
THE EFFECT OF NUMBER OF WORKERS AND WORK MOTIVATION ON BREAD QUALITY SHUN CHEN FOOD INDUSTRY CO., LTD. AT TAIWAN

Arhinza Pramudhitya^{1*}, Setyo Rahyunanto², Retna Dewi Lestari³

Agribusiness Study Program, Universitas Duta Bangsa Surakarta^{1,2,3}

*Correspondence Email: 220310004@mhs.udb.ac.id

ABSTRACT

This study aims to determine the effect of the number of workers and work motivation on bread quality in the company under study. This research uses a quantitative approach with multiple linear regression analysis using SPSS software. Data were collected through questionnaires using a Likert scale. The results show that the number of workers and work motivation simultaneously have a significant effect on bread quality with a significance value of $0.010 < 0.05$. Partially, the number of workers has a significant effect on bread quality with a significance value of $0.048 < 0.05$, and work motivation also has a significant effect with a significance value of $0.039 < 0.05$. The correlation coefficient (R) value of 0.857 indicates a very strong relationship between independent and dependent variables. The coefficient of determination (R Square) of 0.734 shows that 73.4% of bread quality is influenced by the number of workers and work motivation, while the remaining 26.6% is influenced by other variables.

KEYWORDS

Number of Workers; Work Motivation; Bread Quality; Shun Chen Bakery



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INTRODUCTION

The bakery industry is an important part of the global food supply chain, and it keeps growing as consumers demand more bread and ready-to-eat food products. Taiwan, as one of East Asia's food-processing centers, has a strong bakery tradition that blends Western baking techniques with local Asian innovation. PT Shun Chen Bakery, located in Taipei, is one of the bread producers with a production track record that can be studied and analyzed.

Product quality is the main factor behind the success of a food manufacturing company. Inconsistent quality leads to more defective products, wasted raw materials, higher production costs, and lower consumer trust. Earlier research shows that the quality of the workforce has a positive and significant effect on product quality, both on its own

and together with raw materials and the production process (Wolter *et al.*, 2022). Workers play a crucial role in the bakery industry, which still relies heavily on manual skill, precision, and direct supervision, so labor efficiency is an important indicator of a company's operational performance (Irysad *et al.*, 2024). Besides the number of workers, work motivation also matters: employees with high motivation tend to be more careful, disciplined, and responsible, which helps maintain product quality.

An interesting pattern shows up in PT Shun Chen Bakery's production data from 2020 to 2024. During this period, total bread production rose from 85,000 pieces to 110,000 pieces, while the number of workers actually fell from 15 to 10 people. This drop in workforce was not followed by better quality - quite the opposite. Defective products rose from 2,499 to 5,300 pieces, while special products, which require high precision, sharply dropped from 60,000 to 10,800 pieces. This suggests an imbalance between production quantity and product quality: higher output does not necessarily mean better efficiency, and it may be linked to reduced supervision and heavier workloads caused by having fewer workers.

Based on this pattern, the study was designed to answer three questions: (1) does the number of workers significantly affect bread quality; (2) does work motivation significantly affect bread quality; and (3) do the number of workers and work motivation together significantly affect bread quality at PT Shun Chen Bakery. Several earlier studies have looked at related topics but from different angles, including bread quality control using Statistical Process (Fitri *et al.*, 2025), the use of Six Sigma to reduce defect rates (Nurrobbil & Roder, 2024), the effect of workload on employee performance (Susilawati *et al.*, 2025), and the effect of skills and work experience on productivity at bakery small businesses (Alivia & Iriani, 2023). These studies generally look at productivity, labor efficiency, or defect control separately. What is new in this study is that it combines the number of workers and work motivation as variables studied together against bread quality, using PT Shun Chen Bakery in Taiwan as a case study, with a quantitative approach based on 2024 monthly production data as well as 2020–2024 time-series data. The goal of this study is to analyze how the number of workers and work motivation -separately and together - affect bread quality at PT Shun Chen Bakery, and to offer recommendations the company can use when making decisions about staffing policy and employee training programs.

