractive industries: the share of Sub-Saharan African countries imposing local processing requirements on mining products rose from 26% in 2009 to 42% in 2020 (Cust and Zeufack, 2023), reflecting a broader global resurgence of industrial policy (Cherif and Hasanov, 2019). Critics argue that such policies protect inefficient firms and enable rent-seeking (Hansen and Therkildsen, 2016), resulting in aggregate welfare losses (Yan Ing and Grossman, 2024). Recent empirical evidence reveals mixed results: local content policies have promoted industrial activity but reduced tax revenues in Ghana (Chang, 2025), increased oil production but also oil spills in Nigeria (Rexer, 2024), and increased mining employment for nickel but not bauxite in Indonesia (Bosker et al., 2025). Our findings provide insight on which countries are likely to benefit from local content policies. Multinationals outperform local firms in well-governed countries, suggesting that imposing local ownership, sourcing, or processing requirements in these places is likely to reduce sectoral efficiency. In contrast, in weakly-governed states, local firms hold a production advantage and generate larger economic spillovers. Prioritizing local firms as a "second-best" industrial policy may therefore be reasonable in these settings.

2 Data and descriptives

In this section, we describe our data sources and present descriptive evidence on local and multinational asset ownership in the global mining industry.

2.1 Mining data

Our primary data source is the S&P Global Mining and Metals Database (2023), which reports annual data on 35,567 commercial assets (i.e., mines) spanning 162 countries between 2000 and 2022, including the location, primary commodity produced, development stage, activity status, and output by volume for each mine in each year.[6] The database encompasses mines in exploration, development, production, and post-production phases; data on output are reported for 6,170 mines covering 122 countries over 46,252 mine-years. Most of the mines for which production data are not available are inactive or in non-production stages.

We link this mine-year panel with data on mining firms based on time-varying corporate ownership stakes for each mine. Comprehensive corporate ownership data are available for 96.5% of mines in the S&P database. Firm-level data include firms' percentage participation share in each mine, as well as the country and city headquarters location for 16,805 unique mining firms. For wholly or partially owned subsidiary firms, we identify parent firms and parents' characteristics and headquarters locations.[7] Based on these data, we calculate the time-varying *local share* of each mine's ownership as the sum of ownership stakes held by companies headquartered in the country where the mine is located. We also calculate second-level local shares based on the headquarters location of operating firms' parent companies and the share a parent owns of its first-level subsidiary. We proxy firms' size using the total number of mines in which they hold stakes around the world.

We define three sample restrictions and use each in subsequent analyses where appropriate. Most broadly, we define an "in-S&P" sample that retains all mine-year observations for which ownership data are reported in the S&P registry. We use this sample definition to study impacts from mining that could occur even without production (e.g., economic spillovers, which could occur during exploration and development phases). A slightly narrower sample is the "ever-produced" sample, encapsulating all mines that ever report production between 2000-2022. The narrowest sample, the "output" sample, is restricted to an unbalanced panel of mine-years where production is reported. We use this sample to evaluate effects of local

[6]While this dataset provides the most comprehensive coverage of formally-registered commercial mining operations globally, it does not capture informal mining activity. Informality rates vary substantially by commodity and geography. In high-income countries, where formalization is nearly universal, coverage is effectively complete. In low-income countries, higher informality rates mean a larger fraction of total mining activity remains unobserved. Informal operations are particularly prevalent in artisanal and small-scale mining (ASM), accounting for 70-80% of that sector (IGF, 2022). ASM represents approximately 15-35% of cobalt production in the Democratic Republic of the Congo, 26% of tantalum globally, and 20% of gold globally (UN Environment, 2024; IGF, 2022). Nevertheless, because commercial mines are substantially larger and more productive than ASM operations, the S&P Global database captures the overwhelming majority of global mineral and metal output. Moreover, multinational firms are very unlikely to invest in the ASM sector, meaning the S&P database effectively captures the feasible set of investment opportunities for multinationals.

[7]We manually identified headquarters locations for 6.6% of firms where this information was not reported in the S&P database, using Google searches. We are able to obtain comprehensive parent information for 13,378 of the firms identified as first-level owners.

ownership on outcomes directly linked to production, such as mine output and air pollution.

2.2 Geospatial outcomes

We intersect mine locations with high-resolution geospatial datasets measuring socioeconomic and environmental outcomes at a global scale. To measure economic activity around mines, we use annual 1x1km gridded GDP levels derived from satellite imagery of night-time light intensity from Chen et al. (2022), which are available yearly for 2000-2019. We compute aggregate economic activity within 1, 5, 10, 15, 20, and 25km of mining sites each year. We validate the relationship between night light measures and on-the-ground socioeconomic development by intersecting mine locations with the universe of Demographic and Health Surveys (DHS) collected between 2000-2022 within 20km of those locations (DHS, 2024).[8] We also use DHS data to measure household wealth and employment around mines.

To measure population, we use Version 4 of NASA's Gridded Population of the World database (NASA, 2023), which provides 1x1km population estimates for 2000, 2005, 2010, 2015, and 2020. Geo-coded data on the universe of violent conflict events between 1975-2023 are drawn from the Uppsala Conflict Data Program (2023). We aggregate these data to the total number of violent events and conflict-related deaths within 1, 5, 10, 15, 20, and 25km of each mine in each year.

To evaluate environmental outcomes around mines, we use data on land use from the Copernicus Land Monitoring Service (2024), which reports annual gridded land cover categories at 300x300m resolution between 1992-2023. We aggregate 23 detailed land-uses into aggregate classifications: the share of area within 5km of a mine under forest cover, agriculture, urban use, or other land use. Concentrations of fine particulate matter air pollution (PM2.5) at a 1x1km spatial resolution between 1998-2022 are from Shen et al. (2024).

[8]In Appendix Figure A3, we plot correlations between residuals of local night lights-based economic activity around mines and survey-based indicators of socioeconomic development from those areas (household wealth index, literacy rate, child mortality, and access to improved sanitation) after controlling for country-year fixed effects. Correlations are significantly positive at the 1% level for household wealth, literacy, and improved sanitation, and significantly negative at the 1% level for child mortality, confirming that night lights-based economic activity is a meaningful proxy for broader measures of socioeconomic development.

2.3 Institutional quality

Finally, we measure country-level governance quality using the Worldwide Governance Indicators (World Bank, 2024), which draws data from over thirty sources to construct annual measures of governance along the dimensions of voice and accountability, regulatory quality, political stability, rule of law, government effectiveness, and control of corruption. In our preferred specifications, we compute the country-level average of these measures at baseline (the year 2000) to create an aggregate governance index.

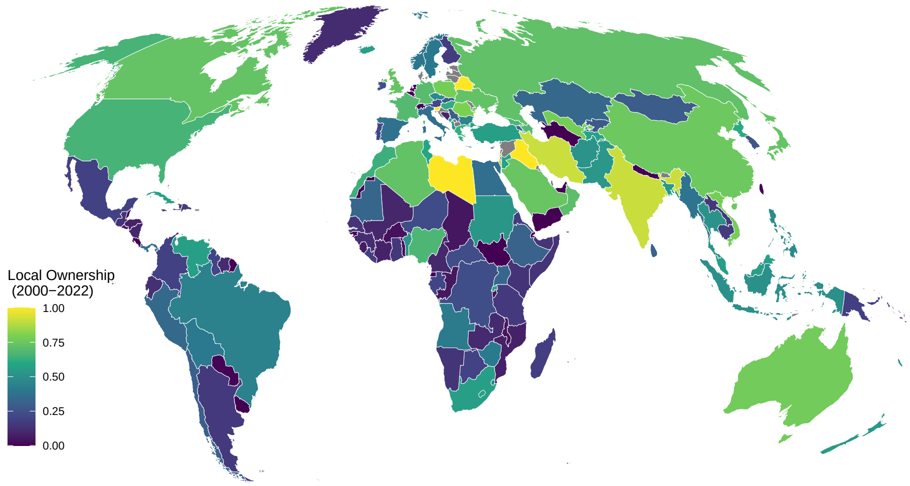
2.4 Descriptive evidence

Global patterns of mine ownership reveal three stylized facts that motivate our mine-level panel analysis. First, despite decades of globalization, local ownership of mines remains persistently high. The global share of mines that is locally owned at any percentage declined from 72% in 2000 to 57% in 2022, with many regions remaining above 70% (Figure A2). This persistence is puzzling if multinationals possess a universal productivity advantage. Large and stable differences in local ownership rates between regions point to historical and institutional factors or path-dependence in multinational activity and investment at the macro-level.

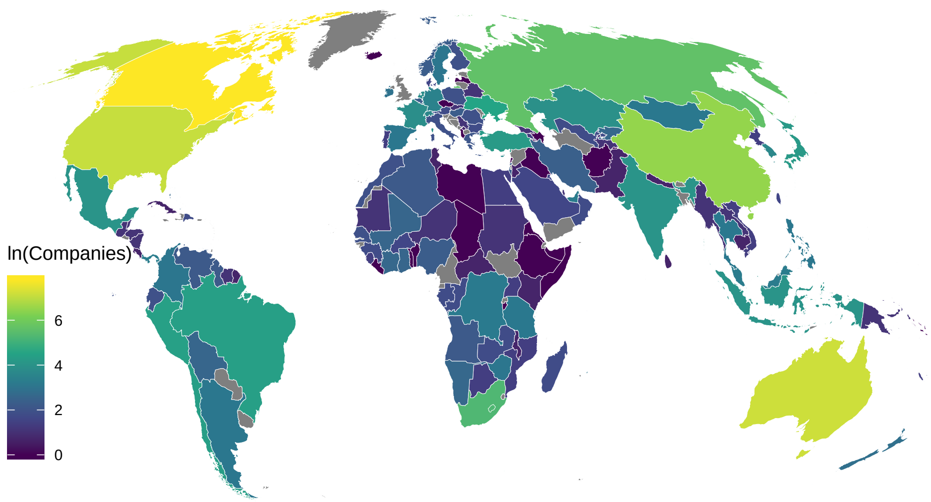
Second, multinational mining company headquarters are clustered in specific countries, including countries with high governance scores like Canada (2,436 multinationals, governance = 1.62 on a -2 to 2 scale), Australia (1,311 multinationals, governance = 1.62), and the United States (1,199 multinationals, governance = 1.50), as well as weaker governance countries like China (688 multinationals, governance = -0.47), Russia (278 multinationals, governance = -0.83), and South Africa (196 multinationals, governance = 0.40), as shown in Figure 1. This heterogeneity in home country institutions allows us to test whether multinationals from good governance origins perform better in good governance hosts and vice versa.

Third, country level correlations between governance and local mine ownership rates exhibit an upward-sloping, U-shaped pattern, with local ownership highest at both extremes of the governance distribution and lowest in the middle (Figure 2, panel a). At the weak governance extreme (e.g., Afghanistan, Iraq, Yemen) high local ownership may reflect comparative advantage of local firms in navigating corruption and institutional voids, i.e., the local advantage. At the good governance extreme (e.g., Sweden, Canada, Australia) high local owner-

Figure 1: Global Characteristics of the Mining Industry



(a) Average Local Ownership Share of Mines (2000-2022)



(b) Number of Multinational Mining Companies Based in Country between 2000-2022

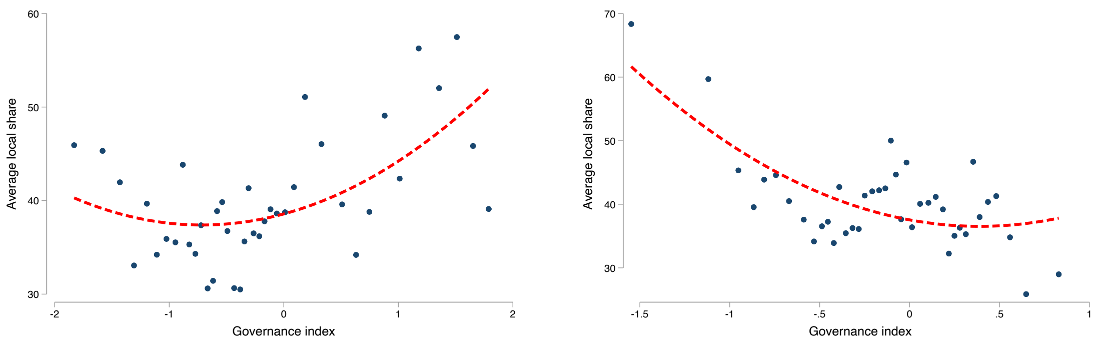
Note: Authors' calculations based on the S&P Global Mining and Metals Database (2023). Local ownership percentage is computed as the average ownership share held by companies headquartered in the same country as the mine. Sub-figure (b) reports the logged number of companies headquartered in each country between 2000-2022 that held an ownership stake in at least one mine in another country. Countries colored in gray have no multinational mining firms.

ship may reflect that highly productive multinationals are headquartered in these countries and operate domestically as "locals," or that local firms do not face country risk premia, reducing costs of capital and enabling them to compete more effectively with multinationals on efficiency. Low local ownership in intermediate governance countries (e.g., Kenya, Ecuador, Armenia) may reflect places where governance is sufficiently strong for the multinational productivity advantage to prevail, but which are not home to leading mining companies.

Figure 2: Correlation between governance and local ownership

(a) Bivariate regression

(b) Controlling for log GDP per capita



Note: Figure shows a binned scatter plot of the average local ownership share across mines within a country-year against that country's WGI score, conditional on year fixed effects. Sample is 155 countries with mining and governance data from 2000-2022. Governance is binned into 40 quantiles. Panel (b) controls for log GDP per capita.

Importantly, once we condition on the log of GDP per capita—which coarsely controls for the underlying productivity distribution of local firms in a given economy—we find that the upward-sloping relationship is reversed. This negative cross-country conditional correlation between governance and local ownership is further indication of local advantage: local firms are more prevalent in poorly-governed markets because they perform relatively better. These facts highlight the importance of asset-level analysis using microdata. While country-level relationships reflect patterns of firm selection across markets as well as underlying productivity differentials across countries, our within-mine approach isolates which ownership type performs better within a given asset, disentangling selection from performance.[9]

[9] Appendix Figure A4 plots country-level correlates of local ownership conditional on year fixed effects. Local ownership is positively correlated with GDP per capita and negatively correlated with income inequality and child mortality. Resource dependence exhibits a U-shaped relationship: greater resource rents correlate with lower local ownership for most countries, but the most resource-dependent economies exhibit higher local ownership, likely reflecting state-owned enterprises.

3 Theoretical framework

Are there institutional conditions under which the standard multinational productivity advantage is reversed, and what mechanisms might drive this reversal? How does institutional weakness affect the composition of multinational firms that enter a given market? To answer these questions, we develop a simple model of entry into foreign markets with heterogeneous firms, following Melitz (2003) and Helpman et al. (2004). The model is designed to capture three central features of firm behavior in weak institutional environments: (*i*) heterogeneous firm productivity and selection into entry, (*ii*) differential exposure to governance frictions between local and foreign firms, and (*iii*) endogenous differences in production and input choices. Our goal is not to provide a fully general theory of multinational production, but rather to isolate the minimal structure necessary to generate sharp and testable predictions about relative firm performance, entry patterns, and input use across institutional environments. This section provides a summary of the theoretical framework, while detailed derivations and proofs can be found in Appendix A.

3.1 Environment

Consider a host country j in which foreign firms from country $k \neq j$, and local firms ($k = j$) can enter a particular sector (e.g., mining). Potential entrants draw productivity φ from a common distribution P. After observing φ, a firm decides whether to pay a fixed entry cost F and operate. We assume that higher-productivity firms produce more output and earn higher variable profits, up to a return to scale parameter β, consistent with standard heterogeneous-firm models. Conditional on entry, pre-tax variable profits are increasing in productivity and follow the form $\pi = A\varphi^{\beta} + C$, where $C > 0$ is a productivity-invariant rent.

Importantly, firms differ not only in productivity but also in their exposure to governance frictions in the host country. We model governance frictions in the reduced form as a tax τ on variable profits. This tax captures a broad set of distortions, including regulatory burdens, corrupt demands for informal payments, bureaucratic delays, conflict risk, and expropriation risk. The implicit cost of governance frictions reduces pre-tax profits by a factor of $(1 - \tau)$.

Two sources of country-specific firm heterogeneity drive the mechanisms of the model. First, local firms and foreign firms may face different fixed costs of entry F. As in Helpman et al. (2004), foreign firms incur additional fixed entry costs associated with regulatory compliance, information frictions, and coordination across borders. Second, the governance tax τ may differ across firms operating in the same host country j. In particular, local firms may enjoy preferential treatment in corrupt environments, facing lower effective taxation than foreign firms. We treat the gap $s = \tau_k - \tau_j > 0$ between the tax rates faced by multinational and local firms as itself a measure of host-country institutional quality. In well-governed countries, $s = 0$ and firms are treated equally regardless of origin.[10] This assumption is supported by recent evidence from Nigeria showing informal, preferential state treatment of local oil firms relative to multinationals in a highly corrupt environment (Rexer, 2024).

At the same time, foreign firms from countries with weak governance may be more adept at navigating weak governance environments, whether because of minimal exposure to home-country anti-corruption laws (D'Souza, 2012; Jia et al., 2022) or greater experience in navigating corruption networks. We assume that multinational firms based in countries that are themselves poorly governed face a lower governance tax relative to foreign firms from well-governed origins. This taxation structure allows the model to generate predictions about how host-country corruption shapes the relative performance of local versus foreign firms *and* the composition of foreign entrants.

As in standard models with heterogeneous firms, the predictions are driven by a zero-net-profit entry condition. A firm enters if post-tax variable profits exceed the fixed cost:

$$(1 - \tau)\pi(\varphi) \geq F. \tag{1}$$

This condition implicitly defines a productivity cutoff $\bar{\varphi}$: only firms with productivity above the cutoff operate. Because the cutoff depends on both fixed costs F and effective taxation τ, institutional conditions shape not only firm profits but also the selection of firms into the market. Expected post-entry profits integrate the truncated distribution of P above $\bar{\varphi}$:

$$\Pi(\bar{\varphi}) = (1 - \tau)\left[\frac{\int_{\bar{\varphi}}^{\infty} A\varphi^{\beta} p(\varphi) d\varphi}{1 - P(\bar{\varphi})} + C\right] \tag{2}$$

[10] Without loss of generality, we are abstracting away from *legal* differences in the tax and subsidy regime between locals and multinationals that might occur even in well-governed markets, interpreting τ as capturing only governance frictions.

3.2 Selection and multinational advantage

We first consider the role of fixed entry costs in generating multinational advantage. Set $\tau = 0$ and suppose foreign firms face higher fixed costs than local firms, $F_M > F_L$. In this case, the productivity cutoff $\bar{\varphi}$ of foreign firms exceeds that of local firms, as illustrated in Figure 3a. Only the most productive foreign firms enter, while a broader range of local firms may operate. Foreign firms may therefore exhibit higher output and profits purely due to stronger selection pressures, given that the expected post-entry profits $\Pi(\bar{\varphi})$ are increasing in $\bar{\varphi}$. This mechanism generates a multinational advantage from differential entry costs, even when φ are drawn from the same distribution across countries.

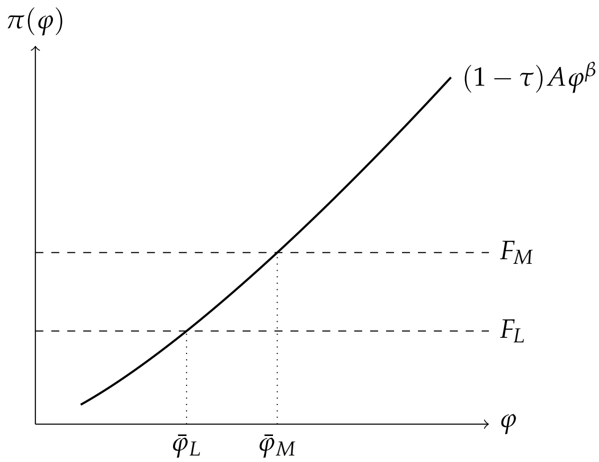
The strength of this multinational advantage depends on two factors: (i) the underlying productivity distribution and (ii) the sensitivity of profits to productivity. When productivity is highly dispersed, differences in fixed costs move the selection margin substantially, increasing multinational advantage. Similarly, when returns to productivity are steep, small differences in the cutoff translate into large differences in average performance among entrants. All derivations are in Appendix A.3.

3.3 Weak governance and local advantage

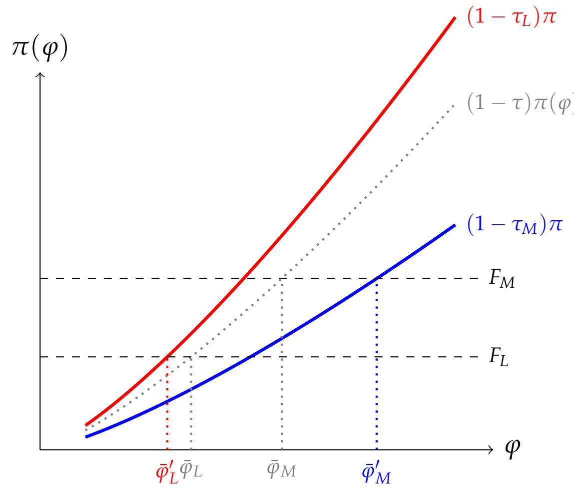
We next introduce differential exposure to governance frictions, with derivations available in Appendix A.4. We assume that local firms face a lower governance tax τ_L than foreign firms τ_M in corrupt host countries, with s representing the differential. Crucially, the gap in tax rates falls in local governance quality. In the best-governed places, both types of firms are treated equally, while a large wedge may emerge in poorly governed markets. Combined with the entry condition, these assumptions reverse the multinational advantage as long as taxation *reduces* expected post-entry profit. In this case, as the gap in tax rates s between local and multinational firms rises, relative multinational advantage declines (or relative local advantage rises).

With the introduction of the governance tax, post-entry expected profits are governed by two opposing forces. The first is a *direct effect*. A lower tax rate mechanically increases post-tax profits for local firms at any given productivity level. This raises output and profitability among entrants. Because local firms have lower tax rates in poorly governed countries, this

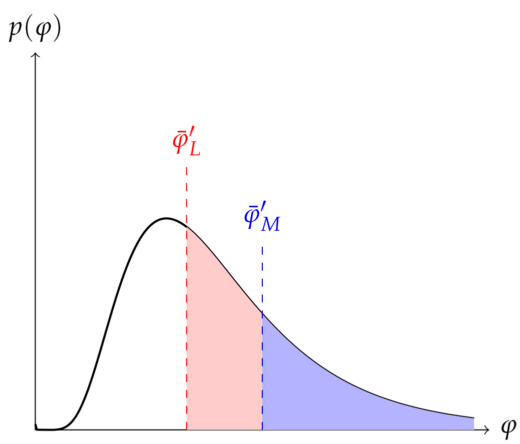
Figure 3: Selection, governance tax, and productivity



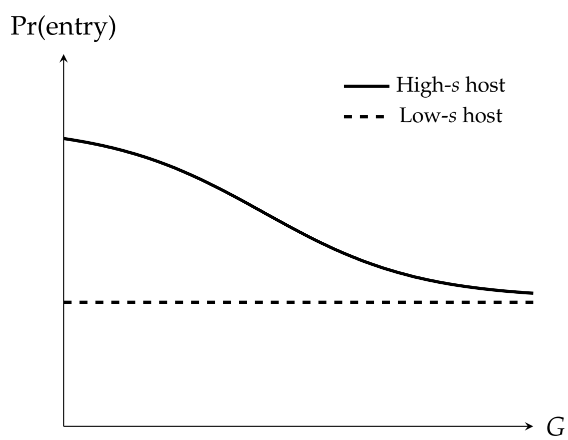
(a) Fixed entry costs and cutoffs



(b) Direct vs. selection: adding $\tau_M > \tau > \tau_L$



(c) Selection with lognormal productivity



(d) Entry probability by governance quality

raises their profits, eroding multinational advantage. This is shown in the upward shift of the profit curve in Figure 3b for any productivity level φ. The second is a *selection effect*. A lower tax rate reduces the productivity cutoff required for profitable entry, relative to a higher tax, allowing less productive firms to enter. Figure 3b shows how when $\tau_L < \tau_M$, local firms face a lower productivity entry cutoff for a given fixed entry cost F. This translates into a wider distribution of entering firms and lower post-entry, pre-tax expected profits for local firms, in Figure 3c. Since local firms face a lower governance tax in weak states, this weakens average productivity among local entrants, reinforcing multinational advantage.

