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Comparative Analysis of Field Labor Productivity Coefficient with AHSP 2025 in Lightweight Brick Work (Case Study: Construction of Al Azhar University Medan Classroom Building)

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ABSTRACT

Labor productivity is an important factor in the success of construction projects, affecting the cost, time, and quality of work. However, in practice, field productivity often does not conform to the standards set by the 2025 Analysis of Unit Price for Work (AHSP). This study aims to analyze labor productivity in lightweight brick masonry work, compare it with the 2025 AHSP, and identify the factors that influence labor productivity. The method used was direct field observation with the time study method over five working days, combined with a questionnaire survey distributed to the workforce. The data were analyzed using multiple linear regression to determine the effect of education, work experience, work discipline, work motivation, wages, age, and managerial factors on productivity. The results show that the average field productivity coefficients over the five days of observation were 0.1160 OH/m² for laborer, 0.2230 OH/m² for mason, 0.0306 OH/m² for head mason, and 0.0153 OH/m² for foremen. Comparison with the 2025 AHSP revealed differences in every labor category, laborer showed a difference of -5.07% (indicating higher field productivity than the standard), while mason, head mason, and foremen showed differences of 13.97%, 2.23%, and 1.25% respectively (indicating lower field productivity than the standard). The regression analysis further showed that wages (X5) and managerial factors (X7) had a significant partial effect on productivity. It is concluded that a gap exists between field labor productivity and the 2025 AHSP standard, and that field conditions should be considered when applying the AHSP for project planning.

Keywords: *Labor Productivity, Lightweight Brick, 2025 AHSP, Multiple Linear Regression, Productivity Factors*

1. Introduction

The construction industry holds strategic significance in national infrastructure development and contributes substantially to a country's economic growth. Every construction project must pay attention to the efficient use of resources, particularly labor, which directly affects field productivity. Labor productivity is a crucial variable that influences the accuracy of cost estimation, project duration, and the quality of the resulting output. Productivity that deviates from the plan can cause project schedules to be delayed, costs to increase, and the quality of construction projects to decline [1].

As conditions change over time such as rising wages, technological advances, changing quality standards, construction tools, and site conditions older productivity coefficients may become less relevant. Therefore, the update of the Analysis of Unit Price for Work (AHSP) in 2025 is important as an adaptation to current

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field realities. However, few empirical studies have verified whether the coefficients in the 2025 AHSP reflect actual field productivity conditions, particularly for lightweight brick masonry work [2].

The verification of the 2025 AHSP coefficient is useful for current project planning because the AHSP is used as a benchmark in preparing labor and cost estimates. Comparing the current standard with measured field coefficients allows contractors and planners to identify where the standard is conservative or where actual labor input is higher, so labor requirements, cost allowances, and work schedules can be evaluated against actual site conditions.

Among the various types of work commonly found in building construction projects, lightweight brick masonry work is one of the most frequent, functioning both structurally and non-structurally as partition walls, space fillers, and architectural elements. Considering the large volume of this work, especially in building projects, its productivity is relevant to labor planning and cost control.

In Indonesia's construction management practice, the AHSP issued by the Ministry of Public Works and Housing (PUPR) serves as a main reference for cost and labor estimation, in which the coefficients for labor, materials, and equipment for each type of work become important benchmarks [3]. The 2025 AHSP is used in this study as the current standard reference for the lightweight brick item examined.

Several previous studies have reported differences between field productivity and established standards. Pramesti and Priyanto [1] analyzed labor productivity and unit prices for lightweight brick wall work, while Asnudin and Iskandar [4] analyzed construction worker productivity in brick wall masonry and reported field productivity below an older SNI-AHSP benchmark. Guntara et al. [3] compared AHSP and actual unit prices in an irrigation rehabilitation project. These studies indicate that field conditions can produce deviations from standard assumptions. However, a focused comparison between measured lightweight-brick labor coefficients and the 2025 AHSP remains limited. This study therefore addresses that gap by using direct five day field measurement and comparing the resulting coefficients with the 2025 AHSP.

