



# Research on the Influencing Factors of Environmental Characteristics on the Psychological Contract Breach among Knowledge Workers in High-Tech Enterprises

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**Abstract.** This study embarks on a comprehensive investigation into the factors influencing the breach of psychological contracts among knowledge workers within the high-technology sector. Utilizing a robust regression analysis, the research examines the impact of four critical independent variables: Performance Orientation (V1), High Competitive Pressure (V2), Rapidly Evolving Technological Environment (V3), and Work-Life Balance (V4) on the phenomenon of psychological contract breaches. The findings illuminate that all four variables significantly affect such breaches, with Performance Orientation and High Competitive Pressure demonstrating a more pronounced impact at the 0.01 significance level, while Rapidly Evolving Technological Environment and Work-Life Balance show a considerable effect at the 0.05 level. The analysis indicates that these factors, inherent to the operational environments of high-technology companies, substantially contribute to the disruption of psychological contracts among employees who rely heavily on knowledge-based work. The study underscores the necessity for organizations to recognize these critical dimensions and adopt comprehensive strategies focused on reducing incidents of psychological contract breaches. By addressing these key factors, companies can significantly enhance employee satisfaction and operational efficiency, paving the way for a more harmonious and productive workplace environment. This research contributes to the ongoing discourse on organizational behavior, offering valuable insights for both academic scholars and industry practitioners aiming to foster a more engaged and committed workforce.

**Keywords:** High tech enterprises, Knowledge workers, Violation of psychological contract, Environmental Characteristic.

## 1 Introduction

In the rapidly evolving landscape of the 21st century, high-tech enterprises have emerged as frontrunners of economic growth and societal transformation, fueled by their relentless pursuit of technological innovation and research [2]. These organizations are distinguished by their significant investments in research and development (R&D), a high proportion of scientific and technical personnel, and an enduring

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capability for innovation. This unique blend of attributes positions high-tech enterprises at the vanguard of addressing the dual challenges of rapid technological progress and intensifying global competition. Their core competitiveness is deeply rooted in technological advancements and innovation, which not only drives their development but also propels economic advancement and societal evolution.

The quintessence of high-tech enterprises lies in their technology-driven nature, where competitive advantage is often hinged on unparalleled technological capabilities and innovative breakthroughs. In an era characterized by swift technological shifts, the imperative for these enterprises is to continuously invest in R&D to sustain their leadership position. This commitment extends beyond product innovation, touching every facet of their operations and necessitating a robust engagement with scientific talent and academic institutions to pioneer technological advancement. However, the accelerated pace of technological change presents formidable challenges, requiring these enterprises to remain vigilant and adaptive to leverage new opportunities while managing the risks associated with substantial R&D investments and the commercialization of research findings.

Furthermore, high-tech enterprises must adeptly navigate the complexities of rapid change and intense global competition [3]. The dynamic market demands and swift technological evolution mandate a high degree of agility and flexibility in strategy, product development, and service delivery. This agility is underpinned by efficient information processing and a culture that encourages innovation, allowing these enterprises to quickly respond to changing market and customer needs. Moreover, the knowledge-intensive nature of these enterprises underscores the critical role of their workforce's expertise and skills in fostering growth, innovation, and sustainable development.

Compounding these challenges is the fierce competition for talent, amplified by the global nature of technological advancement and the scarcity of highly skilled personnel [8]. High-tech enterprises are thus compelled to devise effective talent management strategies, emphasizing competitive compensation, professional development, and a culture conducive to creativity and innovation. By attracting, developing, and retaining exceptional talent, these enterprises not only navigate the intricacies of technological and market dynamics but also secure a foundational pillar for their continued innovation and competitiveness.

In summary, high-tech enterprises represent a critical nexus of innovation, technology, and human capital, navigating through the challenges of rapid technological change, global competition, and talent scarcity. Their success hinges on their ability to invest in technology and innovation, adapt to rapid changes, manage knowledge-intensive operations, and compete for top talent, thereby driving economic growth and societal progress.

