

MEL (Quantitative) Case Study

Data-Driven Insights for MSME
Employment and Growth

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Focus: Kenya Manufacturing Sector

Data Cleaning and Quality Summary

FIVE KEY DATA ISSUES

- **Inconsistent Naming:** County names had spelling variations and extra characters (e.g., 'Nairobi', 'Kisu mu')
- **Duplicate IDs:** Multiple firms shared the same ID, suggesting data entry errors or non-unique identifiers
- **Missing Values:** Gaps in key variables like Revenue and Employees
- **Outliers:** Extreme values in Employees (e.g., 1000 employees for a Micro firm)
- **Unstructured Text:** Production column combined ISIC code and description in one field

MAIN CLEANING STEPS

- **Standardized County Names:** Applied string cleaning and mapping to ensure consistent naming (e.g., 'Nairobi', 'Kisumu')
- **Imputed Missing Data:** Filled missing Employees and Revenue values with respective medians
- **Capped Outliers:** Capped Employees at 50 to align with Small firm definition, creating Employees_Capped variable
- **Extracted ISIC Code:** Parsed production string to extract 4-digit ISIC code for structured analysis
- **Validated Output:** Confirmed data integrity and saved cleaned dataset for downstream analysis

Descriptive Analysis - Employment Indicators

INDICATOR	VALUE
Total Employment	11,277 jobs
Average per Firm	2.25 employees
Micro Firm Share	70% of jobs
Total Firms	5,016 firms
Female-Owned Share	39.8% of jobs

Key Insight: Micro firms are the backbone of employment, contributing 70% of total jobs despite their small individual size. The average firm employs 2.25 people. Female-owned firms represent 45% of all firms but account for only 39.8% of employment, indicating they are smaller employers on average.

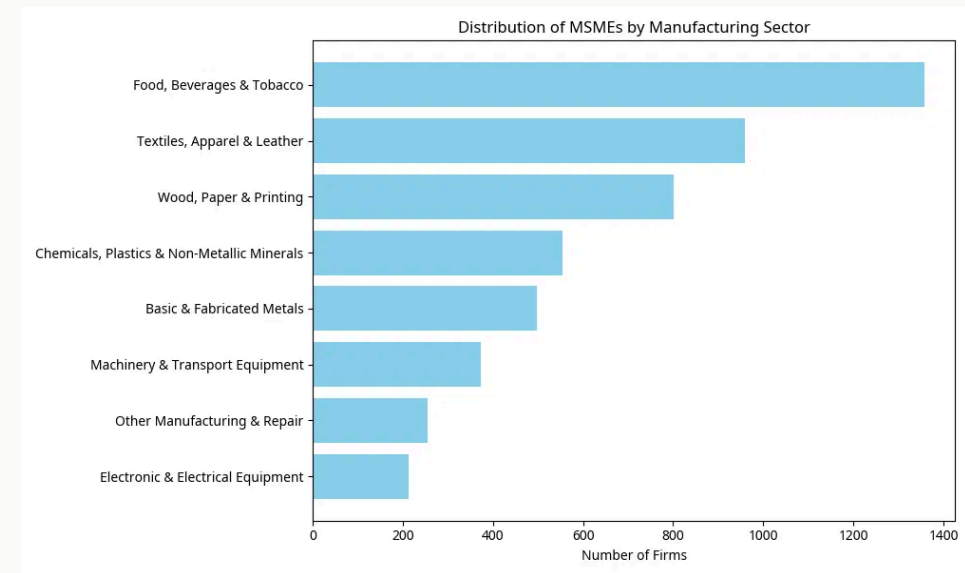


Sector Recoding and Distribution

TRANSFORMATION LOGIC

- **Extraction:** Extracted the 4-digit ISIC code from the production description column
- **Aggregation:** Used the first two digits of the ISIC code to define broader industry groups
- **Mapping:** Mapped 2-digit ISIC codes to 8 high-level manufacturing sectors (e.g., 10-12 to Food, Beverages & Tobacco)
- **Classification:** Created a new Sector variable providing policy-relevant and manageable categorical variable for analysis

