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# The moderating effect of job engagement on the factors influencing and employee performance in financial institution of Ningxia China

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## Abstract

Previous studies on employee performance have mainly focused on developed regions, exploring factors such as employee ability, work motivation, discipline, and organizational culture that affect employee performance. However, few studies have examined the relationship between work environment, training, leadership, work flexibility, and employee performance in developing regions of China, especially in the banking sector. The goal of this study is to examine the moderating role of job engagement in the relationship between influencing factors and employee performance in the banking sector in Ningxia, China. To achieve the research objectives, a quantitative research method was used. The questionnaire collected data from a total of 395 respondents. The empirical results show that job engagement significantly moderates the relationship between work environment, leadership, and employee performance. However, job engagement has a weak moderating effect on the relationship between training, work flexibility, and employee performance. Given that the explanatory power of the research model is as high as 38.4%, this study has important theoretical and practical significance. In theory, this study provides a theoretical model that combines the four influencing factors of work environment, training, leadership, work flexibility, and job engagement as moderating variables for employee performance in the Ningxia banking sector. In practice, this study shows that work environment, leadership, and job engagement are important factors that can be used to improve employee performance and sustainable growth in the banking sector in Ningxia, China.

**Keywords:** Job engagement, Leadership, Training, Work environment, Work flexibility.

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## 1. Introduction

Ningxia is located in the center of China, but its economic status, area, population size, and natural endowments are relatively backward in China. Ningxia's economy has traditionally focused on agriculture, particularly in animal husbandry and crop cultivation [1, 2]. Recent efforts aim to diversify this economy, leading to growth in coal mining, chemical and building material production, and renewable energy sectors, notably wind and solar power [3]. Despite progress, Ningxia remains one of China's less economically developed areas. Therefore, backward areas represented by Ningxia have long been in an embarrassing situation of being neglected, and there are relatively few studies on Ningxia.

The banking industry plays an important and irreplaceable role in the social economy and is known as the "blood" of the economy. Its stable operation is crucial to national economic security and social development. For underdeveloped regions such as Ningxia, the role of the banking industry is more prominent because it is not only a key platform for capital allocation and resource flow but also an important supporting force for promoting regional economic structure optimization and social livelihood improvement. Employee performance plays an important role in reducing costs as well as increasing efficiency, expanding market share, enhancing competitiveness, and realizing development strategies in the banking sector [4, 5]. The strategy of winning in competition requires every employee in the banking sector to be capable of making contributions [6, 7].

The selection of the banking sector, employee performance, and job engagement as the focus of this study is grounded in both practical urgency and theoretical relevance. First, the decline in net profit observed across the banking sector has been identified as a reflection of deteriorating employee performance, which is influenced by a complex interplay of organizational and individual factors [8]. Among these, job engagement has emerged as a particularly salient construct. Second, empirical evidence suggests that low levels of job engagement contribute to increased customer complaints, indicating that engagement may play a moderating or mediating role in the relationship between key organizational variables such as work environment, training, leadership, and work flexibility and employee performance [9]. Third, the increasing rate of employee turnover in the banking industry, often driven by inadequate leadership, ineffective training, and suboptimal work environments, further exacerbates organizational inefficiencies and performance decline [10].

In the context of Ningxia, a less economically developed region in China, the significance of job engagement is even more pronounced. Banking professionals in this region face a unique combination of challenges and opportunities, including the need for upskilling, adherence to traditional work culture, and the influence of community expectations, all of which shape their engagement levels and overall job experience [11]. Recent scholarship has increasingly emphasized that promoting job engagement is one of the most effective strategies for enhancing employee performance and achieving organizational goals [12-15]. Engaged employees are more likely to exhibit proactive behaviors, organizational commitment, and sustained productivity, all of which are critical for the long-term success of the banking sector. These considerations justify the focus of this study on exploring the role of job engagement in improving employee performance within the banking sector of Ningxia.

## 2. Literature Review

### *2.1. Job Engagement*

Baron and Kenny [16] define a moderator as a variable, either qualitative (e.g., gender, ethnicity, or social class) or quantitative (e.g., level of reward), that influences the strength and/or direction of the relationship between an independent variable and a dependent variable. The study observed that a moderator interacts with the independent variable to exert an impact on the level of the dependent variable. The researchers also identified moderation, which arises when the effect of an external hidden variable on an internal hidden variable changes based on the levels or values of a third variable acting as the moderator [16]. Job engagement is the moderator in the present study.

