

Organizational Capital Efficiency and Labour Productivity: Evidence from Publicly Listed Firms in East Africa

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Abstract

Organizational capital, the business processes, managerial routines, workplace organization, and external relational structures through which firms coordinate production, is theorized as a core driver of firm productivity, yet its payoff in developing economies remains contested. The study establishes the effect of organizational capital efficiency on labour productivity among publicly listed firms in Kenya, Uganda, Tanzania, and Rwanda. Using an 11-year panel (2013–2023) of audited financial statements yielding 318 firm-year observations from 29 continuously listed firms, organizational capital efficiency was measured within the Modified Value-Added Intellectual Coefficient Model (MVAIC™), modified to isolate organizational capital from structural capital by treating it as the residual share of value added after direct human, innovation, and brand inputs are netted out, with organizational capital captured through investments in business processes, workplace organization, and external relations. Labour productivity was measured as labour-specific total factor productivity recovered residually from a value-added Cobb–Douglas production function rather than as a simple output-per-worker ratio. Fixed-effects estimation, validated by a Hausman test, shows that organizational capital efficiency has a positive but statistically insignificant effect on labour productivity ($\beta = 0.022$, $p = .096$). The findings suggest that organizational systems in East African firms evolve slowly, are unevenly implemented, and require sustained managerial commitment and complementary capabilities before measurable productivity gains materialize. The study concludes that the productivity-enhancing

potential of organizational capital remains underexploited in the region and draws implications for managers seeking to formalize structures and for policymakers designing enterprise-upgrading and disclosure policies.

Keywords: Organizational capital efficiency; labour productivity; intangible assets; organizational routines; MVAIC; East Africa; listed firms

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1. Introduction

A firm is not simply a unit that converts inputs into outputs; it is also a repository of routines, capabilities, and relational assets that determine how efficiently that conversion happens (Edvinsson & Malone, 1997). Organizational capital, the business processes, managerial routines, workplace organization, and external relational structures through which firms coordinate production and deploy their other resources, has accordingly drawn a substantial literature that assigns it a central productive role (Atkeson & Kehoe, 2005; Corrado et al., 2005; Lev & Radhakrishnan, 2005), part of a broader shift in which intangible assets, rather than physical capital, have become primary drivers of corporate value (Corrado et al., 2009). In advanced economies, organizational capital and the skills of the workers who build it are consistently and positively associated with productivity (Cammeraat et al., 2024; Crass & Peters, 2014).

Whether these relationships travel to developing economies is far less clear, given that organizational capital is difficult to measure, typically absent from formal accounting classifications, evolves slowly, and may require sustained implementation before yielding measurable gains (Corrado et al., 2005; Kihoro & Ngugi, 2020; Squicciarini & Le Mouel, 2012). East Africa presents a particularly instructive context: labour productivity in the region has ranked among the lowest in Africa for three decades (ACET, 2024), informality is pervasive (ILOSTAT, 2023), and although economies are shifting toward services and digital transformation (AfDB, 2020; UNCTAD, 2022), it is unknown whether the organizational investments firms do make quality management systems, supply chain management, knowledge management, workplace reorganization, and external alliances are being converted efficiently into productivity.

Existing East African evidence is fragmentary and contradictory, since organizational capital has usually been studied through the adjacent lens of structural capital, with findings ranging from positive (Kasoga, 2020) to negative (Isanzu, 2016) to null (Murimi et al., 2019; Nyambo & Nyamsogoro, 2024). Most studies are sector-specific and cross-sectional, use accounting profitability rather than productivity outcomes, and homogenize intangible assets under broad umbrella constructs obscuring precisely the component-level variation this study exploits.

The study accordingly establishes the effect of organizational capital efficiency (OCE) on labour productivity among publicly listed firms in Kenya, Uganda, Tanzania, and Rwanda over 2013–2023. Its contribution is threefold. First, it isolates organizational capital as a discrete efficiency construct and estimates its effect within a fixed-effects framework that nets out the other intellectual capital components human, brand, and innovation capital efficiency so that the organizational effect is not conflated with correlated intangibles. Second, it provides rare longitudinal, multi-country firm-level evidence on why a theoretically central intangible may fail to deliver measurable productivity gains in emerging economies, a question of consequence for enterprise-upgrading policy across the region. Third, by benchmarking organizational capital against components that do pay off significantly in the same model, it offers an empirically grounded account of where organizational investment sits in the hierarchy of intangibles in East Africa.

