Scripta Economica:
Journal of Economics, Management, and Accounting
Vol 2 No 2 November 2026, Hal 234-248
ISSN: 3110-0848 (Print) ISSN: 3109-970X (Electronic)
Open Access: https://scriptaintelektual.com/scripta-economica

Production Functions in Micro and Small Industries in Indonesia: A Study of Capital, Labor, and Output

Intan Nur Laily[1*], Sarpini[2]
[1-2] Universitas Islam Negeri Prof. K. H. Saifuddin Zuhri Purwokerto, Indonesia
email: 254110201210@mhs.uinsaizu.ac.id[1]

Article Info :
Received:
27-10-2026
Revised:
28-10-2025
Accepted:
06-11-2026

Abstract

Micro and small industries contribute to Indonesia's manufacturing activities and employment but face production constraints involving capital availability, workforce capabilities, and operational efficiency. This study aims to examine the relationship between capital, labor, and output, assess their productive contributions, and identify conditions influencing resource utilization in Indonesian micro and small industries. A descriptive qualitative literature review was conducted using secondary sources comprising scholarly publications, previous empirical studies, and official statistical documents. Data were analyzed through categorization, comparative interpretation, and thematic synthesis based on production-function theory. The findings indicate that capital supports equipment acquisition, material procurement, and operational continuity, while labor contributes productive effort, technical capabilities, and production coordination. Their contributions to output depend on input complementarity, workforce competencies, technological conditions, and resource allocation. Increasing capital or employment does not necessarily generate proportional output improvements when complementary resources remain constrained or productive assets are inefficiently utilized. The synthesis distinguishes production capacity, output expansion, and productive efficiency as related but analytically different dimensions. The study concludes that coordinated capital–labor utilization and effective production management are central considerations for improving industrial performance. These conclusions represent literature-based interpretations rather than independently estimated production elasticities or causal effects.

Keywords: *Capital, Labor, Micro and Small Industries, Output, Production Efficiency*

©2026 Authors.. This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License.
(https://creativecommons.org/licenses/by-nc/4.0/)

INTRODUCTION

Indonesia's micro and small industries occupy a significant position in the national production system because they connect manufacturing activities with local employment, household income generation, and regional economic development. Their contribution to productive activity, however, must be examined alongside persistent constraints in capital availability, workforce capability, technological adoption, and operational efficiency, which influence the capacity of enterprises to transform production inputs into marketable output. Evidence from Indonesian manufacturing indicates that industrial performance is shaped not only by the availability of productive resources but also by firm characteristics, market conditions, and the capacity to sustain operations under competitive pressures (Afin et al., 2025). The relationship between capital accumulation and industrial development has become increasingly complex as infrastructure expansion, foreign investment, and technological transformation alter production opportunities and the relative productivity of conventional inputs (Genthner & Kis-Katos, 2022; Kassem, 2024). At the enterprise level, production constraints are particularly consequential because smaller firms generally operate with limited financial flexibility and narrower organizational capacities, making inefficient resource allocation potentially more disruptive to operational continuity. Research on Indonesian small and medium enterprises further emphasizes that business performance depends on the interaction between internal capabilities and environmental conditions rather than the expansion of individual resources alone (Srimulyani et al., 2023). Recent evidence concerning the operational improvement of manufacturing firms similarly indicates that technological capabilities and production management are increasingly relevant to understanding differences in productive performance (Tian et al., 2023). These

developments establish the need to examine capital, labor, and output through a production-function perspective that recognizes both the fundamental role of conventional inputs and the organizational conditions governing their effective utilization in Indonesia's micro and small industries.

Contemporary research on manufacturing productivity has developed along several interconnected analytical directions, encompassing production efficiency, technological spillovers, organizational capabilities, and the relationship between productive inputs and enterprise performance. Studies examining Indonesian manufacturing consistently suggest that productivity cannot be adequately understood through input accumulation alone, particularly when differences in technological exposure, investment conditions, and firm-level efficiency influence productive outcomes (Sugiharti et al., 2022; Fawait et al., 2024). Research on imported production inputs further demonstrates the relevance of intermediate resources and international production linkages to firm productivity, indicating that the relationship between capital and output may depend partly on the characteristics and accessibility of complementary inputs (Pane & Patunru, 2023). Within specific manufacturing sectors, productivity analysis has increasingly incorporated technological conditions, industry characteristics, and managerial factors, extending conventional production analysis beyond a narrow consideration of physical capital and employment quantities (Masitah et al., 2023). A related research direction concerns the organizational mechanisms through which available resources contribute to enterprise performance, including strategic management, operational efficiency, and ownership characteristics (Handoyo et al., 2023). Studies of smaller enterprises also associate productive performance with intellectual capital and organizational capabilities, suggesting that the quality of resource utilization deserves consideration alongside the scale of resource ownership (Hariyono & Narsa, 2024). Meanwhile, manufacturing research addressing export participation and environmental productivity illustrates how production outcomes may differ according to operational objectives and firm participation in broader markets (Mandasari & Luckstead, 2025). Taken together, these research streams demonstrate a movement from input-centered explanations of production toward more differentiated interpretations of productivity, while retaining capital and labor as fundamental components of industrial production.

Despite these advances, the reviewed literature reveals a research gap concerning the integrated interpretation of capital, labor, and output specifically within Indonesia's micro and small industrial production activities. Much of the available evidence originates from manufacturing enterprises examined through productivity estimation, foreign investment exposure, international production linkages, or sector-specific performance indicators, rather than from a comparative synthesis explicitly organized around the conventional capital–labor–output relationship in smaller industrial establishments. Research on investment regulation and manufacturing productivity provides valuable evidence concerning external influences on firm performance, but its analytical emphasis differs from explaining how financially constrained micro and small producers combine basic production inputs (Genthner & Kis-Katos, 2022). Similarly, investigations of foreign investment spillovers and productivity contribute to understanding technological diffusion without necessarily resolving how the findings can be interpreted for enterprises operating with relatively simple production structures and limited resources (Yasin et al., 2024). Studies investigating operational strategies and technological transformation identify additional determinants of business performance, although their analytical frameworks are not always directly comparable with production-function explanations centered on capital, labor, and output (Handoyo et al., 2023; Tian et al., 2023). Research concerning digitalization and post-pandemic enterprise recovery further broadens the understanding of smaller businesses but does not, by itself, establish consistent production relationships across industrial activities (Rosyidiana & Narsa, 2024). Methodological differences also complicate comparisons because studies employ distinct performance indicators, enterprise classifications, analytical models, and industrial populations. Consequently, the unresolved issue is not whether capital and labor matter for production, but how existing evidence concerning their productive contributions, complementary roles, and efficiency implications can be synthesized without treating heterogeneous empirical findings as universally applicable to Indonesia's micro and small industries.