RESEARCH METHOD

This study was carried out at PT Shun Chen Bakery in Taipei, Taiwan, from May to July 2026. The location was chosen using purposive sampling, based on the fact that the company has been operating for 59 years and is known as one of Taiwan's leading bread producers, making it a relevant case for studying how the number of workers and work motivation affect bread quality. The study uses a quantitative approach with both primary and secondary data. Primary data were collected through structured interviews and a Likert-scale questionnaire given to all of the company's workers, while secondary data came from production documents, company reports, and supporting scientific literature. Data collection combined interviews, questionnaires, and documentation. The population of this study is all workers at PT Shun Chen Bakery, including the production manager, store manager, production staff, supervisor, administrative staff, and packing staff. Because the population is small (10 people), the study used total (saturated) sampling every member of the population was treated as a respondent, with no separate sampling process to get results that are as accurate and representative as possible.

Data analysis was carried out in stages, comprising: an instrument test, namely a validity test (Pearson product moment) and a reliability test (Cronbach's Alpha); classical assumption tests, namely a normality test (Kolmogorov–Smirnov), a multicollinearity test (VIF), a heteroscedasticity test (Glejser test, scatter plot test), and a linearity test; and a multiple linear regression analysis, using the following model:

$$Y = a + b_1X_1 + b_2X_2 + e$$

Description:

Y = bread quality (percentage of defective products),

X₁ = number of workers,

X₂ = work motivation (dummy variable: 1 = high, 0 = low),

The t-test (partial) is used to examine the effect of each independent variable; the F-test (simultaneous) is used to examine the combined effect of both independent variables; and the coefficient of determination (R²) is used to measure the magnitude of the independent variables' contribution to the dependent variable. The testing criterion uses a 5% significance level ($\alpha = 0.05$): a variable is declared to have a significant effect if the significance value is < 0.05 . Based on this framework, the hypotheses can be formulated as follows: H₀ = There is no significant effect of the number of workers (X₁) and work motivation (X₂) on bread product quality (Y) at PT Shun Chen Bakery Taiwan. H₁ = There is a significant effect of the number of workers (X₁) and work motivation (X₂) on bread product quality (Y) at PT Shun Chen Bakery Taiwan. H₀ (no significant effect of the number of workers and work motivation on bread quality) and H₁ (a significant effect exists).

RESULT AND DISCUSSION

Respondent Characteristics

The study involved 10 respondents — every worker at PT Shun Chen Bakery Taiwan — including the production manager, store manager, supervisor, administrative staff, and packing staff. Most respondents were women (80%), aged 55–60 years (70%), with most having worked at the company for 20–30 years (40%). This profile reflects a highly experienced workforce that nonetheless falls outside the commonly used definition of "working-age" population, which is relevant to the study's focus on labor efficiency and workforce management.

Effect of Workforce Size and Work Motivation on Bread Quality through Multiple Linear Regression Test

Research Instrument Test

A validity test using Pearson product-moment correlation ($n = 10$, table $r = 0.632$) showed that every item measuring the three variables — number of workers, work motivation, and bread quality — was valid, with calculated r -values ranging from 0.652 to 0.951, all above the table value. A reliability test using Cronbach's Alpha likewise showed that all three variables were reliable, with values of 0.834 (number of workers), 0.816 (work motivation), and 0.867 (bread quality), each comfortably above the 0.60 threshold.

Classical Assumption Tests

The normality test (One-Sample Kolmogorov-Smirnov) produced a significance value of 0.200 (above 0.05), meaning the data are normally distributed. The multicollinearity test showed a tolerance value of 0.861 and a VIF of 1.161 for both

independent variables (well below 10), meaning there is no multicollinearity problem. The heteroscedasticity test, checked through a scatterplot, showed points scattered randomly with no clear pattern, meaning the assumption of constant variance (homoscedasticity) holds. All classical assumptions were therefore satisfied, and the regression model is suitable for use.

