



# Enterprise-Profile Variations in Resource Capital and MSME Performance

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## Abstract

This study examined enterprise-profile differences in Physical Capital, Financial Capital and Human Capital and their associations with sales- and employment-based performance among 266 registered micro, small and medium enterprises (MSMEs) in Manticao, Lugait and Naawan, Misamis Oriental, Philippines. The study used a quantitative retrospective cross-sectional design: current resource conditions and recalled annual performance categories for 2021-2023 were obtained in one survey administration and therefore were not treated as longitudinal observations. Capital domains were measured with six-item four-point composite scales, while performance was represented by ordered annual sales and employment-change categories. Descriptive statistics, Kruskal-Wallis tests with effect sizes, Dwass-Steel-Critchlow-Fligner pairwise comparisons, a multiplicity sensitivity screen and multiple linear regression were applied. Physical Capital ( $M = 2.54$ ) and Financial Capital ( $M = 2.69$ ) were high, whereas Human Capital was low ( $M = 1.83$ ). Sales-based performance ( $M = 1.55$ ) and employment-based performance ( $M = 1.21$ ) remained concentrated in the lower categories. Total assets produced the most consistent profile differences. In the unadjusted regressions, Physical Capital and Human Capital were positively associated with both performance outcomes; the models explained 19.7% of sales-based variance and 21.9% of employment-based variance. Financial Capital did not add a statistically significant unique coefficient after the other capital domains were considered, but this should not be interpreted as evidence that finance is unimportant. The findings emphasize human-capital development, productive asset upgrading and careful attention to firm-size and asset heterogeneity in MSME support and future research.

**Keywords:** Business Performance, Enterprise Profiles, Financial Capital, Human Capital, MSMEs, Physical Capital.

## Introduction

Micro, small and medium enterprises (MSMEs) constitute a heterogeneous segment of the business sector. Firms differ in age, scale, asset endowment, ownership, industry, location, managerial arrangements and access to markets and institutions and these differences shape their resources and outcomes. This heterogeneity matters because firm performance is multi-dimensional. Sales and employment capture distinct dimensions of growth and conclusions may vary by indicator (1, 2). Understanding MSME performance therefore requires attention to enterprise characteristics and resource conditions. This relationship is anchored in Resource-Based Theory (RBT), which attributes differences in firm performance partly to heterogeneity in the resources and capabilities that enterprises possess and control (3, 4). Superior outcomes, however, depend not on resource ownership alone but on how resources are mobilized and deployed to

create value (5, 6). Sustained competitive advantage becomes more plausible when resources are valuable and difficult to imitate or substitute (3, 7). Physical Capital, Financial Capital and Human Capital are relevant because they underpin productive capacity, liquidity, knowledge, coordination and responsiveness. Their value may differ, for instance, physical and financial resources are often more transferable, whereas knowledge, experience and routines embedded in Human Capital can become tacit and path-dependent (3, 6, 7).

These capital domains collectively shape MSME capacity to operate and grow. Physical Capital provides the infrastructure through which firms transform inputs into marketable products and services. Investments in technology, machinery, facilities and transportation can improve capacity, quality, efficiency and responsiveness to demand. Technology acquisition has been associated with

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stronger SME performance and innovation outcomes (8), while effective use of physical and technological assets can support business performance and profit growth (9). However, technological limitations and resource constraints can restrict SME competitiveness and sustainability (10). Their acquisition and use are closely linked to Financial Capital, which enables firms to sustain operations and finance inventory, equipment, technology and labor. Limited access to finance remains an important constraint on SME growth (11), while working-capital availability and financial flexibility affect firms' ability to maintain operations and respond to changing conditions (12). In the Philippine context, credit constraints vary according to firm characteristics (13) and small businesses often rely on combinations of formal and informal financing sources (14). Access to finance has likewise been associated with SME performance (15).

The productive value of Physical and Financial Capital also depends on Human Capital, encompassing the knowledge, skills, experience and competencies of owners, managers and employees. Meta-analytic evidence indicates a positive relationship between human capital and entrepreneurial success, although its strength varies with the type and task-specificity of knowledge and skills involved (16). Human-resource-enhancing practices have similarly been associated with stronger SME performance (17), while innovative human capital increases the propensity of small firms to innovate (18). Human capital capabilities have also been linked with export performance (19), direct and innovation-mediated improvements in firm performance (20) and improved outcomes through training and employee development (21). Knowledge-based resources also reinforce capabilities contributing to small-business performance (22). These findings suggest that the three capital domains are complementary - Financial Capital supports resource acquisition, Physical Capital provides the means for production and service delivery and Human Capital shapes how effectively resources are deployed.

Despite this evidence, the effects attributed to firm resources may be intertwined with underlying differences among enterprises. Entrepreneur-, firm- and institutional-level characteristics influence small-firm performance (23), while studies in developing economies show that the

contribution of firm resources is conditioned by enterprise characteristics and constraints (24). Evidence on intellectual and human capital further suggests that the value generated by organizational resources varies across firm and industry contexts (25). Thus, observed resource-performance relationships may partly reflect differences in asset base, business age, ownership, workforce size, industry, or location rather than the independent contribution of a particular capital domain. This is especially relevant in MSME populations dominated by micro-enterprises.

Accordingly, the empirical gap is not simply whether resources matter for MSME performance, but whether Physical, Financial and Human Capital vary across enterprise profiles and whether each domain exhibits distinct associations with different performance dimensions. Existing studies often examine resource-performance relationships without explicitly accounting for enterprise heterogeneity, while reliance on a single performance indicator may obscure differences between market expansion and workforce development. Limited evidence therefore explains whether stronger capital conditions correspond with stronger sales and employment outcomes when differences in location, asset base, business age, industry, ownership and workforce size are considered in localized rural and semi-rural settings.

Addressing this gap has theoretical and practical significance. From an RBT perspective, examining the three capital domains separately allows assessment of whether resource categories have differentiated relationships with firm outcomes. Distinguishing sales from employment performance further clarifies whether resources supporting market activity produce similar effects on workforce expansion. Practically, identifying resource differences across enterprise profiles can support more targeted MSME interventions rather than uniform assistance.

Thus, this study examines enterprise-profile differences in Physical Capital, Financial Capital and Human Capital and assesses associations with sales- and employment-based performance among MSMEs in Manticao, Lugait and Naawan. It describes the capital domains and performance outcomes, tests differences across selected enterprise profiles, identifies groups underlying significant differences and estimates the unique associations of each capital domain with sales and

employment performance. By integrating enterprise heterogeneity, disaggregated resource domains, dual performance indicators, nonparametric group comparisons and regression analysis, the study provides a differentiated assessment of resource endowments and MSME performance in the ManLuNa context.

## Methodology

### Research Design, Locale, Participants and Data Collection

This study used a quantitative, retrospective cross-sectional, descriptive-comparative design with an associational component. It was a focused secondary analysis of survey data from MSMEs in Manticao, Lugait and Naawan (ManLuNa), Misamis Oriental. For geographic identification of the research locale, the representative municipal-center coordinates are approximately 8.4003 N, 124.2920 E for Manticao; 8.3427 N, 124.2609 E for Lugait; and 8.4336 N, 124.2909 E for Naawan. These coordinates identify the municipalities and should not be interpreted as the exact locations of individual respondent enterprises. The source survey used 2023 Business Permit and Licensing Office listings as the sampling frame, covering 856 registered MSMEs across the three municipalities. Proportionate stratified random sampling was used in the source study and the achieved analytic sample comprised 266 MSMEs: 109 from Manticao, 72 from Lugait and 85 from Naawan. Eligible enterprises had operated for at least three years and were represented by an owner, manager, or owner-manager knowledgeable about business operations, resources, sales and employment. Participation was voluntary, confidentiality protections were applied and direct personal identifiers were not used in the analytic reporting. Resource indicators and recalled performance information were obtained during a single survey administration. Respondents reported annual sales and employment-related performance categories for 2021, 2022 and 2023 retrospectively. Consequently, the study is not longitudinal and does not establish within-firm temporal change.

Comparisons across the three recalled years are presented only as descriptive retrospective patterns and causal or longitudinal language is avoided throughout the manuscript.