2. Literature Review

2.1. Theoretical Framework

The study is anchored in the resource-based and knowledge-based

views of the firm, complemented by the dynamic capabilities perspective. The Resource-Based View regards organizational capital as a strategic resource valuable, rare, and difficult to imitate because it is embedded in firm-specific, path-dependent routines and social arrangements (Barney, 1991). The Knowledge-Based View conceptualizes the firm as a knowledge-integrating institution whose structures and systems determine how efficiently the specialized knowledge held by individuals is converted into output (Grant, 1996): organizational capital is precisely the architecture of that integration the codified procedures, coordination mechanisms, and relational arrangements through which individual knowledge becomes collective productive capability.

Two theoretical qualifications are central to this study. First, the returns to organizational capital are lagged: organizational change involves gestation periods during which costs are incurred but benefits have not yet diffused through the organization, and models of organizational capital accumulation treat it as the product of slow, plant-level learning (Atkeson & Kehoe, 2005). Second, the returns are conditional: the dynamic capabilities perspective argues that organizational capital enhances a firm's ability to integrate, reconfigure, and deploy resources, but only when supported by consistent managerial effort, leadership quality, employee engagement, and alignment between organizational systems and strategic goals (Teece, 2020). In institutional environments where these complements are scarce, theory itself predicts attenuated or delayed productivity effects of organizational capital.

Both qualifications carry a further implication for how the results below should be interpreted. The resource-based and knowledge-based views are

theories of value creation, not theories of when that value becomes visible in a single fiscal year's output. A firm can be accumulating organizationally embedded capability, in the sense both perspectives describe, while showing no detectable productivity effect in a short annual panel, because neither theory specifies the speed of conversion from capability to measured output. A null or marginal coefficient on organizational capital efficiency therefore tests a joint hypothesis: that the underlying capability exists, that it has accumulated for long enough to surface in output, and that the available financial-statement proxy captures it. The lagged-returns and conditional-complementarity qualifications above follow from that joint-hypothesis structure, which is revisited when the study's results are interpreted in Section 5.

2.2. Empirical Literature

International evidence links organizational capital to productivity, though with important conditionalities. Cammeraat et al. (2024), using OECD industry-level data, found that workers' numeracy and STEM skills correlate positively with productivity more strongly for organizational capital workers and that ICT skill gaps between organizational capital workers and others can trigger a "lost in translation" mechanism that harms sectoral performance. Lev and Radhakrishnan (2005) show that organizational capital, proxied through selling, general and administrative expenditure, generates measurable excess revenue in US firms, while Atkeson and Kehoe (2005) estimate that organizational capital accounts for a substantial share of the value of US manufacturing plants but accrues slowly through learning. In settings of high institutional maturity and organizational discipline, organizational investments can

produce rapid gains: Xu and Li (2022) found an immediate positive productivity effect in Chinese firms with highly formalized processes, and Park and Choi (2020) documented rapid payoffs to quality management and lean practices in Korean manufacturing.

African and developing-economy evidence is more equivocal. Kasoga (2020) found that structural capital efficiency positively influenced Tanzanian firms by improving internal systems and routines, whereas Isanzu (2016), applying the VAIC™ model to Tanzanian banks, found a negative impact. Kamukama and Sulait (2017) reported structural capital as a significant predictor of competitive advantage in Uganda's microfinance industry, but Murimi et al. (2019) found no significant intellectual capital–performance relationship in Kenyan SMEs, and Nyambo and Nyamsogoro (2024) found structural capital efficiency insignificant for Tanzanian insurers. Kihoro and Ngugi (2020) observed that organizational systems in East African firms evolve slowly and require sustained managerial commitment to influence productivity, while Mwangi and Otieno (2021) showed that process formalization in Kenyan firms improved productivity only after several years of consistent implementation. Suharsono (2026) report that organizational capital enhances productivity only when supported by leadership, engagement, and technological readiness. Collectively, these findings do not describe a uniformly weak organizational capital effect so much as an effect whose sign and significance track two identifiable conditions: the institutional maturity of the market in which the firm operates, and the extent to which organizational investment is accompanied by the managerial and human capital needed to operationalize it. Where both conditions are favourable, as in Xu and Li (2022) and Park and Choi

(2020), payoffs are rapid; where they are absent or partial, as in most of the African evidence reviewed above, results range from null to negative. That patterning, rather than a blanket claim that organizational capital does not matter in developing economies, structures the hypothesis tested below.

