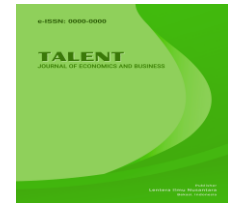




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Examining Turnover Intention in Manufacturing Employees: Insights from Work-Life Balance, Physical Work Environment, and Employee Engagement

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Abstract

This study aims to analyze the influence of work-life balance, physical work environment, and employee engagement on turnover intention among employees in the Thermal Division of PT. Denso Manufacturing Indonesia. The study responds to a research gap in the turnover intention literature by examining these three factors simultaneously in a manufacturing context, particularly within an Indonesian industrial setting that remains relatively underexplored. In addition, this study contributes to the literature by providing empirical evidence on how employee-related and workplace-related factors jointly shape turnover intention in a specific organizational context. Using a quantitative approach, data were collected through a survey involving 75 randomly selected respondents and analyzed using multiple linear regression with the help of SPSS version 27. The findings show that work-life balance, physical work environment, and employee engagement significantly influence turnover intention, both partially and simultaneously. These results indicate that turnover intention is not only associated with employees' psychological attachment to the organization, but also with the balance they experience between work and personal life as well as the conditions of the physical workplace. Based on these findings, it is recommended that the company continue to promote work-life balance, enhance the physical conditions of the workplace, and strengthen employee engagement to reduce the likelihood of employee turnover.

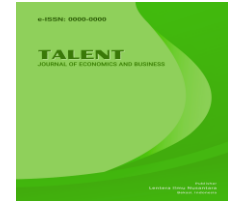
Keywords: Work-Life Balance, Physical Work Environment, Employee Engagement, Turnover Intention, Manufacturing Company

Introduction

In today's modern industrial era, companies are required to continuously innovate in order to remain relevant and competitive. Every organization must develop strong competitive capacity to survive and excel amid increasingly intense business competition. One of the most important ways to achieve this is by strengthening organizational capacity and improving the



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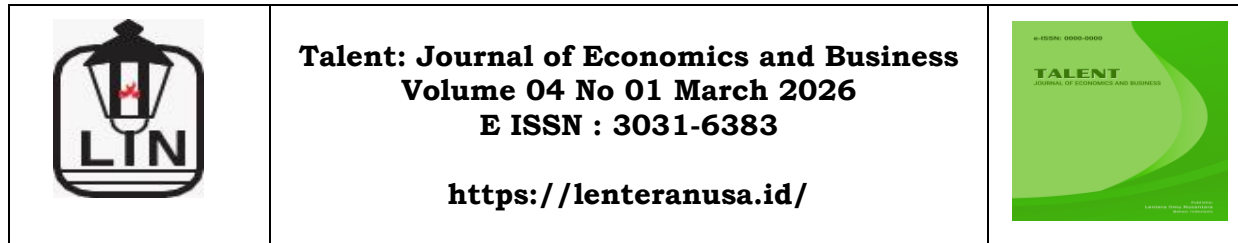


quality of human resources. Human resources are a vital and strategic component of every organization because employees are not only executors of organizational activities but also the primary determinants of whether a company can achieve its vision and mission. Without competent and well-managed employees, it is difficult for an organization to grow, adapt, and respond effectively to the changing demands of the business environment. For this reason, human resources are considered one of the most essential assets in an organization, as they influence both the direction and the success of organizational goals.

One important challenge in human resource management is employee turnover. Organizations are expected to retain qualified employees and minimize excessive movement out of the company, since high turnover can create serious consequences. One way to manage human resources effectively is by understanding and reducing turnover intention, which refers to an employee's desire or intention to leave the organization. Ahmad Saufi et al. (2023) define turnover intention as the desire to move or leave an organization in order to seek better employment opportunities, and it is often regarded as a major predictor of actual withdrawal behavior such as resignation or termination. A high turnover rate can be detrimental to an organization because it results in the loss of experienced workers and forces the company to incur substantial costs related to recruitment, selection, training, and development of new employees. In addition, high turnover may reduce productivity and disrupt the internal stability of the organization.

This issue is particularly relevant to PT Denso Manufacturing Indonesia, especially in the Thermal Division. PT Denso Manufacturing Indonesia is an automotive component manufacturing company located in the MM2100 industrial area. The company, which originates from Japan, produces DC motor components and employs 313 workers in the Thermal Division. Based on turnover data from 2020 to 2023 obtained through a mini interview with Mr. Bahrul Alam, the foreman of the Production Department, the employee turnover rate in the Thermal Division remained relatively high over the four-year period. In 2020, the turnover rate reached 10.7%; in 2021, it was 9.2%; in 2022, it increased to 13.3%; and in 2023, it again reached 10.7%. The highest turnover occurred in 2022, when 45 employees left the company. These figures indicate that employee retention remains a significant issue in the company and deserves further investigation.