Kahn [17] introduced the first formal definition of engagement, describing it as the process of expressing and applying one's authentic self in work-related activities, which facilitates meaningful connections to tasks and colleagues [17]. This involves being fully present both physically and mentally, as well as actively and energetically performing tasks. Engagement is demonstrated by individuals when they actively participate in activities, either alone or in groups, while maintaining mental alertness, concentration, and attentiveness. Additionally, they establish emotional connections with their job and with others to fulfill their professional responsibilities. During involvement, individuals within an organization utilize their entire selves to actively and fully fulfill their professional roles, channeling their own energy into physical, cognitive, and emotional efforts. Engaged people possess self-awareness and are receptive to both themselves and

others. They establish strong connections with their job and colleagues, and they exhibit authenticity and integrity in their performance [17]. Kahn noticed that involvement is manifested by the active allocation of personal physical, cognitive, and emotional resources towards work responsibilities.

Job engagement is defined as obtaining positive scores on the Maslach Burnout Inventory [18]. On the other hand, Schaufeli et al. [19] defines job engagement as a continuous, positive emotional and motivational state of satisfaction in employees. Harter et al. [20] conduct the initial study examining the relationship between employee job engagement and happiness, as well as its impact on business unit results, namely profit. It was one of the earliest research projects to propose a connection between profitability and employee job engagement. Employee job engagement is defined as the individual's active participation, contentment, and excitement towards their work [20].

Saks [21] conducted an empirical study to examine the factors that lead to job engagement and its outcomes in academic literature. The study observed that employee job engagement is a separate and independent concept that comprises cognitive, emotional, and behavioral elements that are linked to an individual's success in their profession. Macey and Schneider [22] conducted groundbreaking conceptual research on employee job engagement, building upon the contributions of other experts. The authors of the study proposed that employee job engagement may be categorized into three distinct constructs: trait engagement, state engagement, and behavioral engagement. They drew upon earlier research and characterized each concept separately, like Saks [21]. In this conceptual paradigm, the previous stage of engagement is built upon by the subsequent state, with each state contributing to the broader notion of employee job engagement. This contribution to the area aided in clarifying the disorganized, dispersed, and unfocused conceptual condition of employee job engagement by dissecting the engagement construct into separate components and disproving popular but inaccurate definitions of engagement [23].

Anitha [24] described employee job engagement as the level of commitment and participation employees exhibit toward the organization and its core values. Once an employee was engaged, they recognized their accountability towards corporate objectives and inspired their coworkers collectively to achieve organizational goals. However, this study did not find any evidence to suggest that the three factors motivation, career path, and employee job engagement together have an impact. Job engagement refers to the active participation and positive attitude that individuals have towards their work, characterized by pleasure and excitement [25].

Shkoler and Kimura [26] demonstrated the impact of motivation as a predictor on the level of commitment and effort invested in work, as well as on job engagement. Job engagement was described as a state of mind relating to work that is characterized by pleasant feelings, a sense of fulfillment, and being fully absorbed in one's tasks [27, 28]. Commitment involves a strong sense of meaning, pride, and enthusiasm toward one’s tasks or responsibilities, reflecting a deep emotional attachment to work [29]. Absorption, on the other hand, describes a mental state in which individuals become fully immersed in their tasks, maintaining intense focus and experiencing a sense of time passing quickly.

In this study, considering the applicability of the various definitions mentioned above and the issues studied in this article, the researcher agrees more with Sypniewska et al. [30]. According to Sypniewska et al. [30], job engagement was described as a lasting and all-encompassing condition that signifies participation, dedication, excitement, concentrated effort, and vitality. Low and Memon [31] defined job engagement as the connection between an employee and their work. They also observed that good job engagement indicates that the person views their employment as significant and valuable, going beyond only their salary and benefits. Job-engaged employees link their self-perception to the job they do, attributing worth to themselves.

### *2.2. Job Demands-Resources Model*

The Job Demands-Resources (JD-R) model, developed by Kulikowski and Sedlak [32] is widely utilized in the field of job engagement research. The JD-R model originated from the study of occupational stress in the 1970s [33]. The JD-R model is a dual-process framework that encompasses the demands and resources available to employees in different situations [33, 34]. The two aspects of this dualistic paradigm are considered as the precursors to employee job engagement, as stated by Bakker and Demerouti [35].