2.3. Hypothesis Development

The resource-based and knowledge-based views predict positive productivity effects of efficiently deployed organizational capital, but lagged-returns and conditional-complementarity arguments, together with the mixed African evidence, counsel agnosticism. The study therefore tested the following null hypothesis:

H₀₁: Organizational capital efficiency has no significant effect on labour productivity among publicly listed firms in East Africa.

3. Methodology

3.1. Research Design, Population, And Data

The study employed a quantitative, longitudinal correlational design within the positivist paradigm (Creswell & Creswell, 2018). The target population was the 120 companies listed on East African Community securities exchanges; Kenya, Uganda, Tanzania, and Rwanda were selected on account of their economic integration, relative stability, and fully functioning exchanges the Nairobi Securities Exchange, Uganda Securities Exchange, Dar es Salaam Stock Exchange, and Rwanda Stock Exchange whose regulations mandate publication of audited financial statements (Duho, 2022). Firms had to be continuously listed and operational across 2013–2023, and cross-listed firms were assigned to their headquarters exchange. Financial statement data were harmonized in a

standardized template and cleaned for outliers, inconsistencies, and missing values, producing a balanced panel of 29 firms and 318 firm-year observations. Continuous variables were log-transformed; organizational capital events (new business processes, new workplace organization methods, new types of external relationships) were coded from disclosures, consistent with survey-based approaches to organizational capital measurement (Awano et al., 2010; Perani & Guerrazzi, 2012).

3.2. Measurement of Variables

3.2.1. Labour Productivity

Labour productivity was measured as labour-specific Total Factor Productivity derived from a value-added Cobb–Douglas production function (Solow, 1957; Syverson, 2011), with value added proxied by turnover, labour by employee headcount excluding R&D employees (to avoid double counting), and capital by net fixed assets. Following Dettori et al. (2012) and Crass and Peters (2014), the log-linearized function was rearranged under constant returns to scale so that labour-specific TFP was recovered residually from $va_{it} - l_{it} = \beta_0 + \beta_k(k_{it} - l_{it}) + \mu_{it} + \varepsilon_{it}$. The value-added formulation isolates efficiency in the use of primary factors (Akerberg et al., 2015; Basu & Fernald, 1997).

3.2.2. Organizational Capital Efficiency and The MVAIC Framework

Measuring organizational capital presents considerable methodological challenges: investments in organizational capital are typically absent from formal accounting classifications and often remain unrecorded in internal documentation (Corrado et al., 2005). The literature offers input-based approaches using management consulting revenues and managerial salaries (Corrado et al.,

2005; Squicciarini & Le Mouel, 2012), accounting-based approaches using selling, general and administrative expenses (Lev & Radhakrishnan, 2005), production-function approaches attributing residual output to organizational knowledge (Atkeson & Kehoe, 2005), and survey-based approaches capturing internal and outsourced organizational improvement costs (Awano et al., 2010; Perani & Guerrazzi, 2012). The study adopted the survey-based logic, capturing investments in business processes (quality management, supply chain systems, lean production, knowledge management), labour organization (decentralization, job rotation, teamwork, departmental realignment), and external relations (alliances, cooperation agreements, outsourcing, customer relationship and supplier integration) (Crass & Peters, 2014) a pragmatic and context-sensitive strategy in East Africa, where standardized financial data on such investments are often incomplete.

Efficiencies were computed within the Modified Value-Added Intellectual Coefficient Model (MVAIC™), which extends Pulic's (1998) VAIC™ in response to the criticism that the original captures only human and structural capital (Nimtrakoon, 2015; Stähle et al., 2011). Modified value added was defined as $VA_m = OP + D + A + EC + ME + R\&D + OI$ (operating profit, depreciation, amortization, employee costs, marketing expenses, R&D, and other innovative costs), and organizational capital efficiency as $OCE_m = (VA_m - HC - R\&D - ME)/VA_m$, a residual-based measure reflecting the share of value added attributable to organizational structures after direct human, innovation, and brand inputs are netted out. Companion efficiencies for human capital (VA_m/HC), brand capital (VA_m/ME), innovation capital ($VA_m/R\&D$), and capital employed

(VA_m/CE) entered the model so that the estimated organizational effect is net of the other components (Samih, 2022). A construction-related caveat follows from these definitions: OCE_m , HCE_m , and BCE_m share the same modified value-added base, and OCE_m is obtained by subtracting the human-capital, R&D, and marketing components from that base. The three measures are accordingly not independent by construction, which is why variance inflation factors, rather than bivariate correlation alone, are used below to judge whether this dependence is severe enough to distort the estimated coefficients (Section 4.2); the caveat is revisited when the correlation results are interpreted in Section 5.2. Firm size (log of total assets) and leverage (total liabilities to total assets) served as controls (Melitz, 2003; Myers, 1977; Syverson, 2011).