The absence of a sufficiently integrated interpretation of conventional production inputs has implications for both the theoretical understanding of small-scale manufacturing and the practical allocation of scarce productive resources. From an analytical standpoint, an explanation based exclusively on increases in capital or employment risks overlooking differences between expanding

production capacity and improving the efficiency with which existing inputs generate output. Research on manufacturing productivity demonstrates that technological conditions and production organization can influence the effectiveness of productive resources, suggesting that higher input utilization should not automatically be interpreted as evidence of proportionate output improvements (Sugiharti et al., 2022; Masitah et al., 2023). For industrial operators, this distinction affects decisions concerning investment in equipment, workforce expansion, production scheduling, and the management of operating expenditures. Evidence linking technological transformation with operational improvements indicates that resource allocation decisions should account for the capacity of production systems to employ additional inputs effectively (Tian et al., 2023). Studies of enterprise performance also indicate that managerial and organizational capabilities influence the practical benefits obtainable from productive resources, reinforcing the need to distinguish input availability from productive utilization (Aisjah et al., 2023; Hariyono & Narsa, 2024). At the policy level, an insufficient understanding of these relationships may weaken the analytical basis for interventions that emphasize financing or employment growth without adequate consideration of production constraints and complementary capabilities. Research on industrial electrification illustrates that changes in productive infrastructure can affect industrial development, although their implications for individual enterprises require careful interpretation according to enterprise characteristics and operating conditions (Kassem, 2024). A focused synthesis of capital, labor, and output is consequently necessary to clarify the circumstances under which input expansion may support production and the conditions that may limit its effectiveness.

The present study is positioned as a descriptive qualitative literature review that develops an integrated interpretation of production functions in Indonesian micro and small industries, with particular emphasis on the relationship between capital, labor, and output. Its proposed contribution differs from econometric studies that estimate productivity, technical efficiency, or investment spillovers using firm-level manufacturing data because it critically organizes existing findings according to the economic functions of conventional inputs and their implications for resource allocation. Research on foreign investment and manufacturing efficiency provides an empirical foundation for understanding productive heterogeneity, while studies of enterprise survival establish the relevance of firm-specific and market-related conditions to industrial performance (Fawait et al., 2024; Afin et al., 2025). Rather than reproducing these empirical approaches, the study examines how their implications can be interpreted alongside the input relationships emphasized in production theory, particularly the distinction between increasing production factors and improving their combined utilization. This analytical orientation also differs from research emphasizing environmental productivity, where performance is evaluated partly through relationships between production activities and environmental outcomes rather than conventional output generation alone (Mandasari & Luckstead, 2025). The relevance of this distinction is reinforced by recent investigations of economies of scale and total factor productivity in Indonesian food and beverage manufacturing, which highlight the analytical importance of separating production expansion from improvements in productive efficiency (Septiani et al., 2026). The novelty proposed here is therefore an explicitly structured synthesis of capital–labor complementarity, input allocation, and production efficiency within the operational characteristics of Indonesian micro and small industries, rather than a new production-function estimator or an unverified claim of empirical causality. The synthesis also accommodates the original manuscript's Islamic economic consideration of responsible production, positioning efficiency alongside fairness, social benefit, and accountability without treating these normative principles as empirically estimated production variables.

This study aims to examine the relationship between capital, labor, and output in Indonesian micro and small industries through a descriptive qualitative synthesis of production-function theory and existing empirical literature. Specifically, it seeks to explain the productive roles of capital and labor, analyze the extent to which their contributions depend on complementary resource utilization, and identify the conditions under which additional inputs may or may not correspond to improvements in production output. The analysis also seeks to distinguish the expansion of production capacity from the achievement of production efficiency, recognizing that the quantity of available resources and the effectiveness of their deployment represent analytically different dimensions of industrial performance. By comparing relevant findings across manufacturing and small-enterprise research, the study intends to clarify areas of convergence and contextual variation

without assuming that relationships identified in particular industrial settings necessarily apply to all Indonesian micro and small enterprises. Its theoretical contribution lies in consolidating production-function reasoning with evidence concerning input complementarity, productive constraints, and resource allocation, while its methodological contribution is limited to the transparent interpretation and synthesis of secondary literature rather than independent estimation of production elasticities or causal relationships. The practical contribution concerns the development of an evidence-informed analytical basis for decisions involving business capital, workforce utilization, production management, and efficiency improvement in resource-constrained enterprises. The study additionally considers the compatibility of efficient production with the Islamic economic principles of fairness, social benefit, and responsible resource utilization. These objectives establish a focused basis for examining how micro and small industrial enterprises may improve the organization of productive inputs while maintaining an interpretation of production outcomes consistent with the methodological limitations of literature-based research.

RESEARCH METHODS

This study employed a descriptive qualitative research design based on a literature review to examine the relationship between capital, labor, and production output in Indonesian micro and small industries. The research was conducted through secondary-data analysis rather than direct observation, surveys, interviews, or econometric estimation. The units of analysis comprised scholarly publications, previous empirical studies, and official statistical documents addressing production functions, productive inputs, industrial efficiency, and the operational characteristics of micro and small enterprises. The literature included studies concerning capital utilization, labor contributions, production capacity, and variations in productive efficiency across manufacturing activities in Indonesia. Sources were selected purposively according to their relevance to the research objectives, particularly their capacity to explain the productive roles of capital and labor, their relationship with output, and the conditions affecting input utilization. Official publications from Statistics Indonesia were included as contextual materials concerning the characteristics and development of micro and small industries, while scientific publications provided empirical and conceptual evidence concerning production relationships. The review also considered literature addressing resource allocation and production efficiency, alongside the Islamic economic principles discussed in the original research framework. The original methodological documentation did not specify a standardized database search strategy, fixed publication period, predetermined number of included studies, or formal inclusion and exclusion protocol. Accordingly, the research was treated as a descriptive qualitative literature review rather than a systematic review or meta-analysis, and no claims were made concerning exhaustive literature coverage or systematic study screening.