Preliminary interviews conducted with current and former employees revealed that one of the factors contributing to employees' intention to resign is low work-life balance. Work-life balance refers to a condition in which employees are able to maintain equilibrium between their job responsibilities and their personal lives. Ideally, individuals should be able to fulfill their professional obligations without sacrificing their well-being, time, or happiness outside the workplace. Angin and Saragih (2021) explain that work-life balance is the extent to which individuals feel psychologically satisfied and experience no conflict in dividing their roles between work life and personal life, including relationships with spouses, parents, family, friends, and the wider community. Similarly, Idulfilastri (2018) states that work-life balance reflects the extent to which individuals feel engaged and satisfied in carrying out roles both at




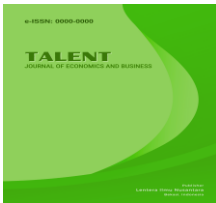
work and within the family. In essence, work-life balance concerns the ability of individuals to manage and harmonize work demands and personal needs so that both domains can function together without causing interference or stress.

Besides work-life balance, the physical work environment may also influence turnover intention. The work environment is one of the important factors that determines whether employees can perform their tasks effectively and comfortably. Saputra et al. (2020) argue that the work environment plays a role in encouraging employees to complete their duties properly. In reality, some employees work with high enthusiasm, while others experience low motivation, and this difference is often associated with workplace conditions. A supportive work environment should be safe, comfortable, and conducive to productivity, because these conditions contribute directly to organizational success. Conversely, when employees do not feel comfortable in their workplace, they may not be able to devote their thoughts and energy optimally to their tasks. In addition to physical conditions, harmonious relationships among coworkers and good interactions between employees and supervisors also shape employees' sense of comfort in the workplace.

Findings from a mini interview with Ms. Selvi, an employee in the Thermal Division, showed that the physical work environment was not always ideal. She explained that the distance from the work area to employee facilities such as the prayer room and toilets was relatively far, causing break time to be reduced because workers needed extra time to access those facilities. She also reported that the workplace temperature tended to be hot, causing excessive sweating and skin irritation among some employees. Such conditions may have contributed to employee discomfort, health complaints, and absenteeism. This issue is supported by employee attendance data from 2021, which indicate that a considerable number of employees were absent each month due to illness. The highest number of sick absences occurred in May, when 9 out of 330 employees were absent during 18 working days. These findings suggest that the physical work environment may be associated not only with absenteeism but also with employees' desire to leave the company.

Another factor that may affect turnover intention is employee engagement. A consistently high number of employees leaving the company from year to year may indicate that employees have a low level of attachment to the organization. Therefore, companies must be able to retain employees by building strong relationships and fostering engagement. Preliminary survey results from one employee at PT Denso Manufacturing Indonesia showed that one of the main reasons employees leave the company is the opportunity to obtain a more attractive job elsewhere. This suggests that some employees may lack commitment and loyalty to the company. In fact, one of the characteristics of employee engagement is the willingness to remain with the organization; when employees do not possess this characteristic, they are more likely to have low attachment and stronger turnover intention.

Overall, work-life balance, the physical work environment, and employee engagement are important factors that influence employees' comfort, satisfaction, and willingness to remain in an organization. When employees feel comfortable, valued, and emotionally connected to the

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company, they are more likely to stay and contribute positively to organizational performance. On the other hand, poor balance between work and personal life, uncomfortable workplace conditions, and weak employee engagement may trigger dissatisfaction and encourage employees to seek employment elsewhere. Based on this background, this study is conducted under the title, “Examining Turnover Intention in Manufacturing Employees: Insights from Work-Life Balance, Physical Work Environment, and Employee Engagement” Accordingly, this study is expected to contribute theoretically by enriching the discussion on turnover intention through the integrated examination of three important predictors, contextually by providing evidence from the Thermal Division of PT Denso Manufacturing Indonesia as a manufacturing-based setting, and methodologically by testing the simultaneous influence of work-life balance, physical work environment, and employee engagement on turnover intention within one analytical model. In this way, the study is not only intended to address a practical organizational issue, but also to provide a clearer academic contribution to the literature on employee turnover intention.

Method

This study employed a quantitative research approach, which emphasizes numerical data and statistical analysis to examine the relationships among variables objectively. A quantitative approach was selected because it allows the researcher to measure the variables accurately and draw conclusions based on empirical evidence that may be generalized beyond specific times and conditions (Sugiyono, 2020). The study was conducted at PT Denso Manufacturing Indonesia, located in MM2100 Industrial Town, Jalan Irian Blok FF 3, 5, and 6, Danau Indah, West Cikarang, Bekasi, West Java, Indonesia. The research was designed to examine the influence of work-life balance, physical work environment, and employee engagement on turnover intention among employees in the Thermal Division.

In this study, the variables consisted of three independent variables and one dependent variable. The independent variables were work-life balance (X1), physical work environment (X2), and employee engagement (X3), while the dependent variable was turnover intention (Y). Operational definitions were used to clarify the meaning of each variable and guide the measurement process scientifically (Sugiyono, 2020). Work-life balance was measured using the dimensions of time balance, involvement balance, and satisfaction balance as proposed by Greenhaus (2003). The physical work environment variable referred to indicators such as air temperature, lighting, safety, cleanliness, and the use of color in the workplace (Sedarmayanti, 2017). Employee engagement was measured through vigor, dedication, and absorption (Noviardy & Aliya, 2020). Meanwhile, turnover intention was assessed through employees’ thoughts of leaving, desire to search for a new job, and intention to leave the company in the near future (Halimah et al., 2016).