Whether weak institutions generate a local advantage therefore depends on which force dominates. If the direct profit effect outweighs the adverse selection effect, local firms will exhibit higher average profitability as corruption rises, potentially reversing multinational advantage entirely. If instead selection effects dominate, observed average local profits may be lower despite preferential treatment. The model therefore predicts that the relative performance of local firms should be systematically related to institutional quality as long as the direct effect dominates. In environments where preferential treatment is substantial and productivity dispersion is moderate, the direct effect is more likely to dominate and corruption can generate a measurable local advantage.

3.4 Origin-country institutions and entry composition

We next consider heterogeneity among foreign firms. Suppose that firms headquartered in countries with weak governance are better able to reduce their effective tax burden in host environments with weak governance. This may reflect greater experience operating under weak rule of law, stronger informal networks, or less exposure to legal sanctions from engaging in corruption. In Appendix A.5, we model tax rates on foreign firms with a logistic structure that asymptotes toward the local host-country rate as home-country governance gets arbitrarily poor. The steepness of this asymptote depends on s, the gap between local and multinational tax rates. As before, in a well-governed market all firms face the same tax rate. As s rises, the wedge creates an opportunity for multinationals from worse-governed countries to obtain tax rates closer to those enjoyed by local firms.

Therefore, as host-country corruption increases, the effective tax disadvantage faced by such firms shrinks relative to firms from well-governed origins, lowering their productivity cutoff and increasing their likelihood of entry. Figure 3d shows that entry probabilities fall in home-country governance quality, G, for high-corruption (s) markets, but not for low-corruption markets where all firms are treated equally. Consequently, the model predicts a compositional shift in foreign entrants as host-country governance worsens. Specifically, poor governance host countries should attract a larger share of foreign firms from poorly governed origin countries. This selection mechanism, which we call *institutional homophily*, operates even if the underlying productivity distribution is identical across origins.[11] Furthermore,

[11] This prediction goes in the opposite direction of Cooray et al. (2023), who find negative assortative matching in international trade with respect to corruption at the country level.

as long as the direct effect of taxation dominates the selection effect, the profit advantage of firms from weakly governed countries will be increasing in local misgovernance, mirroring the local advantage result.

3.5 Production choices and labor intensity

Finally, we extend the framework to allow firms to endogenously choose inputs. Suppose production combines capital and labor under standard Cobb-Douglas technology in perfectly competitive factor and output markets. Capital must be financed externally at borrowing costs that increase with country risk. Multinationals can access global capital markets at home-country or international risk-free rates, while local firms must borrow domestically at rates elevated by weak governance, underdeveloped financial systems, and country risk premia.[12] Appendix Figure A7 confirms that risk premia above the global risk-free rate are strongly negatively correlated with governance quality. Consequently, locals in corrupt countries face higher capital costs than multinationals operating in the same market.

High borrowing costs induce local firms to substitute away from capital and toward labor. As a result, the model predicts that local firms will be more labor-intensive than foreign firms, providing a microfoundation for existing empirical results, such as Ramstetter (1999) on Asian manufacturing firms. This labor-intensity gap should widen as institutional quality deteriorates, given that weak governance countries have the highest risk premia.

3.6 Empirical predictions

Our model provides a link between institutions, firm ownership, productivity, and local employment outcomes. Weak governance can simultaneously distort entry, alter the composition of firms, and reshape factor demands. The framework yields four main predictions that guide our subsequent empirical analysis:

1. *Multinational advantage*: When foreign firms face higher entry costs, they will be positively selected on productivity and exhibit higher average output conditional on entry. Empirically, we expect that on average, multinational firms will produce more from the same assets than local firms.

[12] The assumption of lower multinational borrowing costs is consistent with empirical evidence, see Desai et al. (2004) and Manova et al. (2015).

2. *Local advantage*: Preferential treatment of local firms in corrupt environments can generate a local performance advantage, provided the direct profit effect dominates the negative selection effect. If this is the case, then empirically we expect the multinational output advantage to decline in host-country institutional weakness.

3. *Institutional homophily*: As host-country misgovernance rises, the composition of foreign entrants shifts toward firms from worse-governed origin countries. In addition, multinationals from poorly governed home countries should perform relatively better in poorly governed hosts.

4. *Labor intensity*: Local firms in weak governance environments will be more labor-intensive than foreign firms, reflecting differential access to capital. Empirically, local firms in weak states should thus generate more local employment spillovers, as well as downstream effects of local employment, such as urbanization and night lights, relative to multinationals.

Our empirical analysis focuses on mine-level output, which provides an informative and observable measure of operational performance. Mines produce homogeneous commodities sold at global prices, making output directly comparable across operators. Our within-mine identification strategy holds asset quality constant, isolating changes in operational performance associated with ownership transitions. Since the model makes predictions on net profits, we would ideally measure these directly, but comprehensive global data on asset-level variable costs are not available. Mine fixed effects absorb time-invariant production costs, allowing productivity differentials to manifest as variation in output. However, variable costs may still differ across ownership types within the same mine. Multinationals face stronger selection on productivity in weak governance markets, while locals face elevated capital costs. As a result, our output-based estimates may overstate local advantage relative to profit-based measures, particularly in weak governance settings where these forces are strongest. The local advantages we document should therefore be interpreted cautiously: they reflect operational performance measured by output, which we use as a proxy for profitability. Moreover, output is an important outcome in its own right. Higher output generates larger local employment and land use spillovers even when profits are repatriated, and most countries tax mining through output-based royalties, making production volume and world prices the primary determinants of public revenue.[13]

4 Empirical strategy

4.1 Fixed effects approach

The core empirical exercise of this paper is to estimate the impact of local ownership on asset-level outcomes. However, raw comparisons between local and multinational mines are likely to be confounded by omitted variables. To control for these omitted variables, we estimate high-dimensional fixed-effects regression models that account for several sources of unobserved heterogeneity. First, we include asset fixed effects to control for time-invariant asset characteristics that might drive selection into local ownership. Second, we use country-by-year effects, which flexibly control for country-specific, time-varying shocks that could be correlated with localization, such as policy changes. Finally, we control for commodity-by-year fixed effects, accounting for time-varying commodity cycles that might affect both the level of local ownership and outcomes of interest. In robustness tests, we include additional interactions of these effects, as well as more granular spatial-time effects at lower administrative units. For mine i at time t producing mineral m in country c, we estimate:

$$y_{itmc} = \alpha + \beta \text{LocalShare}_{it} + \zeta_{tc} + \delta_{tm} + \gamma_i + \varepsilon_{itmc} \tag{3}$$

Where y_{itmc} is the outcome of interest and LocalShare_{it} captures the share of first-level equity ownership in the mine controlled by local firms. Coefficient β captures the change in the outcome associated with moving from no local ownership to full (100%) first-level local ownership. The intercept terms ζ_{tc}, δ_{tm}, and γ_i are year-by-country, year-by-commodity, and mine fixed effects, respectively. Since ownership—our primary treatment of interest—varies at the mine-year level, standard errors are clustered at the mine level.

For y_{itmc}, we consider the following outcome variables: the log of annual mine output in

[13] Note also we do not observe and therefore cannot apply tax rates, since τ contains many unobservable governance frictions. Consequently, the *direct effect* of the governance tax on profits is not directly estimable in our data. However, when output is endogenously chosen, the presence of these taxes will lead firms to optimally produce less output in proportion to the size of the tax wedge. This reinforces the direct effect of taxation on profits, and can be observed in output data. Therefore, the main comparative statics hold for pre-tax output.

tonnes, annual PM2.5 air pollution within 25km of the mine, the log of night lights-predicted GDP within 25km of the mine, and the share of the area within 5km of the mine covered by urban, forested, agriculture, and other vegetation land uses.[14]

4.2 Heterogeneous effects by governance

We hypothesize that multinational-owned mines have an advantage in well-governed countries with low levels of corruption and strong rule of law, where highly productive firms can flourish. However, in contexts where corruption is rife, local firms may have political advantages that offset lower technical efficiency. We therefore interact the local ownership variable with measures of country-level institutional quality from the Worldwide Governance Indicators (WGI) (World Bank, 2024) and estimate:

$$y_{itmc} = \alpha + \beta_1 \text{LocalShare}_{it} + \beta_2 \text{LocalShare}_{it} \times \text{WGI}_{c0} + \zeta_{tc} + \delta_{tm} + \gamma_i + \varepsilon_{itmc} \quad (4)$$

Where WGI_{c0} is quality of governance in baseline year 2000 in the country where mine i is located. Because WGI variables are standardized around 0, β_1 captures the impact of local ownership for a country at the average level of governance, while β_2 captures the change in the impact of local ownership for a one-unit (one SD) increase in governance quality. The level of WGI_{c0} is subsumed by country-year fixed effects. To fully saturate the specification, all models include interactions between gov_{c0} and the fixed effects ζ_{tc} and δ_{tm}. In our preferred specification, we use an index of governance quality computed as the simple country-level average of six sub-components of this index (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption). To avoid potentially endogenous changes in governance measures in response to localization or mining, we hold these variables fixed at their values in the initial year of the data (2000). To ensure our results do not depend on a particular WGI component, we re-estimate this specification

[14] Pollution and GDP are measured within 25km radii because air pollution travels (Wang, 2017) and economic effects are likely to spill over to nearby population centers (Aragón and Rud, 2013). Land cover uses smaller radii because changes likely occur directly around mines. We vary radii in robustness checks. Sample restrictions vary by outcome: mine output and PM2.5 use mine-years for which production is reported – this is by definition for output and because air pollution is likely linked directly to production (Graff Zivin and Neidell, 2012); land cover uses the sample of ever-producing mines on the assumption that production at some point is required to generate land-use change. GDP uses the sample of all mine-years with ownership data, given that economic effects can materialize during exploration and discovery phases even if no production later occurs (Cust and Mihalyi, 2017).

with each sub-component of the index.

4.3 Event-study approach

As a complementary identification strategy, we estimate event studies around multinational-to-local divestment events.[15] This approach allows us to test whether divested and non-divested mines followed parallel trajectories before ownership transitions and to trace dynamic effects of local ownership over time. Mines may experience multiple ownership transitions during the sample period, including both multinational-to-local and local-to-multinational changes. We simplify the data structure by defining a single event-time for each mine: the first year a mine has any local equity participation, thus ensuring each mine enters the treatment group only once. We then estimate a fully-saturated event study specification:

$$y_{itmc} = \alpha + \sum_{\tau=-7}^{20} \beta_\tau \text{Local}_{i\tau} + \zeta_{tc} + \delta_{tm} + \gamma_i + \varepsilon_{itmc} \quad (5)$$

Where β_τ are the coefficients for leads and lags of the first year in which mine i has local ownership, represented in event time τ. For heterogeneity analysis, we estimate this model separately for countries with high and low governance (above and below $\text{WGI}_{c0} = 0$).[16]

4.4 Identification and measurement assumptions

Our core identifying assumption is that ownership transitions are exogenous to mine-level productivity trends, conditional on multi-dimensional fixed effects. The primary threat to this assumption is endogenous divestment timing. For instance, if multinationals systematically divest from declining assets, post-divestment output would mechanically be lower,

[15] Appendix Figures A5 and A6 document the ownership transitions underlying our event study identification. Figure A5 shows that both multinational-to-local and local-to-multinational transitions occur frequently across all regions, with notable activity concentrated around 2010-2012 coinciding with the end of the commodity supercycle. Figure A6 plots net localization, revealing substantial heterogeneity: Sub-Saharan Africa experienced strong net localization during 2012-2014, while North America saw net foreign acquisition during the same period. This variation confirms that ownership transitions reflect diverse mechanisms rather than a single global trend.

[16] This strategy has the limitation of focusing only on the first localization event in the sample. Furthermore, the model is estimated with a high-dimensional fixed effects structure, and so is vulnerable to the "negative weight" challenges that arise in these models (Goodman-Bacon, 2021). To address this concern, we implement robustness tests using (i) alternative definitions of "localization," (ii) stacked models that allow for more direct control over the composition of the comparison group, and (iii) the Callaway and Sant'Anna (2021) estimator. Finally, to the extent that the localization treatment is not an absorbing state, this should lead to underestimates in our event-study coefficients.

spuriously generating apparent multinational advantage.

We test for strategic timing by examining mine age at divestment. If multinationals systematically divest as profitability falls, they should sell older mines when reserves near exhaustion and net present value turns negative. Appendix Figure A9 plots the age distribution of mines at divestment against that of all operating mines. Local and multinational mines exhibit nearly identical age distributions, inconsistent with locals systematically operating older, depleted assets. Divested mines average 9.2 years of age compared to 8.8 years for all mines – a modest 4.5% difference with substantial distributional overlap. Finally, divestments occur across the full age spectrum rather than concentrating at older ages. This evidence indicates that multinationals do not systematically divest mines at particular lifecycle stages.

Country-by-year and commodity-by-year fixed effects absorb additional drivers of divestment, including country-level policy changes and commodity price cycles. Remaining variation in divestment timing likely reflects idiosyncratic factors that are plausibly exogenous to mine-level trends, including home-country shocks and firm-level changes in investment strategy. Even if firms do strategically select which assets to divest based on output trends, they are unlikely to precisely control transaction timing given protracted negotiations, regulatory approvals, contractual restrictions, concession permits, and other factors.

Another critical part of our identification comes from mine fixed effects, which absorb time-invariant mine characteristics and identify within-mine output changes across ownership types. We also confirm balance between localized and never-localized mines to reduce concerns about selection into treatment. As reported in Appendix Tables A1 and A2, we compare mines both at baseline (year 2000) and pre-treatment (averaged across the four years prior to localization) for an extensive set of covariates, including forest cover, urbanization, population, GDP, air pollution, violent conflict, mine output, and distance to the nearest city and nearest port. For each characteristic, we calculate normalized mean differences between localized and non-localized mines, as well as Kolmogorov-Smirnov D-statistics and Hellinger distances to assess distributional similarity. We find no meaningful imbalances.[17] We plot kernel densities of baseline and pre-treatment characteristics of localized and non-localized

[17] Normalized mean differences between localized and non-localized mines are below 0.2 for most variables and never exceed 0.25; average KS D-statistics are 0.085 (baseline) and 0.080 (pre-treatment), below the conventional threshold of 0.10; average Hellinger distances are 0.092 (baseline) and 0.101 (pre-treatment), indicating highly similar distributions.

mines in Appendix Figure A8, visually confirming similarity and common support across sample distributions.

Event-study plots, described below in detail, test whether localized and non-localized mines follow parallel trajectories prior to divestment. We find no evidence of differential pre-trends: mine output, crop cover, and urbanization evolve similarly for both groups for at least seven years prior to localization. Economic activity around mines exhibits a slight upward pre-trend in years $t-6$ and $t-7$, but point estimates for these violations are substantially smaller than post-treatment effects. These patterns are inconsistent with selective multinational divestment from declining or otherwise differentially trending assets.

Furthermore, identification relies on the assumption that localization of one mine does not affect neighboring mines (SUTVA). This could be violated if multiple multinational or locally owned mines operate near each other, creating spillovers. We address this in a robustness check by controlling for distance to the nearest other mine interacted with year fixed effects.

Finally, we test for robustness of the main results to several measurement and estimation choices, including *i*) different combinations of fixed effects and time-varying trends at smaller geographic units, *ii*) using actual vs. predicted output data, *iii*) using more detailed information on higher-level ownership structure to construct the treatment variable, *iv*) using a binary variable for any local participation instead of the local share, *v*) using different distance rings spanning from 5km to up to 25km to define spatial outcomes, *vi*) using a stacked model as well as the Callaway and Sant'Anna (2021) estimator to avoid potential bias from staggered treatment timing, *vii*) using sub-indices of governance for heterogeneity, and *viii*) using dominant shareholdings as an alternative (stricter) definition of localization. We discuss these robustness tests in more detail in Section 7.

5 Empirical results

5.1 Global multinational advantage

We begin by testing Model Prediction 1: a global multinational productivity advantage. We do so by estimating the relationship between local ownership and mine output following equation (3). Table 1 shows regression results with increasingly stringent fixed effects specifications. We build up to the full specification in column (7), beginning with no fixed effects at all in column (1). In this bivariate unconditional model, there is a *positive* correlation between local ownership and mine-level production, likely reflecting selection into larger assets by local firms. Local firms may obtain the largest, most important national assets, either through explicit preference in contracting procedures, political connections, or state ownership. The positive association persists in column (2) when only year fixed effects are included, though the magnitude reduces slightly.

Table 1: Local ownership and mine output

Outcome	Log mine output						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local share	0.557***	0.427***	-0.111***	-0.091**	-0.076**	-0.108***	-0.083**
	[0.07]	[0.08]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]
Observations	51297	51297	51297	51297	51297	51297	51297
Mine FE	N	N	Y	Y	Y	Y	Y
Year FE	N	Y	N	Y	N	N	N
Country-Year FE	N	N	N	N	Y	N	Y
Commodity-Year FE	N	N	N	N	N	Y	Y

Notes: Standard errors in brackets are clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000-2022. Local share is measured as the share of the mine owned by firms headquartered in the producing country. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$

The relationship between local ownership and mine output flips when we apply our primary identification strategy of mine fixed effects (3), becoming negative and significant. Columns (3)-(7) imply that switching from fully multinational to fully local ownership reduces output by approximately 7.6-11.1%, an economically meaningful magnitude. This estimate is significant at the 1 or 5% level in every specification, and robust to the inclusion of additional fixed effects: year FEs in (4), country-year FE in (5), commodity-year FE in (6), and both country and commodity-year in (7). Column (7), our preferred specification, yields an estimate of 8.3%, near the midpoint of the range of estimates.

One potential issue with estimates in Table 1 is that local share is measured using only first-level ownership. In practice, firms registered as local in a given jurisdiction may actually be subsidiaries of multinationals, making these assets less local than they appear. In the extreme case of a wholly-owned subsidiary, the local firm is effectively a multinational with a local address. We view this as a uni-directional form of measurement error—some assets are wrongly identified as having a higher local share than they actually do. If multinational firms truly have an average output advantage, then re-classifying these firms should increase the effect size by raising the signal of the independent variable.

Using data on second-level ownership from S&P, we estimate the 'effective' share of local ownership at the mine level by accounting for subsidiary relationships, and then use this as the main independent variable. We construct this parent local share by multiplying the share of the mine owned by a given local firm by the share of that firm not owned by a multinational, summing across owners in a mine.[18] Appendix Table A3 shows the results. Columns (1)-(4) include various combinations of fixed effects. The quantitative magnitudes of the multinational output advantage rise substantially, now between 13.6-19.1%, and are all significant at the 1% level. In our preferred specification in (4), the effect is 13.8%, 66% larger than column (7) of Table 1. Solving the measurement error problem by using second-level ownership measures leads to strong estimates of the multinational advantage, lending more credence to the estimates. Finally, columns (5)-(8) include *both* local share measures simultaneously and show that the most meaningful variation comes from the measurement of local participation that accounts for multinational subsidiaries. This strengthens our identification argument: a refinement of the treatment criteria produces even stronger results.

Patterns of selection on firm size may differ for local and multinational firms. Multinationals typically grow because they are more productive, heightening the multinational advantage relative to similarly sized local firms. In contrast, local firms may grow because of political connections or preferential access to state subsidies, credit, or monopoly rents. In Table 2, we test whether the multinational advantage differs by firm size and whether the output-firm size gradient varies by local ownership. We measure firm size as the number of mining properties operated by a given firm across the world in a given year, and collapse this variable to the mine level by taking the maximum firm size among all first-level owners. We then interact this variable with local share in our fixed effects specifications.

Table 2 shows the results for four combinations of fixed effects. Estimates reveal that local disadvantage (or multinational advantage) is significantly increasing in firm size, consistent with positive productivity selection for multinationals. Notably, the relationship between

[18] For a numerical example, suppose mine i is split between local firm j, which owns 50%, and multinational k, which owns 50%. However, another multinational, firm l, has an interest of 30% in firm j. According to the first-level definition, this asset is 50% local. Under the second-level definition, the asset is only $(1 - 0.3) \times 0.5 = 0.35$, or 35% local.

Table 2: Local ownership and mine output by firm size

Outcome	Log mine output			
	(1)	(2)	(3)	(4)
Local share	-0.037	-0.020	-0.034	-0.037
	[0.04]	[0.04]	[0.04]	[0.04]
Firm size	0.022***	0.016***	0.016***	0.016***
	[0.01]	[0.01]	[0.01]	[0.01]
Local share × Firm size	-0.032***	-0.036***	-0.016*	-0.018**
	[0.01]	[0.01]	[0.01]	[0.01]
Observations	49184	49184	48568	48467
Year FE	N	Y	N	N
Mine FE	Y	Y	Y	Y
Country-Year FE	N	N	Y	Y
Commodity-Year FE	N	N	N	Y

Notes: Standard errors in brackets clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000-2022. Local share is measured as the share of the mine owned by firms headquartered in the producing country. Firm size is measured as the number of properties owned by the largest firm among the first-level mine owners. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$

firm size and output in the strictly multinational sample (when $\text{LocalShare}_{it} = 0$) is positive and significant, as seen from the coefficient on firm size, which ranges from 0.016-0.022 (Row (2)). In contrast, the effect of firm size on output is zero or negative for fully locally-owned assets, given by the sum of coefficients on $\text{FirmSize}_{it} + \text{FirmSize}_{it} \times \text{LocalShare}_{it}$. This result suggests that there is an asymmetric relationship between size and asset productivity for locals and multinationals: large multinationals are positively selected, while large local firms are negatively selected. While firm size and differing returns to scale are not explicitly modeled in the conceptual framework, this result is consistent with the model's emphasis on differing sources of comparative advantage for multinational and local firms.

5.2 Local advantage under weak institutions

5.2.1 Fixed effects regression results

We next test Model Prediction 2: that local *local advantage* may emerge in poorly governed markets whenever the direct taxation advantage of local firms outweighs negative selection pressures. We measure institutional quality using a governance index derived from the World Governance Indicators. We test this prediction by estimating equation (4), the results of which are in Table 3. As in Table 1, we build the specification from the unconditional form in Column (1) to the most exacting form with mine, commodity-year, and country-year fixed effects in Column (7). All specifications include interactions between the fixed effects and the host country governance index.