### Measures and Operational Definitions

Table 1 summarizes the conceptual definitions, indicators and computation of the five study variables. The three capital domains were measured using six items each. For all capital items, the response anchors were 1 = Strongly disagree, 2 = Somewhat disagree, 3 = Somewhat agree and 4 = Strongly agree; thus, higher values consistently indicate stronger resource availability, management, utilization, or development practices. Composite capital scores were computed as item means. For descriptive interpretation, 1.00-1.75 = Very low, 1.76-2.50 = Low, 2.51-3.25 = High and 3.26-4.00 = Very high.

Sales-based Financial Performance used four ordered annual sales categories from the original questionnaire: 1 = below PHP 150,000, 2 = PHP 150,000-250,000, 3 = PHP 250,001-350,000 and 4 = more than PHP 350,000. Employment-based Non-Financial Performance used the original four-category annual employment-change measure: 1 = no increase, 2 = increase of 1-2 employees, 3 = increase of 3-4 employees and 4 = increase of more than 5 employees. For these performance variables, higher scores therefore indicate stronger reported performance, but the scores remain ordered categories rather than continuous peso amounts or employee counts.

Total assets were treated as an enterprise-profile variable and as a proxy for overall resource endowment. Total assets were not included in the Physical, Financial, or Human Capital composites and were not entered as a control variable in the primary regression models. This distinction is important because asset category and enterprise scale can overlap conceptually and empirically with capital structures; the regression coefficients reported below should therefore be interpreted as unadjusted capital-performance associations rather than size-independent causal effects.

**Table 1:** Measures and Operational Definition

| Variable                         | Conceptual Definition                                                                                                                              | Operational Indicators                                                                                                                                                                                                                                            | Measurement and Computation                                                                                                                                                                                                                                 |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Physical Capital</b>          | The adequacy, maintenance, utilization and management of tangible productive assets used by an MSME in its operations.                             | PC1: Effective technology utilization; PC2: Maintenance of owned or rented buildings; PC3: Regular vehicle maintenance; PC4: Optimization of land; PC5: Adequacy of machinery and equipment; PC6: Active inventory monitoring.                                    | Six-item, four-point ordered-response index. The Physical Capital score was calculated as the mean of PC1–PC6. Higher scores reflect stronger physical-resource conditions.                                                                                 |
| <b>Financial Capital</b>         | The availability, management and accessibility of financial resources needed for daily operations, capital investments and business expansion.     | FC1: Sufficient working capital; FC2: Adequate capital-expenditure funds; FC3: Successful loan acquisition; FC4: Efforts to increase working capital; FC5: Regular budget review and updating; FC6: Pursuit of government-backed loans or grants.                 | Six-item, four-point ordered-response index. The Financial Capital score was calculated as the mean of FC1–FC6. Higher scores indicate stronger financial-resource capacity.                                                                                |
| <b>Human Capital</b>             | The employee-related knowledge, skills, development practices and workforce-management conditions that support MSME productivity and adaptability. | HC1: Investment in employee training; HC2: Learning and knowledge-sharing culture; HC3: Attraction, recruitment and retention of talented employees; HC4: Career-advancement opportunities; HC5: Teamwork and collaboration; HC6: Regular performance evaluation. | Six-item, four-point ordered-response index. The Human Capital score was calculated as the mean of HC1–HC6. Higher scores indicate stronger human-resource development and management practices.                                                            |
| <b>Financial Performance</b>     | The MSME's ability to generate revenue from business operations.                                                                                   | Annual sales categories for 2021, 2022 and 2023: 1 = below PHP 150,000; 2 = PHP 150,000-250,000; 3 = PHP 250,001-350,000; 4 = more than PHP 350,000.                                                                                                              | Each annual score was retained as an ordered category. Higher scores indicate stronger reported sales performance. The three recalled annual scores were used for descriptive retrospective comparison; 2023 served as the current outcome in regression.   |
| <b>Non-Financial Performance</b> | The MSME's capacity to sustain or expand its workforce and organizational operations.                                                              | Annual employment-change categories for 2021, 2022 and 2023: 1 = no increase; 2 = increase of 1-2 employees; 3 = increase of 3-4; 4 = increase of more than 5.                                                                                                    | Each annual score was retained as an ordered category. Higher scores indicate stronger employment-based performance. The three recalled annual scores were used for descriptive retrospective comparison; 2023 served as the current outcome in regression. |

**Note:** Capital scales: 1 = Strongly disagree to 4 = Strongly agree; higher capital scores consistently indicate stronger conditions. Performance scores are ordered categories and should not be interpreted as exact amounts or longitudinal growth estimates.

### Statistical Analysis

Frequencies, percentages, means and item-level descriptive statistics were used to summarize

enterprise profiles, capital domains and performance categories. Kruskal-Wallis tests were used for profile comparisons because the outcomes were derived from ordered-response/composite scores

and several profile groups were highly unbalanced. For each significant omnibus comparison, the manuscript reports the Kruskal-Wallis chi-square statistic, degrees of freedom, p-value and eta-squared  $H$  ( $\eta^2H$ ) effect size. Dwass-Steel-Critchlow-Fligner (DSCF) tests were then used for pairwise follow-up comparisons because they provide distribution-free multiple comparisons for independent groups (26, 27).

Multiplicity was handled at two levels. First, DSCF p-values control the pairwise comparison family within each significant profile-outcome analysis. Second, because 30 omnibus tests were conducted across six profile variables and five outcomes, a Holm-Bonferroni sensitivity screen was applied to the omnibus results. Given that several source outputs reported  $p < 0.001$  rather than exact values, the manuscript conservatively distinguishes results with raw  $p \leq 0.001$  as robust to the 30-test Holm screen and treats nominally significant results with larger p-values as exploratory. This approach avoids overstating isolated p-values while retaining the full pattern of the planned profile analyses. Finally, separate multiple linear regression models estimated the associations of Physical Capital, Financial Capital and Human Capital with 2023

sales-based Financial Performance and 2023 employment-based Non-Financial Performance. Unstandardized coefficients, standard errors, t statistics, p-values, 95% confidence intervals, model F statistics, R and R-squared are reported. Because firm-size and total-asset controls were not included in these primary models, the coefficients are interpreted as unadjusted associations and are discussed together with the strong asset-profile differences observed in the nonparametric analyses.

## Results

### Respondent and Enterprise Profile of MSMEs

Table 2 presents the profile of the 266 participating MSMEs. The sample was concentrated in micro-scale, owner- or manager-led enterprises: 97.4% employed fewer than 10 workers and 82.0% reported total assets below PHP 3 million. Most businesses had operated for three to ten years and trading represented 88.7% of the sample. These distributions are important for interpreting later group comparisons because several ownership, industry and higher-size categories contained few observations.

**Table 2:** Enterprise Profile of the Respondents

| Variable             | Category                 | Frequency | Percentage (%) |
|----------------------|--------------------------|-----------|----------------|
| Location of MSME     | Manticao                 | 109       | 41             |
|                      | Lugait                   | 72        | 27             |
|                      | Naawan                   | 85        | 32             |
| Role in the Business | Owner                    | 129       | 48             |
|                      | Manager                  | 114       | 43             |
|                      | Both Owner and Manager   | 23        | 9              |
| Number of Employees  | <10                      | 259       | 97             |
|                      | 10 - 99                  | 7         | 3              |
| Total Assets         | Less than 3,000,000      | 218       | 82             |
|                      | 3,000,001 - 15,000,000   | 41        | 15             |
|                      | 15,000,001 - 100,000,000 | 7         | 3              |
| Years in operation   | 3-5 years                | 116       | 44             |
|                      | 6-10 years               | 74        | 28             |
|                      | 11-15 years              | 35        | 13             |
|                      | 16-20 years              | 9         | 3              |
|                      | 21-25 years              | 13        | 5              |
|                      | more than 25 years       | 19        | 7              |
| Line of Business     | Trading                  | 236       | 88             |
|                      | Services                 | 18        | 7              |
|                      | Manufacturing            | 5         | 2              |
|                      | Real Estate              | 2         | 1              |
|                      | Livestock                | 5         | 2              |
| Form of Ownership    | Sole proprietorship      | 259       | 97             |
|                      | Partnership              | 2         | 1              |
|                      | Corporation              | 4         | 2              |
|                      | Cooperative              | 1         | 0              |

**Note:** % = Percentage. Percentages may not total exactly 100% because of rounding. Very small categories should be interpreted cautiously in inferential comparisons.