The population of this study consisted of all employees in the Thermal Division of PT Denso Manufacturing Indonesia, totaling 313 employees. The sample was selected using simple random sampling, which provides an equal opportunity for each member of the population to be

chosen as a respondent. The number of samples was determined using the Slovin formula with a 10% margin of error, resulting in 75 respondents. This sampling technique was considered appropriate because it supports representativeness and reduces researcher bias in the selection process (Sugiyono, 2020). The primary data used in this study were collected directly from respondents through questionnaires distributed to the selected employees. Primary data are defined as data obtained directly from the main source or research setting (Irma & Yusuf, 2020).

The main instrument of data collection was a structured questionnaire developed based on the theoretical indicators of each variable. The questionnaire used a closed-ended format, in which all responses had been predetermined, making it easier for respondents to answer consistently. Each statement item was measured using a four-point Likert scale consisting of strongly disagree, disagree, agree, and strongly agree, with scores ranging from 1 to 4 (Sugiyono, 2020). In addition to questionnaires, the researcher also used observation, interviews, and library research to enrich the understanding of the research context. Interviews were conducted with a foreman and several employees in the Thermal Division to obtain deeper information regarding the company's conditions and employee-related issues.

Before conducting the main analysis, the research instrument was tested for validity and reliability. Validity testing was used to determine whether the instrument accurately measured the intended constructs, while reliability testing was conducted to assess the consistency of the instrument using Cronbach's Alpha (Sugiyono, 2020). The collected data were then analyzed using SPSS through multiple linear regression analysis to determine the effect of the independent variables on turnover intention. Prior to regression analysis, classical assumption tests were performed, including normality, multicollinearity, heteroscedasticity, and linearity tests, to ensure the suitability of the regression model (Sahir, 2021; Septiandaru, 2020). Hypothesis testing was conducted using the t-test to examine the partial effect of each independent variable, the F-test to assess their simultaneous effect, and the coefficient of determination to identify the proportion of variance in turnover intention explained by work-life balance, physical work environment, and employee engagement (Sugiyono, 2020; Sahir, 2021).

Results and Discussion

Validity Test

The validity test was conducted to determine the validity or appropriateness of the questionnaire used by the researcher to collect data from the respondents. With a total of 75 respondents, the value of r table was obtained using the Pearson Product-Moment correlation with the degree of freedom (df) = $N - 2$. Thus, $df = 75 - 2 = 73$, resulting in an r table value of 0.203. An item is considered valid when r calculated is greater than r table. Conversely, if r calculated is smaller than r table, the questionnaire item is considered invalid. The following are the results of the validity test analysis conducted using SPSS 27:

Table 1 Validity Test Results for Variable X1

Item	Scale if Deleted	Mean Item	Scale Variance if Deleted	Corrected Total	Item-Correlation	Cronbach's Alpha if Deleted	Remarks
X1.1	30.53		78.144	0.787		0.780	Valid
X1.2	30.57		76.897	0.818		0.775	Valid
X1.3	30.55		78.846	0.850		0.781	Valid
X1.4	30.51		76.767	0.873		0.773	Valid
X1.5	30.49		76.280	0.837		0.772	Valid
X1.6	30.39		77.051	0.785		0.776	Valid
X1	16.64		22.936	1.000		0.925	Valid
TOTAL							

Source: Processed research data, 2025

The validity test for the work-life balance variable was conducted on 6 statement items, and the results showed that r calculated $>$ r table. Therefore, all statement items were declared valid.

Table 2 Validity Test Results for Variable X2

Item	Scale if Deleted	Mean Item	Scale Variance if Deleted	Corrected Total	Item-Correlation	Cronbach's Alpha if Deleted	Remarks
X2.1	67.43		53.329	0.507		0.743	Valid
X2.2	67.41		53.219	0.597		0.740	Valid
X2.3	67.47		51.658	0.728		0.730	Valid
X2.4	67.48		50.902	0.687		0.728	Valid
X2.5	67.43		54.383	0.499		0.747	Valid
X2.6	67.39		53.132	0.648		0.739	Valid
X2.7	67.28		54.204	0.577		0.745	Valid
X2.8	67.32		53.788	0.580		0.743	Valid
X2.9	67.45		52.603	0.673		0.736	Valid
X2.10	67.72		51.069	0.568		0.732	Valid
X2	35.49		14.578	1.000		0.845	Valid
TOTAL							

Source: Processed research data, 2025

The validity test for the physical work environment variable was conducted on 10 statement items, and the results showed that r calculated $>$ r table. Therefore, all statement items were declared valid.