Table 3: Local ownership and mine output: heterogeneity by governance

Outcome	Log mine output						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local share	0.593***	0.455***	-0.089**	-0.050	-0.036	-0.066	-0.043
	[0.08]	[0.08]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]
Local share × Governance index (2000)	-0.172**	-0.098	-0.043	-0.083**	-0.074**	-0.083**	-0.082**
	[0.08]	[0.08]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]
Observations	51261	51261	51261	51261	51261	51261	51261
Mine FE	N	N	Y	Y	Y	Y	Y
Year FE	N	Y	N	Y	N	N	N
Country-Year FE	N	N	N	N	Y	N	Y
Commodity-Year FE	N	N	N	N	N	Y	Y

Notes: Standard errors in brackets are clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000-2022. Local share is measured as the share of the mine owned by firms headquartered in the producing country. Governance score is defined as the average of the country-level sub-indices of the World Bank WGI in 2000. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

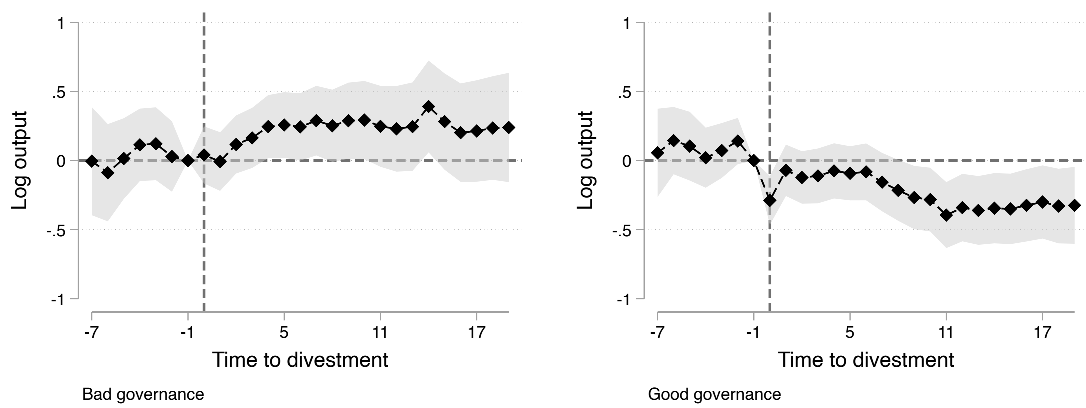
Across all specifications, the multinational output advantage rises as governance quality improves: A 1 SD increase in host-country governance quality increases multinational advantage by 4.3-17.2%, depending on the specification, with 5 out of 7 estimates significant at the 5% level. In our preferred specification (Column 7), the multinational advantage is positive but statistically insignificant when $\text{WGI}_{c0} = 0$. At governance levels 1.5 standard deviations below average—such as Afghanistan, DRC, Iraq, or Myanmar—locals outperform multinationals by approximately 8%. The evidence is therefore consistent with the model prediction of a local advantage in poorly governed markets.

5.2.2 Event-study results

We next report results from estimation of event studies around multinational-to-local mine divestments. Figure 4 plots event-study estimates separately for weak governance (left) and strong governance (right) countries, defined as those with WGI scores below and above zero.

Consistent with fixed effects regression results, event-study estimates reveal a clear decrease in output following the first local takeover of an asset in high-WGI countries. In contrast, there is a clear increase in output following local takeover in low-WGI countries. Both event studies exhibit parallel pre-trends, providing validation that divestments do not simply follow trends in output, conditional on fixed effects. In both low and high-WGI cases, the effect of localization is remarkably sustained, with output remaining elevated or depressed for up to 20 years following divestment, suggesting a durable change in the underlying productivity regime consistent with the model.

Figure 4: Event-study: output



Note: Figure shows coefficients from event-study regressions of log mine output on leads and lags of divestment as well as property and year-by-commodity fixed effects. Divestment timing is determined by the first year in which a mine's status switches from multinational to local ownership. Governance score is defined as the average of the country-level World Bank Worldwide Governance Indicators across sub-indices in 2000. Host countries with a governance score above zero are classified as good governance while those below zero are bad governance.

Quantitatively, output is 35% lower 20 years after localization in high-WGI countries. In contrast, output remains elevated by 27% 20 years after localization in low-WGI countries. Event study dynamics are a helpful complement to the previous fixed effects regressions, which provide only time-averaged effects. Evidently, this time averaging underestimates the cumulative dynamic effect of divestment in both directions.

Are these relative output advantages in strong and weak governance settings dynamic? If good governance conveys a multinational advantage and weak governance conveys a local advantage, then improvement in governance over time should shift advantage toward multinationals, and worsening governance should shift advantage toward locals. To explore these dynamics, we calculate the improvement in each country's governance index between the 2000s and 2010s and identify countries in the top quartile (e.g., Rwanda) and bottom quartile (e.g., Syria) of governance change over this period. We then estimate decade-specific event studies for each subsample of countries. Results, reported in Figure A11, reveal dynamic changes in local versus multinational advantage over time. In countries where governance conditions were poor in the 2000s (top left), there is a clear local advantage. After governance conditions improved substantially, this local advantage disappears in the 2010s (top right) and a weak multinational advantage emerges. In contrast, in countries where governance conditions were moderate or good in the 2000s (bottom left), there is a clear multinational advantage. After governance conditions worsened (bottom right), this multinational advantage attenuates substantially.

5.2.3 Local-multinational joint ventures

Another implication of our local advantage hypothesis is that joint ventures should perform particularly well by combining the productivity advantages of multinationals with the political connections, regulatory flexibility, and tacit knowledge of locals. This result is also predicted in Javorcik and Wei (2009), who find that joint ventures are more common in poorly governed markets using cross-country data. We show evidence for this proposition in Appendix Table A15, where we add terms to equation (3) for joint venture ownership and its interaction with governance quality. Results reveal that output responds positively and significantly to the joint venture structure, and this relationship attenuates with improved governance (though the interaction coefficient is not statistically significant).

5.2.4 Disentangling mechanisms: conflict and governance

Local advantage could reduce τ for local firms through multiple mechanisms: (i) ability to navigate corruption and institutional voids, or (ii) ability to manage security challenges and operate in conflict-prone environments. These two characteristics are closely—but not perfectly—correlated, allowing us to disentangle their effects. To do so, we re-estimate equations (4) and (5), substituting the governance index with country-level conflict intensity, measured as conflict deaths per capita between 1989-2022. Appendix Figure A18 shows that high prevalence of violent conflict erases the multinational production advantage (i.e., effects of mine localization on output are zero rather than negative) but does not generate significant local advantage. This contrasts with weak governance, under which mine localization leads to significant *growth* in output (Figure 4). It thus appears that corruption and institutional voids constrain multinationals more than security risks per se, perhaps because navigating weak governance requires non-contractible local knowledge and political connections, while security challenges can be addressed through contracted protection.[19]

5.3 Multinational firms' home country governance

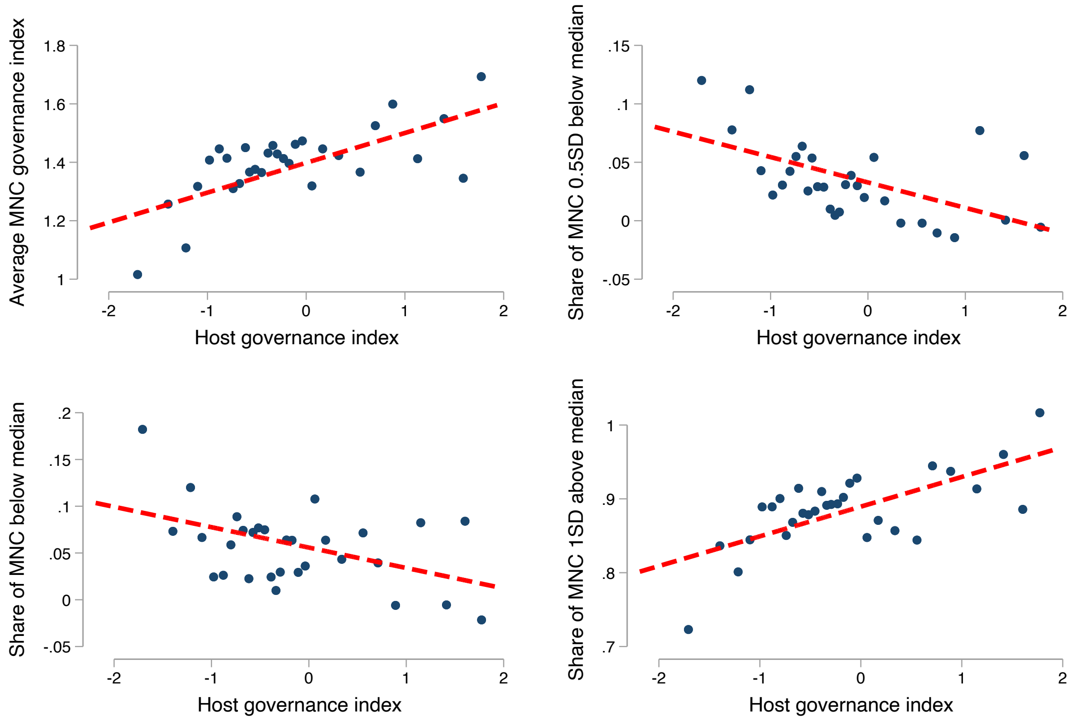
Next, we test Model Prediction 3: institutional homophily between home and host country governance and better performance by multinationals from weak governance countries in weak governance hosts.

To assess home-host assortative matching, we calculate the average home country governance index of multinationals operating in each host country-year and estimate binned scatter plots relating average multinational governance to the host country governance index, controlling for home and host country GDP and year fixed effects. Figure 5 plots results, confirming positive assortative matching on institutional quality. Average multinational governance rises from roughly 1 to nearly 1.8 as host governance improves from -2 to +2 (top-left panel). Moreover, the share of multinationals with below-median home governance rises from near zero in well-governed hosts to around 10% in low-governance hosts (bottom-left panel). Finally, the share of multinationals from high-governance homes (>1 SD above median home country) rises from 80% to nearly 100% as host governance improves from -2 to +2. These patterns confirm that multinationals from weak governance origins concentrate in weak governance hosts, while those from strong governance origins dominate well-governed markets.

These selection patterns suggest that multinationals from countries with weak institutions

[19] To probe which governance dimensions matter most, Appendix Table A16 reports interactions between local ownership and each WGI sub-index: voice and accountability (VAE), political violence (PVE), government effectiveness (GEE), regulatory quality (RQE), rule of law (RLE), and control of corruption (CCE). Local production advantages are significant and of similar magnitude across all dimensions, suggesting local advantage reflects local firms' generalized ability to navigate weak institutional environments, rather than specialization in dealing with any particular governance failure.

Figure 5: Institutional homophily between home and host governance



Note: Figure shows binned scatterplot of correlations between host country governance index and different measures of investor home country governance, after controlling for home and host country GDP and year fixed effects.

possess advantages operating in similar environments—modeled in Section 3 as a "governance tax" that converges toward the level enjoyed by local firms. We empirically assess relative firm performance by home-country governance by interacting home and host-country governance indices, measured in 2000, for the sample of multinational-owned assets.[20] The host governance term is collinear in all models with mine fixed effects, while the home governance term—and its interactions with host governance—varies with changes in ownership.

Table 4 contains the results. The interaction term is positive and significant in all specifications, indicating that multinational firms from better-governed countries perform better in better-governed host countries, while multinationals from poorly-governed home countries perform better in poorly-governed hosts. For example, in our preferred specification in column (6), estimates imply that in a host country 1 SD below the mean in governance, a 1 SD

[20]Home country governance index is measured for the largest shareholder of the mine.

improvement in home-governance leads to an 11.8% output disadvantage. This relationship is made clearer in Appendix Figure A24, which plots the predicted effect of home-country governance by levels of host-country governance, for both a linear specification (left) and a nonlinear kernel regression (right), conditional on mine and year fixed effects. Results indicate that the advantage of being from a high-governance country is concentrated only in other high-governance countries and reverses in low-governance countries.

Table 4: Mine output and governance interactions for multinational firms

Outcome	Log mine output					
	(1)	(2)	(3)	(4)	(5)	(6)
Home governance index	0.166**	0.176**	0.055	0.061	0.003	0.012
	[0.08]	[0.08]	[0.07]	[0.07]	[0.06]	[0.07]
Host governance index × Home governance index	0.171**	0.161**	0.100*	0.113**	0.113**	0.129**
	[0.08]	[0.08]	[0.06]	[0.06]	[0.06]	[0.06]
Observations	11223	11223	11016	11016	10580	10468
Year FE	N	Y	N	Y	N	N
Mine FE	N	N	Y	Y	Y	Y
Country-Year FE	N	N	N	N	Y	Y
Commodity-Year FE	N	N	N	N	N	Y

Notes: Standard errors in brackets are clustered at the mine level. Sample is all solely multinational mine-years producing positive output from 2000-2022. Local share is measured as the share of the mine owned by firms headquartered in the producing country. Governance index is defined as the average of the country-level sub-indices of the World Bank WGI in 2000. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

6 Local spillovers of mining divestment

6.1 Employment impacts

Finally, we test Model Prediction 4: local ownership generates larger employment spillovers in weak governance environments. Our model predicts this pattern because country risk premia elevate local firms' capital costs in countries with weak governance, inducing substitution toward labor-intensive production. Downstream of local firms' larger employment impacts, we expect increased economic activity and urbanization around locally-owned mines.

As a first test of this model prediction, we use DHS data on sectoral employment to calculate two outcome variables: s_{itmc} (the share of DHS sample respondents within 20 kilometers of a mine in a given year (DHS round) t working on (i) agricultural or home-based work, or (ii) non-agricultural work outside the home.Then, for mine i at time t producing mineral m in country c, we estimate the following fixed effects regression:

$$s_{itmc} = \alpha + \beta \text{Local}_{it} + \zeta_{tc} + \delta_{tm} + \varepsilon_{itmc} \quad (6)$$

Standard errors are clustered at the mine level. All shares s are adjusted using DHS sample weights. Our sample is 2,889 unique mines and 4,677 mine-years for which we are able to intersect DHS clusters with mine data. Note that this regression specification differs in two important ways from our previous equations. First, we remove the mine fixed effects γ_i. We do this by necessity, since our restricted sample contains only 1.6 panel observations per unique mine, such that the unit fixed effects will absorb nearly all meaningful variations in the outcome. Therefore, this analysis should be considered more speculative and correlational than our main analysis, as it exploits cross-sectional variation. Second, we use the indicator variable *local* to measure the localization treatment, instead of the continuous variable *locshare*. This is because *locshare* does not add significant information in this subsample – only 10% of the data contains local shares interior to 0 and 1.

Results of this estimation are presented in Table 5. Columns (1)-(5) build up the specification, from the unconditional bivariate model to the model that includes both the commodity-year and country-year fixed effects. Panel A shows results for the agricultural employment rate. Across all models, agricultural employment is strongly and significantly negatively correlated with local ownership at the mine-level. Quantitatively, local ownership is associated with a 3-13.7 p.p. reduction in the agricultural employment rate. In our preferred, most rigorous specification (column 5), we observe a 3 p.p. reduction, equivalent to an 8.5% reduction on the control mean, significant at the 1% level. Panel B shows results for non-agricultural employment. Here, the impact flips. Local ownership is associated with a robust positive increase in non-agricultural employment of 2.2-4.7 p.p., with all estimates significant at the 1% level. In the most rigorous specification of Columnn (5), the 2.2 p.p. increase in non-agricultural employment is equivalent to the 5.4% increase on the control group mean. Overall, in line with Model Prediction 4, we observe that local ownership is associated with a clear shift away from agricultural and household work and toward off-farm employment.

We next test for governance heterogeneity in employment effects. Given limited within-mine panel observations in the DHS sample, we are unable to replicate the split sample event-

Table 5: Local ownership and employment

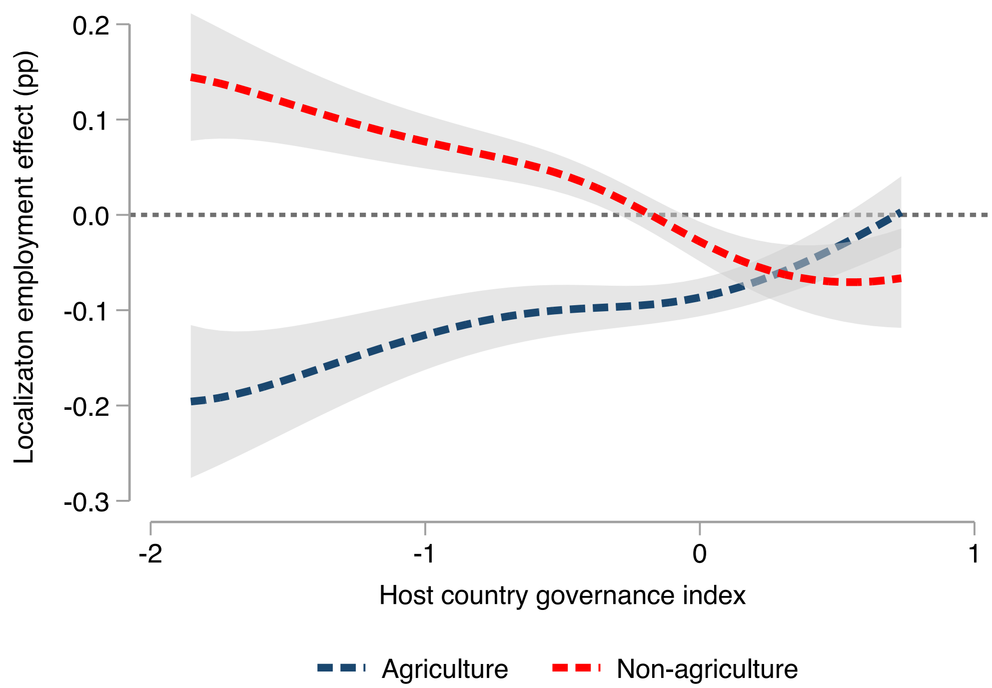
Outcome	Employment rate				
	(1)	(2)	(3)	(4)	(5)
Panel A: Agricultural employment					
Local	-0.137***	-0.114***	-0.085***	-0.038***	-0.030***
	(0.011)	(0.011)	(0.011)	(0.009)	(0.009)
Mean Dep Var	0.35	0.35	0.35	0.35	0.35
Observations	4677	4677	4677	4677	4677
R^2	0.06	0.15	0.29	0.51	0.57
Panel B: Non-agricultural employment					
Local	0.036***	0.047***	0.042***	0.025***	0.022***
	(0.008)	(0.008)	(0.009)	(0.008)	(0.008)
Mean Dep Var	0.41	0.41	0.41	0.41	0.41
Observations	4677	4677	4677	4677	4677
R^2	0.01	0.07	0.22	0.32	0.42
Year FE	No	Yes	No	No	No
Commodity-Year FE	No	No	Yes	No	Yes
Country-Year FE	No	No	No	Yes	Yes

Notes: Standard errors in brackets clustered at the mine level. Employment rate in agriculture / non-agriculture is measured as the share of working-age DHS respondents employed in each sector. Local is measured as an indicator variable equaling one if the mine has any first-level equity participation by firms headquartered in the producing country. Sample is all mine-years for which DHS employment data is available within 20 kilometers of the mine location. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$

study approach. Instead, we estimate a non-linear interaction model using cross-sectional variation. Figure 6 plots the predicted relationship between local ownership and agricultural and non-agricultural employment along the distribution of host-country governance – where predicted effects are estimated using an interacted kernel regression. For simplicity, no controls or fixed effects are included in this nonparametric specification. A linear interaction model with the full suite of interacted fixed effects is reported in Appendix Table A20.

The results from Figure 6 and Appendix Table A20 tell a consistent story: the effect of local mine ownership on labor markets is much more pronounced in countries with weak governance. Quantitative estimates from the kernel regression predict that for countries with a governance index of -1 – just above the 10th percentile (e.g., Azerbaijan, Nigeria, and Cameroon), the switch from multinational to local mine ownership is associated with a 12.7 p.p. reduction

Figure 6: Local ownership and local employment by governance: kernel regression



Note: Figure shows predicted values of the unconditional relationship between localization and sector-specific employment rates by host-country governance levels, estimated using an interacted nonparametric kernel regression with a bandwidth of 0.5. No other controls or fixed effects are included in the model. Employment rates are calculated as the share of the working age DHS respondents within 20km of the mine employed in each sector. Sample is all mine-years for which DHS employment data is available within 20km of the mine location, with all employment statistics adjusted using survey weights. Governance score is defined as the average of the country-level sub-indices of the World Bank WGI in 2000.

in the share of agricultural employment and a 7.7 p.p. increase in the share of non-agricultural employment. At the top end of the governance index observed in DHS (e.g., Botswana, South Africa, Thailand) there is essentially no significant change in either forms of employment share in response to localization.[21] Appendix Figure A26 bins host-country governance by quartiles and estimates the employment-localization regressions within each bin, allowing for commodity-year fixed effects. In this specification, effect sizes become slightly smaller, but the patterns of heterogeneity similar: structural transformation effects in response to local ownership are concentrated exclusively in weak governance environments.

[21] Note that given the DHS sample restriction, the sample contains only low and middle income countries, and so the distribution of governance in this analysis is truncated on the right-hand side.

6.2 Spatial spillovers of multinational versus local ownership

Beyond mine-level output, policymakers care about environmental, economic, and social spillovers from mining. Larger employment around locally-owned mines should generate downstream effects: increased economic activity, urbanization, and environmental impacts.

Table 6 estimates the impact of local ownership on geospatial outcomes around mines, controlling for mine and commodity-year fixed effects. Column (1) reports effects on local economic activity, measured as GDP predicted from satellite-derived nighttime luminosity. A full shift from multinational to local ownership increases local GDP by approximately 1% annually (significant at the 1% level). This effect is modest but notable given that local firms produce less output on average, suggesting they generate economic activity through channels beyond mine production, including greater employment of local labor or reliance on local upstream suppliers or downstream processing.

Table 6: Local ownership and geospatial spillovers

Outcome	Log GDP	PM2.5	Forest	Crop	Other Veg	Urban
	(1)	(2)	(3)	(4)	(5)	(6)
Local share	0.009***	0.202**	0.094	-0.284***	-0.159*	0.199***
	[0.002]	[0.103]	[0.104]	[0.090]	[0.088]	[0.075]
Mine FE	Y	Y	Y	Y	Y	Y
Commodity-Year FE	Y	Y	Y	Y	Y	Y
Mean Dep Var	6.15	16.20	47.75	24.35	40.47	1.57
Observations	306376	51098	95366	85710	112718	116202

Notes: Standard errors in brackets are clustered at the mine level. Samples used for each outcome are: for log GDP (1), the full sample, for PM2.5 (2) the sample of producing mines, and for land cover outcomes (3)-(6), the sample of mines that ever produced. Samples in (3)-(5) are subject to the restriction that the baseline value of land cover is greater than zero. Local share is measured as the share of the mine owned by firms headquartered in the producing country. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Column (2) reports effects on air pollution (PM2.5). Local ownership increases PM2.5 concentrations by 0.2 μg/m^3 around actively producing mines, a modest 1.3% increase above the control group mean. This effect is notable given the concurrent decline in output and the positive correlation between mining output and air pollution (Figure A13, right panel). Two mechanisms likely contribute. First, increased local economic activity and urbanization (Column 6) may elevate pollution. Second, local firms may use dirtier technology, invest less in abatement, or evade environmental regulations more easily (Duflo et al., 2013; Rexer, 2024). The second mechanism appears dominant: PM2.5 increases only in the actively producing sample, with no effect in the full sample and ever-produced sample (Appendix Tables A12 and A13), suggesting pollution effects are tied specifically to production technology rather than broader economic activity.

Columns (3)-(6) report effects of local mine ownership on land use. We observe no change in forest cover (3), but crop cover (4) falls by 0.3 percentage points, or 1.2% of the control group mean. Similarly, the area under other types of vegetation cover falls by 0.4%. This land area is reallocated to urban land cover, which rises by 0.2 percentage points, or 12.7% of the control group mean. Taken together, this set of results documents increased economic activity, urbanization and air pollution, despite lower average production, around locally-owned mines globally.