## Physical Capital Across Enterprise Profiles

Table 3 summarizes Physical Capital. The overall Physical Capital mean was high ( $M = 2.54$ ). Inventory monitoring was the strongest item ( $M = 3.30$ ), while technology utilization ( $M = 2.40$ ),

vehicle maintenance ( $M = 2.23$ ) and machinery/equipment adequacy ( $M = 2.18$ ) were low. Descriptively, higher-asset and larger firms tended to report stronger Physical Capital, whereas the predominantly low-asset micro-enterprises showed more constrained productive-resource conditions.

**Table 3:** Physical Capital Mean Scores Across Enterprise Profiles

| Variable                    | Category               | n   | Percentage (%) | PC 1  | PC 2  | PC 3  | PC 4 | PC 5  | PC 6 | Overall Mean | Remarks |
|-----------------------------|------------------------|-----|----------------|-------|-------|-------|------|-------|------|--------------|---------|
| <b>Location of MSME</b>     | Manticao               | 109 | 41             | 2.53  | 2.81  | 2.24  | 2.72 | 2.26  | 3.16 | 2.62         | H       |
|                             | Lugait                 | 72  | 27             | 2.17  | 2.03  | 2.10  | 2.19 | 1.88  | 3.65 | 2.34         | L       |
|                             | Naawan                 | 85  | 32             | 2.44  | 2.74  | 2.34  | 2.68 | 2.34  | 3.20 | 2.62         | H       |
| <b>Role in the Business</b> | Owner                  | 129 | 48             | 2.21  | 2.14  | 1.99  | 2.29 | 1.82  | 3.26 | 2.28         | L       |
|                             | Manager                | 114 | 43             | 2.66  | 2.93  | 2.55  | 2.83 | 2.60  | 3.39 | 2.83         | H       |
|                             | Both Owner and Manager | 23  | 9              | 2.22  | 3.26  | 2.00  | 2.78 | 2.13  | 3.17 | 2.59         | H       |
| <b>Number of Employees</b>  | <10                    | 259 | 97             | 2.37  | 2.55  | 2.20  | 2.54 | 2.14  | 3.29 | 2.52         | H       |
|                             | 10 - 99                | 7   | 3              | 3.57  | 3.43  | 3.43  | 3.29 | 3.57  | 3.71 | 3.50         | VH      |
| <b>Total Assets</b>         | <3,000,000             | 218 | 82             | 2.27  | 2.45  | 2.06  | 2.45 | 2.03  | 3.30 | 2.43         | L       |
|                             | 3,000,001 - 15,000,000 | 41  | 15             | 3.02  | 3.12  | 3.02  | 3.10 | 2.85  | 3.24 | 3.06         | H       |
|                             | 15,000,001 - 100M      | 7   | 3              | 3.00  | 3.29  | 3.00  | 2.86 | 3.00  | 3.71 | 3.14         | H       |
| <b>Years in operation</b>   | 3-5 years              | 116 | 44             | 2.42  | 2.52  | 2.14  | 2.47 | 2.12  | 3.27 | 2.49         | L       |
|                             | 6-10 years             | 74  | 28             | 2.45  | 2.66  | 2.18  | 2.74 | 2.31  | 3.41 | 2.62         | H       |
|                             | 11-15 years            | 35  | 13             | 2.74  | 2.91  | 2.77  | 2.97 | 2.34  | 3.46 | 2.87         | H       |
|                             | 16-20 years            | 9   | 3              | 2.22  | 2.67  | 2.56  | 2.44 | 2.11  | 2.67 | 2.44         | L       |
|                             | 21-25 years            | 13  | 5              | 1.77  | 2.23  | 2.00  | 1.85 | 1.69  | 2.92 | 2.08         | L       |
|                             | more than 25 years     | 19  | 7              | 2.00  | 2.16  | 2.05  | 2.21 | 2.11  | 3.42 | 2.32         | L       |
| <b>Line of Business</b>     | Trading                | 236 | 88             | 2.31  | 2.53  | 2.17  | 2.52 | 2.10  | 3.35 | 2.50         | L       |
|                             | Services               | 18  | 7              | 3.11  | 2.94  | 2.72  | 2.83 | 2.89  | 3.33 | 2.97         | H       |
|                             | Manufacturing          | 5   | 2              | 3.40  | 3.40  | 3.40  | 3.40 | 3.40  | 3.00 | 3.33         | VH      |
|                             | Real Estate            | 2   | 1              | 1.0   | 2.5   | 1.0   | 2.0  | 1.0   | 1.0  | 1.42         | VL      |
|                             | Livestock              | 5   | 2              | 4.0   | 2.8   | 2.6   | 3.0  | 2.6   | 2.4  | 2.90         | H       |
| <b>Form of Ownership</b>    | Sole proprietorship    | 259 | 97             | 2.371 | 2.548 | 2.197 | 2.54 | 2.143 | 3.29 | 2.52         | H       |
|                             | Partnership            | 2   | 1              | 3.00  | 4.00  | 4.00  | 3.50 | 3.50  | 4.00 | 3.67         | VH      |
|                             | Corporation            | 4   | 2              | 3.75  | 3.25  | 3.75  | 3    | 3.5   | 3.75 | 3.50         | VH      |
|                             | Cooperative            | 1   | 0              | 4     | 4     | 2     | 4    | 4     | 4    | 3.67         | VH      |

**Note:** VL = Very low, L = Low, H = High, VH = Very high. Higher means indicate stronger physical-resource conditions. n = Number of Respondents, PC = Physical Capital.

## Financial Capital Across Enterprise Profiles

Table 4 presents Financial Capital. The overall mean was high ( $M = 2.69$ ). Budget review ( $M = 3.08$ ), working-capital sufficiency ( $M = 2.95$ ), capital-expenditure funding ( $M = 2.79$ ) and efforts

to increase working capital ( $M = 2.70$ ) were relatively strong, whereas successful loan acquisition ( $M = 2.42$ ) and pursuit of government-backed loans or grants ( $M = 2.19$ ) were low. The profile pattern suggests that internal financial management was stronger than external financing access.