Table 3. Validity Test Results for Variable X3

Item	Scale if Deleted	Mean Item	Scale Variance if Item Deleted	Corrected Total	Item-Correlation	Cronbach's Alpha if Deleted	Remarks
X3.1	30.57		90.734	0.778		0.795	Valid
X3.2	30.69		87.810	0.853		0.784	Valid
X3.3	30.65		86.878	0.895		0.780	Valid
X3.4	30.81		86.478	0.903		0.778	Valid
X3.5	30.79		85.008	0.926		0.773	Valid
X3.6	30.69		87.459	0.889		0.782	Valid
X3	16.75		25.948	1.000		0.950	Valid
TOTAL							

Source: Processed research data, 2025.

The validity test for the employee engagement variable was conducted on 6 statement items, and the results showed that r calculated $> r$ table. Therefore, all statement items were declared valid.

Table 4. Validity Test Results for Variable Y

Item	Scale if Deleted	Mean Item	Scale Variance if Item Deleted	Corrected Total	Item-Correlation	Cronbach's Alpha if Deleted	Remarks
Y.1	33.35		71.148	0.816		0.770	Valid
Y.2	33.20		70.649	0.803		0.768	Valid
Y.3	33.33		69.685	0.835		0.763	Valid
Y.4	33.20		70.081	0.828		0.765	Valid
Y.5	33.01		69.365	0.748		0.766	Valid
Y.6	33.08		74.129	0.627		0.786	Valid
Y	18.11		20.988	1.000		0.898	Valid
TOTAL							

Source: Processed research data, 2025.

The validity test for the turnover intention variable was conducted on 6 statement items, and the results showed that r calculated $> r$ table. Therefore, all statement items were declared valid.

Reliability Test

The reliability test was conducted to determine the level of consistency of the questionnaire used by the researcher so that the instrument could be considered dependable, even if the study were repeated using the same questionnaire. A questionnaire is considered reliable if

the Cronbach's Alpha value is greater than 0.50. Conversely, if the Cronbach's Alpha value is less than 0.50, the instrument is considered not reliable. The following are the results of the reliability test analysis conducted using SPSS 27:

Table 5. Reliability Test Results

No.	Variable	Cronbach's Alpha	Required Alpha	Cronbach's	Remarks
1	Work-life Balance	0.808	> 0.60		Reliable
2	Physical Work Environment	0.759	> 0.60		Reliable
3	Employee Engagement	0.814	> 0.60		Reliable
4	Turnover Intention	0.802	> 0.60		Reliable

Source: Processed research data, 2025.

Based on the results of the instrument reliability test, it can be seen that the Cronbach's Alpha values for each variable, namely work-life balance (X1), physical work environment (X2), employee engagement (X3), and turnover intention (Y), were all higher than the required Cronbach's Alpha threshold. Referring to the results of the reliability test, all variables were therefore declared reliable.

Normality Test

The normality test is important because one of the main requirements of parametric testing is that the data must be normally distributed. In this study, the normality test was conducted using the One-Sample Kolmogorov-Smirnov (K-S) statistical test. The decision in this test was made by comparing the Exact Sig. (2-tailed) value with alpha (α), where the significance level used was 10% or 0.1. If the Exact Sig. (2-tailed) value is greater than alpha (0.1), the data are considered normally distributed. Conversely, if the Exact Sig. (2-tailed) value is smaller than alpha, the data are considered not normally distributed. The results of the normality test in this study are presented in the table below.

Table 6. Kolmogorov-Smirnov Normality Test Results

	Unstandardized Residual
N	75
Normal Parameters ^{a,b} Mean	0.0000000
Std. Deviation	2.34473081
Most Extreme Differences Absolute	0.088
Positive	0.054
Negative	-0.088
Test Statistic	0.088

Asymp. Sig. (2-tailed)c 0.200

Source: Processed research data, 2025.

Based on Table 6, the results of the normality test using the Kolmogorov-Smirnov test show that the Asymp. Sig. value of the residual is $0.200 > 0.1$. Therefore, it can be concluded that the regression data are normally distributed.

Multicollinearity Test

The multicollinearity test was conducted to determine whether there was a correlation among the independent variables. This condition can be identified through the tolerance value and the Variance Inflation Factor (VIF). If the tolerance value is greater than 0.10 and the VIF value is less than 10, it can be concluded that there is no correlation among the independent variables (Sujarweni, 2021, p. 185). The results of the multicollinearity test in this study are presented in the table below.

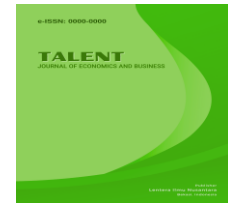
Table 7. Multicollinearity Test Results

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta				Tolerance	VIF
(Constant)	8.291	2.869			2.890	0.005		
Work-life Balance	0.161	0.119	0.100		1.764	0.000	0.982	1.019
Physical Work Environment	-0.160	0.075	-0.132		-2.140	0.036	0.906	1.104
Employee Engagement	0.728	0.066	0.809		10.989	0.000	0.921	1.085

a. Dependent Variable: Turnover Intention

Source: Processed SPSS 27 data, 2025.