Multiple Linear Regression Analysis

The analysis produced the following regression equation:

$$Y = 24.319 - 0.302X_1 - 0.329X_2$$

Here, Y is bread quality, X_1 is the number of workers, and X_2 is work motivation. The constant of 24.319 means that if both independent variables were held at zero, bread quality (measured by the defect rate) would sit at that level. Both regression coefficients are negative, meaning that at this company, increasing either the number of workers or work motivation was actually associated with a lower bread-quality score whenever it was not paired with effective management.

Partial t-Test

Both independent variables were found to have a significant partial effect on bread quality (sig. < 0.05), with a negative direction of relationship. The partial t-test on the number-of-workers variable produced a t-value of -2.398 with a significance level of 0.048 (< 0.05). This significance value is below the 0.05 threshold, so H_0 is rejected and H_1 is accepted. The number of workers was thus proven to have a significant effect on bread quality at PT Shun Chen Bakery Taiwan. The regression coefficient for this variable was -0.302, indicating a negative relationship between the two variables. Each one-unit increase in the number of workers statistically decreases bread quality by 0.302 units, assuming the work motivation variable remains constant.

Table 4. 1 t-Test (Partial)

Variable	t-value	Sig.	Description
Number of Workers (X_1)	-2.398	0.048	Significant
Work Motivation (X_2)	-2.531	0.039	Significant

Source: Primary Data Processed, 2026

Simultaneous F-Test

Table 5. 1 F-Test (Simultaneous)

ANOVA					
	df	Sum of Squares	Mean Square	F	Significance
Regression	2	17.616	8.808	9.682	.010 ^b
Residual	7	6.368	.910		
Total	9				

Source: Primary Data Processed, 2026

The F-test produced an F-value of 9.682 with a significance of 0.010 (< 0.05). This value indicates that the regression model constructed is suitable for explaining the relationship between variables in this study. H_0 is rejected and H_1 is accepted in this simultaneous test, so the number of workers and work motivation together were proven to have a significant effect on bread quality at PT Shun Chen Bakery Taiwan. The resulting regression equation, $Y = 24.319 - 0.302X_1 - 0.329X_2$, confirms that both independent

variables have a consistent negative direction of effect on bread quality as the dependent variable.

Coefficient of Determination

The correlation coefficient (R) of 0.857 falls into the "very strong" category, and the R Square value of 0.734 means that 73.4% of the variation in bread quality can be explained by the number of workers and work motivation together, with the remaining 26.6% explained by factors outside the model.

Discussion

The effect of the number of workers on bread quality shows a significant negative direction: adding workers does not automatically improve quality when it is not accompanied by clear division of tasks, optimal supervision, and coordination among employees. This finding underscores the importance of the right man in the right place principle in workforce placement. A similar finding was also reported in an evaluation of bread product defects at PT ABC Lampung, where the human factor was the main cause of production defects because a shortage of workers left the remaining employees fatigued and unable to maintain focus while working (Prabowo & Satar, 2022). This condition is consistent with the situation at PT Shun Chen Bakery, where the reduction in workforce from 15 to 10 people burdened the remaining employees with a greater workload due to rising production targets.

The effect of work motivation on bread quality is likewise significant but negative in direction, differing from a number of earlier studies that found a positive relationship between motivation and employee performance in the foodservice industry. This finding differs from the results of (Anthony & Daniel, 2023), who reported that work motivation is positively related to employee performance in the foodservice industry. This difference in the direction of the relationship is thought to relate to the operational characteristics of PT Shun Chen Bakery, which has a limited workforce yet is required to meet continually rising production targets. High work motivation under conditions of excessive workload may drive employees to work faster in pursuit of quantity, rather than prioritizing the precision required at production stages that demand high accuracy, such as the production of special items. This condition is consistent with the sharp decline in the volume of special products in the 2020–2024 production data, which indicates a shift in work orientation from precision toward faster output. Work motivation is still recognized as a driver of responsibility, discipline, and the achievement of work targets within a division (Anang & Vivi, 2025). The effect of motivation on product quality is conditional, depending on support from standard operating procedures, work skills, and adequate supervision. High motivation without a structured work system risks accelerating the production process at the expense of precision, so the result aligns with the finding of this study showing a negative effect of work motivation on bread quality. This difference is thought to be influenced by the specific characteristics of the company, its human-resource management system, and differing operational conditions across research objects.