The JD-R model is widely recognized and extensively applied within the field of organizational psychology [36-40]. It focuses on identifying key factors that influence employee well-being, motivation, and overall performance. As explained by Bakker and Demerouti [41], the model suggests that job engagement is primarily shaped by two essential components: job demands, which refer to the physical, psychological, or emotional efforts required at work, and job resources, which include the support, tools, and opportunities available to help employees manage these demands effectively. Job demands encompass tasks with high workloads, time pressures, emotional strain, or complex problem-solving responsibilities, which may potentially contribute to fatigue and stress if not properly managed. They are frequently linked to certain physiological or psychological expenses. For example, demanding tasks, high work pressure, and emotional demands fall under this category.

Job resources include the structural aspects of a job that support goal achievement, alleviate work-related stress and associated costs, and promote personal growth, skill development, and career progression. Examples include support from colleagues and managers, autonomy in job tasks, and opportunities for professional development. To maintain optimal performance levels, individuals invest additional energy to combat exhaustion by increasing mental effort. This implies that fatigue induced by external pressures depletes energy reserves, ultimately diminishing their ability to perform effectively. Veldhuizen et al. [42] conducted a study using office activities to simulate a workday. They found that tired people have difficulty allocating sufficient energy to their work. In addition, tired people's performance is reduced because they have slower reaction times and fewer accurate responses when working.

The balance between these demands and resources is what influences an employee's level of engagement [43]. This implies that firms that prioritize providing support systems and individual resources to their employees are more likely to have highly engaged employees Hakanen and Roodt [33]. Kulikowski and Sedlak [32] suggested that, while studying the impact of incentives on job engagement, it is recommended to first examine the motivational processes that contribute to job engagement, as outlined in the JD-R theory. Put simply, the JD-R model is quite successful in forecasting employee job engagement when utilizing a range of recognized job resources [34].

The JD-R model is unique in its approach as it is not limited to any job demands or resources [44]. It implies that any demand or resource depends on its context. This flexibility allows the model to be adapted to various occupations and industries, making it universally applicable. The model also emphasizes the interaction between demands and resources [45]. For instance, high job demands may not lead to negative outcomes if sufficient job resources are available. This interaction plays a crucial role in understanding outcomes like employee performance and job engagement.

In recent decades, research on employee job engagement has been ongoing. Since Kahn [17] research on employee engagement, research has increasingly focused on understanding its drivers and outcomes, highlighting its benefits across individual, team, and organizational levels. Studies have shown that engaged employees contribute significantly to organizational commitment, value alignment, psychological climate, and overall productivity. Job engagement is crucial for promoting organizational success by increasing productivity, performance, and decreasing turnover rates [46]. It highlights the importance of a deep, positive connection between employees and their work, influenced by a range of psychological and organizational factors.

Recent research underscores the importance of meaningful work in driving employee engagement, supporting findings by Gallup and PwC that employees seek fulfillment and value alignment with their employers, with effective job design by managers playing a key role in matching individuals with meaningful work [47, 48]. Strategic organizational focus on job engagement, including alignment with senior leadership and enhancing job resources, fosters a conducive environment for engagement, enabling employees to thrive even in challenging work settings [49, 50].

Subsequent investigations have aimed to ascertain the job resources that have the most beneficial impact on employee performance and job engagement. For instance, awards that are specifically meant to internally encourage employees are regarded as contributing to their well-being by aligning with their personal beliefs and providing a sense of purpose [32]. The study examined the impact of financial incentives, including pay, fringe benefits, and bonuses, on job engagement. The incentives were integrated into a Job Demands-Resources (JD-R) model, which forecasts job engagement by considering job resources and job demands. Nevertheless, this did not result in any substantial improvement in the model's suitability, and all newly included predictors were found to be insignificant. It may be inferred that monetary incentives do not account for any further variation in job engagement beyond the influence of job demands and job resources.

Research on job engagement has become more detailed. Katili et al. [51] found that work-life balance has the strongest effect on job engagement, which directly improves employee performance. Yao et al. [52] showed that psychological capital moderates the relationship between job engagement and job performance. Researchers have also examined job engagement as a dependent variable to study how different leadership styles affect it. They have also explored the extent to which there is a notable disparity between levels of job engagement and employee turnover rates [53, 54]. In their study, Susanto et al. [13] investigated how motivation, career path, and job engagement influence employee performance and job satisfaction. The results show that higher perceptions of motivation, career development opportunities, and job engagement lead to improved employee performance and increased job satisfaction.