In a broader construction-management context, the present study extends earlier productivity research by combining direct field coefficient measurement, comparison with the current 2025 AHSP, and regression based analysis of productivity factors. The distinction is important because previous studies in the reference set examined productivity or older standards, whereas this study specifically evaluates lightweight brick coefficients against the 2025 edition.

Based on actual field conditions, the AHSP used as the guideline for preparing the cost budget (RAB) of the Classroom Building Construction Project of Universitas Al Azhar Medan was the 2024 AHSP. During construction, problems related to labor productivity were encountered, particularly in brick masonry work, largely caused by weather conditions and work interruptions that reduced effective working hours. Therefore, this study compares the labor productivity coefficient measured directly in the field with the coefficient stipulated in the 2025 AHSP, specifically for lightweight brick masonry work. The study aims to (1) measure and calculate the field labor productivity coefficient, (2) compare the field result with the 2025 AHSP coefficient, and (3) analyze factors influencing labor productivity.

2. Method

This research is descriptive in nature, describing the actual field labor productivity condition, and applies a quantitative approach grounded in positivist philosophy, which assumes that phenomena can be measured objectively through numerical data [5]. This approach was chosen because the main purpose of the study is to numerically measure the field labor productivity coefficient and compare it with the productivity coefficient stated in the 2025 AHSP.

The research was conducted on the Classroom Building Construction Project of Universitas Al Azhar Medan, located at Jl. Pintu Air IV No. 214, Kwala Bekala, Medan Johor District, Medan City, North Sumatra, executed by CV. Trinity Cipta Karya. Data collection took place from February to March 2026, with the overall research process covering planning, data collection, data analysis, and reporting lasting approximately four months.

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The population of this study comprised all workers involved in the lightweight brick wall installation work on the project. The sampling technique applied was total sampling, in which the entire population 26 workers was used as the research sample [5].

Two types of data were used: primary and secondary. Primary data were obtained directly from field observation and questionnaires, consisting of actual working time, completed work volume (m²), number of workers, and field conditions affecting productivity. Secondary data consisted of the labor productivity coefficient standard stated in the 2025 AHSP for lightweight brick masonry work, issued by the Ministry of Public Works and Housing (PUPR), Directorate General of Construction Development, through Circular Letter No. 30/SE/Dk/2025 [6].

Seven independent variables were examined, education (X1), work experience (X2), work discipline (X3), work motivation (X4), wages (X5), age (X6), and managerial factors (X7). These variables were adapted from previous research [7] and combined with indicators developed from field observation. Each variable was measured through several statement indicators using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) [8].

Table 1 Number of Indicators

Variable	Code	Number of Indicators
Productivity	Y	3
Education	X1	2
Work Experience	X2	2
Work Discipline	X3	2
Work Motivation	X4	2
Wages	X5	3
Age	X6	2
Managerial Factors	X7	3

The instrument therefore contained 19 statement indicators across the dependent and independent variables. The questionnaire was distributed to the foremen, head mason, and workers involved in the observed work.

Data were collected through (a) direct field observation using the time study method, in which the researcher recorded start and finish time, number of workers, and completed work volume in m² each day [9] and (b) a questionnaire distributed to identify factors influencing productivity.

Field productivity coefficient was calculated as:

Productivity Coefficient = Number of Workers / Work Volume (m²/day)

In this study, labor productivity and labor productivity coefficient are distinguished. Labor productivity describes output relative to labor input, whereas the coefficient expresses labor input required per unit of output (OH/m²). Consequently, a lower coefficient indicates higher productivity because fewer labor-hours are required to produce 1 m².

The resulting coefficient was compared with the standard coefficient in the 2025 AHSP. The reported difference values were calculated as, Difference (%) = (Field Coefficient − 2025 AHSP Coefficient) × 100%.

This calculation expresses the absolute coefficient difference in percentage form by multiplying the OH/m² difference by 100, it is not a relative percentage normalized by the AHSP coefficient. For example, 0.1160 - 0.1667 = -0.0507 OH/m², which is reported as -5.07%. The ratio Field Coefficient/2025 AHSP Coefficient is reported separately in Section 3.4 to show relative magnitude.