## **2 Case Analysis**

### **2.1 Methodology**

This exploratory research draws upon the semi-structured interview approach used by Turnley (2003) [9], a qualitative research method extensively employed in scholarly investigations [1]. This technique facilitates profound dialogues and interactions between researchers and subjects, thereby enabling a thorough understanding and investigation of the research question. Nonetheless, qualitative research is characterized by smaller sample sizes and often relies on convenience sampling, which may compromise the control over variables and, consequently, the study's rigor in establishing causal relationships. This issue represents a significant limitation of qualitative methodologies. Nevertheless, qualitative research offers distinctive advantages, notably the ability to provide rich and detailed descriptions ("thick description") that deepen our comprehension and exhaustive depiction of the research phenomenon [5]. Such in-depth descriptions can act as invaluable supplements to alternative methodologies, like quantitative research, providing a more holistic and detailed viewpoint. Crucially, qualitative methodologies serve as fertile grounds for developing new theories and concepts, allowing researchers to derive novel theoretical perspectives from field data or to refine existing theoretical frameworks [4]. Hence, despite potential limitations in causal inference, the contribution of qualitative research to theory building and development is indispensable.

### **2.2 Research Subject**

The study selected 10 interviewees, comprising 3 employees from private high-tech enterprises, 4 from state-owned high-tech enterprises, and 3 from foreign-funded high-tech enterprises; the minimum work tenure was 3 years, and the maximum was 18 years. The interviews commenced on March 15, 2023, spanning 31 days, concluding on April 14, 2023. The interviewees, totaling 10 individuals from private, state-owned, and foreign-funded high-tech enterprises, presented a relatively balanced gender distribution with equal numbers of males and females. The range of work tenure from 3 to 18 years allowed for a comprehensive understanding of employees at different levels of work experience. With 40% of the participants being from state-owned enterprises and 30% each from private and foreign-funded enterprises, the study was well-positioned to investigate the effects of organizational nature. The equal distribution of employees from medium and large enterprises facilitated an exploration of the impact of enterprise size. The inclusion of professional, clerical, and managerial positions enabled a thorough understanding of the work content and responsibilities of employees in different positions. Interviewees came from core departments such as quality management, information management, product production, financial management, R&D design, marketing and sales, and human resources, providing insights into the operations and employee experiences within high-tech enterprises. Overall, the diversity and representativeness of the interviewees offered a rich and comprehensive data foundation for subsequent analysis and research.

### 3 Empirical Analysis

This study embarks on a comprehensive investigation into the factors influencing the breach of psychological contracts among knowledge workers within the high-technology sector. Utilizing a robust regression analysis, the research examines the impact of four critical independent variables: Performance Orientation (V1), High Competitive Pressure (V2), Rapidly Evolving Technological Environment (V3), and Work-Life Balance (V4) on the phenomenon of psychological contract breaches. The findings illuminate that all four variables significantly affect such breaches, with Performance Orientation and High Competitive Pressure demonstrating a more pronounced impact at the 0.01 significance level, while Rapidly Evolving Technological Environment and Work-Life Balance show a considerable effect at the 0.05 level. The analysis indicates that these factors, inherent to the operational environments of high-technology companies, substantially contribute to the disruption of psychological contracts among employees who rely heavily on knowledge-based work. The study underscores the necessity for organizations to recognize these critical dimensions and adopt comprehensive strategies focused on reducing incidents of psychological contract breaches. By addressing these key factors, companies can significantly enhance employee satisfaction and operational efficiency, paving the way for a more harmonious and productive workplace environment. This research contributes to the ongoing discourse on organizational behavior, offering valuable insights for both academic scholars and industry practitioners aiming to foster a more engaged and committed workforce.

#### 3.1 Questionnaire Design and Modification

##### 3.1.1 Questionnaire Design.

The survey questionnaire is mainly composed of three parts. In addition to the High-Tech Enterprise Operating Environment Characteristics Scale and the Knowledge Workers' Psychological Contract Breach Scale [6-7], it also includes a section dedicated to collecting basic sociodemographic characteristics of the sample of knowledge workers in high-tech enterprises, such as gender, age, educational background, years of work experience, marital status, department, job nature, nature of the enterprise, and company size.

The design of the background information survey questionnaire covers various aspects of knowledge workers in high-tech enterprises, making the study more comprehensive and in-depth. This background information is of significant reference value for interpreting and analyzing the data from the Psychological Contract Breach Scale.

##### 3.1.2 Preliminary Survey Research.

For the analysis of preliminary survey data, this paper employed a variety of methods including descriptive statistics, reliability analysis, and validity analysis, providing a thorough treatment and interpretation of the data. By calculating means, standard deviations, skewness, and kurtosis, we gained insights into the distribution and dispersion of various variables, confirming the assumption of an approximately normal

distribution. Subsequently, the paper assessed the internal consistency reliability of the questionnaire by calculating Cronbach's alpha coefficients for various variables. Results showed that all variables had Cronbach's alpha coefficients above 0.7, indicating good internal consistency reliability. Additionally, item-total correlation (CITC) analysis was conducted, and items with low correlations were removed, further improving the questionnaire's reliability.