Data collection was undertaken through the identification, examination, and organization of secondary literature relevant to the relationship among capital, labor, and output. The analytical procedure consisted of collecting relevant information, categorizing the evidence according to the principal production factors, interpreting relationships reported in previous studies, and synthesizing findings across different industrial settings. Capital was examined as a productive resource supporting equipment acquisition, raw-material procurement, and operational activities, while labor was considered in relation to workforce availability, productive contributions, and the utilization of available production resources. Output was examined as the production outcome associated with these inputs, with particular attention to the distinction between increasing input quantities and improving productive efficiency. The relationship among these elements was interpreted using the general production-function representation $(Q=f(K,L))$, where (Q) denotes production output, (K) represents capital, and (L) represents labor. This formulation served as a conceptual framework for organizing and interpreting existing evidence and was not employed as an independently estimated statistical model. The synthesis compared reported relationships across studies, identified similarities and contextual differences, and considered the implications of complementary input utilization for production management in micro and small industries. The interpretation additionally examined the compatibility of productive efficiency with Islamic economic considerations concerning fairness, social benefit, and responsible production, without treating these principles as quantitatively measured variables. Analytical conclusions were restricted to relationships and explanations supported by the reviewed literature, with differences in industrial characteristics, research designs, and measurement

approaches considered when assessing the transferability of findings. No independent production elasticities, returns-to-scale coefficients, statistical significance tests, or causal effects were calculated. Since the documented procedure did not report formal quality-appraisal instruments, independent reviewer assessment, or triangulation protocols, such procedures were not attributed to the study. The resulting analysis was intended to provide a traceable conceptual synthesis of existing evidence rather than new firm-level empirical estimates.

RESULTS AND DISCUSSION

Production Functions and the Relationship between Capital, Labor, and Output in Indonesian Micro and Small Industries

Production in Indonesian micro and small industries can be understood as a process in which capital and labor are combined to transform productive resources into marketable output. The literature indicates that this relationship cannot be reduced to the independent availability of financial resources and workers, because production also depends on how these inputs are organized and utilized. Studies of Indonesian manufacturing associate differences in productive performance with input utilization, technological conditions, and firm-specific characteristics, demonstrating the analytical limitations of treating production capacity as equivalent to production efficiency (Sugiharti et al., 2022; Masitah et al., 2023). For micro and small enterprises, the production-function framework consequently provides a basis for interpreting both the contributions of individual inputs and the conditions affecting their combined productive effectiveness.

The conventional production-function representation, \(Q=f(K,L)\), identifies output as a function of capital and labor while allowing their productive contributions to vary according to the characteristics of the production process. Capital encompasses resources used to support machinery, equipment, facilities, and operating activities, whereas labor represents the human effort and capabilities involved in converting available resources into goods. Evidence from Indonesian manufacturing indicates that productive performance is influenced by firm-level heterogeneity and investment conditions, suggesting that enterprises with different resource structures may obtain different production outcomes from apparently similar input combinations (Genthner & Kis-Katos, 2022). This distinction is particularly relevant when interpreting micro and small industries because variations in operating scale, technological capability, and workforce organization can alter the economic significance of additional capital or employment.

Capital contributes to productive capacity by enabling enterprises to secure the material and operational requirements necessary for continuous production. Its productive contribution nevertheless depends on whether additional resources relieve existing production constraints or merely expand capacity that cannot be utilized effectively. Research concerning imported production inputs in Indonesian manufacturing demonstrates that productivity is associated with the characteristics of resources employed in production, emphasizing the importance of input composition rather than input quantity alone (Pane & Patunru, 2023). The implication for micro and small industries is that investment decisions should be assessed according to their capacity to support productive operations, not simply according to the monetary value of capital committed.

Labor influences output through both the quantity of work supplied and the productive capabilities used to operate equipment, organize tasks, and maintain production continuity. An increase in employment may expand production when additional workers can be supported by available capital and an appropriate organization of activities, but the same increase may generate limited additional output when productive capacity is constrained. Research examining internal enterprise capabilities and business performance in East Java indicates that organizational characteristics are relevant to explaining differences in enterprise outcomes, reinforcing the analytical importance of workforce utilization beyond employee numbers (Srimulyani et al., 2023). The distinction between labor availability and labor productivity is consequently necessary when interpreting production relationships in enterprises with restricted financial and technological resources.

The literature-based synthesis identifies several dimensions through which capital and labor may influence output, as summarized in Table 1. The analytical categories distinguish input availability, productive utilization, and operational constraints because these dimensions represent different mechanisms within the production process. Research on manufacturing efficiency and firm

performance supports this distinction by demonstrating that productive outcomes are associated with both resource conditions and the effectiveness of enterprise operations (Fawait et al., 2024; Afin et al., 2025). The table constitutes a conceptual synthesis of the reviewed literature rather than a statistical estimation of production coefficients.

Table 1. Analytical Relationships among Capital, Labor, and Production Output in Micro and Small Industries

Production dimension	Productive mechanism	Implication for output	Principal limitation
Capital availability	Financing equipment, materials, and operations	Supports production capacity	Financial constraints
Capital utilization	Applying productive assets to operations	May improve input productivity	Underutilized equipment
Labor availability	Providing workers for production activities	Supports production volume	Limited complementary capital
Labor capability	Applying technical skills and experience	Supports productive effectiveness	Skill deficiencies
Capital–labor combination	Coordinating equipment and workforce	Supports input complementarity	Input imbalance
Operational efficiency	Organizing production activities	Improves use of available resources	Managerial limitations

The relationships presented in Table 1 indicate that the productive contribution of capital and labor depends on the mechanisms through which resources enter the production process. Capital availability establishes the capacity to finance production, whereas capital utilization determines whether available assets are effectively employed. Labor availability similarly indicates the potential scale of work, while labor capability concerns the effectiveness with which production activities are performed. Evidence on intellectual capital and enterprise competitiveness supports the distinction between possessing resources and developing the organizational capabilities necessary to employ them productively (Hariyono & Narsa, 2024).