An extensive review of literature that considers employee performance as a dependent variable has revealed numerous factors influencing employee performance. These factors include work environment, training, work flexibility, employee satisfaction, leadership, reward mechanisms, incentive mechanisms, organizational culture, work intensity, and work discipline, among others. Simultaneously, studies have explored employee job engagement, analyzing it as an independent, dependent, or mediating variable. However, previous empirical research indicates a significant gap, as few studies have examined the impact of job engagement when used as a moderating variable. Consequently, this study proposes the following hypotheses:

*$H_1$: Job engagement moderates the relationship between work environment and employee performance.*

*$H_2$: Job engagement moderates the relationship between training and employee performance.*

*$H_3$: Job engagement moderates the relationship between leadership and employee performance.*

*$H_4$: Job engagement moderates the relationship between work flexibility and employee performance.*

## 3. Methodology

This study adopted a quantitative approach. This present study aims to predict the variance of employee performance based on work environment, training, leadership, and work flexibility in the banking sector in Ningxia, with a particular focus on the moderating role of job engagement. The hypotheses, developed based on the framework, are tested using a survey method with a descriptive correlation design to analyze the relationships among the key variables. Quantitative methods ensure high data reliability and guide hypothesis testing through deductive reasoning [55-57]. This approach is considered suitable for collecting data, discovering, and describing variable characteristics through statistical analysis. Successful applications in similar research support this methodology [58, 59].

### *3.1. Measurement*

In this study, the unit of analysis is individual employees within the banking sector of Ningxia, China. Following Hopkins [60], who noted the usefulness of individual observations for exploring interaction and generalizability. The target

population is defined as formal employees aged 18 or above who have worked in various types of commercial banks in Ningxia for more than one year, including labor dispatch employees who have signed labor contracts with third parties but work in commercial banks. Because they have a deeper understanding of the working environment, training, leadership, work flexibility, and job engagement in the banking sector, they are more likely to produce productive responses.

Due to the difficulties in accessing a broad population and the limitations in available resources and manpower, snowball sampling was chosen to obtain a larger number of participants for the survey. Snowball sampling involves the initial selection of participants, who subsequently refer additional participants based on the information they provide, thereby facilitating the expansion of the sample [61]. Multi-item scales were used to measure constructs in the study. To ensure the readability of the questionnaire for respondents and the accuracy of the collected data, a 5-point Likert scale was employed. The questionnaire comprised 41 questions. All questions related to the endogenous and exogenous constructs in this questionnaire were derived from and adapted based on previous research related to employee performance, influencing factors, and job engagement, as shown in the above section.

### *3.2. Data Collection*

A self-administered questionnaire was used for data collection, enabling respondents to complete the survey independently without the presence of a trained interviewer. This method allows for efficient data gathering while minimizing potential interviewer bias [62]. Self-administered questionnaires can yield more honest responses and reduce social desirability bias [63]. The survey strategy involved translating the questionnaire into Chinese and distributing it online within the scope of this study. A cover letter was provided to outline the research objectives, clarify the purpose of the study, and assure respondents that their participation was voluntary and that their responses would remain confidential. The questionnaire was distributed through the widely used survey platform in China, namely "WENJUANXING". The questionnaire was sent to bank employees, who were asked to share it with colleagues, with responses requested within six weeks in Ningxia.

## 4. Results

A total of 407 valid questionnaires were eventually received. The data preparation procedure included exporting the raw data collected by the online platform WENJUANXING into an Excel spreadsheet. Data screening was conducted using SPSS software version 29 to detect missing values, outliers, assess the normality of the gathered data, multi-collinearity, and descriptive statistics. After outliers were identified in this study, 395 data points were retained for the next step of data analysis. Smart PLS 4 was selected as the structural equation modeling methodology, evaluating both the measurement model and the structural model.

### *4.1. Measurement Model*

#### *4.1.1. Internal Consistency Reliability*

When applying partial least squares structural equation modeling (PLS-SEM), it is recommended to assess internal consistency using composite reliability [62]. This measure of consistency reliability ranges from 0 to 1, with values closer to 1 indicating greater reliability. A composite reliability below 0.60 reflects inadequate internal consistency. Scores between 0.60 and 0.70 are considered acceptable, while values from 0.70 to 0.90 are generally regarded as good, especially in exploratory research. However, values exceeding 0.95 suggest redundancy among the indicators, implying that the items may be measuring the same aspect [62]. In this study, composite reliability values between 0.60 and 0.95 are deemed acceptable.

