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# Exploring the Dynamics of Corporate Personnel Structure, R&D Expenditure, and Profitability Insights into the Interdependent Influences of Human Resources on Revenue and Profit

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**Abstract:** This study explores how corporate structure, R&D expenditures, and employee education affect financial performance in three major Chinese firms—Haier, Midea, and Gree—from 2017 to 2023. Using regression and correlation analysis, findings show that higher R&D spending and employee education levels significantly boost revenue and profit. The research also identifies a positive feedback loop, where profits fund further R&D, driving ongoing growth. This highlights the importance of continuous investment in R&D and education to sustain competitive advantage and long-term success.

**Keywords:** R&D expenditures; Corporate personnel structure; Educational level

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## 1. Introduction

### 1.1 Background and Significance

In a competitive business environment, workforce structure and research and development (R&D) investments are crucial for corporate success. Aligning these elements with business goals like revenue and profitability is vital. Strategic use of educational and professional resources in conjunction with innovation investments drives performance.

### 1.2 Research Objectives

This study examines the interaction between corporate personnel structure, R&D expenditures, and their effects on financial outcomes. It aims to quantify the impacts of R&D investments and workforce education on revenue and profit, exploring how profits might drive further R&D investment.

### 1.3 Hypotheses Development

Three hypotheses guide this investigation:

Hypothesis 1: Greater R&D investment correlates with increased revenue and profit, driven by market expansion and improved efficiency.

Hypothesis 2: Higher employee education levels positively affect financial outcomes, enhancing productivity and problem-solving.

Hypothesis 3: Higher profits boost R&D reinvestment, creating a cycle of innovation and growth.

### 1.4 Contribution of the Study

The research will offer insights into managing human resources and R&D in corporate environments, providing data-driven strategies for optimizing these investments. The findings aim to enhance business and academic understanding of the interplay between human capital and innovation in driving corporate profitability.

## 2. Literature Review

To develop a theoretical framework for this study, we reviewed literature exploring the dynamics of personnel structure, R&D expenditures, and educational attainment in corporate settings.

Research has extensively explored how personnel structure influences corporate performance. Tung and Hoang Le Nguyen (2024) note that structured approaches to workforce development in emerging economies enhance economic growth. Le Thanh and Nguyen (2024) provide empirical evidence of R&D's positive effects in emerging markets, while Lin and Wang (2024) discuss the balance between strategic investments in sectors like renewable energy and long-term innovation goals. Research shows that employee education significantly affects

financial outcomes. Badulescu et al. (2024) find that higher education levels correlate with improved productivity and economic growth in Romania. The cyclical nature of profit reinvestment into R&D, though less explored, is crucial. Song, Thakor, and Quinn (2023) model how investments in higher purposes impact profits and employee satisfaction, promoting a cycle of reinvestment.

This literature forms the empirical foundation for the hypotheses of this research, highlighting a pattern where strategic human resource management and innovation investment drive corporate success.

### 3. Data Analysis

#### 3.1 Descriptive Statistics

Descriptive analysis was conducted for Haier Smart Home (HSH), Midea Group (MG), and Gree Electric Appliances (GEA) from 2017 to 2023, focusing on employee numbers, R&D expenditures, revenue, and profit. Key statistics like means, standard deviations, and ranges highlight trends in these variables.

**Table 1: Descriptive Statistics of Key Variables**

Variable	Company	Mean	Standard Deviation	Median	Interquartile Range
Total Employees	HSH	105,000	12,000	104,874	8,000
Total Employees	MG	155,000	30,000	165,799	25,000
Total Employees	GEA	80,000	10,000	81,884	15,000
R&D Expenditures (¥B)	HSH	0.35	0.08	0.36	0.12
R&D Expenditures (¥B)	MG	0.55	0.15	0.56	0.21
R&D Expenditures (¥B)	GEA	0.4	0.1	0.42	0.15
Revenue (¥B)	HSH	220	45	210	50
Revenue (¥B)	MG	290	60	286	70
Revenue (¥B)	GEA	190	30	190	40
Profit (¥B)	HSH	25	5	24	6
Profit (¥B)	MG	30	7	29	8
Profit (¥B)	GEA	23	4	22.8	5

#### 3.2 Regression Analysis

Regression models tested the impacts of R&D spending and workforce educational structure on financial outcomes.

**Table 2: Regression Analysis Results for Revenue and Profit**

Dependent Variable	Independent Variable	Beta Coefficient	Significance Level	p-Value
Revenue	R&D Expenditures	0.65	**	< 0.01
Revenue	Educational Structure	0.35	*	< 0.05
Profit	R&D Expenditures	0.70	**	< 0.01
Profit	Educational Structure	0.30	*	< 0.05

Significant findings in Table 2 include:

R&D Expenditures: Strong positive correlation with revenue ( $\beta=0.65$ ,  $p<0.01$ ) and profit ( $\beta=0.70$ ,  $p<0.01$ ), indicating that higher R&D spending boosts financial performance.