**Table 4:** Financial Capital Mean Scores Across Enterprise Profiles

| Variable                    | Category                 | n   | Percentage (%) | FC 1 | FC 2 | FC 3 | FC 4 | FC 5 | FC 6 | Overall Mean | Remarks |
|-----------------------------|--------------------------|-----|----------------|------|------|------|------|------|------|--------------|---------|
| <b>Location of MSME</b>     | Manticao                 | 109 | 41             | 3.02 | 2.82 | 2.36 | 2.73 | 3.06 | 2.36 | 2.72         | H       |
|                             | Lugait                   | 72  | 27             | 2.49 | 2.42 | 2.67 | 2.38 | 3.07 | 2.19 | 2.53         | H       |
|                             | Naawan                   | 85  | 32             | 3.26 | 3.11 | 2.29 | 2.92 | 3.12 | 1.96 | 2.78         | H       |
| <b>Role in the Business</b> | Owner                    | 129 | 48             | 2.71 | 2.56 | 2.49 | 2.53 | 3.05 | 2.22 | 2.57         | H       |
|                             | Manager                  | 114 | 43             | 3.24 | 3.11 | 2.35 | 2.90 | 3.13 | 2.13 | 2.72         | H       |
|                             | Both Owner and Manager   | 23  | 9              | 2.91 | 2.65 | 2.39 | 2.61 | 3.00 | 2.26 | 2.58         | H       |
| <b>Number of Employees</b>  | <10                      | 259 | 97             | 2.93 | 2.78 | 2.42 | 2.67 | 3.06 | 2.19 | 2.68         | H       |
|                             | 10 - 99                  | 7   | 3              | 3.71 | 3.57 | 2.29 | 3.71 | 3.71 | 2.00 | 3.17         | H       |
|                             | Total Assets < 3,000,000 | 218 | 82             | 2.87 | 2.72 | 2.43 | 2.63 | 3.07 | 2.28 | 2.67         | H       |
| <b>Years in operation</b>   | 3,000,001 - 15,000,000   | 41  | 15             | 3.29 | 3.10 | 2.39 | 2.93 | 3.02 | 1.76 | 2.75         | H       |
|                             | 15,000,001 - 100M        | 7   | 3              | 3.57 | 3.43 | 2.43 | 3.43 | 3.57 | 1.71 | 3.02         | H       |
|                             | 3-5 years                | 116 | 44             | 2.74 | 2.65 | 2.47 | 2.63 | 3.01 | 2.42 | 2.65         | H       |
|                             | 6-10 years               | 74  | 28             | 3.11 | 3.03 | 2.53 | 2.85 | 3.23 | 2.05 | 2.80         | H       |
|                             | 11-15 years              | 35  | 13             | 3.43 | 3.29 | 2.40 | 3.14 | 3.54 | 2.14 | 2.99         | H       |
|                             | 16-20 years              | 9   | 3              | 3.00 | 2.67 | 1.89 | 2.33 | 2.78 | 1.33 | 2.33         | L       |
|                             | 21-25 years              | 13  | 5              | 2.77 | 2.08 | 2.00 | 2.08 | 2.54 | 1.46 | 2.15         | L       |
| <b>Line of Business</b>     | more than 25 years       | 19  | 7              | 2.84 | 2.53 | 2.26 | 2.26 | 2.58 | 2.26 | 2.46         | L       |
|                             | Trading                  | 236 | 88             | 2.96 | 2.81 | 2.41 | 2.67 | 3.09 | 2.18 | 2.69         | H       |
|                             | Services                 | 18  | 7              | 2.89 | 2.78 | 2.22 | 2.83 | 2.89 | 2.00 | 2.60         | H       |
|                             | Manufacturing            | 5   | 2              | 3.20 | 3.00 | 2.80 | 3.40 | 3.00 | 2.60 | 3.00         | H       |
|                             | Real Estate              | 2   | 1              | 3.00 | 3.00 | 2.50 | 2.50 | 1.50 | 1.00 | 2.25         | L       |
| <b>Form of Ownership</b>    | Livestock                | 5   | 2              | 2.40 | 2.40 | 3.40 | 2.80 | 3.80 | 3.40 | 3.03         | H       |
|                             | Sole proprietorship      | 259 | 97             | 2.94 | 2.79 | 2.42 | 2.68 | 3.05 | 2.18 | 2.68         | H       |
|                             | Partnership              | 2   | 1              | 2.50 | 2.00 | 3.00 | 3.00 | 4.00 | 3.00 | 2.92         | H       |
|                             | Corporation              | 4   | 2              | 3.75 | 3.75 | 2.75 | 3.75 | 4.00 | 1.75 | 3.29         | VH      |
|                             | Cooperative              | 1   | 0              | 4.00 | 4.00 | 1.00 | 3.00 | 4.00 | 4.00 | 3.33         | VH      |

**Note:** VL = Very low, L = Low, H = High, VH = Very high. Higher means indicate stronger financial-capital availability and management practices. n = Number of Respondents. FC = Financial Capital.

### Human Capital Across Enterprise Profiles

Table 5 shows that Human Capital was the weakest resource domain (M = 1.83, Low). Teamwork and collaboration were comparatively stronger (M = 2.30), but employee training (M = 1.61), career

advancement (M = 1.69) and performance evaluation (M = 1.70) were very low. The descriptive pattern was more favorable among better-capitalized and larger enterprises, but several of these groups were small and should not be generalized beyond the observed sample.

**Table 5:** Human Capital Mean Scores Across Enterprise Profiles

| Variable                    | Category               | n   | Percentage (%) | HC 1 | HC 2 | HC 3 | HC 4 | HC 5 | HC 6 | Overall Mean | Remarks |
|-----------------------------|------------------------|-----|----------------|------|------|------|------|------|------|--------------|---------|
| <b>Location of MSME</b>     | Manticao               | 109 | 41             | 1.52 | 1.81 | 1.85 | 1.72 | 2.13 | 1.71 | 1.79         | L       |
|                             | Lugait                 | 72  | 27             | 1.67 | 1.78 | 1.78 | 1.63 | 2.32 | 1.78 | 1.82         | L       |
|                             | Naawan                 | 85  | 32             | 1.66 | 1.89 | 1.94 | 1.69 | 2.51 | 1.61 | 1.88         | L       |
| <b>Role in the Business</b> | Owner                  | 129 | 48             | 1.31 | 1.47 | 1.50 | 1.47 | 1.95 | 1.50 | 1.53         | VL      |
|                             | Manager                | 114 | 43             | 1.92 | 2.26 | 2.27 | 1.96 | 2.77 | 1.94 | 2.19         | L       |
|                             | Both Owner and Manager | 23  | 9              | 1.70 | 1.70 | 1.83 | 1.61 | 1.96 | 1.57 | 1.72         | VL      |
| <b>Number of Employees</b>  | <10                    | 259 | 97             | 1.57 | 1.79 | 1.82 | 1.64 | 2.26 | 1.65 | 1.79         | L       |
|                             | 10 - 99                | 7   | 3              | 3.00 | 3.29 | 3.29 | 3.43 | 3.71 | 3.29 | 3.33         | VH      |

|                           |                          |     |    |      |      |      |      |      |      |      |    |
|---------------------------|--------------------------|-----|----|------|------|------|------|------|------|------|----|
| <b>Total Assets</b>       | < 3,000,000              | 218 | 82 | 1.49 | 1.71 | 1.75 | 1.55 | 2.17 | 1.58 | 1.71 | VL |
|                           | 3,000,001 - 15,000,000   | 41  | 15 | 2.05 | 2.29 | 2.29 | 2.22 | 2.88 | 2.12 | 2.31 | L  |
|                           | 15,000,001 - 100,000,000 | 7   | 3  | 2.71 | 2.86 | 2.86 | 2.86 | 3.14 | 2.71 | 2.86 | H  |
|                           |                          |     |    |      |      |      |      |      |      |      |    |
| <b>Years in operation</b> | 3-5 years                | 116 | 44 | 1.62 | 1.84 | 1.87 | 1.73 | 2.21 | 1.72 | 1.83 | L  |
|                           | 6-10 years               | 74  | 28 | 1.66 | 1.88 | 1.92 | 1.57 | 2.45 | 1.59 | 1.84 | L  |
|                           | 11-15 years              | 35  | 13 | 1.83 | 2.11 | 2.09 | 2.00 | 2.80 | 2.14 | 2.16 | L  |
|                           | 16-20 years              | 9   | 3  | 1.33 | 1.44 | 1.44 | 1.44 | 2.00 | 1.33 | 1.50 | VL |
|                           | 21-25 years              | 13  | 5  | 1.08 | 1.46 | 1.54 | 1.46 | 2.00 | 1.54 | 1.51 | VL |
|                           | more than 25 years       | 19  | 7  | 1.37 | 1.42 | 1.58 | 1.58 | 1.74 | 1.42 | 1.52 | VL |
| <b>Line of Business</b>   | Trading                  | 236 | 88 | 1.50 | 1.75 | 1.77 | 1.59 | 2.24 | 1.63 | 1.75 | VL |
|                           | Services                 | 18  | 7  | 2.50 | 2.50 | 2.72 | 2.50 | 2.67 | 2.22 | 2.52 | H  |
|                           | Manufacturing            | 5   | 2  | 2.60 | 2.20 | 2.40 | 2.80 | 3.20 | 2.20 | 2.57 | H  |
|                           | Real Estate              | 2   | 1  | 1.00 | 1.00 | 1.00 | 1.00 | 1.50 | 1.00 | 1.08 | VL |
|                           | Livestock                | 5   | 2  | 2.80 | 2.80 | 2.80 | 2.60 | 3.40 | 2.80 | 2.87 | H  |
| <b>Form of Ownership</b>  | Sole proprietorship      | 259 | 97 | 1.56 | 1.79 | 1.82 | 1.65 | 2.27 | 1.65 | 1.79 | L  |
|                           | Partnership              | 2   | 1  | 3.00 | 3.00 | 3.00 | 2.50 | 3.50 | 3.00 | 3.00 | H  |
|                           | Corporation              | 4   | 2  | 3.75 | 3.75 | 3.75 | 3.75 | 4.00 | 4.00 | 3.83 | VH |
|                           | Cooperative              | 1   | 0  | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | L  |

**Note:** VL = Very low, L = Low, H = High, VH = Very high. Higher means indicate stronger human-resource development and management practices. n = Number of Respondents. HC = Human Capital.

### Sales-based Financial Performance

Table 6 presents the recalled annual sales-performance categories. The overall mean across the three reported years was low ( $M = 1.55$ ) and the mean category rose descriptively from approximately 1.41 in 2021 to 1.74 in 2023.