The composite reliability values for the constructs in this study were calculated using the PLS algorithm function within SmartPLS Version 3.2.6. As shown in Table 1, the values range from 0.88 to 0.929, all exceeding the recommended threshold of 0.7 and remaining below the upper limit of 0.95. These results confirm that the constructs exhibit satisfactory internal consistency and reliability.

**Table 1.**
Summary of composite reliability results.

| Constructs | Composite Reliability | Criterion |
|---|---|---|
| Employee Performance (EP) | 0.899 | Values between 0.70 and 0.95 are acceptable [62]. |
| Work Environment (WE) | 0.860 | |
| Training (TR) | 0.884 | |
| Leadership (LS) | 0.939 | |
| Work Flexibility (WF) | 0.799 | |
| Job Engagement (JE) | 0.905 | |

#### *4.1.2. Indicator Reliability*

Indicator reliability is evaluated with the indicator's outer loading. With a high value of outer loading, the measures of a construct are positively correlated, which is referred to as indicator reliability. According to Chin [64], the outer loading of each item should exceed 0.7 and be statistically significant at a 95% confidence level (p-value $\leq$ 0.05). To assess indicator reliability, the square of each outer loading value should ideally be greater than or equal to 0.70 [65]. However, Hair et al. [62] suggested that items with loadings between 0.4 and 0.7 should only be retained if their removal leads to a

significant improvement in composite reliability. In contrast, reflecting indicators with outer standardized loadings lower than 0.4 should be excluded from the measurement model [66].

During the first run of the PLS algorithm, indicators in the measurement model exhibited loadings between 0.565 and 0.897. According to Hair et al. [62], any indicator with an outer loading below 0.4 should be eliminated prior to further analysis. In this study, there are no measurement items with outer loadings below 0.4, which preliminarily indicates that the measurement model's design quality and data quality are relatively high. For the moderating variable JE, most measurement items perform well. However, JE3 (0.599) and JE9 (0.666) should be considered for deletion. To improve the quality of the construct, items WE5, WE6, JE3, JE9, and WF3 were removed. To ensure that the parameters of the measurement model and structural model are re-estimated and meet quality standards, researchers reran the PLS algorithm after removing measurement items with low outer loadings and validated whether the reliability (CR), validity (AVE), path coefficients, and model fit have improved, as Table 2 shows.

**Table 2**.
Summary of descriptive and outer loading statistics.

| Constructs | Items | Mean | Standard Deviation | Outer Loading |
|---|---|---|---|---|
| Employee Performance (EP) | EP1 | 3.92 | 0.889 | 0.786 |
| | EP2 | 4.07 | 0.722 | 0.793 |
| | EP3 | 4.21 | 0.695 | 0.867 |
| | EP4 | 4.31 | 0.637 | 0.861 |
| | EP5 | 4.51 | 0.593 | 0.687 |
| Work Environment (WE) | WE1 | 4.25 | 0.786 | 0.789 |
| | WE2 | 4.25 | 0.765 | 0.774 |
| | WE3 | 3.66 | 0.945 | 0.628 |
| | WE4 | 4.05 | 0.711 | 0.771 |
| | WE7 | 4.29 | 0.686 | 0.743 |
| Training (TR) | TR1 | 3.93 | 0.769 | 0.806 |
| | TR2 | 3.86 | 0.785 | 0.835 |
| | TR3 | 3.83 | 0.877 | 0.775 |
| | TR4 | 3.88 | 0.772 | 0.822 |
| Leadership (LS) | LS1 | 3.73 | 0.841 | 0.724 |
| | LS2 | 3.89 | 0.790 | 0.806 |
| | LS4 | 4.08 | 0.677 | 0.801 |
| | LS5 | 3.96 | 0.803 | 0.849 |
| | LS6 | 3.98 | 0.701 | 0.839 |
| | LS7 | 4.03 | 0.685 | 0.897 |
| Work Flexibility (WF) | WF1 | 2.16 | 1.009 | 0.708 |
| | WF2 | 2.38 | 1.041 | 0.751 |
| | WF4 | 2.57 | 0.968 | 0.804 |
| Job Engagement (JE) | JE1 | 3.42 | 0.737 | 0.693 |
| | JE2 | 3.46 | 0.764 | 0.747 |
| | JE4 | 3.65 | 0.857 | 0.726 |
| | JE5 | 3.76 | 0.701 | 0.750 |
| | JE6 | 3.44 | 1.001 | 0.786 |
| | JE7 | 3.83 | 0.850 | 0.828 |
| | JE8 | 3.55 | 0.979 | 0.775 |