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The questionnaire instrument was tested for validity using Pearson's Product Moment correlation and reliability using Cronbach's Alpha with a minimum threshold of 0.60 [10]. Classical assumption tests were performed normality (Kolmogorov-Smirnov test), multicollinearity (Tolerance and VIF values), and heteroscedasticity (scatterplot method) prior to conducting the regression analysis [11]. Finally, a multiple linear regression analysis was carried out to determine the effect of the seven independent variables on labor productivity, followed by the partial t-test, the simultaneous F-test, and the coefficient of determination (R^2) test [12].

3. Results and Discussion

3.1 Field Productivity Data

Field observation covered five working days. Observation was conducted daily from 08:00 to 17:00 WIB, with a one hour break from 12:00 to 13:00, giving an effective working time of eight hours per day. Days 1-3 were on the first floor and days 4-5 on the second floor.

The five day observation covered only one project and a limited observation period, so the comparison should be interpreted as a project specific field check rather than a general validation of the 2025 AHSP across construction projects.

The lightweight brick installation activity and the general time study procedure were maintained across all five observation days. However, the crew arrangement was not completely identical the number of laborer and mason varied slightly from day to day, while the head mason and foreman counts remained constant at two and one, respectively. Therefore, the five observations represent repeated measurements under the same type of work but not an identical crew composition.

Table 2 Field Productivity Data

Day	Laborer	Mason	Head Mason	Foreman	Work Volume (m²/day)
1	8	15	2	1	67.80
2	8	14	2	1	65.40
3	7	14	2	1	62.90
4	8	15	2	1	66.75
5	7	15	2	1	64.60

3.2 2025 AHSP Coefficient Data

Table 3 presents the labor productivity coefficient standard for installing 1 m² of 10 cm thick lightweight brick wall using ready-mix mortar, according to the 2025 AHSP for the Cipta Karya and Housing sector [6].

Table 3 AHSP Labor Coefficient

Labor Category	Code	Coefficient (OH/m²)
Laborer	L.01	0.1667
Mason	L.02	0.0833
Head Mason	L.03	0.0083
Foreman	L.04	0.0028

3.3 Field Productivity Coefficient Calculation

The field productivity coefficient for each labor category was calculated as number of workers divided by work volume (m²/day). For example, on day 1 the laborer coefficient was 8/67.80 = 0.118 OH/m², the mason

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coefficient was 15/67.80 = 0.221 OH/m², the head mason coefficient was 2/67.80 = 0.029 OH/m², and the foreman coefficient was 1/67.80 = 0.015 OH/m². The same calculation was applied to the remaining four days.

Table 4 Recapitulation of Field Productivity Coefficient (OH/m²)

Day	Laborer	Mason	Head Mason	Foreman
1	0.118	0.221	0.029	0.015
2	0.122	0.214	0.031	0.015
3	0.111	0.223	0.032	0.016
4	0.120	0.225	0.030	0.015
5	0.108	0.232	0.031	0.015
Average	0.1160	0.2230	0.0306	0.0153

The average field productivity coefficients over the five observation days were 0.1160 OH/m² for laborer, 0.2230 OH/m² for mason, 0.0306 OH/m² for head mason, and 0.0153 OH/m² for foremen.

3.4 Comparison of Field Coefficient with the 2025 AHSP

The field coefficient was compared with the 2025 AHSP coefficient using the ratio Field Coefficient / 2025 AHSP Coefficient. A ratio below 1 means the field coefficient is lower than the AHSP coefficient, which corresponds to higher productivity in terms of labor input per m² a ratio above 1 indicates a higher field coefficient and therefore lower productivity relative to the standard.