Based on Table 7, the tolerance values for the variables of work-life balance, physical work environment, and employee engagement are all greater than 0.10. This result indicates that there is no significant correlation among the independent variables. In addition, the Variance Inflation Factor (VIF) values for all variables do not exceed 10. Therefore, it can be concluded that there is no indication of multicollinearity among the independent variables in this regression model.



Heteroscedasticity Test

The heteroscedasticity test is used to examine whether there is a difference in residual variance from one observation period to another (Sujarweni, 2021, pp. 186–187).

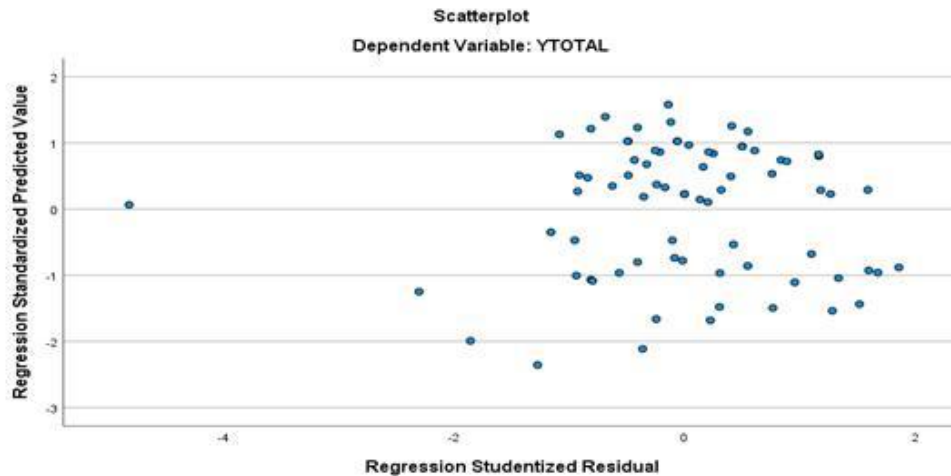


Figure 1. Heteroscedasticity Test
 Source: Processed SPSS 27 data, 2025.

Based on the figure above, the points in the scatterplot are spread randomly and irregularly, with no clear pattern or direction. This indicates that the data in this study are free from heteroscedasticity symptoms. In other words, the regression model fulfills the assumption of homoscedasticity.

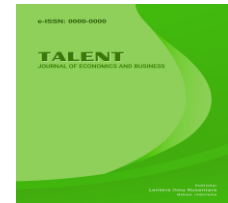
Autocorrelation Test

The autocorrelation test was conducted to determine whether there was a correlation between the residual errors in period t and the errors in period $t-1$ in the linear regression model. The presence or absence of autocorrelation was detected using the Durbin-Watson test. The test criteria are as follows: if $0 < d < dL$, positive autocorrelation occurs; if $dL < d < dU$, the result is inconclusive; if $4 - dL < d < 4$, negative autocorrelation occurs; if $4 - dU < d < 4 - dL$, the result is inconclusive; and if $dU < d < 4 - dU$, there is neither positive nor negative autocorrelation. The results of the autocorrelation test using Durbin-Watson are presented in the table below.

Table 8. Autocorrelation Test Results

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate	Durbin-Watson
1	.846a	0.716	0.704	2.491	2.287

Source: Processed SPSS 27 data, 2025.



Based on Table 8, it is known that the value of $dU = 1.66$ and $4-dU = 2.34$. The Durbin-Watson value obtained in this study is 2.287, which means that $1.66 < 2.287 < 2.34$. Since the Durbin-Watson value lies between dU and $4-dU$, it can be concluded that there is no autocorrelation in this research model.

Multiple Linear Regression Test

Multiple linear regression analysis is used when the regression model involves more than one independent variable. The purpose of this technique is to evaluate the direction and extent of the effect of the independent variables on the dependent variable. In this study, multiple linear regression analysis was applied to examine the relationship between work-life balance, physical work environment, and employee engagement on turnover intention at PT Denso Manufacturing Indonesia. The results of the multiple linear regression test are presented in the following table.

Table 9. Multiple Linear Regression Test Results

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
1 (Constant)	8.291	2.869			2.890	0.005
Work-life Balance	0.161	0.119	0.100		1.764	0.000
Physical Work Environment	-0.160	0.075	-0.132		-2.140	0.036
Employee Engagement	0.728	0.066	0.809		10.989	0.000

a. Dependent Variable: Turnover Intention

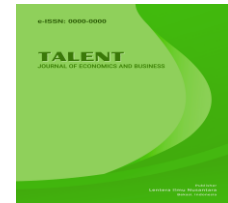
Source: Processed SPSS 27 data, 2025.

