

MEL (Quantitative) Case Study

Data-Driven Insights for MSME
Employment and Growth

Candidate: Reagan Ochola

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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., 'Nairobii', '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.

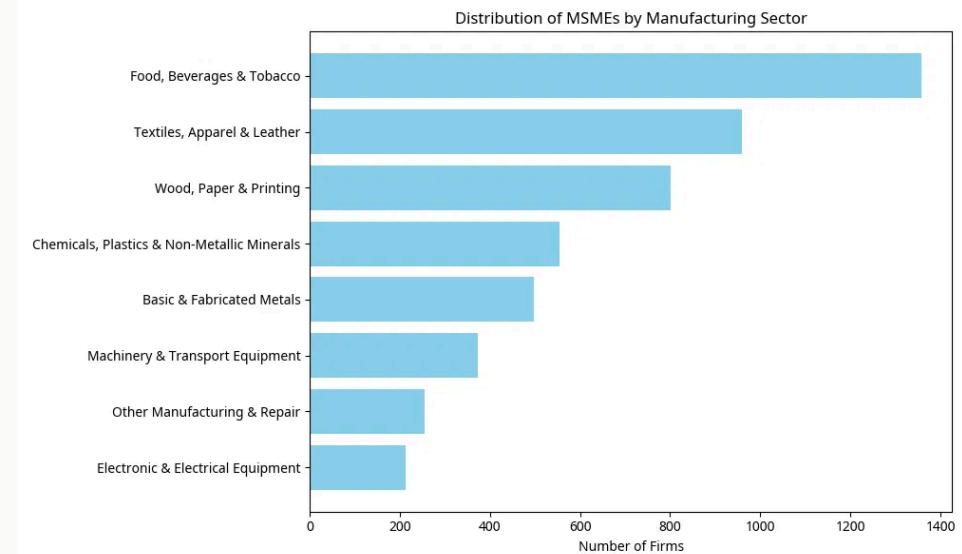


Sector Recoding and Distribution

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.

NO TRAINING

100,560

Ksh per Employee

RECEIVED TRAINING

108,740

Ksh per Employee

↑ 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:** $(\text{Female Employment} / \text{Total Employment}) \times 100$

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

CONTACT INFORMATION

Analyst: Reagan Ochola

Email: reaochola@gmail.com

CLEANED DATASET

[Cleaned_Data_CaseStudySCKenya.xlsx](#)

PRESENTATION FILE

[MEL_CaseStudy_Presentation.pdf](#)