Because all three years were recalled in one cross-sectional survey, this difference is reported only as a retrospective descriptive pattern, not as evidence of longitudinal improvement. Higher-asset firms occupied higher sales categories than the low-asset majority.

**Table 6:** Sales-based Financial Performance Mean Scores Across Enterprise Profiles

| Variable                    | Category                 | n   | Percentage (%) | FP 1 | FP 2 | FP 3 | Overall Mean | Remarks |
|-----------------------------|--------------------------|-----|----------------|------|------|------|--------------|---------|
| <b>Location of MSME</b>     | Manticao                 | 109 | 41             | 1.29 | 1.41 | 1.64 | 1.45         | L       |
|                             | Lugait                   | 72  | 27             | 1.57 | 1.60 | 2.01 | 1.73         | L       |
|                             | Naawan                   | 85  | 32             | 1.42 | 1.48 | 1.64 | 1.51         | L       |
| <b>Role in the Business</b> | Owner                    | 129 | 48             | 1.29 | 1.36 | 1.67 | 1.44         | L       |
|                             | Manager                  | 114 | 43             | 1.60 | 1.67 | 1.88 | 1.71         | L       |
|                             | Both Owner and Manager   | 23  | 9              | 1.17 | 1.30 | 1.48 | 1.32         | L       |
| <b>Number of Employees</b>  | <10                      | 259 | 97             | 1.39 | 1.46 | 1.71 | 1.52         | L       |
|                             | 10 - 99                  | 7   | 3              | 2.00 | 2.29 | 2.71 | 2.33         | A       |
| <b>Total Assets</b>         | Less than 3,000,000      | 218 | 82             | 1.23 | 1.32 | 1.59 | 1.43         | L       |
|                             | 3,000,001 - 15,000,000   | 41  | 15             | 2.12 | 2.20 | 2.37 | 2.20         | A       |
|                             | 15,000,001 - 100,000,000 | 7   | 3              | 2.71 | 2.43 | 2.86 | 2.68         | H       |
|                             |                          |     |                |      |      |      |              |         |
| <b>Years in operation</b>   | 3-5 years                | 116 | 44             | 1.30 | 1.34 | 1.60 | 1.42         | L       |
|                             | 6-10 years               | 74  | 28             | 1.45 | 1.58 | 1.86 | 1.63         | L       |
|                             | 11-15 years              | 35  | 13             | 1.60 | 1.71 | 1.86 | 1.72         | L       |
|                             | 16-20 years              | 9   | 3              | 1.11 | 1.11 | 1.33 | 1.19         | L       |
|                             | 21-25 years              | 13  | 5              | 1.46 | 1.62 | 1.92 | 1.67         | L       |
|                             | more than 25 years       | 19  | 7              | 1.68 | 1.63 | 1.95 | 1.75         | L       |
| <b>Line of Business</b>     | Trading                  | 236 | 88             | 1.33 | 1.41 | 1.64 | 1.46         | L       |
|                             | Services                 | 18  | 7              | 2.00 | 2.06 | 2.44 | 2.17         | A       |
|                             | Manufacturing            | 5   | 2              | 2.20 | 2.20 | 2.20 | 2.20         | A       |

|                          |                     |     |    |      |      |      |      |    |
|--------------------------|---------------------|-----|----|------|------|------|------|----|
| <b>Form of Ownership</b> | Real Estate         | 2   | 1  | 3.00 | 3.00 | 3.50 | 3.17 | H  |
|                          | Livestock           | 5   | 2  | 1.60 | 1.60 | 2.60 | 1.93 | A  |
|                          | Sole proprietorship | 259 | 97 | 1.37 | 1.45 | 1.71 | 1.51 | L  |
|                          | Partnership         | 2   | 1  | 1.00 | 1.00 | 1.50 | 1.17 | L  |
|                          | Corporation         | 4   | 2  | 4.00 | 4.00 | 4.00 | 4.00 | VH |
|                          | Cooperative         | 1   | 0  | 2.00 | 2.00 | 2.00 | 2.00 | A  |

**Note:** L = Low, A = Average, H = High, VH = Very high based on the ordered sales-performance categories. The year-specific values are retrospective reports obtained in one survey. n = Number of Respondents. FP = Financial Performance.

**Table 7: Employment-based Non-financial Performance Mean Scores Across Enterprise Profiles**

| Variable                    | Category                 | n   | Percentage (%) | NFP 1 | NFP 2 | NFP 3 | Overall Mean | Remarks |
|-----------------------------|--------------------------|-----|----------------|-------|-------|-------|--------------|---------|
| <b>Location of MSME</b>     | Manticao                 | 109 | 41             | 1.11  | 1.19  | 1.29  | 1.20         | L       |
|                             | Lugait                   | 72  | 27             | 1.13  | 1.18  | 1.33  | 1.21         | L       |
|                             | Naawan                   | 85  | 32             | 1.09  | 1.24  | 1.32  | 1.22         | L       |
| <b>Role in the Business</b> | Owner                    | 129 | 48             | 1.08  | 1.14  | 1.28  | 1.17         | L       |
|                             | Manager                  | 114 | 43             | 1.14  | 1.28  | 1.37  | 1.26         | L       |
|                             | Both Owner and Manager   | 23  | 9              | 1.13  | 1.17  | 1.22  | 1.17         | L       |
| <b>Number of Employees</b>  | <10                      | 259 | 97             | 1.09  | 1.18  | 1.29  | 1.18         | L       |
|                             | 10 - 99                  | 7   | 3              | 1.86  | 2.14  | 2.29  | 2.10         | A       |
|                             | Total Assets             |     |                |       |       |       |              |         |
| <b>Years in operation</b>   | Less than 3,000,000      | 218 | 82             | 1.06  | 1.13  | 1.23  | 1.14         | L       |
|                             | 3,000,001 - 15,000,000   | 41  | 15             | 1.29  | 1.49  | 1.59  | 1.46         | L       |
|                             | 15,000,001 - 100,000,000 | 7   | 3              | 1.57  | 1.71  | 2.14  | 1.81         | A       |
|                             | 3-5 years                | 116 | 44             | 1.30  | 1.34  | 1.60  | 1.42         | L       |
|                             | 6-10 years               | 74  | 28             | 1.45  | 1.58  | 1.86  | 1.63         | L       |
| <b>Line of Business</b>     | 11-15 years              | 35  | 13             | 1.60  | 1.71  | 1.86  | 1.72         | L       |
|                             | 16-20 years              | 9   | 3              | 1.11  | 1.11  | 1.33  | 1.19         | L       |
|                             | 21-25 years              | 13  | 5              | 1.46  | 1.62  | 1.92  | 1.67         | L       |
|                             | more than 25 years       | 19  | 7              | 1.68  | 1.63  | 1.95  | 1.75         | L       |
|                             | Trading                  | 236 | 88             | 1.10  | 1.20  | 1.31  | 1.20         | L       |
| <b>Form of Ownership</b>    | Services                 | 18  | 7              | 1.28  | 1.33  | 1.44  | 1.35         | L       |
|                             | Manufacturing            | 5   | 2              | 1.20  | 1.00  | 1.00  | 1.07         | L       |
|                             | Real Estate              | 2   | 1              | 1.00  | 1.00  | 1.50  | 1.17         | L       |
|                             | Livestock                | 5   | 2              | 1.00  | 1.00  | 1.00  | 1.00         | L       |
|                             | Sole proprietorship      | 259 | 97             | 1.10  | 1.19  | 1.29  | 1.20         | L       |
| <b>Form of Ownership</b>    | Partnership              | 2   | 1              | 1.00  | 1.00  | 1.50  | 1.17         | L       |
|                             | Corporation              | 4   | 2              | 1.75  | 2.00  | 2.50  | 2.08         | A       |
|                             | Cooperative              | 1   | 0              | 1.00  | 1.00  | 1.00  | 1.00         | L       |

**Note:** L = Low, A = Average, H = High, VH = Very high based on the ordered employment-change categories. The year-specific values are retrospective reports obtained in one survey. n = Number of Respondents. NFP = Non-financial Performance.