The interaction between capital and labor also provides a conceptual basis for examining marginal productivity and possible limitations to input expansion. When one production factor increases while complementary resources remain constrained, the additional output associated with successive units of that factor may decline, although the occurrence and magnitude of such a relationship must be established empirically. Research examining economies of scale and total factor productivity in Indonesian food and beverage manufacturing demonstrates the relevance of distinguishing changes in production scale from changes in productive efficiency (Septiani et al., 2026). For the present literature-based analysis, this distinction supports a cautious interpretation of production theory without claiming that Indonesian micro and small industries universally exhibit a particular pattern of returns to scale.

Technological conditions introduce another source of variation into the relationship between productive inputs and output. Access to electricity, machinery, and operational technologies may alter how capital and labor are combined, potentially modifying both production capacity and the organization of work. Evidence concerning industrial electrification in Indonesia indicates that infrastructure development can influence industrial activity, while research on manufacturing digital transformation associates technological practices with operational improvement (Kassem, 2024; Tian et al., 2023). These findings suggest that conventional input relationships should be interpreted with attention to technological circumstances, even when technology is not independently measured as a variable in the production-function representation adopted for this review.

The synthesis also reveals an important distinction between enterprise performance indicators and production output as an analytical variable. Research on small-enterprise performance frequently incorporates competitiveness, organizational capabilities, and financial outcomes, which are related to productive activities but are not interchangeable with physical production volume or production value

(Aisjah et al., 2023). Likewise, evidence concerning post-pandemic digitalization among Indonesian micro, small, and medium enterprises addresses business performance through mechanisms that extend beyond the direct transformation of capital and labor into output (Rosyidiana & Narsa, 2024). Treating these outcomes as analytically distinct prevents findings about profitability, financial performance, or competitiveness from being incorrectly interpreted as direct estimates of production elasticities.

The principal analytical finding is that capital and labor retain their fundamental explanatory roles in the production activities of Indonesian micro and small industries, but their relationships with output must be interpreted through input complementarity, productive utilization, and operational conditions. Evidence from manufacturing productivity research indicates that exposure to investment, technological knowledge, and external production linkages can influence productive outcomes, suggesting that observed differences between enterprises cannot necessarily be attributed to capital and labor quantities alone (Yasin et al., 2024; Sugiharti et al., 2022). The production-function framework remains useful for organizing these relationships, provided that theoretical mechanisms are distinguished from coefficients and causal effects that would require independent empirical estimation. This interpretation establishes the analytical foundation for examining the separate contributions of capital and labor and the efficiency implications of combining them within resource-constrained industrial enterprises.

The Contribution of Capital and Labor to Production Capacity and Output in Micro and Small Industries

Capital constitutes a fundamental production input because it determines an enterprise's ability to acquire equipment, finance raw materials, and sustain the operational activities required to generate output. In Indonesian micro and small industries, the productive significance of capital extends beyond the availability of financial resources to encompass the capacity to maintain production continuity and utilize productive assets effectively. Research on manufacturing firms indicates that investment conditions and differences in productive capabilities contribute to variations in enterprise productivity, although these relationships cannot be interpreted independently of other organizational and industrial characteristics (Genthner & Kis-Katos, 2022; Pane & Patunru, 2023). The literature consequently supports an interpretation of capital as both a determinant of potential production capacity and a resource whose contribution to realized output depends on complementary production conditions.

The relationship between capital accumulation and production expansion requires a distinction between increases in productive assets and improvements in the utilization of existing capacity. Additional machinery or operating capital may support higher output when production is restricted by insufficient equipment, material availability, or financial liquidity, but such investments may have limited productive consequences when other operational constraints remain unresolved. Evidence concerning foreign direct investment spillovers in Indonesian manufacturing indicates that productivity outcomes are influenced by firm characteristics and the conditions through which productive knowledge and resources are transferred (Sugiharti et al., 2022; Yasin et al., 2024). These findings imply that access to capital should not be treated as a sufficient condition for production growth, because the productive effects of investment depend on whether enterprises can integrate new resources into established production activities.

Labor contributes to industrial production through the physical and cognitive activities required to operate equipment, transform materials, organize workflows, and maintain production quality. The economic contribution of labor therefore involves more than employee numbers, since differences in skills, experience, task specialization, and organizational coordination may influence the productive effectiveness of an otherwise comparable workforce. Research examining internal determinants of enterprise performance in East Java identifies organizational and entrepreneurial characteristics as relevant dimensions of business outcomes, while studies of intellectual capital emphasize the contribution of knowledge-related resources to enterprise competitiveness and performance (Srimulyani et al., 2023; Hariyono & Narsa, 2024). For micro and small manufacturers, these findings suggest that labor should be interpreted as a productive factor incorporating both workforce availability and the capacity to perform production activities effectively, without equating improvements in business performance directly with measured increases in physical output.

The productive consequences of increasing employment depend on the existing relationship between labor requirements and available production facilities. Additional workers may enable enterprises to increase production volume when machinery, working capital, and materials are sufficient to support expanded operations, whereas employment expansion may generate limited additional output under restrictive production conditions. Evidence concerning technological transformation in manufacturing demonstrates the importance of operational arrangements and production practices for enterprise performance, suggesting that the effectiveness of labor utilization can be influenced by the organization of the production system (Tian et al., 2023). This relationship is consistent with the theoretical possibility of diminishing marginal returns when additional labor is employed while complementary inputs remain fixed, although the reviewed evidence does not establish a common marginal productivity threshold for Indonesian micro and small industries.

The comparative literature identifies several mechanisms through which capital and labor may contribute to production, together with conditions that can restrict their productive effectiveness. These mechanisms are organized in Table 2 to distinguish the productive functions of individual inputs from their operational requirements and potential limitations. Research addressing manufacturing efficiency, business strategy, and enterprise performance provides a basis for interpreting how the availability of resources interacts with organizational and operational capabilities (Fawait et al., 2024; Handoyo et al., 2023). The table represents an analytical classification derived from the reviewed literature and does not report independently estimated effects or numerical contributions.