Based on Table 9, the regression results can be used to formulate the linear equation describing the effect of work-life balance, physical work environment, and employee engagement on employees' turnover intention at PT Denso Manufacturing Indonesia. The regression equation is as follows:

$$Y = a + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + e$$

$$Y = 8.291 + 0.161X_1 - 0.160X_2 + 0.728X_3 + e$$

The constant value of 8.291 indicates that if the variables of work-life balance, physical work environment, and employee engagement are assumed to be constant or equal to zero, the turnover intention value would be 8.291 units. The regression coefficient for work-life balance



(X1) is 0.161, which means that every one-unit increase in work-life balance is followed by an increase of 0.161 units in turnover intention, assuming the other variables remain constant. The regression coefficient for physical work environment (X2) is -0.160, indicating that every one-unit increase in the physical work environment variable leads to a decrease of 0.160 units in turnover intention, assuming the other variables remain constant. Meanwhile, the regression coefficient for employee engagement (X3) is 0.728, which means that every one-unit increase in employee engagement is followed by an increase of 0.728 units in turnover intention, assuming the other variables remain constant. The error term (e) represents other factors affecting turnover intention that were not included in the regression model.

Partial Test (t-test)

The t-test was used to determine the extent of the partial effect of each independent variable on the dependent variable. This study used a sample of 75 respondents. The basis for decision-making was as follows: if t count > t table, the independent variable has an effect on the dependent variable; if t count < t table, the independent variable does not have an effect on the dependent variable. In addition, if Sig. < 0.05, the independent variable significantly affects the dependent variable, whereas if Sig. > 0.05, the independent variable does not significantly affect the dependent variable.

Table 10. Partial Test Results (t-test)

Model		Unstandardized Coefficients		Standardized Coefficients		t	Sig.
		B	Std. Error	Beta			
1	(Constant)	8.291	2.869			2.890	0.005
	Work-life Balance	0.161	0.119	0.100		1.764	0.000
	Physical Work Environment	-0.160	0.075	-0.132		-2.140	0.036
	Employee Engagement	0.728	0.066	0.809		10.989	0.000

a. Dependent Variable: Turnover Intention

Source: Processed SPSS 27 data, 2025.

The value of t table with the formula $(n - k - 1) = (75 - 3 - 1) = 71$ is 1.665. Based on Table 10, the first hypothesis (H1) shows that the work-life balance variable has a t count of 1.764, which is greater than t table of 1.665, and a significance value of 0.000, which is smaller than 0.05. This means that work-life balance has a positive and significant effect on turnover intention. Therefore, H0 is rejected and H1 is accepted. The second hypothesis (H2) shows that the physical work environment variable has a t count of -2.140 with a significance value of

0.036, which is smaller than 0.05. This indicates that the physical work environment has a negative and significant effect on turnover intention. Therefore, H0 is rejected and H2 is accepted. The third hypothesis (H3) shows that the employee engagement variable has a t count of 10.989, which is greater than t table of 1.665, and a significance value of 0.000, which is smaller than 0.05. This means that employee engagement has a positive and significant effect on turnover intention. Therefore, H0 is rejected and H3 is accepted.

Simultaneous Test (F-test)

The F-test was used to determine the significance of the simultaneous effect of the independent variables on the dependent variable.

Table 11 Simultaneous Test Results (F-test)

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1146.312	3	382.104	66.684	.000b
Residual	406.834	71	5.730		
Total	1553.147	74			

Source: Processed SPSS 27 data, 2025.

The value of F table with the formula $(n - k) = (75 - 3) = 72$ is 2.18. Based on Table 11, the F count value is 66.684, which is greater than the F table value of 2.18. This result indicates that the independent variables, namely work-life balance, physical work environment, and employee engagement, simultaneously have a significant effect on the dependent variable, turnover intention.

Coefficient of Determination Test (Adjusted R²)


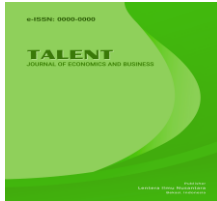
The Adjusted R Square is used in a regression model involving three or more independent variables. The coefficient of determination is calculated to assess how far the independent variables in the multiple linear regression model are collectively able to explain the dependent variable. The results of the coefficient of determination test are presented in the following table.

Table 12 Coefficient of Determination Test Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.846a	0.716	0.704	2.491

Source: Processed SPSS 27 data, 2024.

Based on Table 12, it can be seen that the coefficient of determination, as reflected in the Adjusted R Square value, is 0.704. This indicates that approximately 70.4% of the variation in turnover intention can be explained jointly by work-life balance, physical work environment, and

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employee engagement. Meanwhile, the remaining 29.6% is explained by other factors outside the variables examined in this study.

Discussion

The Effect of Work-Life Balance on Turnover Intention

The result of the first hypothesis test indicates that work-life balance has a significant effect on turnover intention among employees in the Thermal Division of PT Denso Manufacturing Indonesia. This finding is supported by the statistical analysis showing that the t-count value is greater than the t-table value and the significance value is below the required threshold, meaning that the first hypothesis is accepted. In other words, work-life balance is one of the important factors influencing employees' intention to leave the company.