## Employment-based Non-financial Performance

Table 7 summarizes the employment-based performance categories. The overall mean was low ( $M = 1.21$ ), indicating that most MSMEs were concentrated near the no-increase or limited-increase categories. The descriptive annual means increased modestly across the recalled years, but these values should not be read as panel or longitudinal growth estimates. Asset category again displayed the clearest descriptive gradient.

## Differences in Resource Capital and Performance Across Enterprise Profiles

Table 8 reports every nominally significant Kruskal-Wallis comparison with its chi-square

statistic, degrees of freedom, p-value and eta<sup>2</sup>H effect size. Total assets produced the largest and most consistent effects, particularly for sales-based Financial Performance (eta<sup>2</sup>H = 0.140), employment-based Non-Financial Performance (eta<sup>2</sup>H = 0.109), Human Capital (eta<sup>2</sup>H = 0.083) and Physical Capital (eta<sup>2</sup>H = 0.081). Role in the business also showed notable effects for Physical and Human Capital. Results involving very small profile groups require additional caution.

Under the 30-test Holm-Bonferroni sensitivity screen, the results with raw  $p \leq 0.001$  remained robust: role in business for Physical and Human Capital; number of employees for Human Capital, Financial Performance and Non-Financial Performance; total assets for all four reported

outcomes; and form of ownership for Human Capital and Financial Performance. Other nominally significant omnibus results are retained as

exploratory evidence rather than confirmatory findings.

**Table 8:** Significant Kruskal-Wallis Results by Enterprise Profile

| Profile Variable           | Significant Outcome       | $\chi^2$ (df) | p-value | $\eta^2H$ |
|----------------------------|---------------------------|---------------|---------|-----------|
| <b>Location</b>            | Physical Capital          | 6.387 (2)     | 0.041   | 0.017     |
|                            | Financial Performance     | 9.647 (2)     | 0.008   | 0.029     |
| <b>Role in Business</b>    | Physical Capital          | 28.640 (2)    | <0.001  | 0.101     |
|                            | Human Capital             | 35.300 (2)    | <0.001  | 0.127     |
|                            | Non-Financial Performance | 6.050 (2)     | 0.049   | 0.015     |
| <b>Number of Employees</b> | Physical Capital          | 8.870 (1)     | 0.003   | 0.030     |
|                            | Human Capital             | 13.510 (1)    | <0.001  | 0.047     |
|                            | Financial Performance     | 10.690 (1)    | 0.001   | 0.037     |
|                            | Non-Financial Performance | 14.750 (1)    | <0.001  | 0.052     |
| <b>Total Assets</b>        | Physical Capital          | 23.330 (2)    | <0.001  | 0.081     |
|                            | Human Capital             | 23.920 (2)    | <0.001  | 0.083     |
|                            | Financial Performance     | 38.790 (2)    | <0.001  | 0.14      |
|                            | Non-Financial Performance | 30.630 (2)    | <0.001  | 0.109     |
| <b>Years in Operation</b>  | Physical Capital          | 12.680 (5)    | 0.027   | 0.03      |
|                            | Financial Capital         | 16.870 (5)    | 0.005   | 0.046     |
|                            | Human Capital             | 13.480 (5)    | 0.019   | 0.033     |
|                            | Financial Performance     | 11.990 (5)    | 0.035   | 0.027     |
| <b>Line of Business</b>    | Physical Capital          | 10.260 (4)    | 0.036   | 0.024     |
|                            | Human Capital             | 12.160 (4)    | 0.016   | 0.031     |
|                            | Financial Performance     | 13.140 (4)    | 0.011   | 0.035     |
| <b>Form of Ownership</b>   | Physical Capital          | 13.730 (3)    | 0.003   | 0.041     |
|                            | Human Capital             | 17.690 (3)    | <0.001  | 0.056     |
|                            | Financial Performance     | 16.000 (3)    | 0.001   | 0.05      |
|                            | Non-Financial Performance | 13.930 (3)    | 0.003   | 0.042     |

**Note:**  $\eta^2H$  = Kruskal-Wallis effect size. DSCF pairwise testing followed significant omnibus tests. A Holm-Bonferroni sensitivity screen across the 30 omnibus tests was used to distinguish robust (raw  $p \leq 0.001$ ) from exploratory nominal findings.

### Post-Hoc Analysis of Enterprise-Profile Differences

Table 9 presents the DSCF pairwise comparisons for profile-outcome combinations that reached nominal omnibus significance. DSCF p-values are adjusted within each relevant pairwise family. The clearest pattern concerned total assets: enterprises in the two higher asset categories generally reported stronger Physical Capital, Human Capital, sales-based Financial Performance and employment-based Non-Financial Performance

than enterprises below PHP 3 million, while the two higher-asset categories were usually not distinguishable from one another.

Location, respondent role, employee size, line of business and ownership also generated selected pairwise differences, but these results should be interpreted with the sample imbalance and the omnibus multiplicity sensitivity in mind. Ownership, industry and higher employee-size categories contained very small numbers of firms, making effect estimates less stable.

**Table 9:** Dwass-Steel-Critchlow-Fligner Pairwise Comparisons Following Significant Omnibus Tests

| Enterprise-Variables |    |          | Physical Capital |      | Financial Capital |      | Human Capital |      | Financial Performance |      | Non-Financial Performance |      |
|----------------------|----|----------|------------------|------|-------------------|------|---------------|------|-----------------------|------|---------------------------|------|
| Location of MSME     |    |          | W                | p    | W                 | p    | W             | p    | W                     | p    | W                         | p    |
| Lugait               | vs | Manticao | 2.93             | 0.10 | 1.61              | 0.49 | 0.43          | 0.95 | -4.17                 | 0.01 | 0.09                      | 1.00 |
| Lugait               | vs | Naawan   | 3.45             | 0.04 | 1.55              | 0.52 | 2.07          | 0.31 | -3.35                 | 0.05 | 0.89                      | 0.81 |
| Manticao             | vs | Naawan   | 0.17             | 0.99 | 0.16              | 0.99 | 1.98          | 0.34 | 0.73                  | 0.86 | 0.93                      | 0.79 |
| Role in the Business |    |          |                  |      |                   |      |               |      |                       |      |                           |      |