Table 5 Comparison of Field and 2025 AHSP Labor Coefficients

Labor	Code	Field	2025 AHSP	Ratio
Laborer	L.01	0.1160	0.1667	0.6956
Mason	L.02	0.2230	0.0833	2.6766
Head Mason	L.03	0.0306	0.0083	3.6819
Foreman	L.04	0.0153	0.0028	5.4571

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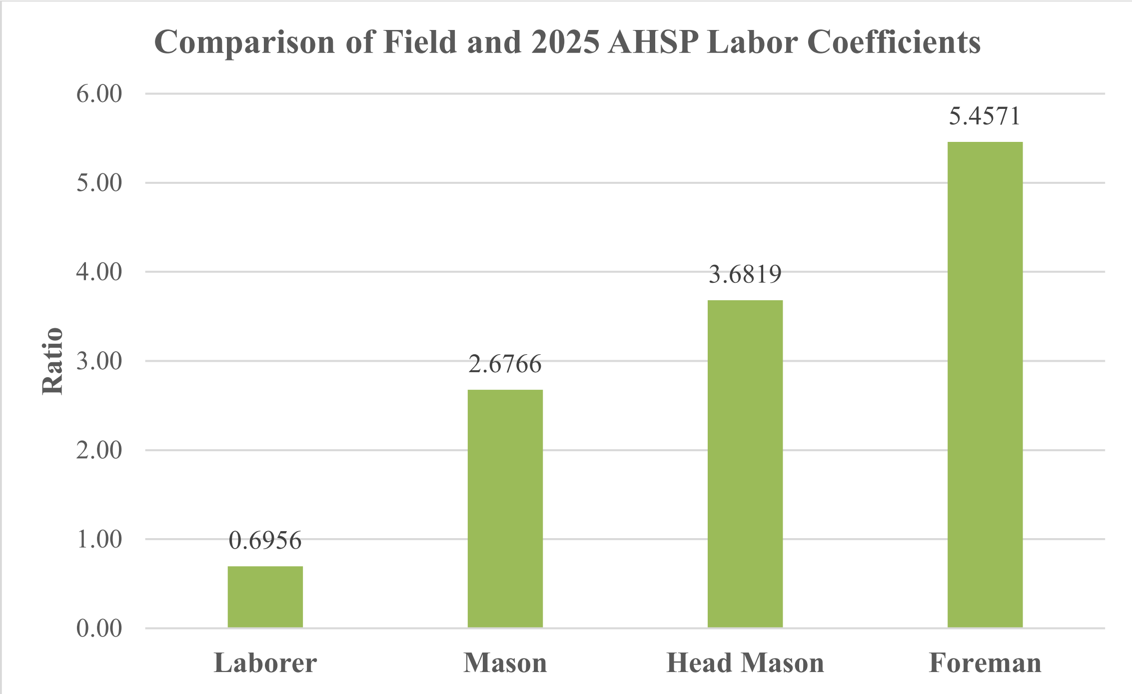

Figure 1 Comparison of Field and 2025 AHSP Labor Coefficients

The field coefficient for laborer (0.1160) was lower than the AHSP standard (0.1667), giving a ratio of 0.6956, indicating less labor input per m² than assumed by the standard. Conversely, the field coefficients for mason, head mason, and foremen were higher than their AHSP counterparts, with ratios of 2.6766, 3.6819, and 5.4571, indicating greater labor input per m² than assumed by the standard.

3.5 Labor Cost Comparison

The comparison was also examined in terms of labor cost, calculated by multiplying each coefficient by its corresponding unit wage rate.

Table 6 Field based Unit Price Analysis (Labor Cost)

Labor	Field Coefficient	Unit Price (Rp)	Total Cost (Rp)
Laborer	0.1160	100,000	11,596
Mason	0.2230	150,000	33,444
Head Mason	0.0306	150,000	4,584
Foreman	0.0153	170,000	2,598
Total Labor Cost			52,222

Table 7 2025 AHSP based Unit Price Analysis (Labor Cost)

Labor	2025 AHSP Coefficient	Unit Price (Rp)	Total Cost (Rp)
Laborer	0.1667	100,000	16,670
Mason	0.0833	150,000	12,495
Head Mason	0.0083	150,000	1,245
Foreman	0.0028	170,000	476
Total Labor Cost			30,886

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The total labor cost based on field coefficients (Rp.52,222) was Rp.21,336 higher than the labor cost based on the 2025 AHSP coefficients (Rp.30,886), indicating that the field-based labor cost for lightweight brick masonry work exceeded the amount estimated using the national standard.