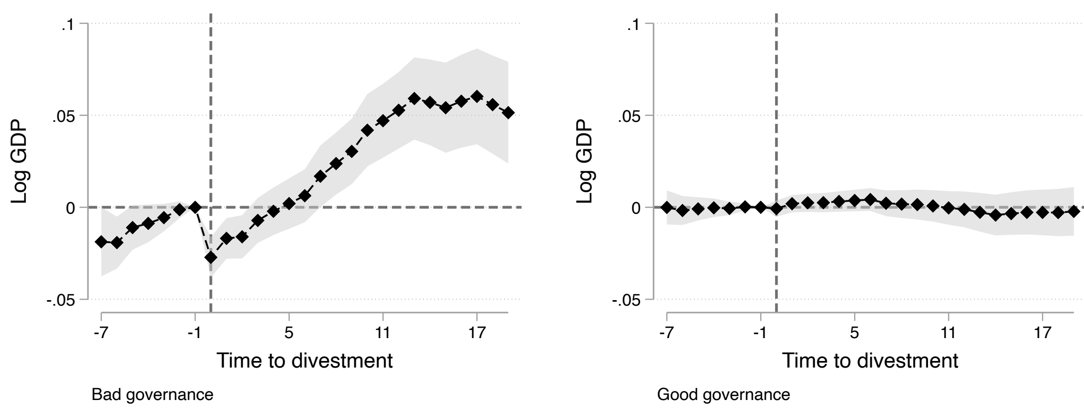
Table 7: Local ownership and geospatial spillovers: heterogeneity by governance

Outcome	Log GDP	PM2.5	Forest	Crop	Other Veg	Urban
	(1)	(2)	(3)	(4)	(5)	(6)
Local share	0.007**	0.210	0.155	-0.279***	-0.235**	0.198**
	(0.004)	(0.145)	(0.137)	(0.104)	(0.114)	(0.101)
Local share × Governance index (2000)	-0.005**	-0.155	-0.107	0.156*	0.159*	-0.141**
	(0.002)	(0.108)	(0.109)	(0.084)	(0.086)	(0.068)
Observations	306376	51098	95366	85710	112718	116202
Mine FE	Yes	Yes	Yes	Yes	Yes	Yes
Commodity-Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in brackets are clustered at the mine level. Samples used for each outcome are: for log GDP (1), the full sample, for PM2.5 (2) the sample of producing mines, and for land cover outcomes (3)-(6), the sample of mines that ever produced. Samples in (3)-(5) are subject to the restriction that the baseline value of land cover is greater than zero. Local share is measured as the share of the mine owned by firms headquartered in the producing country. Governance score is defined as the average of the country-level sub-indices of the World Bank WGI in 2000. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

We next explore heterogeneity in local mining impacts by governance. Table 7 reports estimates of the interaction models of equation 4 for geospatial outcomes. Each model includes mine and commodity-year fixed effects, the latter of which is interacted with country-level governance measured in the year 2000. Column (1) reports effects on economic activity. At average governance quality, local ownership increases economic activity by 0.7%, declining 71% per standard deviation increase in governance. Countries 1.5 SD below mean governance experience a 1.45% increase in economic activity under local mine ownership (significant at the 5% level), while those 1.5 SD above experience no effect. This contrast is borne out clearly in the event-studies reported in Figure 7. For low-governance countries, economic activity dips briefly following mine localization, likely reflecting a pause or disruption in mining. This dip is followed by a steady increase in local economic activity, ultimately resulting in a 5% economic gain 15-20 years after divestment – a quantitatively meaningful change. In contrast, we observe no change in local economic activity following mine localization in high-governance countries. Both series exhibit reasonably parallel pre-trends. We validate these night lights-based GDP effects by regressing average DHS household wealth indices on local ownership and the local-governance interaction. Results, shown in Appendix Table A19, show a significant negative interaction between local ownership and governance: household wealth is higher around locally-owned mines in weak governance environments.

Figure 7: Event-study: local economic activity



Note: Figure shows coefficients from event-study regressions of log local GDP on leads and lags of divestment as well as property and year-by-commodity fixed effects. GDP is predicted by night lights luminosity and measured within 25 kilometers of the mine location. Divestment timing is determined by the first year in which a mine's status switches from multinational to local ownership. Governance score is defined as the average of the country-level World Bank Worldwide Governance Indicators across sub-indices in 2000. Host countries with a governance score above zero are classified as good governance while those below zero are bad governance.

Column (2) reports heterogeneous impacts on air pollution. Although estimates are not significant, they move in the same direction as GDP estimates: localization increases air pollution in low-governance countries but not in better-governed ones. However, the evidence from event-study plots reported in Appendix Figure A15 is inconclusive. Column (3) is similarly insignificant, consistent with no clear impact of divestment on deforestation. Similarly, in Appendix Figure A16, forest cover is flat before and after divestment.

Land cover devoted to crops (Column 4) and urban area (Column 6) shifts substantially with localization, with effects concentrated in weak governance countries. In the worst-governed countries (1.5 SD below mean), full local ownership reduces crop cover by 0.5 percentage points (2.1% of control mean) and increases urbanization by 0.41 percentage points (26.1% of control mean), both significant at the 5% level. Well-governed countries (1.5 SD above mean) exhibit no land cover response. This reallocation from agricultural to urban land is consistent with employment shifts documented earlier. Event studies in Figures A14 and A17 confirm these patterns: urban and cropped land coverage move as near-perfect inverses, suggesting approximately one-to-one substitution. Both exhibit parallel pre-trends followed by approximately linear divergence post-divestment in poorly-governed countries, while well-governed countries show minimal land use change around mines.

7 Robustness

In this section, we test the robustness of our results to alternative specifications, measurement choices, and sample definitions.

Specification Choice: Appendix Table A4 reports estimates from our main fixed effects model with various combinations of two and three-way interactions between year, commodity, country, and owner-country fixed effects. The results are remarkably consistent, showing a global multinational production advantage of 6.5-19.3% across specifications, significant in 5 out of 7 models. Appendix Table A5 allows for more granular location-specific and flexible time trends at the ADM1 (e.g., state) or ADM2 (e.g., municipality) levels, in combination with other fixed effects. The multinational production advantage remains robustly significant in all models and ranges from 9.2-11.3%. Appendix Table A6 uses a "stacked" differences-in-differences estimator (Dube et al., 2023; Rexer, 2024) instead of the fixed effects estimator, which allows for a more precise control over the composition of the comparison group and removes already-treated units as controls. Once we make these adjustments, results are similar, although not identical, to the main results. The output effect – although of a strikingly similar magnitude – is no longer statistically significant. The localization impact on local GDP is similar in both magnitude and significance, while the PM2.5 effect increases some-what in magnitude. The urbanization effect is similar in magnitude and significance, while the crop cover effect falls to zero. Instead, the effect on forest cover becomes negative and significant, indicating forest loss. Overall, the stacked model supports the conclusion of a sizable multinational advantage, as well as local economic spillovers and land use transitions accompanying multinational-to-local divestments. As an alternative approach, we use the Callaway and Sant'Anna (2021) estimator to avoid bias from staggered treatment timing and heterogeneous treatment effects (Goodman-Bacon, 2021). This is not our preferred estimator because it does not allow for inclusion of interacted, multi-level fixed effects. Event study results, presented in Appendix Figure A19, are qualitatively similar to our main findings.

To address concerns that localized mines may be systematically different – and thus follow different trends – than mines that are never-localized, we use coarsened exact matching (Iacus et al., 2012) to restrict our sample to comparable mines prior to re-estimating fixed effect and event study models. We exactly match treated mines (i.e., those that experience a multinational-to-local ownership transition) with never-localized mines on their ADM-1 region, primary commodity, and deciles of baseline (2000) forest cover, urban land share, population, GDP, and air pollution within 20km. We then re-estimate key specifications on the matched sub-sample, including matching weights. Results, reported in Appendix Tables A21-A23 and Figure A27, are strongly robust to this matching procedure.

To account for potential spatial spillovers between neighboring mines, we re-estimate our main specifications controlling for distance to the nearest other mine interacted with year fixed effects. Results, reported in Appendix Table A24, are strongly robust.

Measurement Choices: Appendix Tables A7 and A8 test robustness of the main results to different definitions of localization. Table A7 defines local as an indicator variable for any local participation, while Table A8 defines local as an indicator for whether the largest shareholder in the mine is local. Results are similar to those reported in Table 1, though slightly smaller in magnitude. Table A10 estimates impacts on the log of *actual* output only, rather than using output modeled by S&P where available to fill in missing values. Similar results are observed. Finally, Table A11 tests robustness of the local economic activity (Panel A) and air pollution (Panel B) results to different distance radii around mines, in intervals of 5km from 5 to 25km. Results are not sensitive to the arbitrary distance used to define the radius of the outcome variable.

Sample Selection: The effects on output can only be estimated for the sample of mine-years where production is reported. However, estimates for other outcomes, such as economic activity or land use, may be reported for a variety of different samples. While we argue that the sample selection logic should indeed be outcome specific, Appendix Tables A12, A13, A14 report results for the full sample, the sample of mines that ever produced output, and the sample of actively producing mines, respectively. Local GDP results (Column (1)) are similar in all samples, though not statistically significant in the output sample – perhaps due to the smaller sample size. The impact on PM2.5 air pollution (Column (2)) is only positive and significant in the output sample, which is to be expected given that air pollution is correlated with production. Crop cover loss (Column (4)) is robust in all samples, as is urban land cover growth (Column (6)). Changes in forest cover and other vegetation are less consistent across samples. Overall, the choice of sample ultimately does not appear to affect the main takeaway: divestment of mines to local firms generates local economic spillovers and land substitution from agricultural to urban uses.

8 Conclusion

This paper helps resolve a fundamental puzzle: why do seemingly inefficient local firms persist, despite theoretical and empirical evidence suggesting multinationals are more productive? We show that institutional quality fundamentally determines firms' comparative advantage. Departing from a standard Melitz-style model of firm selection, we incorporate institutional heterogeneity and model corruption as differential taxation. In well-governed markets, high entry costs select productive multinationals. In weak governance settings, local firms' ability to navigate corruption through political connections and institutional knowledge can dominate multinationals' technical advantages.

The model generates testable predictions, which we confirm using a panel dataset of 35,567 commercial mines spanning 162 countries between 2000 and 2022. We document a global multinational advantage, with multinational firms producing 8% more on average from the same assets conditional on extensive fixed effects. However, this advantage fully reverses in weak governance settings, where local firms outperform multinationals by 8%. We further document institutional heterogeneity within multinationals: those from weak governance home countries gravitate toward weak governance hosts and perform more like locals in these markets, indicating institutional homophily and specialization in weak institutions. Finally, we show that these ownership patterns matter for development. Local firms generate 8.5% more non-agricultural employment, 12.7% more urbanization, 1% higher local GDP, and 1.2% higher air pollution, with effects concentrated in countries with weak governance.

Our analysis faces several limitations. First, we observe mine output rather than profits. This comes as a tradeoff for asset-level coverage of the global mining industry. Second, the S&P database includes nearly all commercial mines but misses informal mines and much of the artisanal mining sector. This sector lies largely outside the investment choice set for multinationals, making it less relevant for our study. Third, we do not directly observe capital intensity or borrowing costs of local versus multinational firms. While this prevents direct validation of Model Prediction 4, we provide downstream evidence consistent with this prediction. Finally, institutions are inherently difficult to quantify, with any index embedding conceptual choices about what constitutes "good governance." The Worldwide Governance Indicators nonetheless provide multidimensional measurement and global comparability.

Beyond mining, our findings contribute to understanding foreign investment patterns, firm performance, and industrial policy in developing countries. We provide micro-foundations for the institutional dimension of the Lucas Paradox: capital does not flow to low-income countries because multinationals lack a competitive advantage where corruption dominates technical efficiency. Further, we show why seemingly inefficient local firms persist yet struggle to grow in these economies: weak institutions select for tacit knowledge and political connections that scale poorly relative to technology and professional management practices.

Policy implications follow directly. Local content requirements impose efficiency costs in well-governed countries where the multinational advantage prevails, but may enhance allocative efficiency in weakly-governed countries where locals outproduce multinationals and generate larger employment spillovers – albeit with environmental costs. These policies may thus represent a rational second-best response to institutional constraints. The ongoing retreat from globalization and resurgence of industrial policy may reflect not just protectionism, but recognition that institutional heterogeneity can create local advantages in weak governance environments.

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ONLINE APPENDIX

A Theoretical appendix

A.1 The model

In this section, we ask how the relative output advantage of multinational and local firms varies across different types of markets. To answer this question, we model the decision of a firm to enter a given market and produce mineral output. We use the entry decision to derive testable predictions on patterns of selection and relative output across firms depending on home and host country conditions. In doing so, we focus on the role of corruption in generating local advantage and altering patterns of selection and investment across countries.

A.2 The environment

Firms are indexed by k, their country of origin. A firm from country k faces just one decision – whether to enter and produce mining output in market j. If a firm enters and produces, it earns variable profits π from mining production. We parameterize the post-entry variable profit function as $\pi = A\varphi^{\beta} + C$, where φ is an exogenous productivity parameter and β indexes returns to scale. If $C < 0$, then C is a variable cost, while if $C > 0$ it represents a taxable rent from operating that is independent of the firm's productivity (that is, a baseline level of profit). Firms draw φ from a distribution with PDF $p(\varphi)$ and corresponding CDF P. before making their entry decision. This distribution does not vary by origin country k. Of course, this is a strong assumption given well-known productivity differentials across countries, and represents a limiting case.

Firm k faces a fixed cost of entry into market j, F_{jk}. We make the assumption that the local firm has lower costs of entry than any multinational, $F_{jj} < F_{jk}$ for all $k \neq j$. Greater entry costs for multinationals is a reasonable assumption that follows the literature (Helpman et al., 2004). Multinational production requires setting up a foreign office, obtaining relevant permits, hiring local staff, dealing with language and cultural differences, covering transportation costs, etc., whereas local firms may face fewer such barriers to entry.

An additional simplifying assumption we make is that $F_{jk} = F_{ji}$ for all $i, k \neq j$, that is, all multinational firms face the same entry hurdle in j. Local advantage is defined as average variable profits excluding fixed costs, $E[\pi(\varphi)|entry]$, being greater for local or multinational firms. To derive these values, we calculate conditional expectations of truncated productivity distributions after selection has occurred.

The model proceeds in four cases. In the first case, firms face fixed costs and select into markets based on these costs. In the second case, firms face local corruption, which we model as a tax on profits τ that may be more favorable to local firms. In the third case, this local corruption interacts with firms' origin-country characteristics, such that firms from more corrupt countries may be better able to lower their corruption tax burden. Finally, in the fourth case we introduce differential input demands by firm type driven by differential access to capital, which in turn determines the extent of local environmental and socioeconomic spillovers around mines.

A.3 Case 1: Firm selection with varying fixed costs

Proposition 1: Multinational advantage. *If multinational firms face higher fixed costs of entry $F_{jk} > F_{jj}$, then multinationals will earn higher expected profits than local firms in market j.*

Proof: The condition under which a firm from country k enters market j is

$$\pi(\varphi) - F_{jk} > 0$$

We can drop the j subscript since we focus on one market. Since π is strictly increasing in φ, there exists a minimum φ such that the entry condition is satisfied:

$$\pi(\bar{\varphi}_i) = F_i$$

Since $F_k > F_j$, then $\pi(\bar{\varphi}_k) > \pi(\bar{\varphi}_j)$. Since π is strictly increasing, then $\bar{\varphi}_k > \bar{\varphi}_j$. Given a higher hurdle, multinationals must have a higher minimum productivity, and therefore profit level, to be willing to enter the market. This is the standard insight of Helpman et al. (2004): the interaction between fixed costs and productivity dispersion generates selection patterns by which only the most productive firms engage in FDI. This selection effect generates a multinational profit advantage. Given our profit function, we have the entry cutoff:

$$\bar{\varphi} = \left[\frac{F - C}{A} \right]^{1/\beta} \tag{7}$$

Then we have average post-entry profits

$$\Pi(\bar{\varphi}) = E[\pi(\varphi) | \varphi > \bar{\varphi}] = \frac{\int_{\bar{\varphi}}^{\infty} A\varphi^{\beta} p(\varphi) d\varphi}{1 - P(\bar{\varphi})} + C \tag{8}$$

Note that Π is increasing in $\bar{\varphi}$, since a rising cutoff pushes up the lower-bound truncation of the distribution and so the conditional mean rises. Using the chain rule we have

$$\frac{\partial \Pi}{\partial F} = \frac{\partial \Pi}{\partial \bar{\varphi}} \frac{\partial \bar{\varphi}}{\partial F}$$

Since $\frac{\partial \Pi}{\partial \varphi} > 0$ and $\frac{\partial \varphi}{\partial F} > 0$, we have that multinational advantage holds whenever $F_k > F_j$ ■

A.4 Case 2: Firm selection with local corruption

Now assume that firms face a tax τ on variable profits, so that post-tax profits are $\pi(\varphi) = (1 - \tau)(A\varphi^{\beta} + C)$. Tax τ can be interpreted broadly, capturing real tax rates as well as other factors that negatively affect a firm's profits in a particular governance environment: bureaucracy and red tape, conflict and political instability, insecure property rights, expropriation risk, and so on. A context in which there is *corruption* is one in which firms are not equally exposed to these burdens, that is, the tax rate varies for multinationals and locals. In particular, we define corruption to be the gap between local and multinational tax rates $s = \tau_k - \tau_j$, i.e., the excess tax a multinational has to pay, or the extent to which a local can lower it's tax (or broadly, governance) burden through corruption. In well-governed countries, all firms are treated equally and $s = 0$. Rexer (2024) and The Economist (2025) document this type of corruption in African oil and mining industries, respectively.

Proposition 2: Local advantage. *Define $h(\bar{\varphi}) = E[A\varphi^{\beta} + C | \varphi > \bar{\varphi}]$. When local firms can use corruption to lower their tax burden, that is, $\tau_k > \tau_j$, then local advantage in production may emerge. The degree of local advantage will be increasing in corruption s whenever $\frac{\pi'(\bar{\varphi})}{\pi(\bar{\varphi})} > \frac{h'(\bar{\varphi})}{h(\bar{\varphi})}$*

Proof: With taxation, the entry cutoff becomes

$$\bar{\varphi} = \left[\frac{F/(1-\tau) - C}{A}\right]^{1/\beta} \tag{9}$$

Note that firms are negatively selected on τ. If a firm faces a lower τ, then $\bar{\varphi}$, the minimal productivity required for entry, also falls. Since all firms are drawn from a common distribution, a clear corollary is that if locals face lower taxes because of corruption, they will be more negatively selected. Expected post-entry profits are

$$\Pi(\bar{\varphi}) = (1-\tau)\left[\frac{\int_{\bar{\varphi}}^{\infty} A\varphi^{\beta} p(\varphi) d\varphi}{1 - P(\bar{\varphi})} + C\right] = (1-\tau)h(\bar{\varphi})$$

The question is whether this object rises or falls with the tax rate τ. If taxes reduce expected profit, then it must be the case that as corruption s rises, multinational advantage declines (or local advantage rises). To check, we differentiate Π with respect to τ

$$\frac{\partial \Pi}{\partial \tau} = (1-\tau)h'(\bar{\varphi}(\tau))\bar{\varphi}'(\tau) - h(\bar{\varphi}(\tau)) \tag{10}$$

The first term in equation (10) is the *selection effect* of facing higher taxes, which is positive, since $h'(\bar{\varphi}) > 0$ and $\bar{\varphi}'(\tau) > 0$. Firms that face a higher tax rate must clear a higher productivity hurdle to enter, and are therefore positively selected, yielding higher post-entry profits. Instead, local firms that face lower tax rates are more negatively selected, reducing average profits. The second term in equation (10) is simply the *direct* or *treatment effect* of increasing the tax on the expected profit at a given cutoff $\bar{\varphi}$, which is of course negative since positive profits are required for entry. So the final sign depends on which effect dominates—local advantage increases with corruption whenever the expression is negative:

$$h'(\bar{\varphi})\bar{\varphi}'(\tau) < \frac{h(\bar{\varphi})}{1-\tau} \tag{11}$$

Another way to put think about this is as follows: when there is no corruption (i.e., both firms face the same tax rate but multinationals have higher fixed costs as in Case 1), there will be positive multinational selection and multinational production advantage. But as τ falls for locals because of corruption, this will tend to close the profit gap if the direct effect dominates, or widen the profit gap if the selection effect dominates. This condition can be further simplified. Recall that the cutoff point satisfies

$$(1-\tau)\pi(\bar{\varphi}) - F = 0$$

Implicitly differentiating this expression with respect to τ can give us a general expression.

$$(1-\tau)\pi'(\bar{\varphi})\bar{\varphi}'(\tau) - \pi(\bar{\varphi}) = 0$$

$$\bar{\varphi}'(\tau) = \frac{\pi(\bar{\varphi})}{(1-\tau)\pi'(\bar{\varphi})}$$

Plugging this equation (11) above reveals that the impact of higher taxes on expected post-entry profits is negative, and therefore local advantage is increasing in corruption, whenever:

$$\frac{\pi'(\bar{\varphi})}{\pi(\bar{\varphi})} > \frac{h'(\bar{\varphi})}{h(\bar{\varphi})} \blacksquare \tag{12}$$

This condition summarizes our selection vs. treatment effects: equation (12) says that in order for taxation to reduce expected profits (and thus for local advantage to be increasing in s), the marginal increase in profits from raising φ around the cutoff has to be proportionally larger than the marginal increase in the conditional expectation that results from selection. Technology parameters drive the direct effect, while distributional parameters drive the selection effect. If productivity has greater returns β, then π' will be large and the direct effect of taxes matters a lot. That is, if returns to scale are high, then the direct effect of taxes on profits is largest when φ is large. On the right-hand-side, in contrast, if the distribution is such that moving the cutoff matters a lot for selection (and therefore expected profits), then the selection effect will dominate. In the limiting case without firm heterogeneity, p is a point mass and $h' = 0$; there is no selection effect and all direct effect.

Another way to see the impact of π' is from equation (9). Here, greater returns to scale β push down the responsiveness of the entry cutoff to tax changes, as the entry margin is steeper. This reduces the strength of the selection effect relative to the indirect effect. To see this, take the derivative of (9) with respect to taxes:

$$\bar{\varphi}'(\tau) = \frac{F}{A\beta(1-\tau)^2}\left(\frac{F/(1-\tau)+C}{A}\right)^{\frac{1-\beta}{\beta}} \tag{13}$$

This is strictly positive and declining in β. So as returns to scale increase, the influence of changes in τ on the cutoff declines, weakening the selection effect.

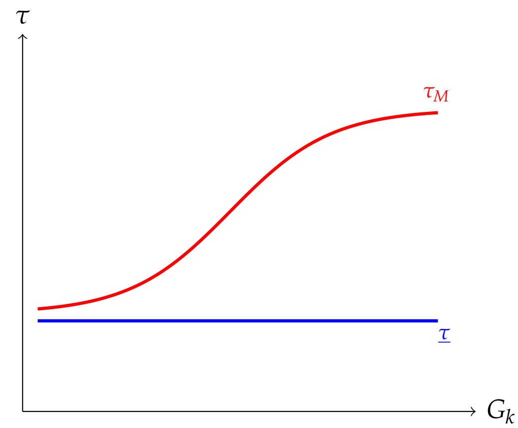
A.5 Case 3: Firm selection with global corruption

Now allow τ to vary by firm home country k. Specifically, let τ be a decreasing function of home-country corruption, bounded above and below, so that firms from countries with more corruption are able to attain tax rates closer to the lower bound tax rate enjoyed by local firms. Let G_k be the quality of governance in country k. To capture our setting, the tax faced by a firm from k in j, $\tau_j(G_k)$, should satisfy the following: properties: i) $\tau_j(G_k) = \underline{\tau}_j$ if $k = j$, ii) $\lim_{G_k \to -\infty} \tau_j(G_k) = \underline{\tau}_j$, iii) $\lim_{G_k \to \infty} \tau_j(G_k) = \bar{\tau}_j$, and iv) $\tau'(G) \geq 0 \; \forall G$. Consider the logistic tax function:

$$\tau_j(G_k) = \left[\bar{\tau}_j + \frac{\underline{\tau}_j - \bar{\tau}_j}{1+e^{\kappa G_k}}\right]\mathbb{I}(j \neq k) + \underline{\tau}_j \mathbb{I}(j = k)$$

As before, a corrupt host country is one in which $s = \bar{\tau}_j - \underline{\tau}_j$ is large. In this context, note that in a non-corrupt country, it should be that $\tau'(G) = 0$. Since everyone gets the same tax rate, there is no variation with respect to home country governance. When $s = 0$, all foreign firms face tax rate $\bar{\tau}_j$ regardless of G_k, which is equal to the local rate $\underline{\tau}_j$. However, when $s > 0$, only the highest G_k firms face $\bar{\tau}_j$, while firms from more corrupt origins face lower rates, asymptotically approaching the lower local rate $\underline{\tau}_j$. We call this the *race to the bottom* property: corruption allows foreign firms to access lower levels of taxation. In other words, corrupt firms can use their abilities in corruption to incur lower tax rates, converging to the local advantage (Figure A1). This variation in governance across countries and in tax rates across firms enables two additional predictions. First, selection may exhibit *institutional homophily*, as firms from poorly governed countries benefit from lower taxation and therefore face lower entry thresholds in corrupt countries. Second, because these multinationals have rates that converge to the local rate, they will display features of "local" advantage. We consider each of these hypotheses in turn.