Table 2. Production Mechanisms and Constraints Associated with Capital and Labor in Micro and Small Industries

Production factor	Productive contribution	Conditions supporting output	Potential production constraints
Fixed capital	Provides machinery, equipment, and facilities	Appropriate equipment capacity and utilization	Underutilization and limited technical capability
Working capital	Finances materials and routine operations	Adequate liquidity and input availability	Financing shortages and interrupted production
Labor quantity	Provides workforce capacity	Sufficient complementary inputs	Excess employment relative to production capacity
Labor skills	Supports equipment operation and production quality	Technical knowledge and experience	Skill mismatches and operational errors
Labor organization	Coordinates production tasks	Effective supervision and task allocation	Workflow inefficiency and inadequate coordination
Capital–labor integration	Combines assets and human capabilities	Compatible equipment and workforce capacity	Input imbalance and production bottlenecks

The mechanisms presented in Table 2 indicate that capital and labor influence output through distinct but interconnected production processes. Fixed capital establishes the technological and physical boundaries of production, while working capital supports the continuous provision of materials and operating requirements. Labor quantity affects available productive effort, whereas worker capabilities and task organization influence how effectively this effort can be converted into output. Research associating industrial infrastructure development with changes in manufacturing activity indicates that productive capacity is partly conditioned by access to supporting resources, reinforcing the need to evaluate capital and labor within the operational structure of production (Kassem, 2024).

The relationship between capital and labor is particularly relevant to evaluating the economic consequences of resource imbalances in smaller manufacturing enterprises. Investment in productive equipment may expand potential output, but the resulting capacity cannot be fully utilized when workers lack appropriate technical capabilities or when routine operations are constrained by insufficient working capital. Conversely, a larger workforce may increase operating expenditures

without producing corresponding output gains when existing facilities or material supplies restrict productive activity. Research on economies of scale and total factor productivity in Indonesian food and beverage manufacturing highlights the importance of distinguishing production expansion from productivity growth, while manufacturing studies of technological change demonstrate that operational capabilities can influence the effectiveness of productive resources (Septiani et al., 2026; Tian et al., 2023). These relationships support an interpretation of capital–labor complementarity as an important analytical condition, although the degree of complementarity cannot be quantified through the descriptive literature-review method employed in this study.

Differences in industrial characteristics further complicate the interpretation of capital and labor contributions to output. Production activities involving standardized machinery may depend relatively strongly on equipment capacity and technical utilization, whereas labor-intensive manufacturing processes may be more sensitive to workforce organization, experience, and task-specific capabilities. Research examining productivity determinants in the Indonesian palm oil industry illustrates the sector-specific nature of industrial efficiency, while investigations of export participation and carbon productivity indicate that manufacturing performance can also reflect differences in production organization and external market relationships (Masitah et al., 2023; Mandasari & Luckstead, 2025). Such findings do not establish identical input relationships for micro and small enterprises, but they indicate why coefficients or productivity patterns obtained from particular manufacturing sectors should not be transferred without considering differences in enterprise scale and production technology.

The interpretation of capital and labor contributions also requires distinguishing production output from broader indicators of financial performance and enterprise competitiveness. Improvements in profitability may result from changes in prices, costs, financing conditions, or market access without a corresponding increase in the physical quantity produced. Research on small-enterprise performance and post-pandemic digitalization illustrates the importance of organizational and technological capabilities for business outcomes, although these outcomes are not equivalent to direct measurements of production output (Aisjah et al., 2023; Rosyidiana & Narsa, 2024). The distinction is methodologically consequential because the present study synthesizes relationships reported across heterogeneous research designs rather than estimating an independent production function from a common dataset. Claims concerning the relative contribution of capital and labor must consequently remain conditional on the variables, measurement procedures, and enterprise characteristics represented in the underlying studies.

The synthesized evidence indicates that the productive roles of capital and labor are best interpreted through their functional contributions and the conditions governing their combined utilization. Capital supports the availability and continuity of productive resources, while labor provides the operational capabilities required to transform those resources into output, with neither input necessarily generating proportional production increases when complementary constraints remain unresolved. Evidence on Indonesian manufacturing productivity and firm survival suggests that enterprise outcomes are influenced by productive efficiency, organizational characteristics, and market conditions, reinforcing the analytical limitations of explanations based exclusively on input quantities (Afin et al., 2025; Fawait et al., 2024). For Indonesian micro and small industries, the principal implication is that increasing productive capacity requires attention to the compatibility between capital investment, workforce capabilities, and operational requirements rather than the independent expansion of either production factor. This interpretation provides a basis for examining production efficiency and resource allocation without attributing unobserved causal effects or independently estimated production elasticities to the reviewed literature.

Production Efficiency, Resource Allocation, and Sustainable Output in Indonesian Micro and Small Industries

Production efficiency represents a central consideration in evaluating whether capital and labor are utilized in ways that support attainable output under existing resource constraints. For Indonesian micro and small industries, the analytical significance of efficiency extends beyond increasing production volume because enterprises must also consider the relationship between productive resources, operating expenditures, and the capacity to maintain continuous production. The reviewed literature indicates that differences in manufacturing productivity are associated with technological

capabilities, organizational conditions, and the effectiveness of resource utilization, making efficiency conceptually distinct from the expansion of production inputs (Sugiharti et al., 2022; Masitah et al., 2023). This distinction is particularly relevant for enterprises with limited access to financing and productive equipment, where additional expenditure may increase operating costs without generating proportionate improvements in output. A production-function interpretation consequently requires attention to both the productive contributions of capital and labor and the operational mechanisms determining whether these inputs are employed effectively.

The relationship between input allocation and productive efficiency can be examined through the distinction between technical efficiency and the broader economic consequences of production decisions. Technical efficiency concerns an enterprise's capacity to obtain output from a given combination of inputs relative to an applicable production frontier, whereas allocative efficiency concerns the selection of input combinations in relation to their costs and productive contributions. Research on Indonesian manufacturing has employed productivity and efficiency-oriented approaches to investigate differences among firms, indicating that production outcomes cannot be attributed exclusively to the quantity of capital and labor available (Fawait et al., 2024). For smaller enterprises, inefficient allocation may arise when investment decisions are disconnected from production requirements or when employment expands without sufficient complementary equipment and materials. The present literature synthesis uses these distinctions as analytical concepts rather than measured performance indicators because the study does not estimate a production frontier, observe firm-level input prices, or calculate technical and allocative efficiency scores.