3.6 Difference Between Field Coefficient and the 2025 AHSP

The coefficient difference for each labor category was calculated using Difference (%) = (Field Coefficient - 2025 AHSP Coefficient) × 100%. As clarified in the method section, these percentages represent the absolute coefficient differences expressed as percentages, not relative percentages against the AHSP denominator.

Table 8 Recapitulation of Coefficient Difference

Labor	Code	Field	2025 AHSP	Difference	Difference (%)
Laborer	L.01	0.1160	0.1667	-0.0507	-5.07%
Mason	L.02	0.2230	0.0833	0.1397	13.97%
Head Mason	L.03	0.0306	0.0083	0.0223	2.23%
Foreman	L.04	0.0153	0.0028	0.0125	1.25%

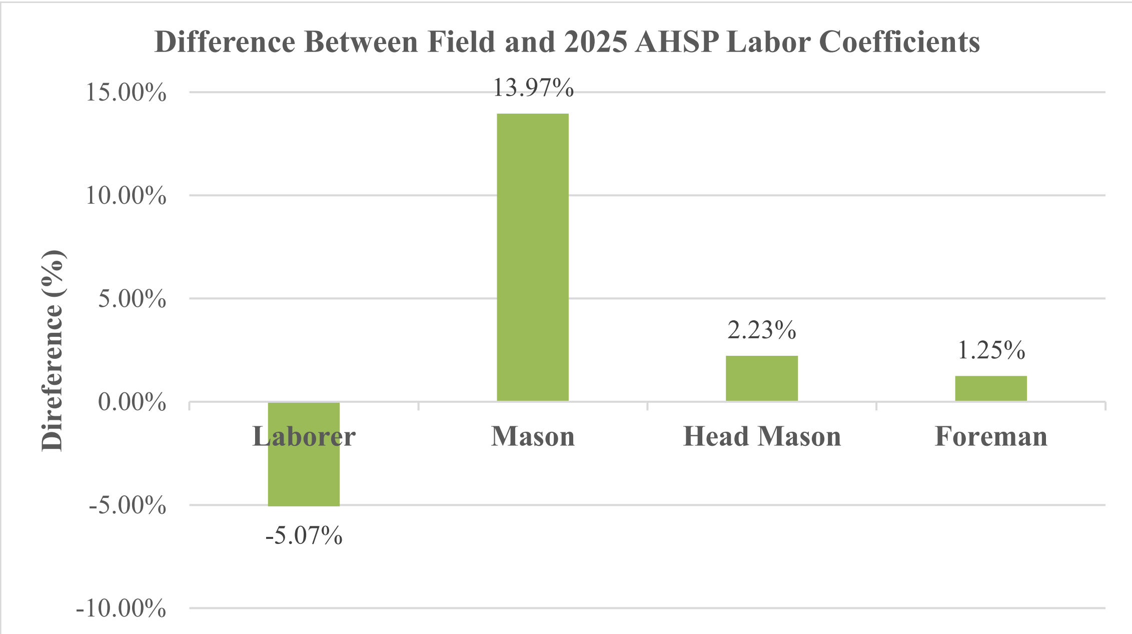

Figure 2 Difference Between Field and 2025 AHSP Labor Coefficients

The laborer category showed a negative difference (-5.07%), indicating a lower field coefficient and therefore higher labor productivity than assumed by the 2025 AHSP. In contrast, the mason, head mason, and foreman categories showed positive differences of 13.97%, 2.23%, and 1.25%, respectively, indicating higher labor input per m² and therefore lower productivity than the standard.

3.7 Validity Test

The questionnaire instrument was tested for validity using the Pearson Product Moment correlation on responses from 26 respondents at a 5% significance level, yielding an r-table value of 0.3882.