In the simultaneous relationship, both variables were shown to have a significant effect on bread quality, confirming that the success of the production process depends not only on the number of workers available, but also on employees' work drive in carrying out their tasks. This result is consistent with the view that effective human resource management encompassing both workforce size and work motivation is a strategic factor in maintaining production stability and quality in the bakery industry.

CONCLUSION

This study aims to analyze the effect of the number of workers and work motivation on bread quality at PT Shun Chen Bakery Taiwan. Based on the results of the multiple linear regression analysis, it can be concluded that the number of workers has a significant partial effect on bread quality (sig. 0.048 < 0.05; regression coefficient -0.302), meaning that adding workers does not always improve quality when it is not accompanied by effective work management. Work motivation also has a significant partial effect (sig. 0.039 < 0.05; regression coefficient -0.329), indicating that motivation that is not properly directed can lead to a decline in production quality. Simultaneously, both variables were shown to have a significant effect on bread quality (F-test, sig. 0.010 < 0.05), confirming that the regression model used is suitable for explaining the relationship between the number of workers and work motivation and bread quality at the company. These findings confirm that successfully maintaining bakery product quality is not determined solely by the size of the workforce or the level of work motivation, but by the effectiveness of overall human resource management including task division, supervision, and work coordination.

Based on these findings, it is recommended that the management of PT Shun Chen Bakery maintain a workforce size appropriate to production needs, accompanied by clear task division and supervision, and periodically evaluate work motivation programs through a reward system, work environment, and improved communication between leadership and employees. This simultaneous test result is consistent with the findings of (Putra & Sunarsih, 2023), who reported that the number of workers and work motivation together have a significant effect on the quality variable. Workforce management and work motivation factors are closely related to the productivity of production-division employees (Nugraha et al., 2025), meaning that the success of maintaining bread quality at PT Shun Chen Bakery cannot be viewed through a single variable in isolation. The combination of a proportional workforce size and well-directed work motivation is a key factor in maintaining consistent product quality, given that both variables complement one another in shaping employees' capacity and readiness at every stage of production. Future research is recommended to expand the number of respondents and incorporate other potentially relevant variables, such as work skills, work discipline, work experience, training, production technology, and quality control, in order to obtain a more comprehensive model for explaining the determinants of bread quality.

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Author's short biography

Authors Name:

Name : Arhinza Pramudhitya

Affiliation : Agribusiness Study Program, Universitas Duta Bangsa Surakarta

Phone Number : 08989942238

Email : 220310004@mhs.udb.ac.id

The author is a student of the Agribusiness Study Program, Duta Bangsa University, Surakarta, who conducted this research as part of his undergraduate thesis which focuses on the number of workers and work motivation on bread quality.

Authors Name:

Name : Ir.Dr. Setyo Rahyunanyto, S.P.,M.Si

Affiliation : Agribusiness Study Program, Universitas Duta Bangsa Surakarta

Phone Number : 081234147181

Email : srahyunanto25@gmail.com

The author is a lecturer in the Agribusiness Study Program, Duta Bangsa University, Surakarta, who acts as an accompanying supervisor for this research with expertise in Agricultural Extension.

Authors Name:

Name : Retna Dewi Lestari, S.P.,M.Si

Affiliation : Industrial Engineering Study Program, Universitas Duta Bangsa Surakarta

Phone Number : 081297219460

Email : retna_dewi@udb.ac.id

The author is a lecturer in the Agribusiness Study Program, Duta Bangsa University, Surakarta, who acts as a supervisor for this research with expertise in Agribusiness.