Figure A1: Tax rates by multinational origin in weak governance hosts



The intuition for institutional homophily is as follows. In a non-corrupt country where $s = 0$, there is no difference in the tax rates by home-country governance G_k, so the cutoff is independent of k and all firms enter at the same rate regardless of origin. However, as s rises, firms from corrupt (low G_k) countries face lower tax rates than firms from less corrupt countries. Therefore, they face a lower cutoff as well, and so more of them should enter. Thus, the type of firms entering skews toward more corrupt. To illustrate, differentiate $\tau_j(G_k)$ with respect to G_k for foreign firms:

$$\tau_j'(G_k) = \frac{(\bar{\tau}_j - \underline{\tau_j})\kappa e^{\kappa G_k}}{(1 + e^{\kappa G_k})^2} \tag{14}$$

This equation is strictly positive, so that as governance improves, the tax rate rises. Second, the expression is increasing in s, so that $\frac{\partial^2 \tau(G_k)}{\partial s \partial G_k} > 0$. That is, the tax advantage of firms from more corrupt countries rises in more corrupt markets. Given that in equation (9) the entry cutoff rises in τ, $\bar{\varphi}'(\tau) > 0$, we have that as G rises, the tax level rises, pushing up the cutoff, and these effects are more pronounced when s is high. So relatively more firms from low G_k countries will enter high s_j markets.

Proposition 3: Institutional homophily. *Define institutional homophily as the property* $\frac{\partial \bar{G}_j}{\partial s_j} < 0$, *where* $\bar{G}_j$ *is the average governance level of firms entering market* j*. Make the following assumptions: i) there is a unit measure of firms in each origin country* k*, ii)* $\beta > 1$ *and* $C > \frac{F(\beta+1)}{2\beta(1-\tau)}$*, iii) that* $p'(\bar{\varphi}) < 0$*, so that the cutoff lies past the mode of the productivity distribution. If these assumptions hold, then the selection of multinationals into markets exhibits institutional homophily.*

Proof: Since there is a unit measure of potential entrants from each country k, we are normalizing country size. Holding j fixed, we can drop host subscripts for convenience. Then we have that the share of foreign firms entering a market from country k will be:

$$\sigma_k = \frac{a_k}{A}$$

where $a_k = 1 - P(\bar{\varphi}_k)$ and $A = \sum_l 1 - P(\bar{\varphi}_l)$. The expected governance level of multinationals entering country j is therefore:

$$\bar{G} = \frac{1}{A}\sum_k G_k a_k$$

Differentiating with respect to s and following the quotient rule yields:

$$\begin{aligned}
\frac{\partial \bar{G}}{\partial s} &= \frac{A\sum_k G_k \frac{\partial a_k}{\partial s} - \sum_k G_k a_k \frac{\partial a_k}{\partial s}}{A^2} \\
&= \frac{A\sum_k G_k \frac{\partial a_k}{\partial s} - A\bar{G}\sum_k \frac{\partial a_k}{\partial s}}{A^2} \\
&= \frac{1}{A}\sum_k (G_k - \bar{G})\frac{\partial a_k}{\partial s}
\end{aligned}$$

We can see from this expression that whether this effect is negative (i.e., institutional homophily) boils down to whether an increase in s reallocates market share more to low G than high G firms. Using the chain rule, we can expand $\frac{\partial a_k}{\partial s}$ for a given G_k

$$\begin{aligned}
\frac{\partial a_k}{\partial s} &= -p(\bar{\varphi}_k)\frac{\partial \bar{\varphi}_k}{\partial s} \\
&= -p(\bar{\varphi}_k)\left.\frac{\partial \bar{\varphi}_k}{\partial \tau}\right|_{\tau=\tau(G_k)} \frac{\partial \tau(G_k)}{\partial s} \\
&= -p(\bar{\varphi}_k)\frac{\partial \bar{\varphi}_k}{\partial \tau}(\tau(G_k))\frac{\partial \tau(G_k)}{\partial s}
\end{aligned}$$

Thus, the reallocation effect for k depends on i) how τ falls as s rises, ii) how the cutoff rises with taxes, and iii) the density of the productivity distribution around the cutoff where firms are affected by a marginal shift. Putting it all together yields:

$$\frac{\partial \bar{G}}{\partial s} = -\frac{1}{A}\left[\sum_k (G_k - \bar{G})p(\bar{\varphi}_k)\frac{\partial \bar{\varphi}_k}{\partial \tau}(\tau(G_k))\frac{\partial \tau(G_k)}{\partial s}\right] \tag{15}$$

What is the sign of this object? Let $b(G_k) = p(\bar{\varphi}_k)\frac{\partial \bar{\varphi}_k}{\partial \tau}(\tau(G_k))\frac{\partial \tau(G_k)}{\partial s}$. Note then that (15) is simply a (negative) covariance term between G_k and the function $b(G_k)$. Therefore, institutional homophily, $\frac{\partial \bar{G}}{\partial s} < 0$, holds as long as G_k is positively correlated with $b(G_k)$, or in other words, that b is increasing in G_k. Define $z(G_k) = p(\bar{\varphi}_k)\frac{\partial \bar{\varphi}_k}{\partial \tau}(\tau(G_k))$ and $w(G_k) = \frac{\partial \tau(G_k)}{\partial s}$, then:

$$b'(G) = z'(G)w(G) + w'(G)z(G)$$

Note that $w'(G) = \frac{\partial^2 \tau(G_k)}{\partial s \partial G_k} > 0$ by the properties of our tax function in (14). Furthermore, $z(G)$ is always positive because p is a pdf and strictly positive, and $\frac{\partial \bar{\varphi}_k}{\partial \tau} > 0$ from equation (13). Therefore, $z'(G)w(G) > 0$ is a sufficient condition for institutional homophily to hold. However, the race to the bottom structure of taxation means that for any G, we have $w(G) < 0$. So we need $z'(G) < 0$ for institutional homophily.

$$z'(G) = p(\bar{\varphi})\frac{\partial^2 \bar{\varphi}}{\partial \tau^2}\frac{\partial \tau}{\partial G} + p'(\bar{\varphi}(\tau(G)))\frac{\partial \tau}{\partial G}\frac{\partial \bar{\varphi}}{\partial \tau}^2$$

Note that if $p'(\bar{\varphi}) < 0$ and the second derivative $\frac{\partial^2 \bar{\varphi}}{\partial \tau^2} < 0$, then $z'(G) < 0$ and institutional homophily holds. The first of these sufficient conditions corresponds to the assumption that the cutoff is past the mode, so the density p is declining thereafter. The second means that the cutoff exhibits concavity in τ.

The intuition behind these conditions is that it must be the case that rising corruption affects selection most for low G. As s (corruption) rises, this reduces taxes most for low G. But this is not sufficient to imply that the cutoff and the entry level changes most for low G firms. Indeed, the change in s shifts taxes downward for *all* firms, following the race to the bottom logic. If the cutoff for higher G firms is more responsive to taxes *or* the density is more responsive to a changing cutoff for higher G firms—depending on the location of the cutoff relative to p—these effects can offset the tax schedule effect. This is why the behavior of the cutoff and the density respect to G, captured by z, is so critical.

With race to the bottom taxation and our cutoff past the mode, it only remains to derive a sufficient condition for $\frac{\partial^2 \bar{\varphi}}{\partial \tau^2} < 0$, such that the cutoff is concave (or at least non-convex) in τ. To derive this, take the second derivative of the cutoff with respect to τ, from equation (13):

$$\bar{\varphi}''(\tau) = \bar{\varphi}(\tau)\left(\frac{F}{\beta[(1-\tau)(F-C(1-\tau)]^2}\right)\left(\frac{F(\beta+1)}{\beta} - 2C(1-\tau)\right)$$

Our sufficient condition for cutoff non-convexity is:

$$\frac{F(\beta+1)}{\beta} - 2C(1-\tau) \leq 0$$

$$C > \frac{F(\beta+1)}{2\beta(1-\tau)}$$

In other words, C has to be a sufficiently positive per-period taxable rent that is independent of productivity. But also note that C cannot be so high that $\bar{\varphi} \leq 0$ and all firms enter. This implies bounds on C

$$\frac{F(\beta+1)}{2\beta(1-\tau)} \leq C < \frac{F}{1-\tau}$$

Which simplifies to,

$$\frac{F}{1-\tau} \geq \frac{F(\beta+1)}{2\beta(1-\tau)}$$

$$\beta \geq 1$$

Thus, whenever we have non-decreasing returns to scale, this is sufficient for the interval for C to be nonempty, which delivers the concavity condition $\bar{\varphi}''(\tau) < 0$ ■.

Proposition 4: Corruption advantage *As long as taxes reduce expected profits over the tax range* $[\underline{\tau}, \overline{\tau}]$*, then the profit advantage of firms from low G relative to high G countries will increase in s.*

Proof: Do multinationals entering more corrupt markets have an advantage relative to multinationals from more well-governed markets. The analysis here is analogous to the local advantage result of Case 2. Re-write post-entry multinational profits as an explicit function of G:

$$\Pi(\bar{\varphi}) = (1-\tau(G))\left[\frac{\int_{\bar{\varphi}(\tau(G))}^{\infty} A\varphi^{\beta} f(\varphi)d\varphi}{1-F(\bar{\varphi})} - C\right] = (1-\tau(G))h(\bar{\varphi}(\tau(G)))$$

Take the derivative with respect to G:

$$\frac{\partial \Pi}{\partial G} = \tau'(G)[-h(\bar{\varphi}(\tau) + h'(\bar{\varphi})\bar{\varphi}'(\tau)(1-\tau)]$$

This expression again shows the selection vs. direct effect of taxation on profits. Increasing G lowers taxes when $s > 0$, which worsens selection but also increases direct post-tax profits. Note that this is the same as in Case 2, but multiplied by a $\tau'(G) > 0$. Now assume local advantage over the relevant range, that is, the term in brackets is negative in $[\underline{\tau}, \overline{\tau}]$ or the direct effect of taxation dominates the selection effect and rising taxation reduces profits. In this case, the whole expression is negative, and increasing home-country corruption improves performance by allowing for access to lower taxes. This effect is stronger for more corrupt host countries with higher s, since $\tau'(G)$ is increasing in s (see equation 14). Consequently, multinationals from more corrupt countries will do better in more corrupt markets, provided local advantage is increasing in local corruption ■.

A.6 Case 4: Global corruption and factor markets

To analyze how corruption in market j affects factor demands for local and multinational firms, we assume a Cobb-Douglas production function.[22] In particular, $A = K^{\alpha} L^{\gamma}$ and $\varphi^{\beta} = \Phi$. Firms are price takers in a competitive market facing output prices p, wages w, and rental rate r. Post-entry variable profits are:

$$\pi = p\Phi K^{\alpha} L^{\gamma} + C - wL - rK$$

Assume further that firms face equilibrium interest rates based on their headquarters location. In particular, a firm from country k faces the risk-free rate, plus a risk premium: $r_k = \bar{r} + r(G_k)$. The risk premium is decreasing in G_k, reflecting greater political stability, investor protections, and so on.[23] Appendix Figure A7 confirms that country risk premia are strongly negatively correlated with governance quality.

Proposition 5: Labor intensity of production. *The gap in labor intensity between local and multi-*

[22]This is without loss of generality—a more flexible CES function yields the same result without any additional intuition.

[23]We can easily extend this to account for better diversification, or portfolio-weighted borrowing costs.

national firms increases in local corruption.

Proof: The capital labor ratio for optimal factor demands is

$$\frac{K}{L} = \frac{\alpha}{\gamma}\frac{w}{r_k}$$

For a local firm j vs multinational k in country j, the difference in the labor intensity of production is then:

$$\Delta(L/K) = \frac{\gamma}{\alpha}\left(\frac{r_j - r_k}{w}\right) = \frac{\gamma}{\alpha w}(r(G_j) - r(G_k))$$

Holding G_k fixed, the gap in labor intensity is increasing as G_j falls, or the level of local corruption rises ■.

This gives us our final prediction: that local firms are more labor intensive in more corrupt countries. Local firms in these countries face high borrowing costs due to country risk, while their MNC competitors do not. This leads them to substitute labor for capital, creating more local jobs and downstream spillovers of local employment, such as urbanization and night-light intensity.

Appendix tables

Table A1: Summary Statistics for Localized and Control Groups

Variable	Treated Mean	Treated SD	Control Mean	Control SD	NMD
Baseline					
Forest cover	36.98	36.68	40.13	37.66	-0.09
Urbanization	1.05	5.02	0.64	4.07	0.09
Population (thousands)	110	305	57	235	0.19
GDP (million USD)	947	2,044	592	1,875	0.18
Air pollution	14.48	12.90	12.36	11.03	0.18
Conflict	0.03	0.79	0.15	2.04	-0.08
Mine output (units*)	2,375	5,174	1,639	5,369	0.14
Dist to nearest city (km)	255.43	310.48	265.53	308.39	-0.03
Dist to nearest port (km)	607.03	527.98	528.61	485.32	0.16
Pre-Treatment					
Forest cover	37.15	36.84	40.12	37.66	-0.08
Urbanization	1.49	6.37	0.99	5.37	0.08
Population (thousands)	80	280	66	285	0.05
GDP (million USD)	1,291	2,948	876	2,801	0.15
Air pollution	17.07	15.69	13.59	11.99	0.25
Conflict	0.07	2.22	0.11	1.82	-0.02
Mine output (units*)	1,986	5,064	1,116	5,411	0.17
N	4,059		25,349		

Note: Table reports sample means, standard deviations, and normalized mean differences (NMD) for baseline and pre-treatment outcomes around mines, disaggregated by treatment status. "Treated" refers to mines that were localized at some point between 2001-2022; "Control" refers to mines that were never localized during this period. "Baseline" values are measured in the year 2000. "Pre-treatment" values correspond to the average value across the four years preceding localization for treated mines and the average over the 2000–2022 period for never-treated mines. Geospatial outcomes are measured within a 20 km radius around each mine. Distance (Haversine) to nearest city is computed based on cities with populations exceeding 100,000, and distance to nearest port is computed based on ports capable of receiving medium to large vessels. Mine output is reported in generic units, which differ across commodities (i.e., tonnes for iron ore and ounces for gold). NMD is calculated as the difference in group means divided by the pooled standard deviation. Values closer to zero indicate better balance between treated and control groups, with $|\text{NMD}| \leq 0.25$ commonly considered to be a criterion for acceptable baseline balance.

Table A2: Distributional Balance Metrics

	Raw Values		Residualized Values	
	KS D-Stat.	Hellinger Dist.	KS D-Stat.	Hellinger Dist.
Baseline				
Forest Cover	0.041	0.045	0.042	0.070
Urbanization	0.082	0.072	0.156	0.149
Population	0.108	0.105	0.076	0.111
GDP	0.148	0.142	0.080	0.113
Air Pollution	0.083	0.098	0.072	0.090
Conflict	0.008	0.019	0.129	0.179
Mine Output	0.142	0.201	0.092	0.209
Dist. to City	0.081	0.082	0.049	0.058
Dist. to Port	0.074	0.068	0.049	0.064
Pre-Treatment				
Forest Cover	0.040	0.047	0.040	0.072
Urbanization	0.081	0.063	0.162	0.153
Population	0.040	0.051	0.034	0.076
GDP	0.128	0.217	0.114	0.126
Air Pollution	0.101	0.124	0.108	0.114
Conflict	0.040	0.076	0.081	0.164
Mine Output	0.130	0.128	0.107	0.192

Note: Table provides measures of distributional similarity between the subsample of mines that are ever treated (i.e., localized at some point between 2001-2022) versus never treated during this period. The Kolmogorov–Smirnov (KS) D-statistic measures the maximum vertical difference between two empirical cumulative distribution functions. We do not report KS p-values due to over-rejection in large samples. The Hellinger distance is an alternative metric used to quantify the difference between two probability distributions based on the square root of the probabilities and ranges from 0 (identical distributions) to 1 (completely disjoint distributions). "Baseline" values are measured in the year 2000. "Pre-treatment" values correspond to the four years preceding divestment for treated mines and the average over the 2000–2022 period for never-treated mines. Residual values are obtained after absorbing country and commodity fixed effects. Geospatial variables are measured using 20 km radii around mines. Distance (Haversine) to nearest city is computed based on cities with populations exceeding 100,000, and distance to nearest port is computed based on ports capable of receiving medium to large vessels.

Table A3: Local ownership and output by ownership structure

Outcome	Log mine output							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parent Local Share	-0.191***	-0.179***	-0.136***	-0.138***	-0.217***	-0.223***	-0.157***	-0.152***
	[0.04]	[0.04]	[0.04]	[0.04]	[0.05]	[0.05]	[0.05]	[0.05]
Local Share					0.033	0.058	0.028	0.019
					[0.05]	[0.05]	[0.05]	[0.05]
Observations	50742	50742	50126	50025	50742	50742	50126	50025
Year FE	N	Y	N	N	N	Y	N	N
Mine FE	Y	Y	Y	Y	Y	Y	Y	Y
Country-Year FE	N	N	Y	Y	N	N	Y	Y
Commodity-Year FE	N	N	N	Y	N	N	N	Y

Notes: Standard errors in brackets are clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000-2022. Local share is measured as the share of the mine owned by firms headquartered in the producing country. Parent local share is measured as the share of the mine owned by local firms, adjusted for the share of equity in local firms held by multinational parents. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$

Table A4: Localization and output: robustness to fixed effects

Outcome	Log mine output						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local share	-0.108***	-0.083**	-0.095**	-0.065	-0.104*	-0.193**	-0.101
	(0.038)	(0.039)	(0.042)	(0.052)	(0.058)	(0.091)	(0.097)
Observations	50643	50025	47838	49951	47973	50445	47111
Mine FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Commodity-Year FE	Yes	Yes	No	Yes	No	Yes	Yes
Year-Country FE	No	Yes	No	No	No	No	No
Year-Owner country FE	No	No	No	Yes	No	No	No
Commodity-Country-Year FE	No	No	Yes	No	No	No	No
Commodity-Owner country-Year FE	No	No	No	No	Yes	No	No
Country-Owner country FE	No	No	No	No	No	Yes	No
Country-Owner country-Year FE	No	No	No	No	No	No	Yes

Notes: Standard errors in brackets are clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000-2022 for which fixed effects are defined. Local share is measured as the share of the mine owned by firms headquartered in the producing country. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table A5: Localization and output: robustness to ADM fixed effects

Outcome	Log mine output							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Local share	-0.103***	-0.098**	-0.095**	-0.092**	-0.112**	-0.102**	-0.097*	-0.093*
	(0.039)	(0.039)	(0.040)	(0.040)	(0.050)	(0.051)	(0.050)	(0.051)
Observations	46996	46924	46894	46822	36110	36037	35990	35917
Mine FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ADM1-Year FE	Yes	Yes	Yes	Yes	No	No	No	No
Country-Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Commodity-Year FE	No	No	Yes	Yes	No	No	Yes	Yes
ADM2-Year FE	No	No	No	No	Yes	Yes	Yes	Yes

Notes: Standard errors in brackets are clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000-2022 for which fixed effects are defined. Local share is measured as the share of the mine owned by firms headquartered in the producing country. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table A6: Localization and outcomes: stacked model

Outcome	Output	GDP	PM 2.5	Urban	Crop	Tree
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All controls						
Divested	-0.111	0.011**	0.477***	0.226**	0.126	-0.340*
	(0.097)	(0.005)	(0.077)	(0.111)	(0.130)	(0.179)
Observations	199861	1948514	2580745	2594760	1549400	2057379
R^2	0.922	0.999	0.959	0.987	0.998	0.998
Panel B: Never treated						
Divested	-0.115	0.010*	0.524***	0.241**	0.083	-0.403**
	(0.102)	(0.005)	(0.080)	(0.111)	(0.128)	(0.180)
Observations	120687	1683156	2244866	2257500	2250353	2254388
R^2	0.917	0.999	0.957	0.988	0.999	0.999
Panel C: Not yet treated						
Divested	-0.145	0.017***	0.208***	0.130	0.079	-0.225
	(0.104)	(0.006)	(0.079)	(0.115)	(0.132)	(0.180)
Observations	80228	275678	350479	351933	346157	349304
R^2	0.932	0.998	0.971	0.982	0.999	0.999
Mine-Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Commodity-Year-Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in brackets are clustered at the mine level. Cohorts are defined as event-years in which mine ownership switches from multinational to local. Never treated sample includes as controls in each cohort only those multinational mines that are never localized. Them not-yet-treated sample includes as controls in each cohort only those multinational mines that eventually become locally owned, up until the date at which they become localized. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table A7: Localization and output: robustness to local definition

Outcome	Log mine output					
	(1)	(2)	(3)	(4)	(5)	(6)
Local	-0.087**	-0.071**	-0.051	-0.087**	-0.059	-0.078**
	(0.034)	(0.034)	(0.035)	(0.035)	(0.036)	(0.039)
Observations	50742	50742	50126	50643	50025	47838
Mine FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	No	No	No
Country-Year FE	No	No	Yes	No	Yes	No
Commodity-Year FE	No	No	No	Yes	Yes	No
Commodity-Country-Year FE	No	No	No	No	No	Yes

Notes: Standard errors in brackets are clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000-2022 for which fixed effects are defined. Local is measured as an indicator if the mine has any equity stake by a firm headquartered in the producing country. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table A8: Localization and mine output: dominant share treatment

Outcome	Log mine output						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dominant local owner	0.539***	0.417***	-0.077**	-0.060*	-0.054	-0.077**	-0.060*
	[0.07]	[0.07]	[0.03]	[0.03]	[0.03]	[0.03]	[0.04]
Mine FE	N	N	Y	Y	Y	Y	Y
Year FE	N	Y	N	Y	N	N	N
Country-Year FE	N	N	N	N	Y	N	Y
Commodity-Year FE	N	N	N	N	N	Y	Y
Observations	51297	51261	51297	51297	51297	51297	51297

Notes: Standard errors in brackets are clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000-2022 for which fixed effects are defined. Dominant local owner is measured as an indicator if the mine has a dominant (plurality) equity stake by a firm headquartered in the producing country. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table A9: Localization and output by joint venture ownership structure and governance

Outcome	Log mine output			
	(1)	(2)	(3)	(4)
Local Share	-0.151***	-0.131***	-0.104**	-0.104**
	[0.04]	[0.04]	[0.04]	[0.04]
Parent Owned JV	0.124**	0.147***	0.104*	0.101*
	[0.05]	[0.05]	[0.05]	[0.05]
Parent Owned JV $\times$ Governance index (host)	-0.010	-0.011	-0.017	-0.021
	[0.04]	[0.04]	[0.04]	[0.04]
Observations	59293	59293	58919	58844
Year FE	N	Y	N	N
Property ID FE	Y	Y	Y	Y
Country-Year FE	N	N	Y	Y
Commodity-Year FE	N	N	N	Y