3.3. Model Specification and Estimation

The estimating equation was:

$$TFP_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 SIZE_{it} + \beta_3 CE_{it} + \beta_4 HCE_{it} + \beta_5 BCE_{it} + \beta_6 OCE_{it} + \mu_i + \varepsilon_{it}.$$

Although a panel autoregressive distributed lag specification was initially contemplated, the temporal dimension of the panel proved too brief for reliable estimation of the dynamic lag structure, and the analysis adopted the fixed-effects estimator, which controls for unobserved, time-invariant firm characteristics managerial capability, organizational culture, structural routines plausibly correlated with the regressors. The choice was validated by a Hausman (1978) test against the random-effects alternative. Diagnostics included Fisher-type ADF panel unit-root tests, Shapiro–Wilk and skewness–kurtosis normality tests, variance inflation factors, the Breusch–Pagan/Cook–Weisberg heteroskedasticity test, and the Ramsey RESET specification test.

4. Results

4.1. Descriptive Statistics

Table 1 reports descriptive statistics. Organizational capital efficiency displays a distinct distributional profile relative to the ratio-based components ($M = 0.392$, $SD = 0.336$), with negative

minimum values (-0.577) reflecting its residual-based construction: for some firm-years, direct human, innovation, and brand inputs exhaust or exceed modified value added, leaving no organizational surplus. Labour productivity averages 7.427 ($SD = 1.524$) with substantial heterogeneity, and leverage exhibits wide dispersion ($M = 0.588$, $SD = 0.643$).

Table 1. Descriptive statistics (N = 318 firm-year observations)

Variable	Obs	Mean	SD	Min	Max
Labour Productivity	318	7.427	1.524	3.570	10.792
Firm Leverage	318	0.588	0.643	0.046	7.156
Firm Size	318	6.926	0.831	4.701	8.707
Organizational Capital Efficiency	318	0.392	0.336	-0.577	1.749

Note. Continuous variables are expressed in natural logarithms; organizational capital efficiency is a residual-based measure. Source: Authors' computations from audited financial statements (2013–2023).

Cross-country comparison (Table 2) shows that organizational capital is highest on average in Uganda ($M = 0.440$) and Rwanda ($M = 0.414$), with Kenya lowest ($M = 0.359$). Dispersion is widest in Uganda ($SD = 0.388$; range -0.577 to 1.749), indicating substantial heterogeneity in managerial systems and internal structures even within a single national context consistent with the broader observation that institutional

environments in emerging economies produce wide variation in organizational capabilities. Notably, the country ordering of organizational capital does not track the ordering of labour efficiency, in which Uganda ($M = 8.609$) and Kenya ($M = 7.698$) lead while Rwanda ($M = 5.251$) trails, offering a first descriptive indication that organizational capital intensity alone does not guarantee productivity.

Table 2. Descriptive statistics by country (means)

Variable	Kenya	Rwanda	Tanzania	Uganda
Labour Productivity	7.698	5.251	5.975	8.609
Organizational Capital Efficiency	0.359	0.414	0.370	0.440
Firm Leverage	0.497	0.704	0.580	0.546
Firm Size	6.893	6.981	7.009	6.907

Note. Country-level means over 2013–2023. Source: Authors' computations from audited financial statements.

4.2. Diagnostic Tests

Fisher-type ADF panel unit-root tests rejected the unit-root null for all variables, with organizational capital

efficiency exhibiting the strongest evidence of stationarity in the dataset (inverse $\chi^2(58) = 394.583$, $p < .001$; inverse normal $Z = -13.454$, $p < .001$).

Multicollinearity was benign (OCE VIF = 2.520; mean VIF = 1.524). Shapiro–Wilk tests supported normality (organizational capital efficiency $W = 0.986$, $p = .765$; labour productivity $W = 0.980$, $p = .634$). The Breusch–Pagan/Cook–Weisberg test found no heteroskedasticity ($\chi^2(1) = 2.92$, $p = .088$), and the Ramsey RESET test indicated correct specification ($F(3, 308) = 1.99$, $p = .115$).