Table 9 Validity Test Result

Variable	Item	R Count	R Table	Result
Productivity (Y)	Y.1	0.809	0.3882	Valid

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Variable	Item	R Count	R Table	Result
	Y.2	0.945	0.3882	Valid
	Y.3	0.923	0.3882	Valid
Education (X1)	X1.1	0.928	0.3882	Valid
	X1.2	0.887	0.3882	Valid
Work Experience (X2)	X2.1	0.947	0.3882	Valid
	X2.2	0.903	0.3882	Valid
Work Discipline (X3)	X3.1	0.874	0.3882	Valid
	X3.2	0.927	0.3882	Valid
Work Motivation (X4)	X4.1	0.957	0.3882	Valid
	X4.2	0.956	0.3882	Valid
Wages (X5)	X5.1	0.845	0.3882	Valid
	X5.2	0.881	0.3882	Valid
	X5.3	0.891	0.3882	Valid
Age (X6)	X6.1	0.936	0.3882	Valid
	X6.2	0.946	0.3882	Valid
Managerial Factors (X7)	X7.1	0.943	0.3882	Valid
	X7.2	0.934	0.3882	Valid
	X7.3	0.971	0.3882	Valid

All r-count values exceeded the r-table value (0.3882) therefore, every indicator across all variables was declared valid.

3.8 Reliability Test

Table 10 Reliability Test Result

Variable	Code	Cronbach's Alpha	Standard	Result
Productivity	Y	0.869	0.60	Reliable
Education	X1	0.778	0.60	Reliable
Work Experience	X2	0.815	0.60	Reliable
Work Discipline	X3	0.755	0.60	Reliable
Work Motivation	X4	0.906	0.60	Reliable
Wages	X5	0.839	0.60	Reliable
Age	X6	0.869	0.60	Reliable
Managerial Factors	X7	0.941	0.60	Reliable

All Cronbach's Alpha values exceeded the 0.60 threshold therefore, the entire instrument was declared reliable [10].

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3.9 Classical Assumption Test

The normality test used the Kolmogorov-Smirnov method, in which the residuals are considered normally distributed if the Asymp. Sig. (2-tailed) value is greater than 0.05 [11]. The test produced an Asymp. Sig. (2-tailed) value of 0.060, which is above the 0.05 threshold, indicating that the residual data in this study are normally distributed. This is supported by the Normal P-P Plot in Figure 3, in which the data points are scattered around and follow the direction of the diagonal line.

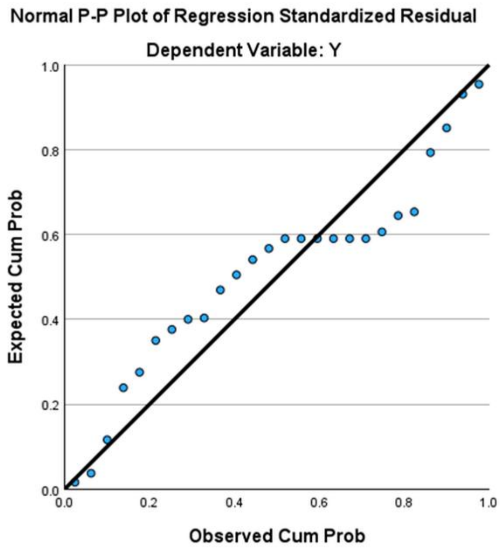

Figure 3 Normal P-P Plot of Regression Standardized Residual

The multicollinearity test was carried out using the Tolerance and Variance Inflation Factor (VIF) values, as presented in Table 11.

Table 11 Multicollinearity Test Results

Variable	Tolerance	VIF
Education (X1)	0.456	2.192
Work Experience (X2)	0.246	4.066
Work Discipline (X3)	0.248	4.034
Work Motivation (X4)	0.150	6.648
Wages (X5)	0.256	3.911
Age (X6)	0.237	4.221
Managerial Factors (X7)	0.159	6.300

All independent variables produced a Tolerance value greater than 0.10 and a VIF value smaller than 10, indicating that no multicollinearity occurred among the independent variables in the regression model.

The heteroscedasticity test was carried out using the scatterplot method, in which the residuals should be scattered randomly without forming a specific pattern [11]. As shown in Figure 4, the data points are scattered randomly and do not form any particular pattern, indicating that no heteroscedasticity occurred in the regression model.