*4.1.3. Convergent Validity*

Convergent validity refers to the extent to which a construct correlates positively with alternative measures of the same concept [62]. It is assessed using the Average Variance Extracted (AVE), which is computed as the mean of the squared factor loadings of the indicators associated with the construct. This metric is not applicable to measurement models that include only a single item. An AVE value of 0.50 or higher indicates that the construct accounts for more than half of the variance observed in its indicators [62]. Accordingly, AVE values exceeding 0.50 are considered acceptable for the purposes of this study. Table 3 indicates that all constructions in this analysis demonstrate that the overall measurement model possesses strong reliability and validity.

**Table 3.**
Summary of AVE values.

| Constructs | Constructs Convergent Validity (AVE) |
|---|---|
| Employee Performance (EP) | 0.642 |
| Work Environment (WE) | 0.553 |
| Training (TR) | 0.656 |
| Leadership (LS) | 0.688 |
| Work Flexibility (WF) | 0.57 |
| Job Engagement (JE) | 0.576 |

*4.1.4. Discriminant Validity*

Discriminant validity refers to the degree to which a construct is distinct from other constructs, indicating that it captures unique characteristics not represented by other variables [62]. It reflects the extent to which a latent variable differs from others within a given model. A high level of discriminant validity demonstrates that the construct is conceptually and empirically distinct, exhibiting features not accounted for by other constructs in the study. In this context, three common approaches are used to assess discriminant validity: cross-loadings of indicators, the Fornell-Larcker criterion, and the Heterotrait-Monotrait (HTMT) ratio.

Chin [64] posited that cross-loading was determined by comparing the scores of each latent variable indicator with those of all other latent variable indicators. The loading of each construct's items is anticipated to exceed that of all other constructs' items in terms of cross-loading. When the indicator loadings of a construct are higher than those of other constructs, it indicates that the indicators for each construct are distinct and not interchangeable [64]. These results shown in Table 4 confirm that the current measurement model meets the discriminant validity criteria, which provides a guarantee for the measurement quality of this study, the credibility and validity of the model, and the reliability of the conclusions of subsequent studies.