Capital allocation affects production efficiency through decisions concerning the acquisition, maintenance, and utilization of assets required for manufacturing operations. Investment in machinery or production facilities may improve operational capacity when existing equipment restricts output, but its productive contribution depends on the compatibility of new assets with workforce capabilities and production requirements. Evidence concerning foreign investment regulation and manufacturing productivity demonstrates that investment-related conditions influence firm performance, while research on imported production inputs emphasizes the importance of input characteristics and productive linkages (Genthner & Kis-Katos, 2022; Pane & Patunru, 2023). These findings indicate that the economic value of productive investment cannot be interpreted solely through the amount of capital committed to an enterprise. For micro and small manufacturers, resource-allocation decisions should distinguish expenditure that addresses identifiable production constraints from expenditure that expands capacity without resolving existing operational limitations.

Labor allocation similarly affects production efficiency through workforce deployment, task specialization, technical competence, and the coordination of activities within the production process. An enterprise may experience production bottlenecks when workers are assigned to activities without considering equipment availability, material flow, or the sequence of production operations. Research on internal determinants of enterprise performance in East Java and the contribution of intellectual capital to smaller businesses supports the relevance of organizational capabilities and knowledge-related resources to enterprise outcomes (Srimulyani et al., 2023; Hariyono & Narsa, 2024). These findings suggest that workforce effectiveness depends partly on the organization of labor rather than exclusively on employment levels. Although the reviewed studies do not establish a common labor-productivity coefficient for Indonesian micro and small industries, they provide a basis for identifying workforce organization and productive capability as relevant considerations in interpreting variations in output.

The synthesis identifies several operational mechanisms through which capital and labor allocation may influence production efficiency, including equipment utilization, working-capital management, workforce coordination, and technological adaptation. These mechanisms are presented in Table 3 to distinguish production constraints from the organizational responses that may address them. Evidence concerning manufacturing operations and digital transformation indicates that improvements in production practices can be associated with changes in operational performance, while research on manufacturing execution systems identifies the relevance of production monitoring and performance indicators for smaller manufacturers (Tian et al., 2023; Bianchini et al., 2024). The relationships presented in the table are conceptual interpretations of the reviewed literature rather than intervention effects established through primary observations or experimental comparisons.

Table 3. Resource Allocation Mechanisms and Their Implications for Production Efficiency in Micro and Small Industries

Resource allocation dimension	Potential inefficiency	Analytical consideration	Expected operational implication
Fixed-capital utilization	Idle or insufficiently used equipment	Alignment between equipment capacity and production requirements	More effective use of productive assets
Working-capital management	Interrupted procurement and production activities	Availability of funds for materials and operating needs	Greater production continuity
Labor deployment	Uneven workloads and production bottlenecks	Allocation of workers according to production stages	Improved workflow coordination
Workforce capabilities	Inadequate technical skills	Compatibility between worker competencies and equipment	More effective task execution
Capital–labor coordination	Imbalanced productive resources	Adjustment of input combinations to operational requirements	Reduced production constraints
Technological adaptation	Limited operational information and process control	Appropriateness of technology for enterprise capabilities	Improved production monitoring
Production planning	Mismatch between capacity and production requirements	Coordination of materials, labor, and equipment	More consistent resource utilization

Table 3 demonstrates that production inefficiencies may originate from several interconnected operational conditions rather than from the shortage of a single production factor. Underutilized equipment represents a different constraint from insufficient equipment, just as uneven labor deployment differs from an absolute shortage of workers. Research examining manufacturing strategy and operational efficiency indicates that productive performance is associated with organizational arrangements, while evidence concerning enterprise competitiveness suggests that managerial capabilities influence how available resources contribute to business outcomes (Handoyo et al., 2023; Aisjah et al., 2023). The analytical implication is that production improvement requires the identification of specific constraints before additional capital or labor is introduced. This approach also prevents the unsupported assumption that every enterprise would benefit equally from investment expansion, workforce growth, or technological expenditure.

The economic significance of capital–labor coordination becomes clearer when production efficiency is interpreted alongside economies of scale and marginal productivity. In production theory, increasing inputs may generate different output responses depending on the characteristics of the production technology and the proportions in which resources are combined. Evidence concerning economies of scale and total factor productivity in Indonesian food and beverage manufacturing demonstrates the importance of distinguishing scale-related production changes from efficiency-related productivity improvements (Septiani et al., 2026). A larger enterprise may produce greater total output because it employs more resources without necessarily operating closer to its attainable production frontier. For micro and small industries, this distinction implies that production expansion should not automatically be classified as an efficiency improvement, particularly when the additional output requires a disproportionately large increase in capital expenditure or labor utilization.

Technological adaptation introduces a further consideration because changes in productive infrastructure and operational systems may modify the effectiveness of conventional inputs. Research concerning industrial electrification in Indonesia demonstrates the relationship between infrastructure development and industrial activity, while investigations of foreign direct investment spillovers indicate that the productivity implications of external investment are influenced by conditions affecting knowledge and resource transmission (Kassem, 2024; Yasin et al., 2024). Technological improvements may support equipment utilization, production monitoring, and labor coordination, but

their productive benefits depend on whether enterprises possess the capabilities necessary to incorporate them into existing operations. Studies examining digitalization among Indonesian micro, small, and medium enterprises also emphasize the relevance of technological capabilities to enterprise performance, although financial or organizational improvements should not be interpreted as direct evidence of higher physical output (Rosyidiana & Narsa, 2024). The literature therefore supports a conditional interpretation of technological adaptation as a potential complement to capital and labor rather than an independent guarantee of production efficiency.

The relationship between production efficiency and sustainable enterprise operations also requires distinguishing productive performance from financial, environmental, and social outcomes. Manufacturing enterprises may improve production efficiency while experiencing different financial results because profitability is additionally influenced by prices, financing costs, and market conditions. Research on export participation and carbon productivity illustrates that manufacturing performance may be evaluated through environmental productivity indicators that differ from conventional measures of production output (Mandasari & Luckstead, 2025). From the Islamic economic orientation incorporated into the original research framework, responsible production also raises considerations concerning fairness, lawful productive activities, and the social consequences of resource utilization, although these principles were not operationalized as measurable variables in the reviewed methodology. Their analytical relevance lies in recognizing that technically efficient production and socially responsible enterprise conduct represent related but conceptually distinct dimensions of economic activity.