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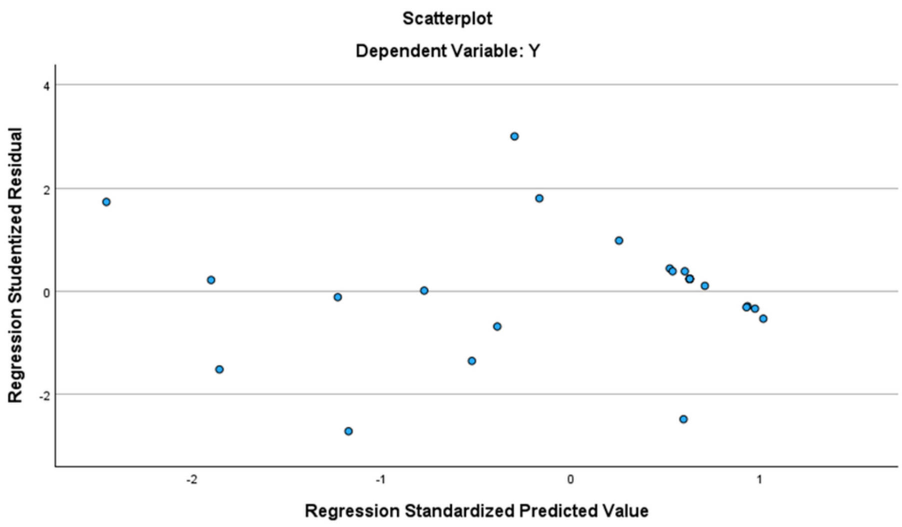

Figure 4 Scatterplot of the Heteroscedasticity Test

3.10 Multiple Linear Regression Analysis

The results of the multiple linear regression analysis are presented in Table 12.

Table 12 Regression Coefficients

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	7.909	1.760	-	4.493	<0.001
Education (X1)	0.176	0.192	0.151	0.915	0.372
Work Experience (X2)	-0.332	0.293	-0.255	-1.134	0.272
Work Discipline (X3)	0.526	0.317	0.371	1.658	0.115
Work Motivation (X4)	0.009	0.292	0.009	0.032	0.975
Wages (X5)	-0.672	0.206	-0.719	-3.257	0.004
Age (X6)	0.163	0.234	0.159	0.695	0.496
Managerial Factors (X7)	0.765	0.215	0.997	3.562	0.002

The multiple linear regression equation is: $Y = 7.909 + 0.176X1 - 0.332X2 + 0.526X3 + 0.009X4 - 0.672X5 + 0.163X6 + 0.765X7$.

The partial t-test was carried out by comparing the t-count with the t-table value, set at 2.101 ($\alpha = 0.05$), and by examining the significance value [12]. The results show that of the seven independent variables examined, only two wages (X5) and managerial factors (X7) had a significant partial effect on labor productivity (Sig. = 0.004 and 0.002, respectively, both below 0.05), while education (X1), work experience (X2), work discipline (X3), work motivation (X4), and age (X6) showed no significant partial effect.

Table 13 F-Test Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	95.054	7	13.579	8.906	<0.001
Residual	27.446	18	1.525	-	-
Total	122.500	25	-	-	-

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The F-test produced F-count (8.906) greater than F-table (2.577), with significance below 0.05. Thus, the seven variables simultaneously have a significant relationship with labor productivity in this project.

Table 14 Results of the Coefficient of Determination Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.881	0.776	0.689	1.235

The Adjusted R Square value of 0.689 indicates that 68.9% of the variation in the modeled productivity measure can be explained jointly by the seven independent variables, while 31.1% is associated with factors outside the model.

The wage coefficient (X5) is negative (B = -0.672). Holding the other variables constant, a one unit increase in the wage score is associated with a 0.672 unit decrease in the modeled productivity score. This negative direction should not be interpreted as evidence that higher wages inherently reduce productivity, it is an empirical association observed in this project and may reflect the specific wage, workload, payment, or workforce conditions captured by the questionnaire. The finding should therefore be interpreted cautiously.

The regression analysis used 26 respondents and seven independent variables. This relatively small, project-specific sample is acknowledged as a limitation, so the regression results should be interpreted as evidence for the observed project context rather than as broadly generalizable estimates for all construction projects.