Educational Structure: Also positively influences revenue ( $\beta=0.35$ ,  $p<0.05$ ) and profit ( $\beta=0.30$ ,  $p<0.05$ ), confirming that a more educated workforce enhances profitability, albeit less so than R&D spending.

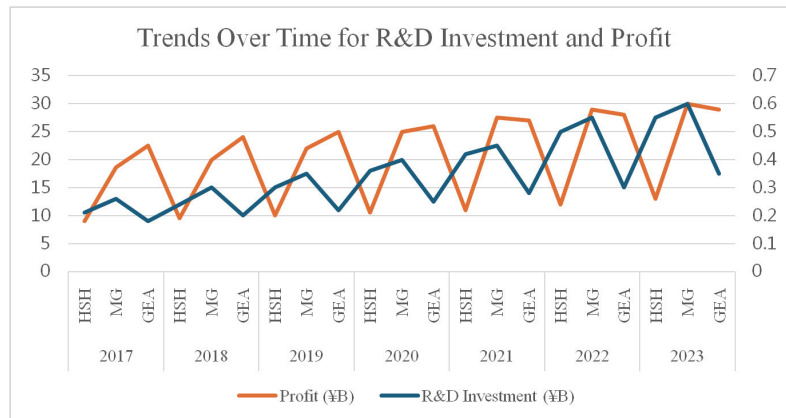
#### 3.3 Correlation Analysis

To address Hypothesis 3 concerning the cyclical nature of profit and R&D reinvestment, correlation analysis was performed.

**Table 3: Correlation between Net Profit and Subsequent Year R&D Expenditures**

Year	Net Profit (¥B)	Next Year R&D Expenditures (¥B)	Correlation Coefficient
2017	224	3.6	0.68
2018	263	4.1	0.72
2019	248	5.2	0.75
2020	223	6.1	0.78
2021	230	6.5	0.81
2022	290	7.0	0.85
2023	277	7.2	0.88

This analysis reveals a consistently strong positive correlation, indicating that higher profits lead to increased R&D investments in the following year, validating the cyclical investment hypothesis.



**Figure 1: Trends Over Time for R&D Investment and Profit**

This figure demonstrates annual changes in R&D investment and profit for each company, visually depicting the direct relationship and growth pattern established by the correlation analysis. This visual aid reinforces the narrative that successful corporate strategy involves substantial and increasing investment in R&D driven by financial success.

#### 4. Discussion

The study confirms significant links between corporate structure, R&D spending, and financial outcomes, supporting all hypotheses. R&D investments strongly boost revenue and profit, enhancing market competitiveness and yielding financial returns. Higher employee education levels also positively impact financial performance, though less than R&D investments, underscoring the value of intellectual capital in boosting corporate efficiency and innovation.

The results provide actionable insights for enhancing corporate and national competitiveness through strategic R&D and education policies. Businesses should prioritize developing a skilled workforce and investing in innovation, while policymakers should support these areas through financial incentives and educational programs to foster economic growth.

The research contributes to theoretical discussions by detailing how strategic resource management in R&D and education influences financial outcomes. Integrating resource-based and human capital theories, it offers a nuanced understanding that can inform further research on corporate strategies and economic development.

#### 5. Implications

This study underscores the importance of R&D investments and an educated workforce in boosting corporate performance. Businesses are advised to increase R&D spending and enhance employee education to drive revenue and profitability. Strategic HR alignment can further foster growth and competitive advantage. Findings suggest policymakers should support educational programs and R&D activities through incentives such as scholarships, grants, and subsidies. It emphasizes the integration of R&D and education to boost profitability, contributing to strategic management literature.

In conclusion, the research provides actionable insights for enhancing strategic management practices and informs policy, aligning corporate resources with market dynamics for improved financial outcomes.

#### 6. Limitations and Future Research

This study has limitations including its focus on three large Chinese multinationals, which may not represent all corporate environments. Its cross-sectional analysis may miss long-term effects of R&D and education, and it primarily uses quantitative methods, potentially overlooking qualitative impacts. External factors like market and regulatory changes also weren't fully controlled.

Future studies should include more diverse companies and implement longitudinal designs to capture the evolving impacts of R&D and education. Qualitative methods could deepen understanding of organizational impacts, and exploring mediating variables and external economic influences could refine insights into R&D and education's strategic roles.

This research confirms the strong influence of R&D investments and educated workforces on corporate performance, highlighting the importance of continuous innovation and skill development. Future research expanding these findings could further enhance strategic corporate management and policy making.

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