This result suggests that employees' perceptions of how well they are able to balance work demands and personal life are closely related to their decision-making process regarding whether to remain in or leave the organization. Work-life balance is not only associated with the allocation of time between work and personal responsibilities, but also with emotional involvement and satisfaction in both domains. When employees experience imbalance, such as excessive job demands, limited personal time, and difficulty fulfilling family or social responsibilities, they may feel pressured and emotionally exhausted. Such conditions can gradually increase dissatisfaction and encourage employees to consider leaving the organization.

In the context of PT Denso Manufacturing Indonesia, particularly in the Thermal Division, this finding is relevant because the manufacturing work environment often requires employees to perform under strict schedules, production targets, and repetitive operational demands. If these work demands are not accompanied by a healthy balance between professional and personal life, employees may experience stress and reduced well-being. Consequently, turnover intention may emerge as a psychological response to prolonged imbalance. Therefore, the company needs to pay greater attention to policies and practices that support employees' work-life balance, such as fair workload distribution, adequate rest time, and a more supportive organizational climate.

The Effect of Physical Work Environment on Turnover Intention

The result of the second hypothesis test shows that the physical work environment has a negative and significant effect on turnover intention among employees in the Thermal Division of PT Denso Manufacturing Indonesia. This is evidenced by the statistical result indicating that the significance value is below 0.05, meaning that the second hypothesis is accepted. The negative regression coefficient indicates that the better the physical work environment, the lower the turnover intention of employees.

This finding demonstrates that physical workplace conditions play an important role in shaping employees' comfort, health, and willingness to remain in the company. The physical work environment includes several important elements such as air temperature, lighting, safety, cleanliness, and the overall adequacy of work facilities. If these aspects are not properly

managed, employees may experience discomfort that affects not only their productivity but also their job satisfaction. In the long run, uncomfortable physical conditions may lead employees to develop the intention to leave and seek a better working environment elsewhere.

In the case of the Thermal Division, where employees are directly involved in operational activities, physical conditions become even more crucial. A workplace that is too hot, lacks accessible facilities, or does not provide sufficient comfort can contribute to fatigue, health complaints, and absenteeism. These experiences may create negative perceptions of the job and reduce employees' attachment to the organization. Therefore, improving the physical work environment is not merely a matter of providing facilities, but also a strategic effort to reduce turnover intention and maintain workforce stability.

The Effect of Employee Engagement on Turnover Intention

The result of the third hypothesis test indicates that employee engagement has a significant effect on turnover intention among employees in the Thermal Division of PT Denso Manufacturing Indonesia. This result is supported by the analysis showing that the t-count value is greater than the t-table value and that the significance value is below the required level. Therefore, the third hypothesis is accepted, which means that employee engagement is an important variable in explaining turnover intention.

Employee engagement reflects the degree to which employees feel energetic, dedicated, and fully absorbed in their work. Employees with strong engagement tend to have a deeper emotional connection with their tasks and with the organization. They are more likely to feel that their work is meaningful, to demonstrate enthusiasm in performing their duties, and to show commitment to organizational goals. Because of this, employee engagement is often seen as a key factor influencing whether employees choose to stay with or leave an organization.

In this study, the significant effect of employee engagement suggests that the level of emotional and psychological attachment employees have toward their work plays a major role in turnover intention. If employees feel less involved, less appreciated, or less inspired in their roles, their commitment to the organization may weaken. As a result, the desire to seek a more attractive or meaningful job elsewhere may increase. For PT Denso Manufacturing Indonesia, this means that efforts to strengthen employee engagement, such as improving communication, recognizing employees' contributions, and fostering a sense of belonging, are essential in order to reduce employees' intention to leave.

The Simultaneous Effect of Work-Life Balance, Physical Work Environment, and Employee Engagement on Turnover Intention

The result of the fourth hypothesis test shows that work-life balance, physical work environment, and employee engagement simultaneously have a significant effect on turnover intention among employees in the Thermal Division of PT Denso Manufacturing Indonesia. This finding is based on the F-test result, which shows that the F-count value of 66.684 is greater than

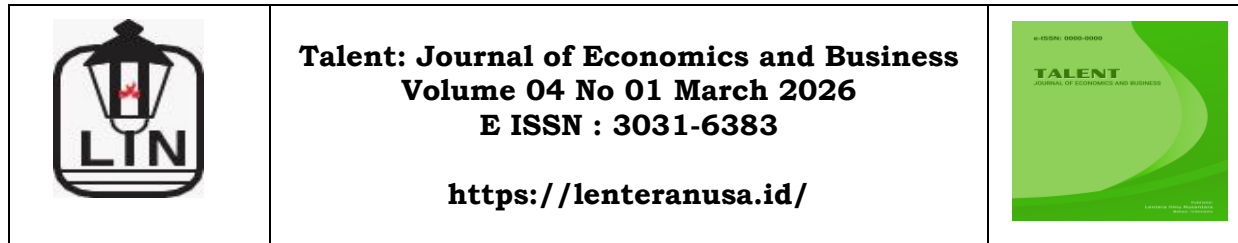
the F-table value of 2.18. Therefore, the fourth hypothesis is accepted, indicating that the three independent variables jointly influence turnover intention.