Notes: Standard errors in brackets are clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000–2022 for which fixed effects are defined. Local share is measured as the share of the mine owned by firms headquartered in the producing country. Parent owned JV is defined as an indicator for vertical joint ventures in which the first-level operator of a mine is local but the parent company is a multinational. Governance index refers to the host-country governance measure. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table A10: Localization and output: actual output

Outcome	Log actual mine output					
	(1)	(2)	(3)	(4)	(5)	(6)
Local share	-0.104***	-0.086**	-0.067*	-0.103***	-0.076*	-0.083*
	(0.039)	(0.039)	(0.040)	(0.039)	(0.040)	(0.043)
Observations	49426	49426	48822	49323	48725	46600
Mine FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	No	No	No
Country-Year FE	No	No	Yes	No	Yes	No
Commodity-Year FE	No	No	No	Yes	Yes	No
Commodity-Country-Year FE	No	No	No	No	No	Yes

Notes: Standard errors in brackets are clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000-2022 for which fixed effects are defined. Local share is measured as the share of the mine owned by firms headquartered in the producing country. Actual mine output does not substitute missing production values with S&P modeled mine output. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table A11: Localization, economic activity, and air pollution: distance radii

Distance (km)	5	10	15	20	25
	(1)	(2)	(3)	(4)	(5)
Panel A: Local GDP					
Local share	0.007**	0.006**	0.007***	0.008***	0.009***
	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Observations	305967	306151	306271	306348	306383
Panel B: Air pollution					
Local share	0.202*	0.210**	0.208**	0.205**	0.202**
	(0.105)	(0.104)	(0.104)	(0.103)	(0.103)
Observations	51097	51102	51102	51134	51134
Mine FE	Yes	Yes	Yes	Yes	Yes
Commodity-Year FE	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in brackets are clustered at the mine level. Samples used for each outcome are: for log GDP (Panel A), the full sample, for PM2.5 (2) the sample of producing mines. Distance radii for outcome measurement are indicated in table header. Local share is measured as the share of the mine owned by firms headquartered in the producing country. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table A12: Local ownership and economic and environmental outcomes: full sample

	Log GDP	PM2.5	Forest	Crop	Other Veg	Urban
	(1)	(2)	(3)	(4)	(5)	(6)
Local share	0.009***	-0.047	0.146**	-0.239***	-0.090**	0.104***
	[0.002]	[0.037]	[0.059]	[0.056]	[0.045]	[0.034]
Mine FE	Yes	Yes	Yes	Yes	Yes	Yes
Commodity-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep Var	6.15	15.38	47.66	24.33	40.53	1.57
Observations	306383	386509	316004	222534	365970	388486

Notes: Standard errors in brackets are clustered at the mine level. Samples used for all outcomes is the full sample of mine-years for which S&P ownership data is available. Samples in (3)-(5) are still subject to the restriction that the baseline value of land cover is greater than zero. Local share is measured as the share of the mine owned by firms headquartered in the producing country. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table A13: Local ownership and economic and environmental outcomes: ever-produced sample

	Log GDP	PM2.5	Forest	Crop	Other Veg	Urban
	(1)	(2)	(3)	(4)	(5)	(6)
Local share	0.013***	0.018	0.095	-0.284***	-0.158*	0.199***
	[0.004]	[0.079]	[0.104]	[0.090]	[0.088]	[0.075]
Mine FE	Yes	Yes	Yes	Yes	Yes	Yes
Commodity-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep Var	6.71	16.49	39.61	27.13	38.11	3.48
Observations	99492	115934	95452	85773	112804	116288

Notes: Standard errors in brackets are clustered at the mine level. Samples used for all outcomes is the full sample of mine-years for which S&P ownership data is available for mines that have ever produced positive output. Samples in (3)-(5) are still subject to the restriction that the baseline value of land cover is greater than zero. Local share is measured as the share of the mine owned by firms headquartered in the producing country. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table A14: Local ownership and economic and environmental outcomes: output sample

	Log GDP	PM2.5	Forest	Crop	Other Veg	Urban
	(1)	(2)	(3)	(4)	(5)	(6)
Local share	0.008	0.202**	-0.072	-0.207*	-0.055	0.171*
	[0.005]	[0.103]	[0.126]	[0.117]	[0.113]	[0.098]
Mine FE	Yes	Yes	Yes	Yes	Yes	Yes
Commodity-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep Var	6.80	16.18	38.71	24.93	39.83	3.09
Observations	46488	51134	42026	37856	49899	51297

Notes: Standard errors in brackets are clustered at the mine level. Samples used for all outcomes is the sample of mine-years for which output data is available (the output sample). Samples in (3)-(5) are still subject to the restriction that the baseline value of land cover is greater than zero. Local share is measured as the share of the mine owned by firms headquartered in the producing country. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table A15: Localization and output by joint venture ownership structure and governance

Outcome	Log mine output			
	(1)	(2)	(3)	(4)
Local Share	-0.151***	-0.131***	-0.104**	-0.104**
	[0.04]	[0.04]	[0.04]	[0.04]
Parent Owned JV	0.124**	0.147***	0.104*	0.101*
	[0.05]	[0.05]	[0.05]	[0.05]
Parent Owned JV × Governance index (host)	-0.010	-0.011	-0.017	-0.021
	[0.04]	[0.04]	[0.04]	[0.04]
Observations	59293	59293	58919	58844
Year FE	N	Y	N	N
Property ID FE	Y	Y	Y	Y
Country-Year FE	N	N	Y	Y
Commodity-Year FE	N	N	N	Y

Notes: Standard errors in brackets are clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000–2022 for which fixed effects are defined. Local share is measured as the share of the mine owned by firms headquartered in the producing country. Parent owned JV is defined as an indicator for vertical joint ventures in which the first-level operator of a mine is local but the parent company is a multinational. Governance index refers to the host-country governance measure. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table A16: Localization and mine output: heterogeneity by WGI sub-indices

Outcome	Log mine output					
	(1)	(2)	(3)	(4)	(5)	(6)
Local share	-0.062	-0.096**	-0.058	-0.046	-0.079*	-0.070
	(0.044)	(0.039)	(0.047)	(0.048)	(0.041)	(0.044)
Local share × VAE	-0.091**					
	(0.040)					
Local share × PVE		-0.083**				
		(0.036)				
Local share × GEE			-0.076**			
			(0.037)			
Local share × RQE				-0.091**		
				(0.042)		
Local share × RLE					-0.069**	
					(0.032)	
Local share × CCE						-0.066**
						(0.032)
Observations	51261	51256	51250	51250	51261	51261
Mine FE	Yes	Yes	Yes	Yes	Yes	Yes
Commodity-Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in brackets clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000-2022. Local share is measured as the share of the mine owned by firms headquarted in the producing country. World Bank WGI sub-indices are defined as follows: VAE - voice and accountability, PVE - political violence, GEE - government effectiveness, RQE - regulatory quality, RLE - rule of law, CCE - control of corruption. All are measured in 2000. All models include interactions between governance measures and commodity-year fixed effects. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$

Table A17: Localization and mine output: heterogeneity by governance, dominant share

Outcome	Log mine output						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dominant local owner	0.585***	0.458***	-0.053	-0.022	-0.014	-0.039	-0.020
	[0.07]	[0.07]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]
Dominant local owner × Governance index (2000)	-0.212***	-0.144*	-0.047	-0.079**	-0.071**	-0.079**	-0.080**
	[0.07]	[0.08]	[0.03]	[0.03]	[0.03]	[0.03]	[0.04]
Mine FE	N	N	Y	Y	Y	Y	Y
Year FE	N	Y	N	Y	N	N	N
Country-Year FE	N	N	N	N	Y	N	Y
Commodity-Year FE	N	N	N	N	N	Y	Y
Observations	51261	51261	51261	51261	51261	51261	51261

Notes: Standard errors in brackets are clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000-2022. Dominant local owner is measured as an indicator equaling one if the mine's largest owner is a firm headquartered in the producing country. Governance score is defined as the average of the country-level sub-indices of the World Bank WGI in 2000. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table A18: Localization and DHS wealth index

Outcome	Household wealth index				
	(1)	(2)	(3)	(4)	(5)
Local	-0.063*	0.058*	0.098***	0.059*	0.065*
	(0.034)	(0.034)	(0.035)	(0.035)	(0.035)
Mean Dep Var	2.74	2.74	2.74	2.74	2.74
Observations	5855	5855	5855	5855	5855
R^2	0.00	0.12	0.26	0.30	0.39
Year FE	No	Yes	No	No	No
Commodity-Year FE	No	No	Yes	No	Yes
Country-Year FE	No	No	No	Yes	Yes

Notes: Standard errors in brackets clustered at the mine level. Household wealth is measured as a standardized asset index. Local is measured as an indicator variable equaling one if the mine has any first-level equity participation by firms headquartered in the producing country. Sample is all mine-years for which DHS employment data is available within 20 kilometers of the mine location. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$

Table A19: Localization and DHS wealth index

Outcome	Household wealth index				
	(1)	(2)	(3)	(4)	(5)
Local	-0.199***	-0.101**	-0.001	0.003	0.015
	(0.044)	(0.044)	(0.047)	(0.046)	(0.047)
Local × Governance index (2000)	-0.356***	-0.285***	-0.151**	-0.120*	-0.119
	(0.073)	(0.069)	(0.070)	(0.072)	(0.075)
Observations	5855	5855	5855	5855	5855
R^2	0.012	0.141	0.332	0.296	0.436
Year FE	No	Yes	No	No	No
Commodity-Year FE	No	No	Yes	No	Yes
Country-Year FE	No	No	No	Yes	Yes

Notes: Standard errors in brackets clustered at the mine level. Household wealth is measured as a standardized asset index. Local is measured as an indicator variable equaling one if the mine has any first-level equity participation by firms headquartered in the producing country. Sample is all mine-years for which DHS employment data is available within 20 kilometers of the mine location. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$

Table A20: Localization and employment outcomes: heterogeneity by governance

Outcome	Employment rate				
	(1)	(2)	(3)	(4)	(5)
Panel A: Agricultural employment					
Local	-0.098***	-0.071***	-0.035***	-0.028***	-0.015
	(0.012)	(0.012)	(0.012)	(0.011)	(0.011)
Local × Governance index (2000)	0.025	0.050***	0.058***	0.021	0.032*
	(0.019)	(0.019)	(0.018)	(0.016)	(0.017)
Observations	4677	4677	4677	4677	4677
R^2	0.120	0.232	0.423	0.512	0.597
Panel B: Non-agricultural employment					
Local	-0.004	0.029***	0.017	0.023**	0.015
	(0.010)	(0.010)	(0.011)	(0.011)	(0.011)
Local × Governance index (2000)	-0.087***	-0.048***	-0.041**	-0.004	-0.015
	(0.016)	(0.017)	(0.017)	(0.016)	(0.016)
Observations	4677	4677	4677	4677	4677
R^2	0.016	0.092	0.319	0.316	0.456
Year FE	No	Yes	No	No	No
Commodity-Year FE	No	No	Yes	No	Yes
Country-Year FE	No	No	No	Yes	Yes

Notes: Standard errors in brackets clustered at the mine level. Employment rate in agriculture / non-agriculture is measured as the share of working-age DHS respondents employed in each sector. Local is measured as an indicator variable equaling one if the mine has any first-level equity participation by firms headquartered in the producing country. Sample is all mine-years for which DHS employment data is available within 20 kilometers of the mine location. Governance score is defined as the average of the country-level sub-indices of the World Bank WGI in 2000. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$

Table A21: Local ownership and mine output (matched sample)

Outcome	Log mine output					
	(1)	(2)	(3)	(4)	(5)	(6)
Local share	0.183*	0.103	-0.125***	-0.110***	-0.096**	-0.101**
	[0.10]	[0.10]	[0.04]	[0.04]	[0.04]	[0.04]
Observations	42934	42934	42465	42465	41985	41903
Year FE	N	Y	N	Y	N	N
Mine FE	N	N	Y	Y	Y	Y
Country-Year FE	N	N	N	N	Y	Y
Commodity-Year FE	N	N	N	N	N	Y

Notes: Standard errors in brackets are clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000-2022. Local share is measured as the share of the mine owned by firms headquartered in the producing country. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$

Table A22: Local ownership and economic and environmental outcomes (matched sample)

Outcome	Log GDP	PM2.5	Forest	Crop	Other Veg	Urban
	(1)	(2)	(3)	(4)	(5)	(6)
Local share	0.006***	0.121	0.081	-0.296***	-0.134	0.203***
	[0.00]	[0.11]	[0.11]	[0.10]	[0.09]	[0.07]
Mine FE	Y	Y	Y	Y	Y	Y
Commodity-Year FE	Y	Y	Y	Y	Y	Y
Observations	251818	42805	78085	68618	93815	96736

Notes: Standard errors in brackets are clustered at the mine level. Samples used for each outcome are: for log GDP (1), the full sample, for PM2.5 (2) the sample of producing mines, and for land cover outcomes (3)-(6), the sample of mines that ever produced. Samples in (3)-(5) are subject to the restriction that the baseline value of land cover is greater than zero. Local share is measured as the share of the mine owned by firms headquartered in the producing country. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table A23: Localization and mine output: heterogeneity by governance (matched sample)

Outcome	Log mine output						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local share	0.291***	0.238**	-0.099**	-0.064	-0.051	-0.082	-0.055
	[0.10]	[0.10]	[0.05]	[0.05]	[0.05]	[0.05]	[0.05]
Local share × Governance index (2000)	-0.211**	-0.183*	-0.043	-0.078*	-0.070*	-0.078*	-0.080*
	[0.10]	[0.09]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]
Observations	39919	39919	39919	39919	39919	39919	39919
Mine FE	N	N	Y	Y	Y	Y	Y
Year FE	N	Y	N	Y	N	N	N
Country-Year FE	N	N	N	N	Y	N	Y
Commodity-Year FE	N	N	N	N	N	Y	Y

Notes: Standard errors in brackets are clustered at the mine level. Sample is all mine-years from 6170 unique mines producing positive output from 2000-2022. Local share is measured as the share of the mine owned by firms headquartered in the producing country. Governance score is defined as the average of the country-level sub-indices of the World Bank WGI in 2000. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

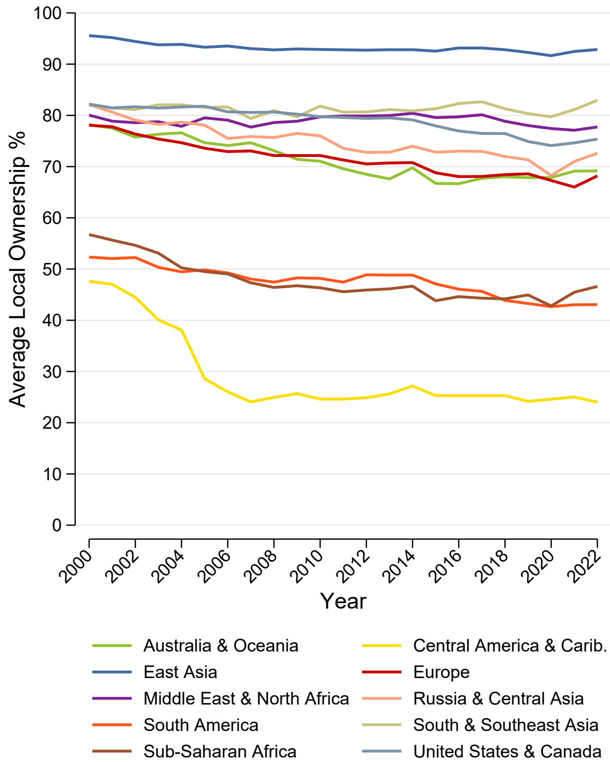
Table A24: Local ownership and economic outcomes: controlling for mine distance

	Log output	Log GDP	PM2.5	Forest	Crop	Other Veg	Urban
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local share	-0.107***	0.009***	0.216**	0.094	-0.282***	-0.154*	0.195***
	[0.038]	[0.002]	[0.103]	[0.104]	[0.090]	[0.088]	[0.075]
Mine FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Commodity-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year × Mine Distance	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	51297	306376	51098	95366	85710	112718	116202

Notes: Standard errors in brackets are clustered at the mine level. Samples used for each outcome are: for log output (1), the output sample, for log GDP (2), the full sample, for PM2.5 (3) the output sample, and for land cover outcomes (4)-(7), the sample of mines that ever produced. Samples in (4)-(6) are subject to the restriction that the baseline value of land cover is greater than zero. Local share is measured as the share of the mine owned by firms headquartered in the producing country. Mine distance is the distance in kilometers to the nearest other mine. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

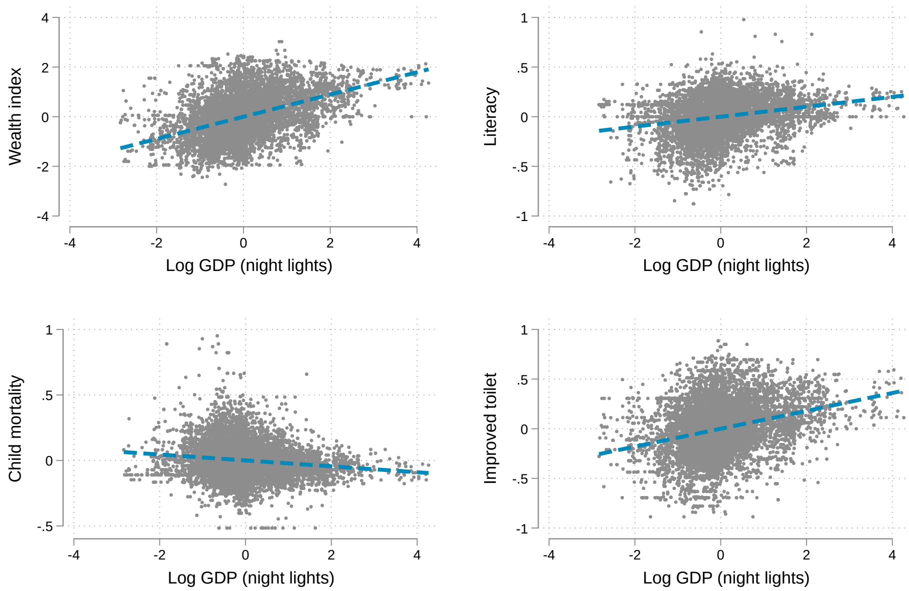
Appendix figures

Figure A2: Local ownership over time by region, balanced panel sample



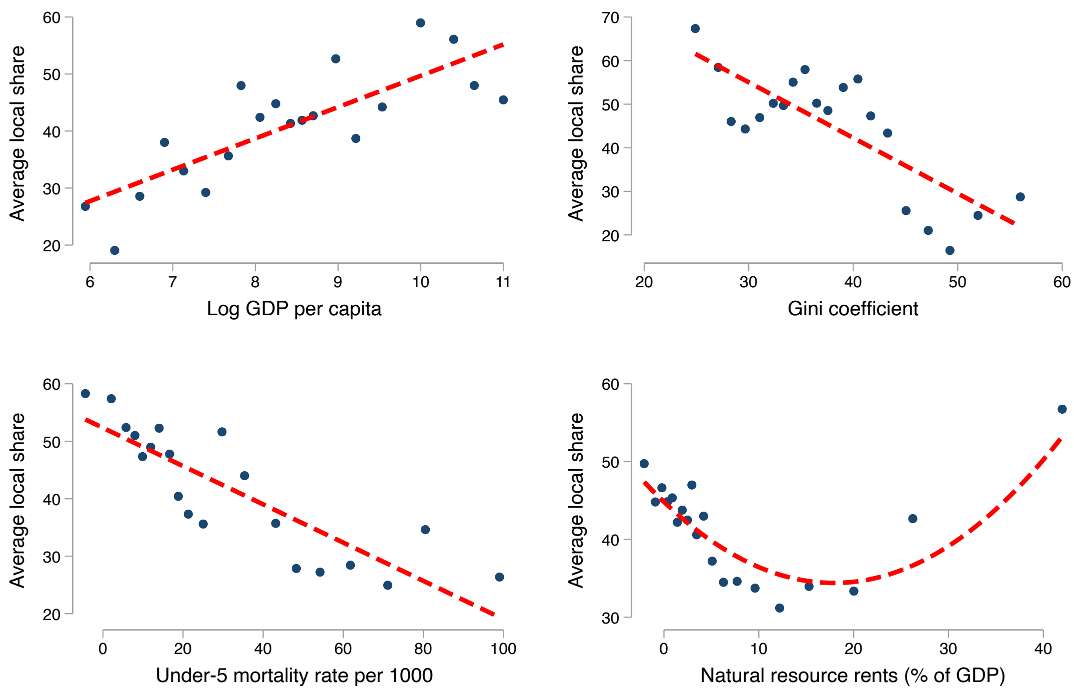
Note: Authors' calculations based on the S&P Global Mining and Metals Database (2023). Local ownership share is defined as the share of corporate ownership stakes held by companies headquartered in the same country where the mine is located. Sample is restricted to mines reporting data in 10 or more years between 2000-2022.

Figure A3: Measurement validation of satellite night lights-predicted GDP



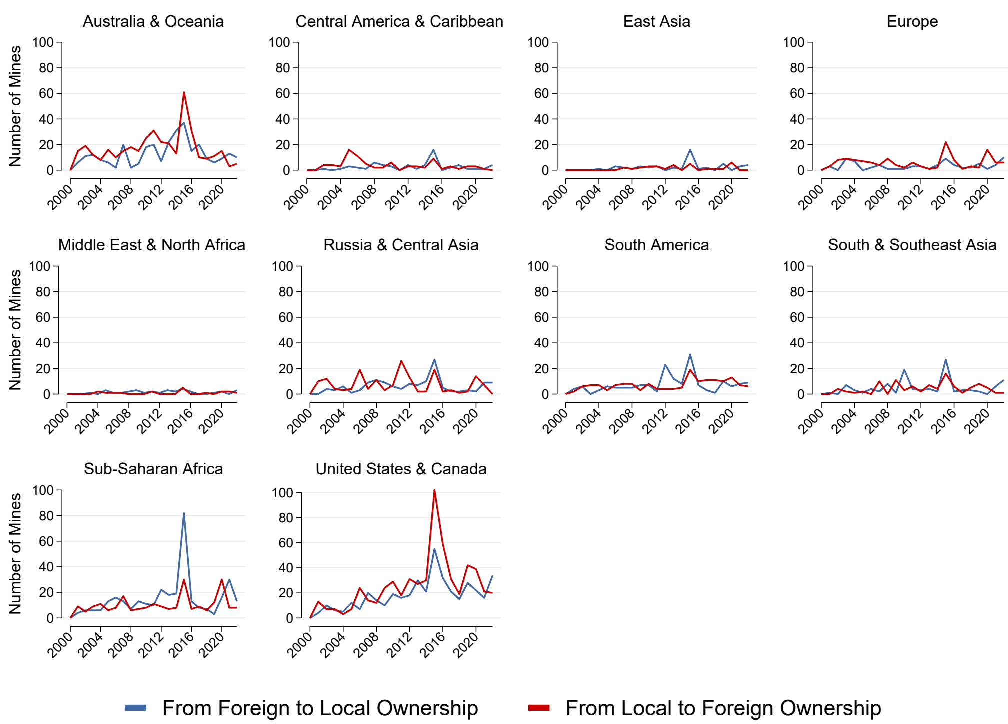
Note: Plots present partial correlations between local GDP and DHS outcomes at the mine level, controlling for country-by-year effects. Local GDP is measured as the log of total night lights-predicted GDP, in USD, within 25 kilometers of the mine. Wealth index is measured as the standardized DHS asset index. Literacy is the share of the adult population that is literate. Child mortality is the share of births in which the child died before their 5th birthday. Improved sanitation measures the share of households in the DHS sample with. All mine-level DHS estimates use survey weights and are defined within 20 kilometers of the mine. Sample is all active mine-years from 2000-2019 for which DHS data is available.