Moreover, validity analysis was performed on the designed scales through the calculation of the KMO value and Bartlett's test of sphericity, verifying the effectiveness of the scales used in this study. Results showed KMO values above 0.7 and significance values (Sig.) of 0.000 in Bartlett's test, both less than 0.05, indicating that the scales are valid and suitable for factor analysis. These outcomes further attest to the high reliability and validity of the questionnaire designed for this study, capable of accurately reflecting the situation of psychological contract breach among knowledge workers in high-tech enterprises. In summary, the preliminary research results demonstrate that the questionnaire designed for psychological contract breach among knowledge workers in high-tech enterprises has high reliability and validity, with its data effectiveness recognized, making it suitable for formal research.

## **3.2 Data Collection and Analysis**

### **3.2.1 Distribution and Collection of the Official Questionnaire.**

Building on the preparatory work, questionnaire design, and preliminary survey, the official field survey was conducted from May 12 to July 11, 2023, in various high-tech enterprises located in cities including Beijing, Shanghai, Hangzhou, Jiaxing, Suzhou, Dalian, and Chongqing. At the beginning of the survey, semi-structured interviews were first carried out with company management personnel and related knowledge workers. Subsequently, questionnaires were distributed to knowledge workers employed in high-tech enterprises through random sampling, interspersed with semi-structured interviews. A total of 500 questionnaires were distributed. After excluding questionnaires with obvious omissions, multiple entries, or disorderly responses, 487 valid questionnaires were collected, resulting in an effective response rate of 97.40%. For the analysis of survey data, SPSS 26.0 software was selected to perform statistical and further analysis on the collected sample data.

### **3.2.2 Correlation Analysis between High-Tech Enterprise Operating Environment Characteristics and Psychological Contract Breach among Knowledge Workers.**

Based on the survey data on psychological contract breaches among knowledge workers in high-tech enterprises, this study analyzes the correlation between the operational environment characteristics of high-tech enterprises and psychological contract breaches among knowledge workers. The variables are the average total scores of each dimension under the influence factors. To more intuitively understand the main factors affecting psychological contract breaches among knowledge workers in high-tech enterprises, this study conducts a correlation analysis of the above variables. Variables such as performance orientation (V1), high competitive pressure (V2), rapidly

developing technological environment (V3), and work-life balance (V4) all show a significant positive correlation with psychological contract breaches among knowledge workers, warranting further regression analysis on the impact of these four variables on psychological contract breaches among knowledge workers.

### **3.2.3 Regression Analysis of the Relationship between the Operational Environment Characteristics of High-Tech Enterprises and the Psychological Contract Breach of Knowledge Workers.**

This study employs a linear regression approach, selecting the psychological contract breach of knowledge workers as the dependent variable (V0). It identifies three key independent variables reflecting the operational environment characteristics of high-tech enterprises: performance orientation (V1), high competitive pressure (V2), a rapidly evolving technological environment (V3), and the balance between work and life (V4). These variables are denoted as V1, V2, V3, and V4, respectively. The purpose is to analyze the primary factors influencing the psychological contract breach among knowledge workers in high-tech enterprises. The scores for each variable are derived from a weighted average of all items measuring that variable, constructing a multivariate linear regression equation.

Upon testing, the regression model exhibits an R-squared (R<sup>2</sup>) value of 0.642, indicating that the aforementioned independent variables account for 64.2% of the variance in the intention to engage in the studied behavior among the sample. This high R<sup>2</sup> value suggests a good fit for the model. The Durbin-Watson (D-W) statistic is 2.136, close to 2, implying minimal autocorrelation within the data. With a model P-value of 0.000, the model significantly passes the F-test, indicating that the regression model is statistically significant and the identified factors are indeed influential in explaining the psychological contract breaches among knowledge workers in high-tech enterprises.

## **4 Conclusion**

The regression analysis elucidated that independent variables V1 (Performance Orientation), V2 (High Competitive Pressure), V3 (Rapidly Evolving Technological Environment), and V4 (Work-Life Balance) significantly influence the breach of psychological contracts among knowledge workers, with V1 and V2 showing significance at the 0.01 level, and V3 and V4 at the 0.05 level, positively. These findings suggest that in the operational milieu of high-technology companies, such characteristics markedly precipitate breaches in psychological contracts among knowledge-based employees. Therefore, it is imperative for organizations to acknowledge these dimensions and implement targeted strategies aimed at mitigating psychological contract breaches, thereby enhancing employee satisfaction and operational efficiency.

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