**Table 4.**
Summary of cross loading values.

| | EP | JE | LS | TR | WE | WF |
|---|---|---|---|---|---|---|
| EP1 | **0.786** | 0.352 | 0.285 | -0.318 | 0.336 | -0.103 |
| EP2 | **0.793** | 0.354 | 0.367 | -0.156 | 0.380 | -0.088 |
| EP3 | **0.867** | 0.298 | 0.322 | -0.240 | 0.333 | -0.180 |
| EP4 | **0.861** | 0.309 | 0.363 | -0.216 | 0.392 | -0.162 |
| EP5 | **0.687** | 0.303 | 0.264 | -0.142 | 0.327 | -0.178 |
| JE1 | 0.228 | **0.693** | 0.466 | -0.035 | 0.341 | 0.179 |
| JE2 | 0.231 | **0.747** | 0.453 | -0.024 | 0.297 | 0.259 |
| JE4 | 0.214 | **0.726** | 0.419 | -0.028 | 0.257 | 0.318 |
| JE5 | 0.269 | **0.750** | 0.499 | -0.05 | 0.337 | 0.167 |
| JE6 | 0.207 | **0.786** | 0.455 | 0.025 | 0.197 | 0.328 |
| JE7 | 0.431 | **0.828** | 0.389 | -0.086 | 0.313 | 0.086 |
| JE8 | 0.400 | **0.775** | 0.348 | -0.05 | 0.295 | 0.066 |
| LS1 | 0.306 | 0.483 | **0.724** | 0.002 | 0.355 | 0.157 |
| LS2 | 0.303 | 0.473 | **0.806** | -0.029 | 0.478 | 0.200 |
| LS3 | 0.377 | 0.415 | **0.801** | -0.026 | 0.449 | 0.069 |
| LS4 | 0.338 | 0.434 | **0.849** | -0.062 | 0.506 | 0.072 |
| LS5 | 0.288 | 0.432 | **0.839** | 0.023 | 0.374 | 0.139 |
| LS6 | 0.343 | 0.492 | **0.897** | -0.033 | 0.528 | 0.129 |
| LS7 | 0.355 | 0.475 | **0.880** | -0.098 | 0.474 | 0.186 |
| TR1 | -0.129 | -0.014 | -0.023 | **0.806** | -0.013 | 0.082 |
| TR2 | -0.211 | -0.044 | -0.034 | **0.835** | -0.055 | 0.095 |
| TR3 | -0.296 | -0.073 | -0.045 | **0.775** | -0.116 | 0.085 |
| TR4 | -0.151 | -0.020 | -0.018 | **0.822** | -0.001 | 0.026 |
| WE1 | 0.421 | 0.265 | 0.367 | -0.108 | **0.789** | -0.129 |
| WE2 | 0.289 | 0.189 | 0.321 | -0.062 | **0.774** | -0.140 |
| WE3 | 0.185 | 0.378 | 0.409 | 0.020 | **0.628** | 0.118 |
| WE4 | 0.286 | 0.308 | 0.498 | 0.023 | **0.771** | -0.043 |
| WE7 | 0.377 | 0.341 | 0.472 | -0.099 | **0.743** | -0.088 |
| WF1 | -0.128 | 0.215 | 0.142 | 0.077 | -0.087 | **0.708** |
| WF2 | -0.100 | 0.202 | 0.159 | 0.124 | -0.049 | **0.751** |
| WF4 | -0.160 | 0.120 | 0.084 | 0.035 | -0.086 | **0.804** |

The Fornell-Larcker criterion was applied at the construct level to verify discriminant validity, ensuring that each construct is sufficiently separate from the others. The square root of each construct’s AVE must exceed its highest

correlation with any other construct [62]. The square root values of the AVE of each construct and their correlation with other constructs are obtained using the Smart PLS algorithm function. Table 5 exhibits that all the square roots of AVE values are higher than other values in the same row and the same column, satisfying the criterion that the square roots of constructs' AVE are higher than their highest correlation with any other constructs, thereby confirming that the Fornell-Larcker criterion is met, and discriminant validity of the model is established.

**Table 5.**
Summary of intercorrelations.

| | EP | JE | LS | TR | WE | WF |
|---|---|---|---|---|---|---|
| EP | **0.801** | | | | | |
| JE | 0.404 | **0.759** | | | | |
| LS | 0.401 | 0.551 | **0.830** | | | |
| TR | -0.271 | -0.056 | -0.041 | **0.810** | | |
| WE | 0.442 | 0.386 | 0.549 | -0.077 | **0.743** | |
| WF | -0.177 | 0.227 | 0.161 | 0.094 | -0.101 | **0.755** |

**Note:** Diagonal values represent the square root of the AVE, while the off-diagonal values represent the correlations.

The heterogeneous trait-to-homogeneous trait ratio (HTMT) was proposed by Henseler et al. [67] and is a widely accepted metric for assessing discriminant validity, especially in PLS-SEM. Compared with traditional methods such as the Fornell-Larcker criterion, HTMT provides a more sophisticated way to assess the distinctiveness between latent constructs. An HTMT value below the threshold of 0.85 (or 0.90 in more lenient settings) is considered acceptable, indicating sufficient discriminant validity between constructs. Table 6 shows the results of the HTMT test based on the data of this study, providing strong support for the next step of research.

**Table 6.**
HTMT Test Results for Correlations Among the Variables.

| | EP | JE | LS | TR | WE | WF |
|---|---|---|---|---|---|---|
| EP | | | | | | |
| JE | 0.426 | | | | | |
| LS | 0.448 | 0.629 | | | | |
| TR | 0.281 | 0.069 | 0.053 | | | |
| WE | 0.504 | 0.470 | 0.641 | 0.110 | | |
| WF | 0.237 | 0.364 | 0.225 | 0.139 | 0.205 | |

*4.2. Structural Model*

The PLS-SEM analysis should be performed initially without the moderator to evaluate the significance of the main effect [62]. In this study, employee performance is the dependent variable, while work environment (WE), training (TR), leadership (LS), and work flexibility (WF) serve as the independent variables. Job engagement (JE) functions as the moderator. The relationships between variables are analyzed using the output from the Smart PLS 4 algorithm. Lohmöller [68] asserts that the path coefficient for every relationship (WE -> EP, TR -> EP, LS -> EP, WF -> EP, JE -> EP) must exceed 0.10, with a confidence level of no less than 0.05. Consequently, the findings indicate that the route coefficients in the direct structural model are fulfilled.