The findings of the literature synthesis indicate that improving production efficiency in Indonesian micro and small industries requires attention to the allocation, coordination, and productive utilization of capital and labor rather than reliance on input expansion as an isolated strategy. Manufacturing research examining operational capabilities and enterprise survival supports the interpretation that productive outcomes depend on organizational effectiveness, firm-specific conditions, and the capacity to sustain activities under changing market requirements (Afin et al., 2025; Handoyo et al., 2023). At the practical level, this suggests that capital assistance, workforce development, and technological adoption should be considered in relation to identifiable production constraints and the operational capacity of individual enterprises. The principal scientific contribution is a synthesized explanation linking the conventional capital–labor production function with resource-allocation mechanisms, efficiency considerations, and the distinction between output expansion and productivity improvement. These conclusions remain interpretive because the descriptive qualitative design does not independently estimate production frontiers, input elasticities, returns to scale, or the causal effects of resource-allocation decisions.

CONCLUSION

This study concludes that capital and labor constitute fundamental production inputs in Indonesian micro and small industries, although their contributions to output depend on the effectiveness of their utilization and the operational conditions of individual enterprises. Capital supports production capacity through the provision of equipment, raw materials, facilities, and working resources, while labor contributes the physical effort, technical capabilities, and organizational functions required to transform these resources into output. The reviewed literature indicates that the relationship between productive inputs and output cannot be explained solely by increases in capital expenditure or workforce size. The productive contribution of each input is influenced by the availability and suitability of complementary resources, workforce competencies, technological capabilities, and production management. Consequently, input expansion does not necessarily produce proportional output improvements, particularly when additional resources encounter equipment limitations, inadequate workforce capabilities, or operational bottlenecks. These findings support the relevance of production-function theory while emphasizing the need to distinguish productive capacity, output expansion, and production efficiency.

The analysis further establishes that effective capital–labor coordination constitutes an important consideration in improving resource allocation and productive performance. Investment in machinery and operating resources is more likely to support production when accompanied by appropriate workforce capabilities, while labor expansion requires sufficient equipment, materials, and organizational capacity. The study contributes to the literature by integrating evidence concerning

conventional production inputs, operational constraints, input complementarity, and efficiency into a coherent analytical interpretation of Indonesian micro and small industrial production. Its practical implications concern the need for enterprise operators and relevant stakeholders to align financial support, workforce development, technological utilization, and production planning with identifiable operational requirements rather than emphasizing input expansion independently. The Islamic economic orientation incorporated into the study further supports consideration of fairness, social benefit, and responsible resource utilization alongside productive efficiency, without establishing these principles as empirically measured determinants of output. As the research employed a descriptive qualitative literature review, its conclusions represent a synthesis of existing evidence rather than independent estimates of production elasticities, returns to scale, or causal relationships. Differences in industrial characteristics, geographical settings, measurement approaches, and research designs also limit the generalizability of findings across enterprises. Future empirical research using firm-level production data would be necessary to estimate the relative contributions of capital and labor, assess variations in productive efficiency, and examine whether the relationships identified in the literature remain consistent across industrial classifications and enterprise scales.

REFERENCES

Afin, R., Keresztély, T., & Cserháti, I. (2025). Firm performance and markets: Survival analysis of manufacturing enterprises in Indonesia. *Journal of Industrial and Business Economics, 52*, 107–151. https://doi.org/10.1007/s40812-024-00302-7

Agusti, L. T., Jolianis, J., & Selvia, N. (2026). Pengaruh modal, tenaga kerja, jam kerja, internet, dan pendidikan terhadap pendapatan industri mikro dan kecil (IMK) makanan dan minuman di Kecamatan Padang Utara Kota Padang. Manajemen Kreatif Jurnal, 4(2), 77–86. https://doi.org/10.55606/makreju.v4i2.4513

Agustina G, S., Aznabia F, A., Reihan H. P, N., & Mardiya, A. Z. (2026). Analisis pertumbuhan industri manufaktur berdasarkan skala usaha di Indonesia. Jurnal Bersama Ilmu Ekonomi, 2(2), 89–96. https://doi.org/10.55123/ekonom.v2i2.357

Aisjah, S., Arsawan, I. W. E., & Suhartanto, D. (2023). Predicting SME's business performance. *Journal of Open Innovation, 9*(3), 100122. https://doi.org/10.1016/j.joitmc.2023.100122

Alfatiy, M. R., Ghuffar, R. A., & Hasibuan, R. R. A. (2025). Peran biaya produksi dalam menentukan keputusan produsen. Jurnal Manuhara: Pusat Penelitian Ilmu Manajemen dan Bisnis, 3(3), 257–266. https://doi.org/10.61132/manuhara.v3i3.1999

Antoro, B. (2025). Analisis fungsi produksi dalam usahatani. Universitas Dharmawangsa, 19(3), 1409–1418.

Arif, M. P. P. M. (2021). Analisis faktor-faktor yang mempengaruhi output industri mikro kecil pada kabupaten/kota di Jawa Tengah tahun 2018–2022. Ekonomi dan Bisnis, 1(1), 167–186.