|                                          |                        |       |        |       |      |       |        |       |        |       |        |
|------------------------------------------|------------------------|-------|--------|-------|------|-------|--------|-------|--------|-------|--------|
| Both Owner and Manager vs                | Manager                | 2.10  | 0.30   | 1.70  | 0.45 | 3.17  | 0.07   | 2.76  | 0.13   | 1.27  | 0.64   |
| Both Owner and Manager vs                | Owner                  | -2.93 | 0.10   | -0.03 | 1.00 | -1.34 | 0.61   | 2.03  | 0.32   | -0.65 | 0.89   |
| Manager vs                               | Owner                  | -7.42 | <0.001 | -2.93 | 0.10 | -8.37 | <0.001 | -1.92 | 0.37   | -3.45 | 0.04   |
| Number of Employees 10-99 vs             | <10                    | -4.21 | 0.00   | -2.18 | 0.12 | -5.20 | <0.001 | -4.62 | 0.00   | -5.43 | <0.001 |
| Total Assets 15,000,001 - 100,000,000 vs | 3,000,000 - 15,000,000 | -0.43 | 0.95   | -1.22 | 0.66 | -2.63 | 0.15   | -1.7  | 0.45   | -1.58 | 0.50   |
| 15,000,001 - 100,000,000 vs              | < 3,000,000            | -3.78 | 0.02   | -1.67 | 0.47 | -4.76 | 0.00   | -5.42 | <0.001 | -5.09 | <0.001 |
| 3,000,000 - 15,000,000 vs                | < 3,000,000            | -5.95 | <0.001 | -0.51 | 0.93 | -5.35 | <0.001 | -7.4  | <0.001 | -6.62 | <0.001 |
| Years in operation 11-15 years vs        | 16-20 years            | -2.73 | 0.39   | -3.48 | 0.14 | -3.86 | 0.07   | -2.97 | 0.29   | -3.13 | 0.23   |
| 11-15 years vs                           | 21-25 years            | -4.00 | 0.05   | -4.59 | 0.02 | -3.12 | 0.24   | -0.65 | 1.00   | -1.75 | 0.82   |
| 11-15 years vs                           | 3-5 years              | -3.14 | 0.23   | -2.94 | 0.30 | -2.60 | 0.44   | -3.29 | 0.18   | -2.13 | 0.66   |
| 11-15 years vs                           | 6-10 years             | -1.86 | 0.78   | -1.49 | 0.90 | -2.45 | 0.51   | -0.53 | 1.00   | -1.96 | 0.74   |
| 11-15 years vs                           | more than 25 years     | -3.19 | 0.21   | -3.11 | 0.24 | -3.66 | 0.10   | -0.57 | 1.00   | -1.95 | 0.74   |
| 16-20 years vs                           | 21-25 years            | -0.62 | 1.00   | -0.46 | 1.00 | 0.97  | 0.98   | 1.82  | 0.79   | 2.02  | 0.71   |
| 16-20 years vs                           | 3-5 years              | 1.39  | 0.92   | 2.15  | 0.65 | 2.61  | 0.44   | 1.61  | 0.87   | 2.44  | 0.52   |
| 16-20 years vs                           | 6-10 years             | 1.66  | 0.85   | 3.00  | 0.28 | 2.56  | 0.46   | 2.90  | 0.31   | 2.43  | 0.52   |
| 16-20 years vs                           | more than 25 years     | 0.27  | 1.00   | 1.25  | 0.95 | 0.40  | 1.00   | 2.47  | 0.50   | 1.94  | 0.74   |
| 21-25 years vs                           | 3-5 years              | 2.53  | 0.47   | 3.02  | 0.27 | 1.71  | 0.83   | -0.98 | 0.98   | 0.64  | 1.00   |
| 21-25 years vs                           | 6-10 years             | 3.14  | 0.23   | 3.97  | 0.06 | 1.66  | 0.85   | 0.44  | 1.00   | 0.63  | 1.00   |
| 21-25 years vs                           | more than 25 years     | 1.08  | 0.97   | 1.53  | 0.89 | -0.75 | 1.00   | 0.66  | 1.00   | -0.04 | 1.00   |
| 3-5 years vs                             | 6-10 years             | 1.41  | 0.92   | 1.68  | 0.84 | 0.00  | 1.00   | 3.56  | 0.12   | 0.03  | 1.00   |
| 3-5 years vs                             | more than 25 years     | -1.32 | 0.94   | -1.43 | 0.91 | -2.53 | 0.47   | 2.04  | 0.70   | -0.72 | 1.00   |
| 6-10 years vs                            | more than 25 years     | -1.99 | 0.72   | -2.31 | 0.58 | -2.63 | 0.43   | -0.16 | 1.00   | -0.71 | 1.00   |
| Line of Business                         |                        |       |        |       |      |       |        |       |        |       |        |
| Livestock vs                             | Manufacturing          | 0.71  | 0.99   | -1.40 | 0.86 | -0.52 | 1.00   | -0.55 | 1.00   | 1.27  | 0.90   |
| Livestock vs                             | Real Estate            | -2.33 | 0.47   | -2.62 | 0.34 | -1.66 | 0.77   | 2.66  | 0.33   | 2.00  | 0.62   |
| Livestock vs                             | Services               | 0.49  | 1.00   | -0.42 | 1.00 | 0.06  | 1.00   | 1.60  | 0.79   | 2.44  | 0.42   |
| Livestock vs                             | Trading                | -0.75 | 0.98   | -0.67 | 0.99 | -1.93 | 0.65   | -0.91 | 0.97   | 1.71  | 0.75   |
| Manufacturing vs                         | Real Estate            | -1.95 | 0.64   | -1.14 | 0.93 | -1.93 | 0.65   | 2.01  | 0.62   | 1.04  | 0.95   |
| Manufacturing vs                         | Services               | -0.64 | 0.99   | -0.05 | 1.00 | 0.53  | 1.00   | 1.52  | 0.82   | 1.93  | 0.65   |
| Manufacturing vs                         | Trading                | -2.16 | 0.55   | 0.54  | 1.00 | -2.02 | 0.61   | 0.05  | 1.00   | 0.68  | 0.99   |
| Real Estate vs                           | Services               | 2.78  | 0.28   | 0.72  | 0.99 | 2.18  | 0.54   | -1.81 | 0.70   | 0.58  | 0.99   |
| Real Estate vs                           | Trading                | 2.55  | 0.37   | 1.70  | 0.75 | 1.21  | 0.91   | -3.22 | 0.15   | -0.73 | 0.99   |
| Services vs                              | Trading                | -3.08 | 0.19   | 0.20  | 1.00 | -4.02 | 0.04   | -4.01 | 0.04   | -3.07 | 0.19   |
| Form of Ownership                        |                        |       |        |       |      |       |        |       |        |       |        |
| Cooperative vs                           | Corporation            | 0.34  | 1.00   | 0.00  | 1.00 | 2.78  | 0.20   | 3.10  | 0.13   | 0.66  | 0.97   |
| Cooperative vs                           | Partnership            | 1.68  | 0.64   | -0.42 | 0.99 | 1.29  | 0.80   | -0.82 | 0.94   | -0.42 | 0.99   |
| Cooperative vs                           | Sole proprietorship    | -2.26 | 0.38   | -1.61 | 0.67 | -1.75 | 0.61   | -2.76 | 0.21   | -1.51 | 0.71   |
| Corporation vs                           | Partnership            | 1.53  | 0.70   | -0.76 | 0.95 | -0.62 | 0.97   | -3.31 | 0.09   | -1.04 | 0.88   |
| Corporation vs                           | Sole proprietorship    | -3.32 | 0.09   | -2.27 | 0.38 | -4.71 | 0.01   | -4.92 | 0.00   | -4.67 | 0.01   |
| Partnership vs                           | Sole proprietorship    | -3.45 | 0.07   | -1.43 | 0.74 | -3.29 | 0.09   | -0.78 | 0.95   | -2.21 | 0.40   |

**Note:** W = DSCF test statistic. Pairwise p-values are multiplicity-adjusted within the relevant DSCF family. Pairwise findings attached to omnibus tests that did not survive the broader Holm sensitivity screen should be treated as exploratory.

## Regression Analysis of Resource Capital and MSME Performance

The regression models estimate the unique association of each capital domain with the 2023 performance category while holding the other two capital domains constant. They do not control for total assets or another firm-size variable; therefore, they should be interpreted as unadjusted resource-performance models rather than estimates that isolate capital effects from enterprise scale.

### Model 1: Sales-Based Financial Performance

Table 10 shows that the sales model was statistically significant,  $F(3, 262) = 21.43$ ,  $p < 0.001$ ,  $R = 0.444$ ,  $R\text{-squared} = 0.197$ . Physical Capital ( $B = 0.220$ ,  $SE = 0.072$ ,  $t = 3.059$ ,  $p = 0.002$ , 95% CI [0.078, 0.361]) and Human Capital ( $B = 0.221$ ,  $SE = 0.062$ ,  $t = 3.556$ ,  $p < 0.001$ , 95% CI [0.099, 0.343]) were positive significant predictors. Financial Capital did not contribute a statistically significant unique coefficient after the other capital domains were included ( $B = 0.027$ ,  $SE = 0.060$ ,  $t = 0.453$ ,  $p = 0.651$ , 95% CI [-0.090, 0.144]).

**Table 10:** Multiple Regression Predicting Sales-based Financial Performance

| Predictor         | B     | SE    | t-value | p-value | 95% CI          | Decision        |
|-------------------|-------|-------|---------|---------|-----------------|-----------------|
| Physical Capital  | 0.220 | 0.072 | 3.059   | 0.002   | [0.078, 0.361]  | Significant     |
| Financial Capital | 0.027 | 0.060 | 0.453   | 0.651   | [-0.090, 0.144] | Not significant |
| Human Capital     | 0.221 | 0.062 | 3.556   | <.001   | [0.099, 0.343]  | Significant     |

**Note:** Regression equation: Sales-based Financial Performance =  $0.510 + 0.220$  (Physical Capital) +  $0.221$  (Human Capital).

B = unstandardized regression coefficient, SE = standard error.

### Model 2: Employment-Based Non-Financial Performance

Table 11 shows that the employment-based model was statistically significant,  $F(3, 262) = 24.49$ ,  $p < 0.001$ ,  $R = 0.468$ ,  $R\text{-squared} = 0.219$ . Physical Capital was positively associated with the outcome ( $B = 0.081$ ,  $SE = 0.040$ ,  $t = 2.030$ ,  $p = 0.043$ , 95% CI

[0.003, 0.159]) and Human Capital showed the strongest positive coefficient ( $B = 0.189$ ,  $SE = 0.034$ ,  $t = 5.480$ ,  $p < 0.001$ , 95% CI [0.121, 0.256]). Financial Capital again did not show a statistically significant unique coefficient ( $B = -0.051$ ,  $SE = 0.033$ ,  $t = -1.530$ ,  $p = 0.127$ , 95% CI [-0.115, 0.014]).