4.3. Correlation Analysis

Pairwise Pearson correlations are reported in Table 3. Organizational capital efficiency shows a positive but weak association with labour productivity ($r = .190$), the smallest among the intellectual

capital components labour productivity correlates far more strongly with human capital efficiency ($r = .692$) and innovation capital efficiency ($r = .657$). Strikingly, organizational capital efficiency correlates strongly with leverage ($r = .670$), suggesting that organizational restructuring in the sample is intertwined with financing structure: firms undertaking organizational change appear to rely more heavily on debt. The bivariate patterns anticipate the regression finding that organizational capital plays a complementary rather than leading role, supporting productivity indirectly through process stability and knowledge flows.

Table 3. Pairwise correlations

Variable	(1)	(2)	(3)	(4)
(1) Labour Productivity	1.000			
(2) Firm Leverage	−0.156*	1.000		
(3) Firm Size	0.661*	−0.200*	1.000	
(4) Organizational Capital Efficiency	0.190*	0.670*	0.367*	1.000

Note. Coefficients marked with an asterisk are significant at the 10% level or better (two-tailed). Source: Authors' computations.

4.4. Model Selection and Regression Results

The Hausman test decisively rejected the random-effects specification ($\chi^2(6) = 145.11$, $p < .001$), with substantial FE–RE coefficient differences observed for organizational capital in particular (FE $b =$

0.0558 versus RE $B = 0.0963$), reinforcing the conclusion that unobserved firm-specific characteristics are systematically related to the regressors. The fixed-effects results appear in Table 4. The model is highly significant ($F(6, 283) = 80.91$, $p < .001$) with a within-firm R^2 of 0.632.

Table 4. Fixed-effects regression of labour productivity on intellectual capital efficiency components

Variable	Coef.	SE	t	p	95% CI
Firm Leverage	−0.021	0.014	−1.53	.126	[−0.048, 0.006]
Firm Size	0.080	0.002	5.09	<.001	[0.005, 0.011]
Organizational Capital Efficiency	0.022	0.013	1.67	.096	[−0.004, 0.047]
Labour Productivity	0.586	0.014	42.29	<.001	[0.559, 0.613]

Note. $N = 318$; groups = 29; R^2 within = 0.632, between = 0.824, overall = 0.808; $F(6, 283) = 80.91$, $p < .001$. Dependent variable: labour-specific total factor productivity. Source: Authors' estimations

Organizational capital efficiency shows a positive but statistically insignificant effect on labour productivity at the 5% level ($\beta = 0.022$, $t = 1.67$, $p = .096$); H_{01} is therefore not rejected, although the coefficient approaches marginal significance at the 10% level. The contrast within the same model is instructive: human capital efficiency ($\beta = 0.028$, $p < .001$) and brand capital efficiency ($\beta = 0.019$, $p < .001$) are precisely estimated and strongly significant, while innovation capital efficiency, retained as a companion regressor, is likewise insignificant ($\beta = 0.020$, $p = .347$). Firm size is positive and significant, and leverage is negative but insignificant.

5. Discussion

5.1. The slow burn of Organizational Capital

The positive but insignificant effect of organizational capital efficiency suggests that, despite the theoretical significance of organizational capital for operational efficiency, transaction cost reduction, and coordination, its measurable influence on labour productivity during the study period was restricted. Three explanations are plausible. First, organizational capital typically evolves slowly and requires sustained investment in systems, culture, and processes before benefits are realized: Kihoro and Ngugi (2020) found that organizational systems in East African firms require sustained managerial commitment to influence productivity, and Mwangi and Otieno (2021) showed that process formalization in Kenyan firms improved productivity only after several years of consistent implementation horizons that within-firm year-to-year variation may not capture. Second, many East African firms may not yet possess advanced knowledge-management

structures, formalized processes, or mature organizational systems, and organizational enhancements that are unevenly implemented or inadequately integrated into daily operations will yield diminished productivity effects. Third, measurement challenges compound the substantive ones: organizational capital is intrinsically difficult to quantify from financial data (Corrado et al., 2005; Squicciarini & Le Mouel, 2012), and its effects may manifest through discrete, non-linear adjustments that a linear specification averages away.

The finding aligns with the dynamic capabilities perspective, in which organizational capital enhances a firm's ability to integrate, reconfigure, and deploy resources effectively only when supported by consistent managerial effort and long-term commitment (Teece, 2020; Hsu & Wang, 2012), and with mixed developing-economy evidence reporting indirect, gradual, and contingent organizational capital effects (Suharsono, 2026; Cenciarelli et al., 2018). It contrasts with settings of high institutional maturity and organizational discipline, where organizational investments produce rapid gains (Park & Choi, 2020; Xu and Li (2022)) a contrast suggesting that the productivity impact of organizational capital depends on institutional maturity, organizational discipline, and cultural factors that vary across regions.