This result confirms that turnover intention is a multidimensional phenomenon that cannot be explained by only one factor. Employees' intention to leave is shaped by the combined influence of their personal work-life experience, the physical conditions of the workplace, and the level of their psychological attachment to the organization. In other words, turnover intention emerges not only because employees feel physically uncomfortable or emotionally disconnected, but also because multiple workplace factors interact and influence their overall evaluation of the job.

The simultaneous effect found in this study implies that PT Denso Manufacturing Indonesia should not address turnover intention through a single policy or isolated intervention. Instead, the company needs a more comprehensive human resource strategy that integrates improvements in work-life balance, physical working conditions, and employee engagement. Focusing on only one dimension may not produce optimal results, because employees' decision to stay or leave is often influenced by a combination of experiences within the workplace. Therefore, if the company aims to reduce turnover intention effectively, it should implement holistic policies that create a healthier, more comfortable, and more engaging work environment for employees.

Conclusion

Based on the analysis and discussion presented in the previous chapters, and in line with the objective of this study, which was to examine the effect of work-life balance, physical work environment, and employee engagement on turnover intention in the Thermal Division of PT Denso Manufacturing Indonesia, several conclusions can be drawn. First, work-life balance has a positive and significant effect on turnover intention among employees in the Thermal Division of PT Denso Manufacturing Indonesia. This indicates that work-life balance plays an important role in determining employees' turnover intention, although the positive direction of this relationship suggests that the finding should be interpreted cautiously and consistently with the reported regression results. Second, the physical work environment has a negative and significant effect on turnover intention in the Thermal Division of PT Denso Manufacturing Indonesia. This finding implies that the physical work environment also contributes significantly to turnover intention, indicating that better physical working conditions are associated with lower turnover intention. Third, employee engagement has a positive and significant effect on turnover intention in the Thermal Division of PT Denso Manufacturing Indonesia. This shows that employee engagement is one of the factors that can influence turnover intention, yet this result also requires careful interpretation because its direction is not fully in line with the common theoretical expectation. Fourth, work-life balance, physical work environment, and employee engagement simultaneously have a positive and significant effect on turnover intention in the Thermal Division of PT Denso Manufacturing Indonesia. This means that these three independent variables are important factors in assessing turnover intention among employees in the Thermal



Division of PT Denso Manufacturing Indonesia, while also indicating the empirical contribution of this study in examining these relationships simultaneously within a specific manufacturing context.

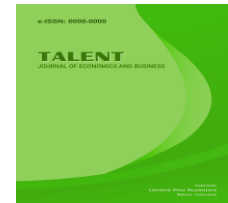
Based on the research findings and the conclusions above, several recommendations can be proposed. For the management of PT Denso Manufacturing Indonesia, it is important to improve work-life balance or provide support programs related to balancing work and personal life so that employees can feel more emotionally and mentally balanced, although the effectiveness of such initiatives should be evaluated carefully in view of the positive coefficient identified in this study. Management should also improve the quality of the physical work environment, such as lighting, ventilation, room temperature, and facility cleanliness, since these factors have been proven to affect employee comfort and retention intention. In addition, employee engagement should be strengthened consistently through recognition, involvement in decision-making, and career development opportunities so that employees feel valued and develop a stronger sense of belonging toward the company, while future interpretation of this variable should remain aligned with the statistical direction reported in the findings. For the Human Resources Department, regular monitoring of job satisfaction and turnover intention through internal surveys is necessary so that preventive actions can be taken before turnover rates become too high. HR should also develop retention strategies based on evaluations of employee engagement and work-life balance, especially in the Thermal Division, which has a relatively high workload.

Nevertheless, this study has several limitations that should be acknowledged. It was conducted using a cross-sectional quantitative design, which limits the ability to capture changes in employee perceptions over time and does not allow for strong causal interpretation. In addition, the study focused only on one division within a single company, which may restrict the broader generalizability of the findings to other industrial settings, organizational structures, or employee groups. The use of self-reported questionnaire data may also have introduced subjective bias, particularly in measuring variables closely related to personal perception and intention. For future researchers, it is recommended to include additional variables such as job stress, leadership style, or compensation, as these factors may also influence turnover intention.

Future studies are strongly encouraged to adopt broader and more diverse samples across companies, sectors, or regions in order to improve external validity. Longitudinal, qualitative, or mixed-method approaches are also recommended to provide deeper insight into how and why employees develop turnover intention, especially when some findings show directions that differ from common theoretical expectations. Moreover, subsequent research may examine mediating or moderating variables to clarify the mechanism through which work-life balance, physical work environment, and employee engagement influence turnover intention. Such extensions would not only strengthen the explanatory power of the model but also provide a more comprehensive basis for theory development and managerial intervention.



Talent: Journal of Economics and Business
Volume 04 No 01 March 2026
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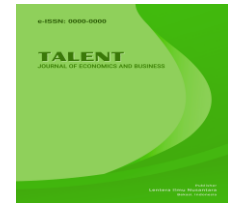


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Talent: Journal of Economics and Business
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