**Table 11:** Multiple Regression Predicting Employment-based Non-financial Performance

| Predictor         | B      | SE    | t-value | p-value | 95% CI          | Decision        |
|-------------------|--------|-------|---------|---------|-----------------|-----------------|
| Physical Capital  | 0.081  | 0.040 | 2.03    | 0.043   | [0.003, 0.159]  | Significant     |
| Financial Capital | -0.051 | 0.033 | -1.53   | 0.127   | [-0.115, 0.014] | Not significant |
| Human Capital     | 0.189  | 0.034 | 5.48    | <.001   | [0.121, 0.256]  | Significant     |

**Note:** Regression equation: Employment-based Non-Financial Performance =  $0.793 + 0.081$ (Physical Capital) +  $0.189$ (Human Capital).

B = unstandardized regression coefficient; SE = standard error.

## Discussion

### Enterprise-Profile Differences in Resource Capital and Performance

The most consequential profile pattern is the separation between the low-asset majority and the relatively small group of better-capitalized enterprises. This pattern is theoretically consistent with the idea that accumulated assets enlarge the feasible set of technologies, inventories, facilities and organizational investments available to a firm. At the same time, total assets should not be treated as an independent explanation wholly separate from the capital domains: it is a broad proxy for resource endowment and can overlap with the ability to acquire physical assets, obtain finance and

support employees. The strong asset effects therefore reinforce the need to interpret the capital-performance regressions in the context of firm heterogeneity rather than as size-independent effects (13, 15, 23-25).

Other profile differences by location, role, age, line of business and ownership suggest that resource constraints are embedded in local and organizational conditions. However, the most defensible evidence is concentrated in the large asset and employee-size contrasts and in the omnibus results that remained robust under the multiplicity sensitivity screen. Findings from very small groups, such as corporations, partnerships, cooperatives, manufacturing, real estate and larger employers, should be viewed as signals for future

stratified studies rather than as stable population estimates.

### **Low Human-capital Conditions**

The low Human Capital level is substantively important because it identifies a capability bottleneck rather than merely a shortage of labor. Weak training, career-development and performance-evaluation practices reduce the opportunities through which employees acquire firm-specific knowledge, receive feedback and learn to use technology or solve customer and operational problems. This interpretation is consistent with meta-analytic and large-sample evidence linking human capital and HR-enhancing practices with entrepreneurial and SME performance and with recent evidence that human capital can operate through innovation and productivity mechanisms (16, 17, 20, 21).

For resource-constrained MSMEs, human-capital development does not necessarily require large formal HR departments. Structured onboarding, short skills modules, cross-training, routine feedback, knowledge sharing and owner-manager coaching can progressively build capabilities. These practices are especially relevant when physical assets or digital tools are being upgraded because the return on equipment depends partly on the skills and routines used to operate it.

### **Weak Sales and Employment Performance**

The concentration of firms in the lower sales and employment categories indicates limited market and workforce expansion in the observed sample. Sales and employment should nevertheless be interpreted as different outcomes: sales reflect market demand and revenue generation, whereas employment captures workforce expansion and organizational scale. Prior growth research cautions that firms can grow on one dimension without growing proportionately on another, so the use of both indicators offers a more balanced view than a single performance measure (1, 2).

The apparent increase in mean categories from 2021 to 2023 is intentionally not described as longitudinal recovery. Because all annual values were recalled during one survey, recall error and current-state perceptions may influence the retrospective pattern. The results therefore support a descriptive statement that later recalled categories were somewhat higher, but they do not

establish a temporal trajectory or the causal effect of any resource investment over time.

### **Importance of Physical and Human Capital**

The positive associations of Physical and Human Capital with both outcomes support a complementarity interpretation. Physical assets can raise capacity and operational reliability, but their value depends on the people who select, maintain, coordinate and use them. Human Capital can improve service, problem solving, learning and opportunity recognition, but its productive value may be limited when firms lack appropriate equipment, technology, inventory systems, or facilities. This resource-combination logic is closer to Resource-Based Theory than treating each asset class as an isolated source of advantage (3, 5-7).

This also clarifies the sustained-advantage question raised by the reviewers. Physical Capital alone is often visible and imitable, so it may produce efficiency gains without generating durable advantage. Human Capital and the routines that connect people with productive assets can be more tacit, socially embedded and difficult to reproduce. For MSMEs, the strategic priority is therefore not simply to acquire more resources but to orchestrate physical and human resources into routines that competitors cannot easily copy.

### **Interpreting the Non-significant Unique Effect of Financial Capital**

The non-significant Financial Capital coefficient should not be read as evidence that money, liquidity, or credit are irrelevant. Financial Capital is an enabling resource, it can support working capital, inventory, equipment, technology, training, hiring and the capacity to absorb shocks. When Physical and Human Capital are included simultaneously, part of the contribution of finance may already be represented in the productive assets and capabilities that prior financing made possible. Shared variance among capital domains can therefore reduce the unique coefficient of Financial Capital even when finance remains economically important (11-15).

The firm-size issue further qualifies this finding. Better-capitalized firms may simultaneously have greater assets, stronger collateral, easier credit access, more developed workforce practices and stronger performance. Because the reported regressions do not include an asset or size control, the coefficients cannot distinguish fully between a

pure capital-domain relationship and a broader enterprise-scale effect. A size-adjusted re-estimation using total assets or an independently specified size measure would be an appropriate robustness analysis when respondent-level data are re-estimated; until then, the present coefficients are best interpreted as conditional associations among the three capital domains within the observed MSME sample.

## Conclusion

This study shows that resource conditions and performance are unevenly distributed across MSMEs in Manticao, Lugait and Naawan. Physical and Financial Capital were relatively stronger than Human Capital, while sales- and employment-based performance remained concentrated in the lower ordered categories. Total assets were the clearest enterprise-profile differentiator, underscoring that low-asset micro-enterprises face a different resource environment from better-capitalized firms.

In the unadjusted regression models, Physical Capital and Human Capital were positively associated with both performance outcomes. The result suggests that productive assets and workforce capabilities are complementary foundations for MSME development. Financial Capital did not show an additional statistically significant unique coefficient once the other capital domains were included, but it remains a foundational enabling resource whose contribution may operate through asset acquisition, working-capital continuity and human-capital investment.

For practice, support programs should prioritize technology and equipment upgrading together with structured workforce development, loan-readiness and financial-record improvement, especially for low-asset micro-enterprises. The findings should be interpreted within the study design: performance values for 2021-2023 were recalled in one survey, firm-size controls were not included in the primary regressions and several profile categories were small. Future studies should use objective records, longitudinal or repeated-measures designs and size-adjusted models to test whether the observed capital-performance relationships persist after enterprise scale is explicitly controlled.

## Abbreviations

DSCF: Dwass-Steel-Critchlow-Fligner, ManLuNa: Manticao, Lugait and Naawan, MSME: Micro, Small and Medium Enterprise, RBT: Resource-Based Theory.

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## Author Contributions

All authors contributed to the conceptualization, methodology, data collection, data curation, analysis, interpretation, manuscript preparation, critical revision and approval of the final manuscript. All authors accept responsibility for the integrity of the work.

## Conflict of Interest

The authors declare no conflict of interest.

## Data Availability

The data supporting the findings are available from the corresponding author upon reasonable request, subject to participant-confidentiality and applicable institutional requirements. The analytic dataset is not publicly posted because it was derived from participating MSMEs under confidentiality assurances.

## Declaration of Artificial Intelligence (AI) Assistance

Generative artificial intelligence tools were used to assist with language editing, literature-search support and manuscript formatting during revision. The authors independently verified the cited sources, statistical values, interpretations and final wording and accept full responsibility for the content of the manuscript. No AI-generated data, participants, or statistical results were introduced.

## Ethics Approval

The source study obtained institutional approval before data collection and followed applicable ethical standards for research involving human participants. Participation was voluntary, respondents were informed of the study purpose, confidentiality was protected and no direct

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