**Table 7**.
Path coefficients of direct paths.

| Relationship | Path coefficients (ß) | t -values | p-value |
|---|---|---|---|
| WE->EP | 0.208 | 3.862 | 0 |
| TR->EP | -0.211 | 5.480 | 0 |
| LS->EP | 0.165 | 2.753 | 0.006 |
| WF->EP | -0.224 | 4.622 | 0 |

**Note:** Significance Value=0.05.

Moderation occurs when the effect of an exogenous latent variable on an endogenous latent variable depends on a third variable, known as the moderator, which influences the strength, direction, or both aspects of the relationship [16]. This study uses the product indicator method to test the moderating effect. Specifically, it examines the impact of job engagement on the relationship between work environment, training, leadership, work flexibility, and employee performance. The performance indicator method directly uses the product of the observed indicators to construct the interaction term, making it closer to the original data [62]. All the variables are represented by reflective measurement models. The product indicator approach is suitable for reflective measurement models, as it assumes that the observed values of the independent and moderating variables are accurately measured.

Table 8 illustrates the moderation effects of Job Engagement (JE) with Work Environment (WE), Training (TR), Leadership (LS), and Work Flexibility (WF) on Employee Performance (EP). Among these interactions, JE x WE → EP exhibits a positive and significant moderation effect. Conversely, JE x LS → EP shows a significant but negative moderation effect. The other two interactions, JE x TR → EP and JE x WF → EP, exhibit weak negative effects that are not

statistically significant, implying that these factors do not reliably influence the relationship between job engagement and employee performance. These results highlight the importance of tailoring organizational practices to optimize the positive synergies between job engagement and environmental factors while minimizing potential conflicts.

**Table 8.**
Moderating effect of job engagement.

| Moderation Effects | Path Coefficients (ß) | t-values | p-values |
|---|---|---|---|
| JE x WE -> EP | 0.142 | 2.341 | 0.019 |
| JE x TR -> EP | -0.060 | 1.59 | 0.112 |
| JE x LS -> EP | -0.104 | 2.018 | 0.044 |
| JE x WF -> EP | -0.050 | 1.14 | 0.254 |

**Note:** Significance Value=0.05.

## 5. Discussion and Conclusions

In this study, job engagement is hypothesized to be a moderating factor in the four relationships discussed previously. The moderating effect of job engagement is illustrated in the PLS path model, with an $R^2$ value of 0.384. Since this value is greater than 0.26, it is considered quite substantial [69]. The results of this study show that job engagement significantly moderates the relationship between employee performance and two independent variables (work environment and leadership). However, job engagement does not significantly moderate the relationship between employee performance and the other two variables (training and work flexibility). These results highlight the subtle and complex role of job engagement in the interaction between the above four influencing factors and employee performance. The present research provides significant theoretical and practical implications. The theoretical contribution lies in extending the existing theoretical framework on employee performance by incorporating job engagement as a moderating variable. This study has developed a conceptual framework to examine the moderating effect of job engagement. Practically, this study offers valuable insights and guidance for managers or decision-makers in the banking sector to improve employee performance. Because the various resources of an organization, such as human resources and funds, are limited, it is impossible to be comprehensive. Therefore, managers within the organization can identify key factors that affect performance (such as work environment, training, leadership, and work flexibility) and determine areas that need focus to enhance employee performance [70]. Therefore, decision makers and managers in the banking sector should prioritize cultivating a supportive work environment and implementing effective leadership practices. At the same time, they should carefully design training programs, implement training activities, and develop flexible work policies that are consistent with the company's current situation to mitigate the potential disadvantages caused by improper management of training and work flexibility [71-73]. In addition, given that job engagement plays a moderating role in these relationships, and the strength and direction of the moderating effect vary, this study recommends integrating strategies to improve job engagement. In this way, the four influencing factors and one moderating variable proposed in this study can jointly promote the growth of employee performance.

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