Figure A4: Correlates of local ownership



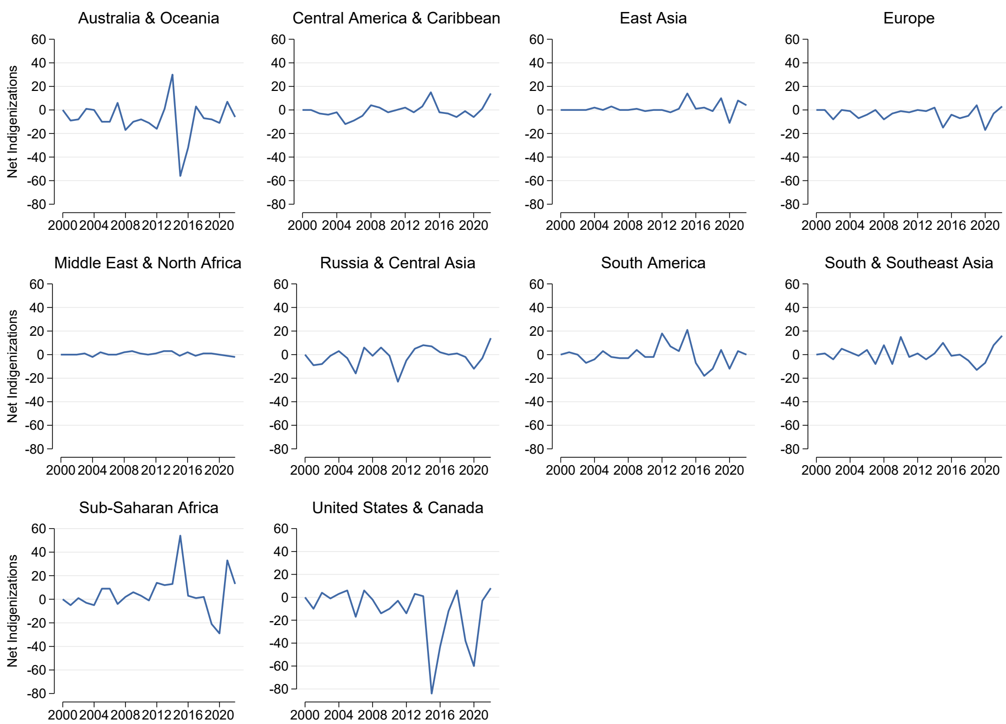
Note: Figure shows binned scatter plots of the average local ownership share across mines within a country-year against country characteristics, conditional on year fixed effects. Sample is 156 countries with mining and economic data from 2000-2021. Independent variables are binned at 20 quantiles of their respective distributions.

Figure A5: Ownership change events



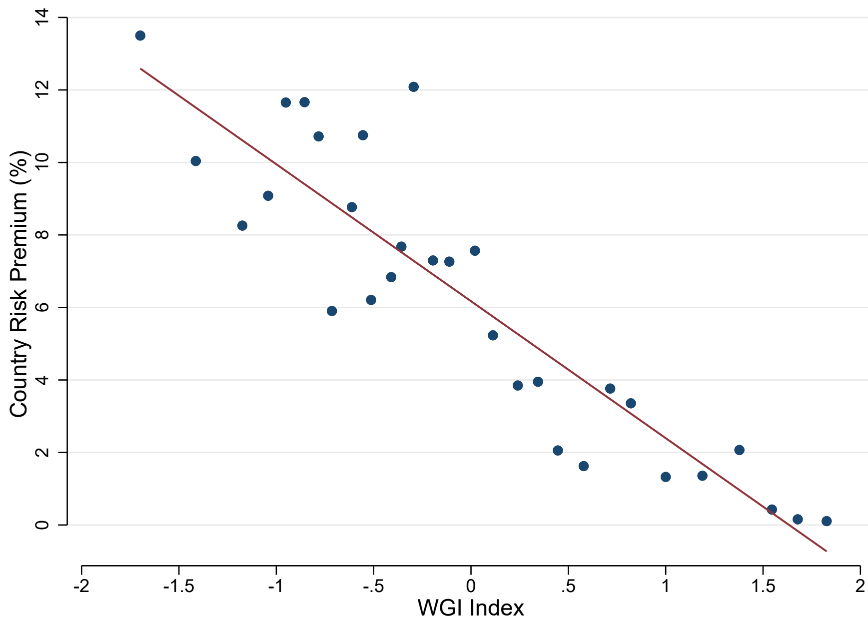
Note: Figure shows ownership change events, as indicated in the legend, by world region over time.

Figure A6: Net localization by region



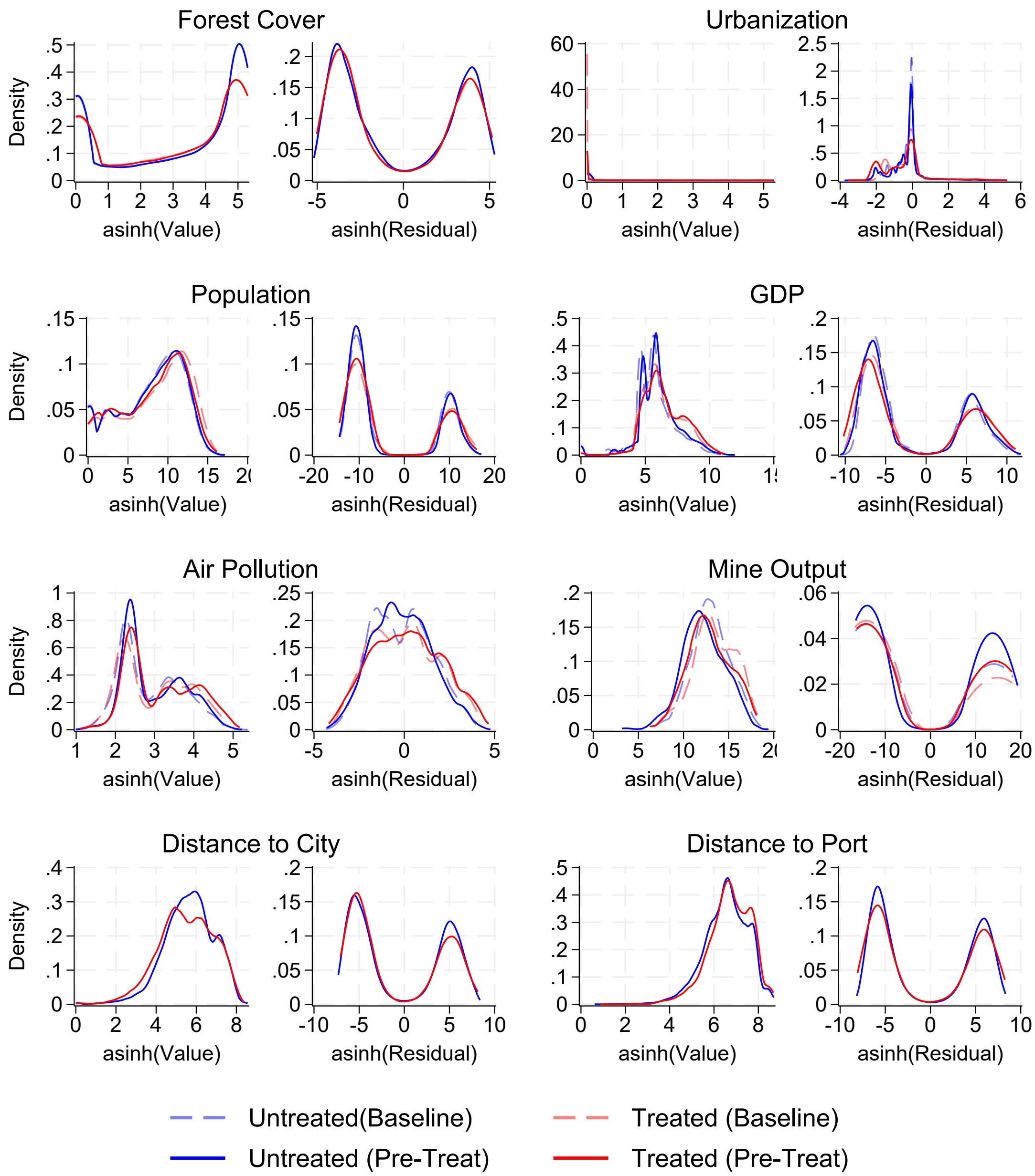
Note: Figure shows net localization events – the total number of multinational-to-local divestments minus the total number of local-to-multinational transactions – by world region over time.

Figure A7: Country-level risk premia and governance quality



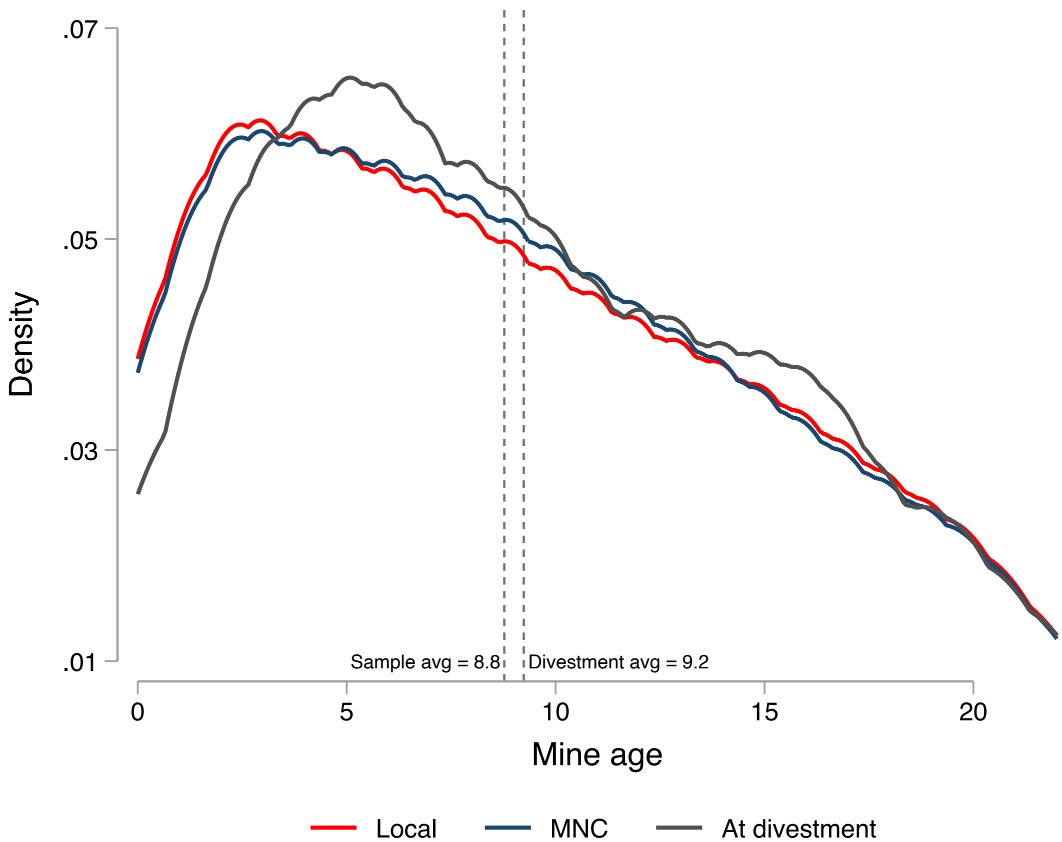
Note: Figure shows binned scatter plot of country-level risk premia, from Damodaran (2026), against country WGI governance score in 2000. Sample is 178 countries with estimated risk premia and governance data available. Independent variable is binned at 30 quantiles of the distribution.

Figure A8: Distributional Balance between Treated and Control Mines



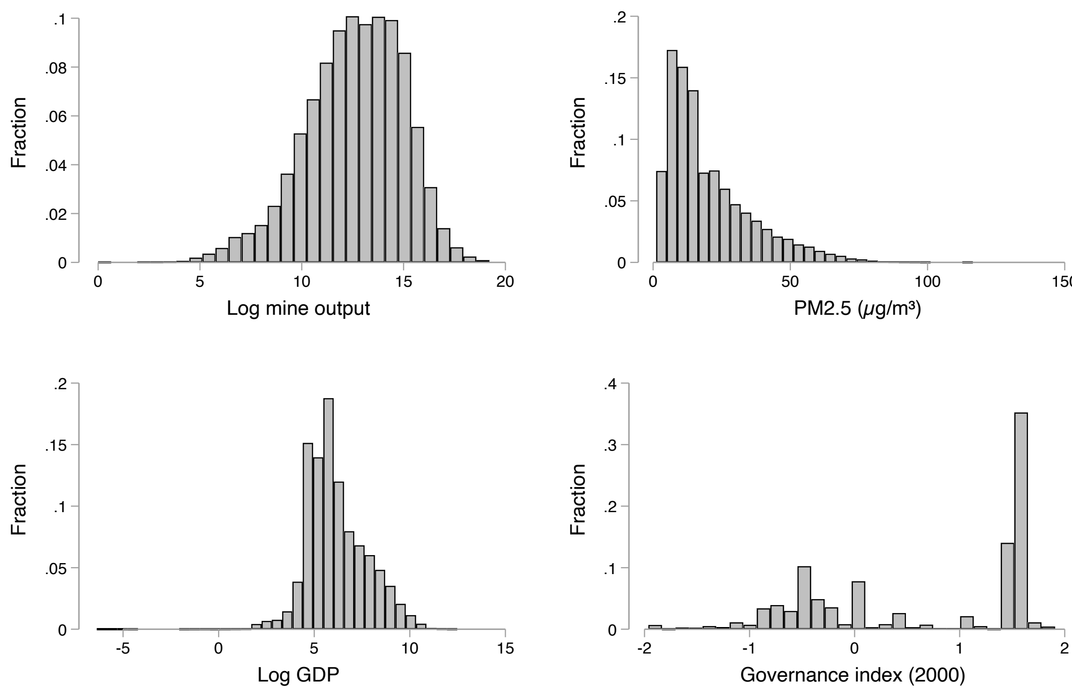
Note: Figure reports kernel density plots for key characteristics around treated (i.e., localized at some point between 2001-2022) and never treated mines. Characteristic distributions are reported at baseline (year 2000) in dashed lines, and pre-treatment (i.e., averaged across the four years prior to localization, or the 2000-2022 average for never treated mines) in solid lines. For each variable, the left sub-graph reports kernel density of the inverse hyperbolic sine of the raw value, while the right sub-graph reports kernel density of the inverse hyperbolic sine of the residual after absorbing country and commodity fixed effects. Geospatial variables are measured at 20km radii around mines. Distance (Haversine) to nearest city is computed based on cities with populations exceeding 100,000, and distance to nearest port is computed based on ports capable of receiving medium to large vessels.

Figure A9: Divestment timing



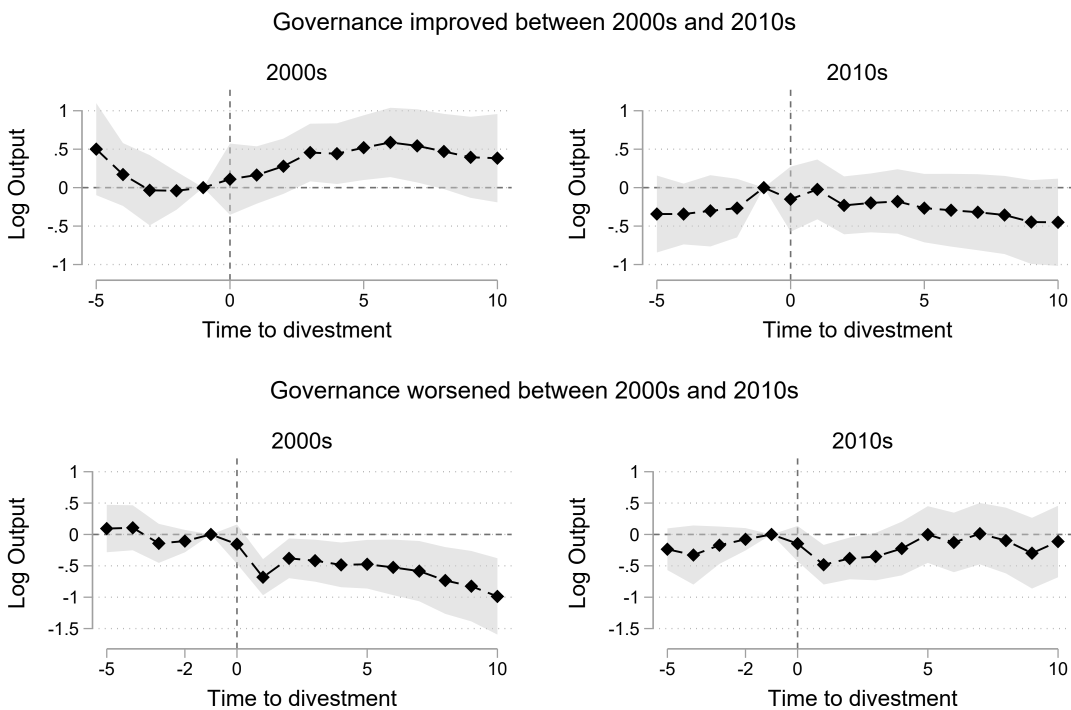
Note: Figure shows the average age of mining assets in the S&P data. Asset age defined as the difference between the current year and the first year in which production is observed, and therefore is only defined for mines the ever-produced sample. Local assets are those with any local participation, while multinational assets are those with full multinational ownership. At divestment indicates the distribution of ages across assets in the year in which their ownership status switched from multinational to local.

Figure A10: Histograms of key variables



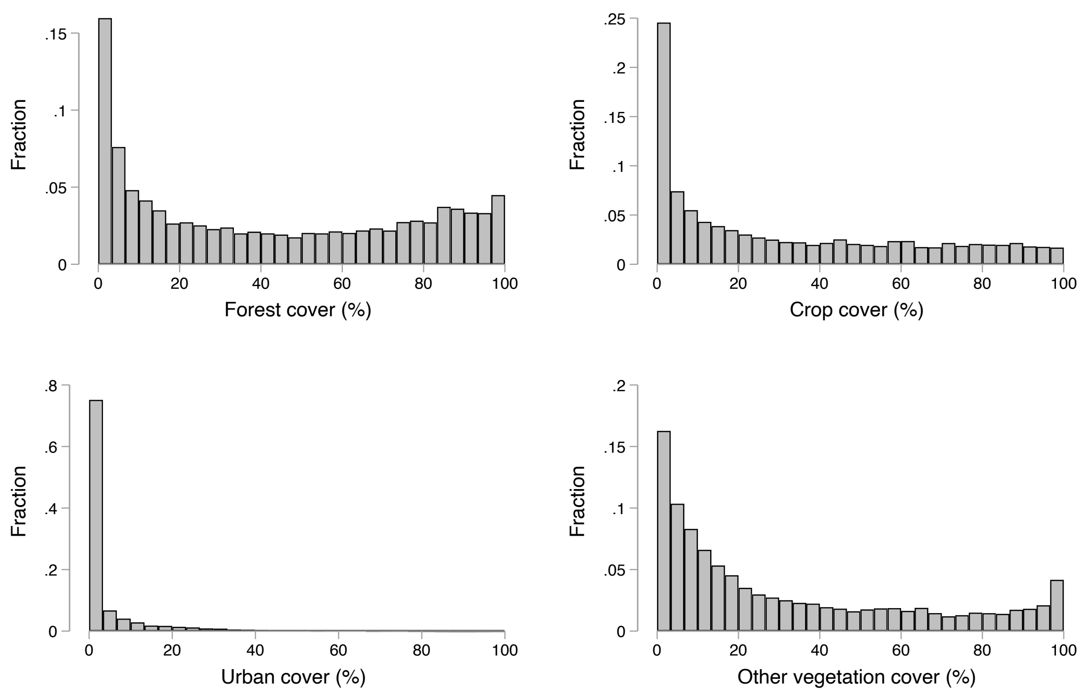
Note: Figure shows histograms of key mine characteristics. PM2.5 and GDP are measured as averages within 25 km of the mine. Governance index is defined as the average of the country-level World Bank Worldwide Governance Indicators across sub-indices in 2000 and its distribution show at the the mine-level.

Figure A11: Event-study: dynamic multinational/local advantage



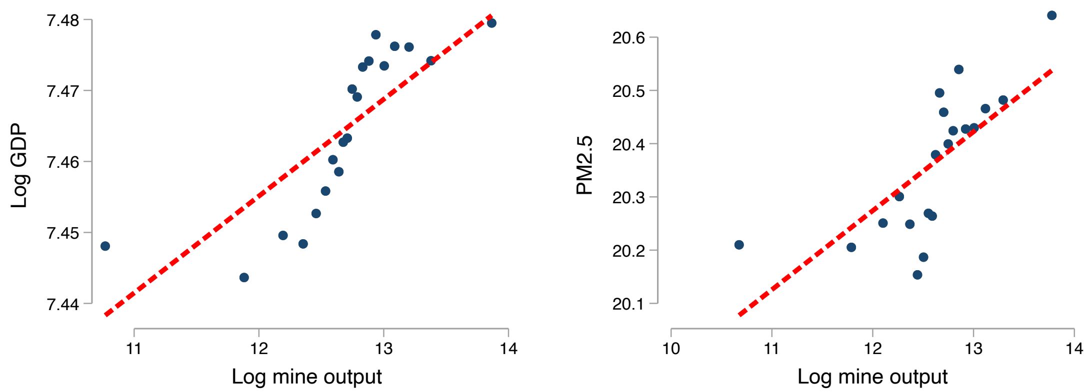
Note: Figure shows coefficients from event-study regressions of log mine output on leads and lags of divestment as well as property and year-by-commodity fixed effects. Divestment timing is determined by the first year in which a mine's status switches from multinational to local ownership. The top two sub-figures show results from event studies estimated on the subsample of countries where change in the WGI governance index between the 2000s and 2010s was in the top quartile globally. Effects of mine localization are estimated separately for localizations that occurred in the 2000s (left) and 2010s (right). The bottom two sub-figures show analogous event studies for the subsample of countries where change in the WGI governance index between the 2000s and 2010s was in the bottom quartile globally.

Figure A12: Histograms of land use variables



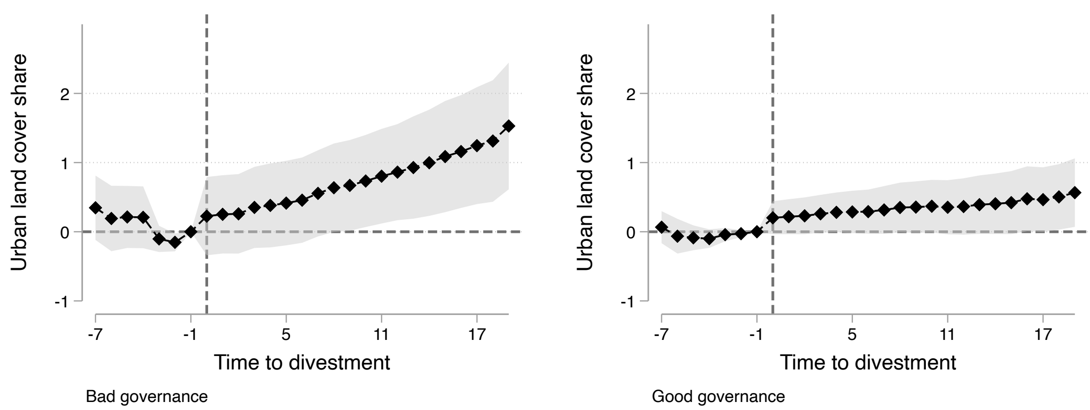
Note: Figure shows histograms of key land cover variables. All samples are restricted to mines for which the baseline (year 2000) land cover share for that category is greater than zero. All land cover variables are defined as the share of the land area within 5 km of the mine covered by a particular land use category.