3.11 Discussion

Compared with the 2025 AHSP labor coefficients, the field coefficient for laborer was lower than the AHSP standard, while the field coefficients for mason, head mason, and foremen were higher. Because the coefficient represents labor input per m², the lower laborer coefficient indicates higher productivity, whereas the higher coefficients for the other categories indicate lower productivity relative to the standard. The field based total labor cost was also higher than the AHSP based cost, showing that the observed crew required more labor input overall for the studied work item.

The comparison can also be observed from the total labor cost between the field-based and 2025 AHSP-based unit price analyses. The higher labor cost obtained from field coefficients indicates that labor productivity at the project has not yet been fully optimized. Based on these results, the 2025 AHSP is considered a better reference for cost planning because it was developed from a more efficient and economical national standard, whereas the field-based coefficient reflects the actual condition at the project site and can therefore be used as an evaluation tool to improve labor efficiency so that it approaches the 2025 AHSP standard. Such deviations between field and standard coefficients can serve as an indicator of the cost and time efficiency achieved in completing a project [13].

The difference values of -5.07%, 13.97%, 2.23%, and 1.25% describe the absolute coefficient differences expressed as percentages. The ratio analysis provides the relative magnitude 0.6956 for laborer and above 1 for mason, head mason, and foremen. These deviations indicate that actual site conditions do not fully reproduce the assumptions represented by the national standard.

The regression results show that wages (X5) and managerial factors (X7) were significant in the partial test, while the other five variables were not significant individually. The negative wage coefficient requires careful interpretation and should not be used to argue that increasing wages necessarily decreases productivity. Instead, the sign indicates the direction of association in this dataset and supports further investigation of wage structure, workload, and payment conditions. Managerial factors showed a positive coefficient, indicating that stronger managerial conditions in the measured indicators were associated with higher productivity.

The managerial finding has direct site implications contractors can strengthen daily work coordination, plan crew allocation according to work volume, and ensure materials are ready before the masonry crew begins or changes work fronts. These actions are consistent with the positive managerial coefficient observed in the model, while remaining within the scope of the project evidence.

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The simultaneous F-test showed that all seven variables together had a significant effect on labor productivity in lightweight brick masonry work, confirming that these variables jointly play an important role in determining the level of labor productivity, consistent with the notion that multiple linear regression is capable of identifying the dominant factors affecting labor productivity in construction projects [14]

Because the model is based on 26 respondents from one project, the significance and direction of the regression coefficients should be treated as project context findings. The Adjusted R Square of 68.9% indicates substantial explanatory power within this model, but 31.1% remains associated with variables outside the study, and the limited sample constrains generalization.

In practice, contractors may use the field coefficient together with the 2025 AHSP the AHSP can remain the standard benchmark for preliminary labor and cost estimates, while the measured field coefficient can be used to calibrate crew requirements and evaluate whether the planned labor allowance is realistic for the actual site conditions.

4. Conclusion

The five day observation produced average field labor productivity coefficients of 0.1160 OH/m² for laborer, 0.2230 OH/m² for mason, 0.0306 OH/m² for head mason, and 0.0153 OH/m² for foremen. Compared with the 2025 AHSP, the absolute coefficient differences expressed as percentages were -5.07%, 13.97%, 2.23%, and 1.25%, respectively. The laborer result indicates higher field productivity than the standard, while the other three categories indicate lower field productivity relative to the standard.

Among the seven modeled factors, wages and managerial factors had significant partial effects on the modeled productivity measure, while education, work experience, work discipline, work motivation, and age did not. The seven variables were significant simultaneously, with an Adjusted R Square of 0.689. The regression results are limited to the 26 respondents and one project observed in this study.

For practice, the 2025 AHSP should be retained as the standard benchmark for planning, while field coefficients should be used as a project-specific evaluation input. Contractors can combine both references when preparing labor and cost estimates, and can prioritize crew coordination, work planning, and material readiness based on the positive managerial finding. The negative wage coefficient should be interpreted cautiously the study does not establish that higher wages cause lower productivity, so wage recommendations should emphasize alignment of payment systems with workload and further verification under larger samples.

Future research should include additional projects, longer observation periods, and variables such as working-environment conditions, construction methods, material availability, and equipment use to improve generalizability.

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6. Conflict of Interest

The author of this work, whose name is stated below, attests to the absence of conflicts of interest.

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