SECTOR DISTRIBUTION



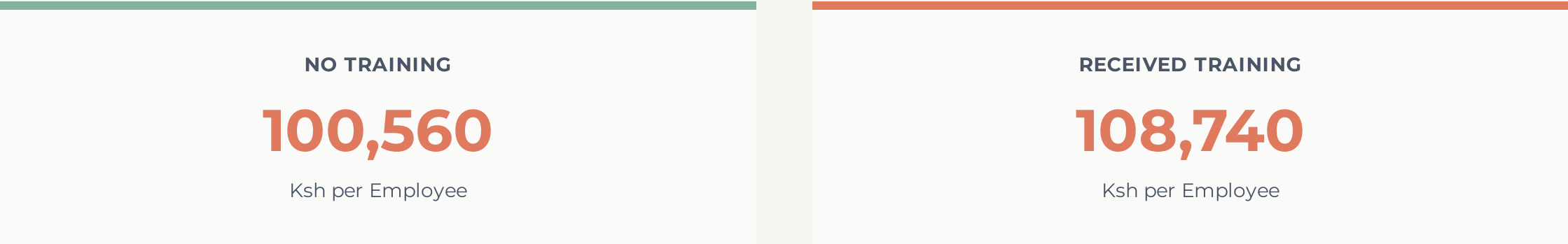
Key Insight: The Food, Beverages & Tobacco sector is the largest, accounting for 27% of the firms (1,358 firms), followed by Textiles, Apparel & Leather (19%) and Wood, Paper & Printing (16%). This concentration suggests that programme interventions should be tailored to the specific needs of these dominant sectors.

Policy Metric 1 - Employment Creation Efficiency

Does programme training lead to more efficient job creation, measured by revenue generated per employee?

METRIC: REVENUE PER EMPLOYEE (EFFICIENCY)

Total Revenue divided by Total Employees (Capped). Calculated as the mean of this metric for firms that received training versus those that did not.



↑ 8.1% Efficiency Gain for Trained Firms

Policy Metric 2 – Gender Equity in Employment

POLICY QUESTION

To what extent are female-owned firms contributing to the overall employment generated by the programme's target group?

METRIC DEFINITION & CALCULATION

Female-Owned Firms' Share of Total Employment: Total employment in female-owned firms as a percentage of total employment across all firms.

- **Numerator:** Sum of Employees_Capped for female-owned firms
- **Denominator:** Sum of Employees_Capped for all firms
- **Calculation:** (Female Employment / Total Employment) × 100

RESULTS & INTERPRETATION

METRIC	VALUE
Female-Owned Firms' Share of Employment	39.8%
Female-Owned Firms' Share of Firms	45.0%
Employment Gap	-5.2 pp

Female-owned firms account for **39.8% of total employment** despite representing 45% of all firms. This **5.2 percentage point gap** indicates that female-owned firms are smaller employers on average. Targeted growth support is needed to ensure equitable programme impact.

LIMITATION & ASSUMPTION

Key Insights and Recommendations

KEY INSIGHTS

1

Micro Firms Drive Employment

Micro firms account for 70% of total employment despite their small individual size. Female-owned firms lag in scaling, suggesting structural barriers beyond training.

2

Training Boosts Efficiency

Firms receiving training show 8.1% higher revenue per employee (Ksh 108,740 vs Ksh 100,560), demonstrating positive impact on firm productivity and economic output.

3

Sector Concentration

Food, Beverages & Tobacco (27%), Textiles (19%), and Wood/Paper (16%) sectors dominate the MSME landscape, requiring sector-specific support strategies.

RECOMMENDATIONS

1

Targeted Growth Support

Develop specific interventions for female-owned firms to help them scale employment beyond the micro level, including access to finance and business mentoring.

2

Deepen Training Impact

Investigate why training has greater scaling effects on male-owned firms. Adapt training content and delivery to address female-owned firm constraints and opportunities.

3

Sector-Specific Strategy

Tailor programme support to dominant sectors (Food, Textiles, Wood) through sector associations, value chain development, and industry-specific technical assistance.

Thank You

Questions and Discussion

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CLEANED DATASET

Cleaned_Data_CaseStudySCKenya.xlsx

PRESENTATION FILE

MEL_CaseStudy_Presentation.pdf