5.2. Organizational Capital in the hierarchy of intangibles

The within-model comparison is the study's most consequential lens: human and brand capital efficiency deliver significant productivity gains while organizational capital efficiency does not. In environments where organizational infrastructures are immature, the returns to intangibles appear to run through people and markets before they run through systems. The correlation

structure adds two further insights. The weak bivariate association between organizational capital efficiency and labour productivity ($r = .190$) indicates that even before conditioning, organizational capital is not a leading correlate of productivity in the region. The weak association also speaks to the construction caveat raised in Section 3.2.2: because OCE_m is built by subtracting HCE_m and BCE_m inputs from a shared value-added base, some mechanical dependence between OCE_m and its co-components is built into the measure, yet the diagnostics reported in Section 4.2 (OCE VIF = 2.520, below conventional thresholds) indicate that this dependence was not severe enough to inflate standard errors or drive the coefficient toward insignificance; the null finding is better read as substantive than as a measurement artifact and the strong correlation between organizational capital efficiency and leverage ($r = .670$) suggests that organizational restructuring is frequently debt-financed; to the extent that leverage constrains complementary investment in training and innovation, this financing pattern may itself dilute the productivity payoff of organizational change.

The correlational evidence cannot adjudicate the direction of this relationship, however, and a competing reading is at least as plausible: firms with weaker organizational systems may turn to debt precisely because they lack the internally generated efficiency gains that would otherwise fund restructuring, in which case leverage is a symptom of organizational weakness rather than its cause. Distinguishing these accounts would require an instrument for organizational investment that this study's data do not provide. Rather than dismissing organizational investment, these results imply that its returns are conditional on complements skilled

people to operate new systems, leadership to sustain implementation, and financial slack to see change through.

6. Conclusions, Implications, and Limitations

The study established the effect of organizational capital efficiency on labour productivity among publicly listed firms in Kenya, Uganda, Tanzania, and Rwanda over 2013–2023. Organizational capital efficiency exerted a positive but statistically insignificant effect, and the null hypothesis could not be rejected. The study concludes that, despite the positive directional influence of organizational capital efficiency, its productivity-enhancing potential remains underexploited in East African listed firms, pending foundational improvements in structures, formalized procedures, and systems that facilitate operational excellence, coordination, and knowledge sharing.

The implications are pointed. For managers, organizational reforms quality management systems, knowledge management, workplace reorganization, and external relational structures should be treated as long-horizon investments requiring sustained, consistent implementation, embedded leadership commitment, and alignment with strategy, rather than as quick productivity levers; sequencing matters, and organizational change is most likely to pay off when paired with the human capital that operates it. For policymakers, the findings support enterprise-upgrading programmes that build managerial capability and process maturity, and disclosure standards that make organizational investment visible, given that such investment is largely expensed and invisible under prevailing accounting frameworks. Theoretically, the results

refine the application of the resource-based and dynamic capabilities perspectives to emerging markets by demonstrating empirically that organizational capital's predictions are conditional on institutional maturity and complementary assets.

Limitations include the restriction to listed firms, the relatively short panel horizon which precluded dynamic (PARDL) estimation of long-run effects and may understate lagged organizational payoffs and the residual-based, partly qualitative measurement of organizational capital drawn from financial disclosures. A further limitation concerns identification: the fixed-effects design nets out time-invariant firm heterogeneity but does not rule out reverse causality, whereby firms already becoming more productive are also the ones with the resources and confidence to invest in organizational restructuring, nor does it resolve the direction of the leverage–organizational capital correlation discussed in Section 5.2. Without a credible instrument or a natural experiment in organizational investment, the coefficient on organizational capital efficiency is best interpreted as a conditional association net of observed and time-invariant unobserved confounders, rather than as a causal effect. Future research should employ longer panels or distributed-lag structures to capture delayed returns, test complementarity hypotheses directly through interactions between organizational and human capital, examine the leverage–organizational change nexus identified here, extend coverage to unlisted and informal firms, triangulate financial proxies with survey-based measures of organizational practices, and pursue instrumental-variable or quasi-experimental designs capable of separating the causal effect of organizational investment from reverse causality.

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