Bianchini, A., Savini, I., Andreoni, A., Morolli, M., & Solfrini, V. (2024). Manufacturing execution system application within small–medium enterprises. *Sustainability, 16*(7), 2974. https://doi.org/10.3390/su16072974

Fawait, M., Islamiya, H. A. T., Sari, D. W., Haryanto, T., Singh, S. K., & Masnan, F. (2024). Does market characteristic determine foreign direct investment spillovers? *Cogent Economics & Finance, 12*(1), 2392199. https://doi.org/10.1080/23322039.2024.2392199

Genthner, R., & Kis-Katos, K. (2022). Foreign investment regulation and firm productivity: Granular evidence from Indonesia. *Journal of Comparative Economics, 50*(3), 668–687. https://doi.org/10.1016/j.jce.2022.02.003

Handoyo, S., Suharman, H., Ghani, E. K., & Soedarsono, S. (2023). Business strategy, operational efficiency, ownership structure, and manufacturing performance. *Journal of Open Innovation, 9*(2), 100039. https://doi.org/10.1016/j.joitmc.2023.100039

Hardiansyah, R., & Putri, A. S. (2021). Pengantar ekonomi mikro. Insan Cendekia Mandiri. https://repo.stie-pembangunan.ac.id/id/eprint/1825/

Hariyono, A., & Narsa, I. M. (2024). The value of intellectual capital in improving MSMEs' competitiveness and financial performance. *Cogent Economics & Finance, 12*(1), 2325834. https://doi.org/10.1080/23322039.2024.2325834

Kassem, D. (2024). Does electrification cause industrial development? Grid expansion and firm turnover in Indonesia. *Journal of Development Economics, 167*, 103234. https://doi.org/10.1016/j.jdeveco.2023.103234

Lesmana, E. D. Y., & Affandi, M. (2013). Pengaruh modal, tenaga kerja, dan lama usaha terhadap produksi kerajinan manik-manik kaca (Studi kasus sentra industri kecil kerajinan manik-manik kaca Desa Plumbon Gambang, Kecamatan Gudo, Kabupaten Jombang). Jurnal Ilmiah Mahasiswa FEB, 2(2).

Mahmud, S. N. F., Santoso, I. R., & Djuuna, R. F. (2025). Analisis pengaruh modal usaha dan tenaga kerja terhadap produksi industri kecil dan menengah Karawo binaan Dinas Koperasi UKM, Perindustrian, dan Perdagangan Provinsi Gorontalo. Jurnal Akuntansi, Manajemen dan Ilmu Ekonomi (Jasmien), 5(3), 297–305. https://doi.org/10.54209/jasmien.v5i03.1264

Mandasari, P., & Luckstead, J. (2025). Examining the nexus between exporting status and CO_2 productivity in Indonesian agri-based manufacturing. *Energy Economics, 143*, 108215. https://doi.org/10.1016/j.eneco.2025.108215

Masitah, T. H., Setiawan, M., Indiastuti, R., & Wardhana, A. (2023). Determinants of the palm oil industry productivity in Indonesia. *Cogent Economics & Finance, 11*(1), 2154002. https://doi.org/10.1080/23322039.2022.2154002

Mufidha, S. (2017). Analisis pengaruh modal kerja, bahan baku, dan jumlah tenaga kerja terhadap hasil produksi sentra industri kecil sepatu dan sandal kulit (Studi kasus pada sentra industri kecil sepatu dan sandal kulit di Kelurahan Selosari dan Kelurahan Magetan, Kabupaten Magetan). Fakultas Ekonomi dan Bisnis, Universitas Brawijaya. https://jimfeb.ub.ac.id/index.php/jimfeb/article/view/3645/3233

Nafisatur, M. (2024). Metode pengumpulan data penelitian. Metode Pengumpulan Data Penelitian, 3(5), 5423–5443.

Nurhayani. (2022). Analisis sektor industri manufaktur di Indonesia. Jurnal Paradigma Ekonomika, 17(3), 713–722. https://www.online-journal.unja.ac.id/paradigma/article/view/20477

Pane, D. D., & Patunru, A. A. (2023). The role of imported inputs in firms' productivity and exports: Evidence from Indonesia. *Review of World Economics, 159*, 629–672. https://doi.org/10.1007/s10290-022-00476-z

Purnama, R. P. A. (2021). Analisis pengaruh modal, tenaga kerja, produksi terhadap produksi kerajinan. Scientific, 14.

Rosyidiana, R. N., & Narsa, I. M. (2024). Micro, small, and medium-sized enterprises during post-pandemic economic recovery. *Cogent Business & Management, 11*(1), 2342488. https://doi.org/10.1080/23311975.2024.2342488

Septiani, B. A., Setiawan, M., Oude Lansink, A. G. J. M., & Purnagunawan, R. M. (2026). Market power, economies of scale and total factor productivity growth. *British Food Journal, 128*(1), 296–314. https://doi.org/10.1108/BFJ-09-2024-0950

Sofiani, T. P., & Zulvia, D. (2023). Dampak modal dan tenaga kerja terhadap produksi pada usaha pada usaha mikro, kecil, dan menengah di Kecamatan Padang Utara Kota Padang. Profit: Jurnal Manajemen, Bisnis dan Akuntansi, 2(2), 99–109. https://doi.org/10.58192/profit.v2i2.732

Srimulyani, V. A., Hermanto, Y. B., Rustiyaningsih, S., & Waloyo, L. A. S. (2023). Internal factors of entrepreneurial and business performance of SMEs in East Java, Indonesia. *Heliyon, 9*(11), e21637. https://doi.org/10.1016/j.heliyon.2023.e21637

Sugiharti, L., Yasin, M. Z., Purwono, R., Esquivias, M. A., & Pane, D. (2022). The FDI spillover effect on efficiency and productivity of manufacturing firms. *Journal of Open Innovation, 8*(2), 99. https://doi.org/10.3390/joitmc8020099

Sumanto. (2024). Dinamika upah industri dan keterkaitan produktivitas di industri. Muara Teknik: Jurnal Ilmiah Ilmu Teknik Mesin, Industri & Komputer, 2(2), 21–28

Tian, M., Chen, Y., Tian, G., Huang, W., & Hu, C. (2023). Digital transformation practices and operations improvement in manufacturing firms. *International Journal of Production Economics, 262*, 108929. https://doi.org/10.1016/j.ijpe.2023.108929

Yasin, M. Z., Esquivias, M. A., Lau, W. Y., & Primanthi, M. R. (2024). Friend or foe? Revealing R&D spillovers from FDI in Indonesia. *Journal of Open Innovation, 10*(1), 100209. https://doi.org/10.1016/j.joitmc.2024.100209

Yolanda, C., & Hasanah, U. (2024). Peran usaha mikro, kecil dan menengah (UMKM) dalam pengembangan ekonomi Indonesia. Jurnal Manajemen dan Bisnis, 2(3), 170–186. https://doi.org/10.36490/jmdb.v2i3.1147