Figure A13: Correlations between mine output, local GDP, and PM2.5



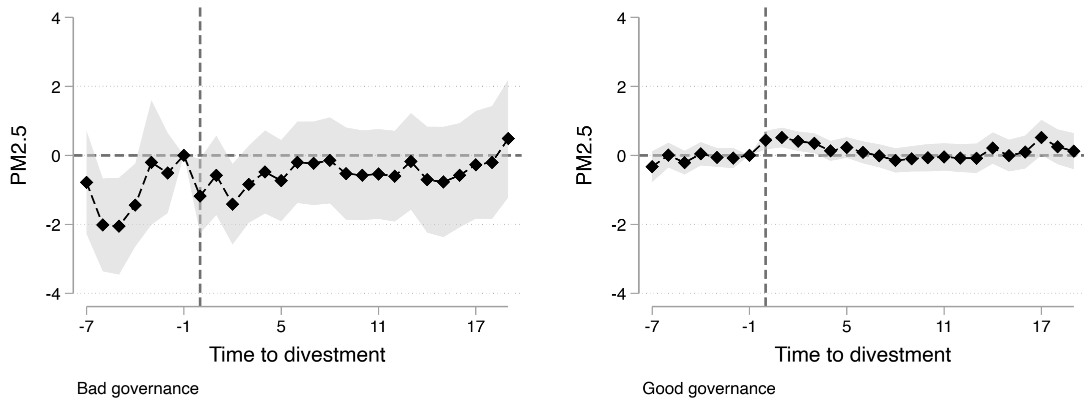
Note: Figure shows binned scatterplot of correlations between mine output and GDP (left) and mine output and PM2.5 (right). Sample is all mine-years with positive output.

Figure A14: Event-study: Urbanization



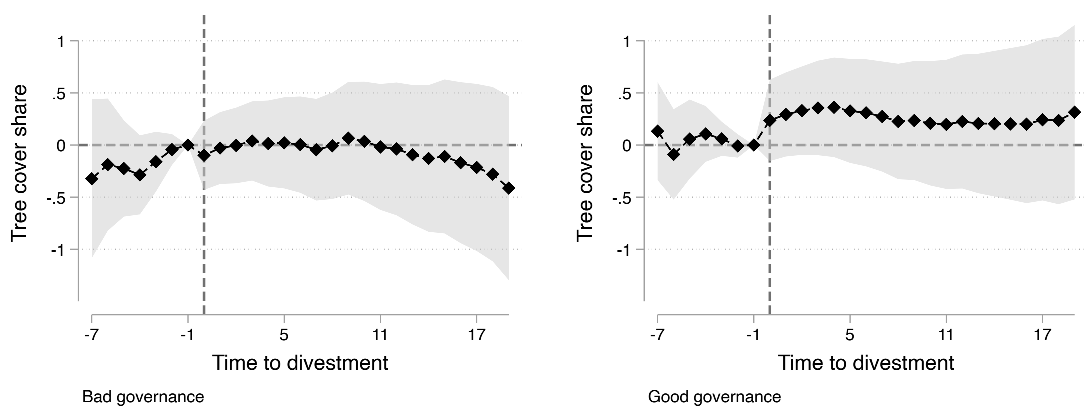
Note: Figure shows coefficients from event-study regressions of urban land cover share on leads and lags of divestment as well as property and year-by-commodity fixed effects. Urban land cover share is predicted by satellite images and measured within 5 kilometers of the mine location. Divestment timing is determined by the first year in which a mine's status switches from multinational to local ownership. Governance score is defined as the average of the country-level World Bank Worldwide Governance Indicators across sub-indices in 2000. Host countries with a governance score above zero are classified as good governance while those below zero are bad governance.

Figure A15: Event-study: Air pollution



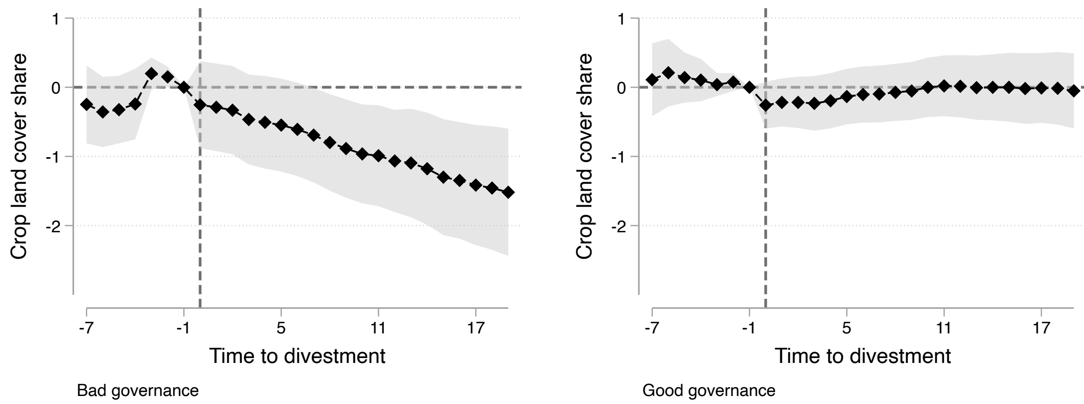
Note: Figure shows coefficients from event-study regressions of air pollution on leads and lags of divestment as well as property and year-by-commodity fixed effects. Air pollution is measured in μg/m^3 within 25 kilometers of the mine location. Divestment timing is determined by the first year in which a mine's status switches from multinational to local ownership. Governance score is defined as the average of the country-level World Bank Worldwide Governance Indicators across sub-indices in 2000. Host countries with a governance score above zero are classified as good governance while those below zero are bad governance.

Figure A16: Event-study: Forest cover



Note: Figure shows coefficients from event-study regressions of forest land cover share on leads and lags of divestment as well as property and year-by-commodity fixed effects. Forest land cover share is predicted by satellite images and measured within 5 kilometers of the mine location. Divestment timing is determined by the first year in which a mine's status switches from multinational to local ownership. Governance score is defined as the average of the country-level World Bank Worldwide Governance Indicators across sub-indices in 2000. Host countries with a governance score above zero are classified as good governance while those below zero are bad governance.

Figure A17: Event-study: Crop cover



Note: Figure shows coefficients from event-study regressions of urban land cover share on leads and lags of divestment as well as property and year-by-commodity fixed effects. Urban land cover share is predicted by satellite images and measured within 5 kilometers of the mine location. Divestment timing is determined by the first year in which a mine's status switches from multinational to local ownership. Governance score is defined as the average of the country-level World Bank Worldwide Governance Indicators across sub-indices in 2000. Host countries with a governance score above zero are classified as good governance while those below zero are bad governance.

Figure A18: Event-study: Localization and output by armed conflict

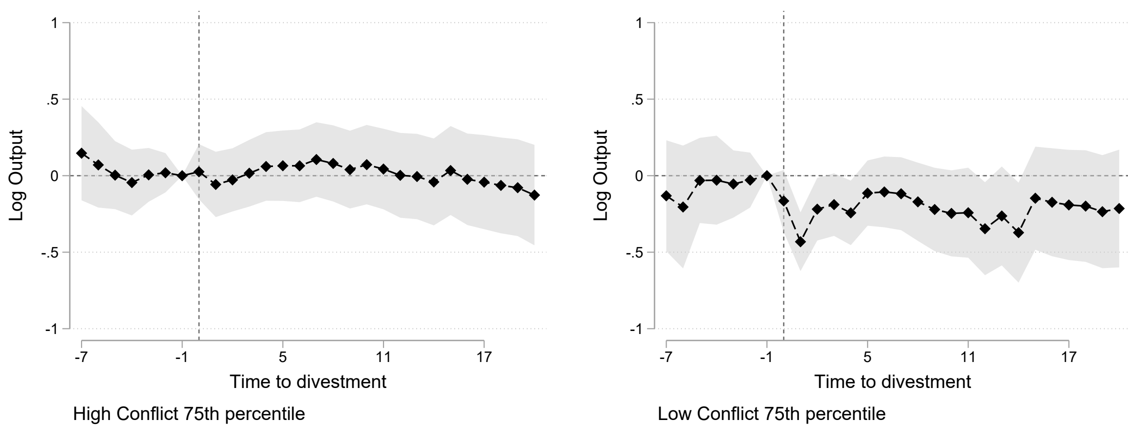


Figure A19: Event-study: Callaway and Sant'Anna (2021) Estimator

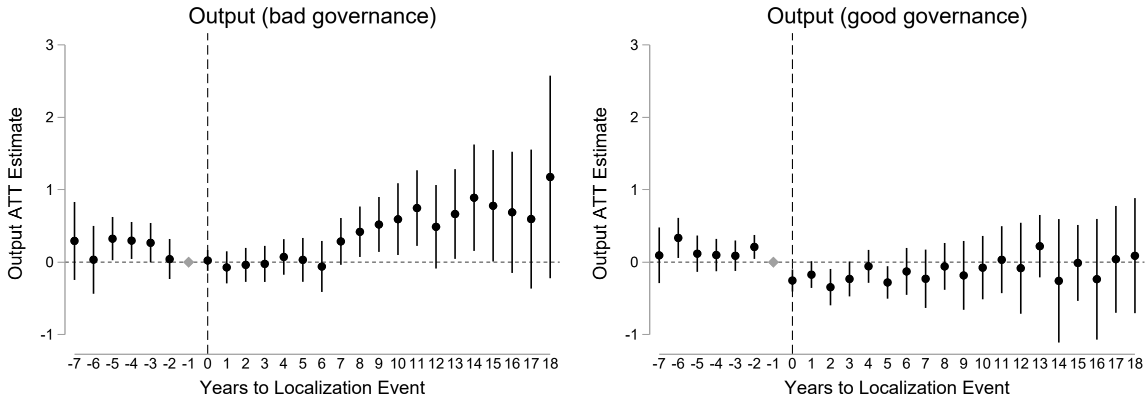
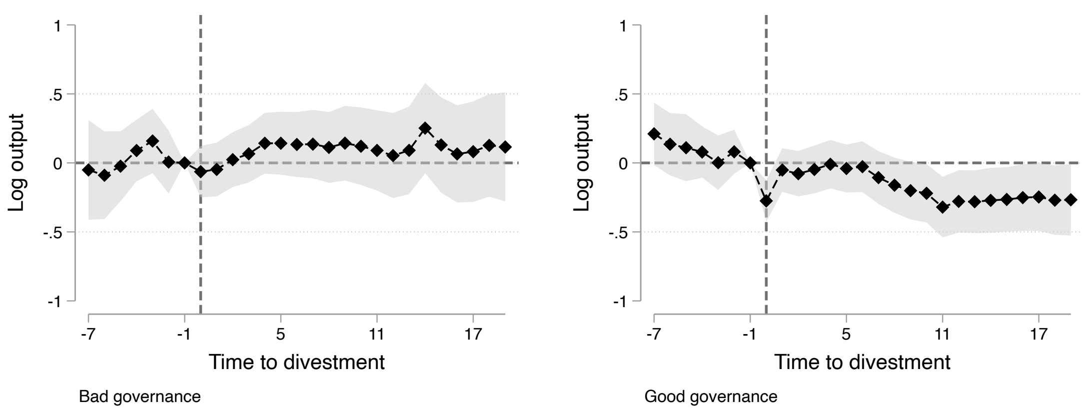
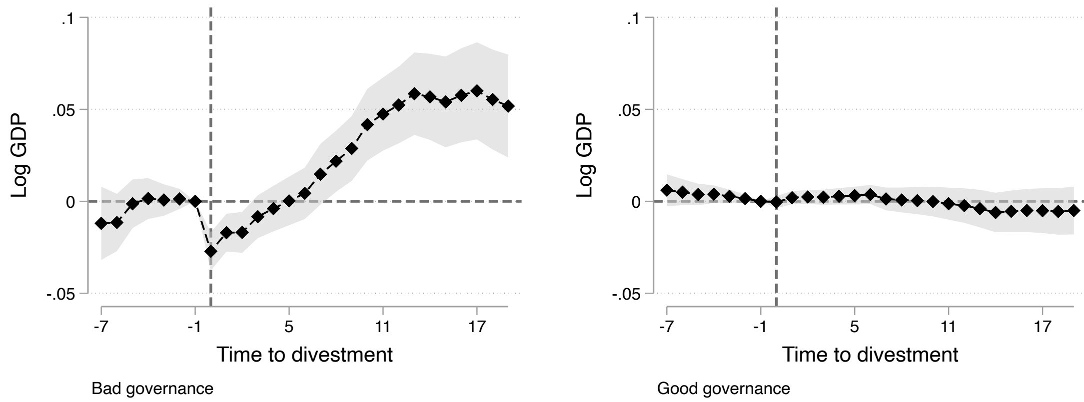


Figure A20: Event-study: output, dominant transitions



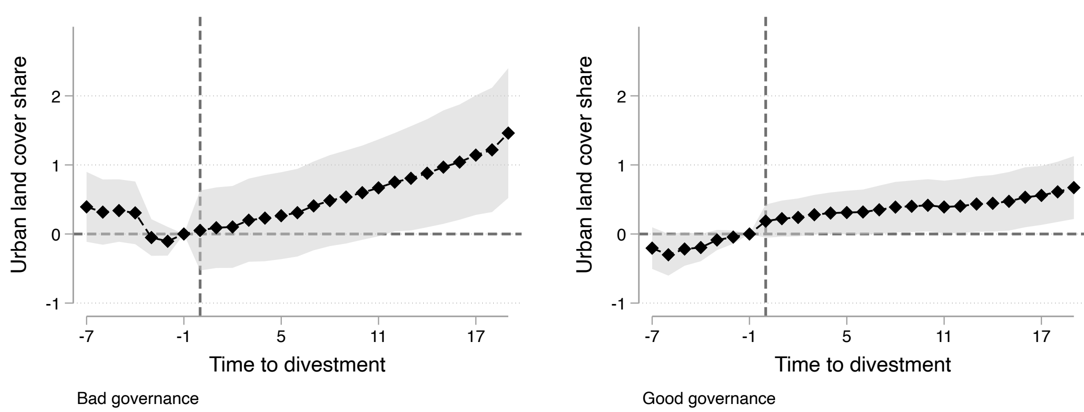
Note: Figure shows coefficients from event-study regressions of log mine output on leads and lags of divestment as well as property and year-by-commodity fixed effects. Divestment timing is determined by the first year in which a mine's status switches from multinational to dominant local ownership. Governance score is defined as the average of the country-level World Bank Worldwide Governance Indicators across sub-indices in 2000. Host countries with a governance score above zero are classified as good governance while those below zero are bad governance.

Figure A21: Event-study: local economic activity, dominant transitions



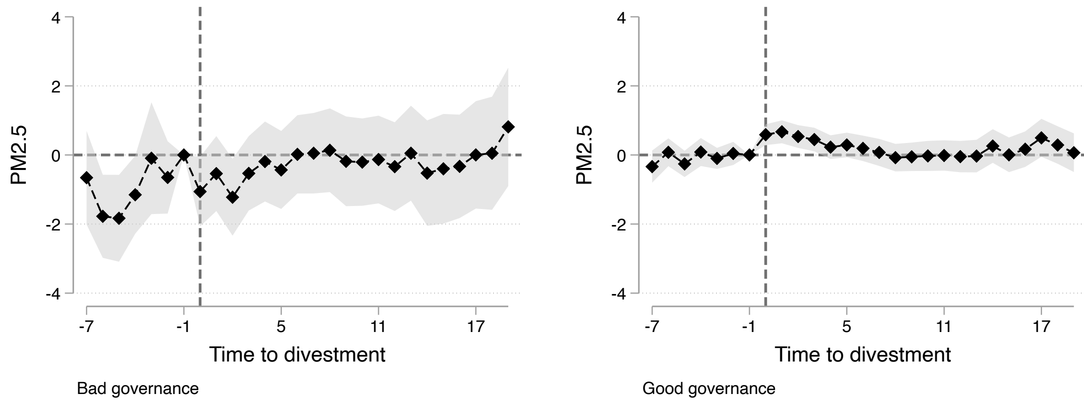
Note: Figure shows coefficients from event-study regressions of log local GDP on leads and lags of divestment as well as property and year-by-commodity fixed effects. GDP is predicted by night lights luminosity and measured within 25 kilometers of the mine location. Divestment timing is determined by the first year in which a mine's status switches from multinational to dominant local ownership. Governance score is defined as the average of the country-level World Bank Worldwide Governance Indicators across sub-indices in 2000. Host countries with a governance score above zero are classified as good governance while those below zero are bad governance.

Figure A22: Event-study: Urbanization, dominant transitions



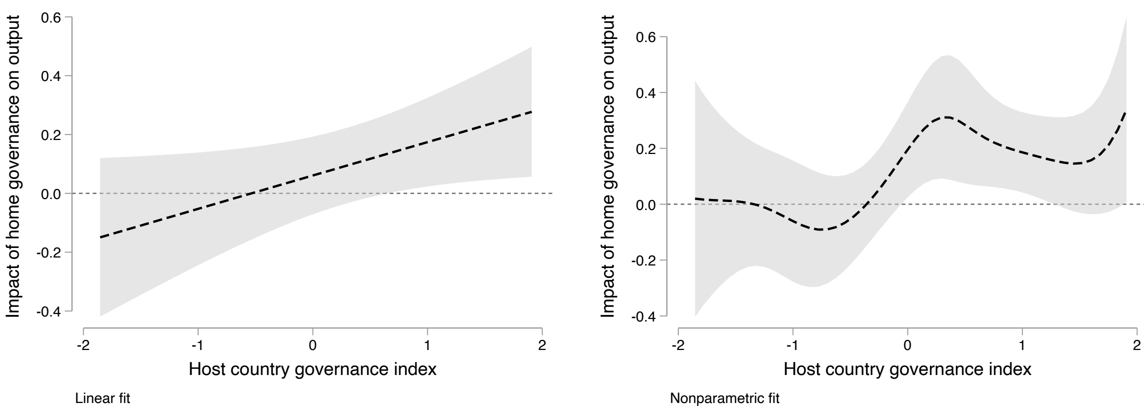
Note: Figure shows coefficients from event-study regressions of urban land cover share on leads and lags of divestment as well as property and year-by-commodity fixed effects. Urban land cover share is predicted by satellite images and measured within 5 kilometers of the mine location. Divestment timing is determined by the first year in which a mine's status switches from multinational to dominant local ownership. Governance score is defined as the average of the country-level World Bank Worldwide Governance Indicators across sub-indices in 2000. Host countries with a governance score above zero are classified as good governance while those below zero are bad governance.

Figure A23: Event-study: Air pollution, dominant transitions



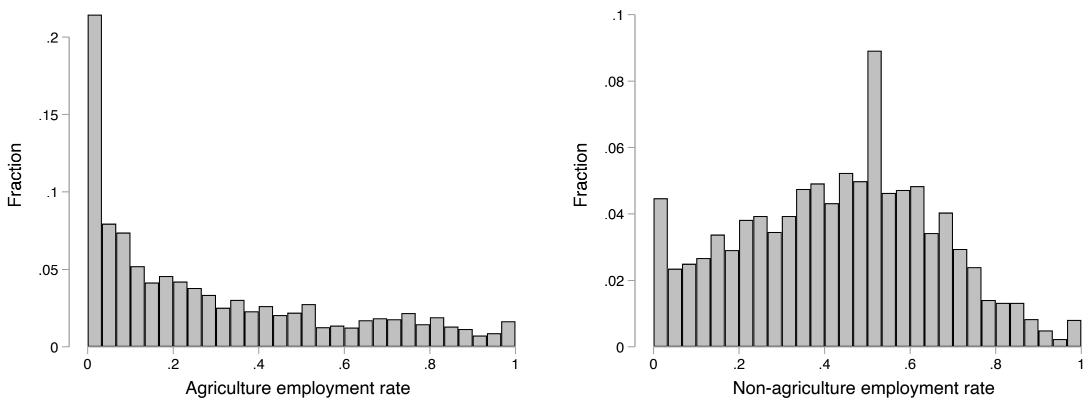
Note: Figure shows coefficients from event-study regressions of air pollution on leads and lags of divestment as well as property and year-by-commodity fixed effects. Air pollution is measured in μg/m^3 within 25 kilometers of the mine location. Divestment timing is determined by the first year in which a mine's status switches from multinational to dominant local ownership. Governance score is defined as the average of the country-level World Bank Worldwide Governance Indicators across sub-indices in 2000. Host countries with a governance score above zero are classified as good governance while those below zero are bad governance.

Figure A24: Home and host governance



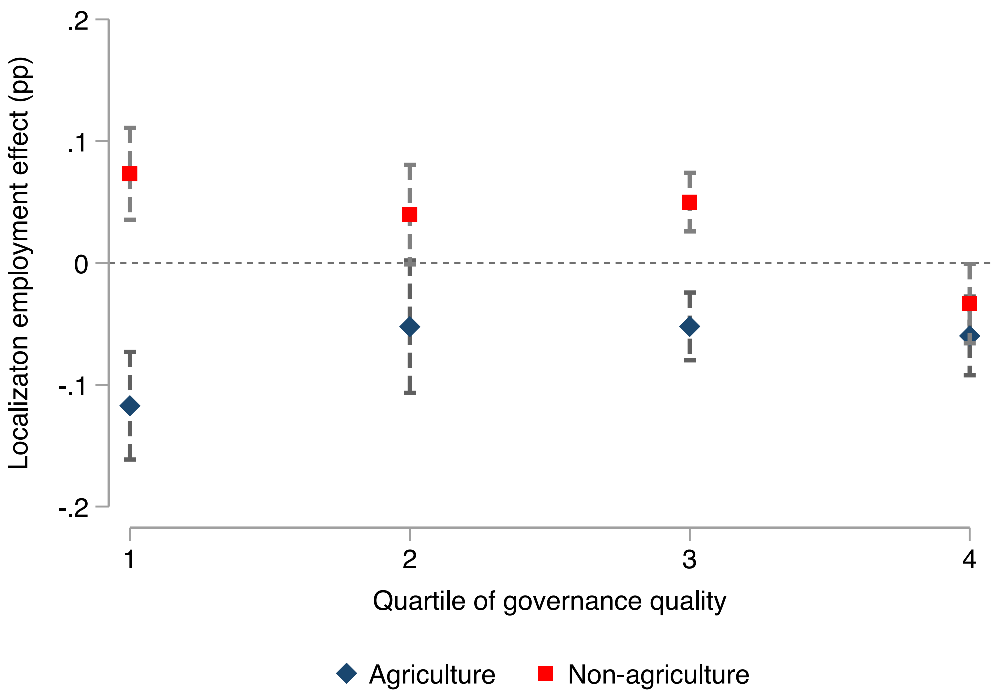
Note: Figure shows predicted margins of the relationship between mine output and home-country governance quality along the distribution of host-country governance conditional on mine and year fixed effects, for linear (left) and kernel (right) interacted regression models. Sample is all fully multinationally-owned assets producing positive output. Governance score is defined as the average of the country-level World Bank Worldwide Governance Indicators across sub-indices in 2000.

Figure A25: Employment histogram



Note: Histogram of agricultural and non-agricultural employment rates at the mine-year level. Employment rates are defined as the share of working age DHS respondents engaged in *i*) agricultural or domestic work, or *ii*) non-agricultural non-household work. Sample is all mine-years for which DHS employment data is available. Employment rates are averaged within 20 km of the mine location, re-weighted by survey sampling weights.

Figure A26: Local ownership and local employment composition by governance: binned quantile estimation



Note: Figure shows estimates of the impact of localization from equation (6) for agricultural and non-agricultural employment. Regressions are estimated in 4 subsamples of the data for each quartile of host-country governance quality. Governance score is defined as the average of the country-level World Bank Worldwide Governance Indicators across sub-indices in 2000. Bars show 95% confidence intervals. Sample is all mine-years for which DHS employment data is available. Employment rates are averaged within 20 km of the mine location, re-weighted by survey sampling weights.

Figure A27: Switch to Local and Output: Event Study (matched sample)