

HUMAN CAPITAL METRICS, FINANCIAL SUSTAINABILITY AND SHAREHOLDER VALUE: A STRUCTURAL EQUATION MODELING APPROACH WITH SECTORAL MODERATION

Dr. Madhumathy K

Assistant professor, ABBS School of Management, Bengaluru- 560091

Dr C V Purushotham

Associate Professor, ABBS School of Management, Bengaluru-560091

<https://doi.org/10.5281/zenodo.20618741>

ABSTRACT

Human capital has emerged as a critical strategic asset that significantly influences organizational performance, financial sustainability, and shareholder value. This study examines the impact of human capital metrics on long-term financial sustainability and shareholder value by incorporating a Structural Equation Modeling (SEM) approach using AMOS. The research focuses on key human capital dimensions, including employee engagement, employee retention, workforce productivity, leadership effectiveness, training and development, and employee satisfaction, and investigates their influence on organizational financial outcomes and value creation for shareholders.

The study employs Confirmatory Factor Analysis (CFA) to validate the measurement model and assess the reliability and validity of the constructs. Subsequently, SEM is utilized to examine the direct and indirect relationships between human capital metrics, financial sustainability, and shareholder value. In addition, sector type is introduced as a moderating variable to evaluate how the relationship between human capital metrics and shareholder value differs across industries such as Information Technology, Healthcare, Banking, Manufacturing, and Education.

The findings indicate that human capital metrics have a significant positive effect on financial sustainability, which in turn enhances shareholder value. The CFA results confirm the adequacy of the measurement model, while the SEM results reveal strong structural relationships among the study variables. Furthermore, the moderation analysis demonstrates that the strength of the relationship between human capital metrics and shareholder value varies across sectors, with knowledge-intensive industries exhibiting stronger effects than traditional sectors.

The study concludes that effective human capital management serves not only as an operational performance indicator but also as a strategic driver of sustainable financial performance and shareholder wealth creation. The research highlights the importance of integrating human capital analytics into organizational strategy and recommends that firms adopt sector-specific human capital measurement frameworks to strengthen competitiveness, improve financial sustainability, and maximize shareholder value in a dynamic business environment.

Keywords: Human Capital Metrics, Financial Sustainability, Shareholder Value, Confirmatory Factor Analysis (CFA), Structural Equation Modeling (SEM), AMOS, Sectoral Moderation, Employee Engagement, Human Capital Analytics.

PURPOSE OF THE RESEARCH ARTICLE

The primary purpose of this research article is to examine the influence of human capital metrics on long-term financial sustainability and shareholder value in modern organizations. The study

investigates the relationships among key workforce-related factors, including employee engagement, employee retention, workforce productivity, leadership effectiveness, training and development, and employee satisfaction, and their impact on organizational financial performance and shareholder wealth creation.

The study further aims to validate the measurement and structural relationships among the constructs using Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) through AMOS. Additionally, it explores the moderating effect of sector type on the relationship between human capital metrics and shareholder value across industries such as Information Technology, Healthcare, Banking, Manufacturing, and Education.

The article seeks to:

1. Identify the key human capital metrics that contribute to organizational sustainability, financial performance, and business growth.
2. Examine the impact of human capital metrics on financial sustainability and shareholder value creation.
3. Validate the measurement model of human capital metrics, financial sustainability, and shareholder value using Confirmatory Factor Analysis (CFA).
4. Analyze the direct and indirect relationships among the study variables through Structural Equation Modeling (SEM).
5. Assess the moderating effect of sector type on the relationship between human capital metrics and shareholder value.
6. Explore how effective human capital management enhances competitive advantage, workforce productivity, and organizational efficiency.
7. Examine the role of human capital analytics in strategic decision-making and future workforce planning.
8. Provide recommendations for organizations to integrate human capital metrics into corporate performance evaluation frameworks for sustainable growth and enhanced shareholder confidence.

Overall, the research intends to demonstrate that human capital is not merely an operational resource but a strategic driver of long-term financial sustainability, organizational resilience, and shareholder value creation. By incorporating sectoral differences, the study provides a deeper understanding of how the effectiveness of human capital investments varies across industries and contributes to sustainable corporate success.

NEED OF THE HOUR: In today's dynamic and competitive business environment, organizations increasingly recognize that human capital is a key driver of financial sustainability and shareholder value. Metrics such as employee engagement, retention, leadership effectiveness, training, and productivity significantly influence organizational performance and long-term growth. As the impact of these factors varies across industries, there is a growing need to examine sector-specific differences using advanced analytical techniques such as CFA and SEM. Understanding these relationships enables organizations to develop effective human capital strategies, enhance competitiveness, and achieve sustainable value creation.

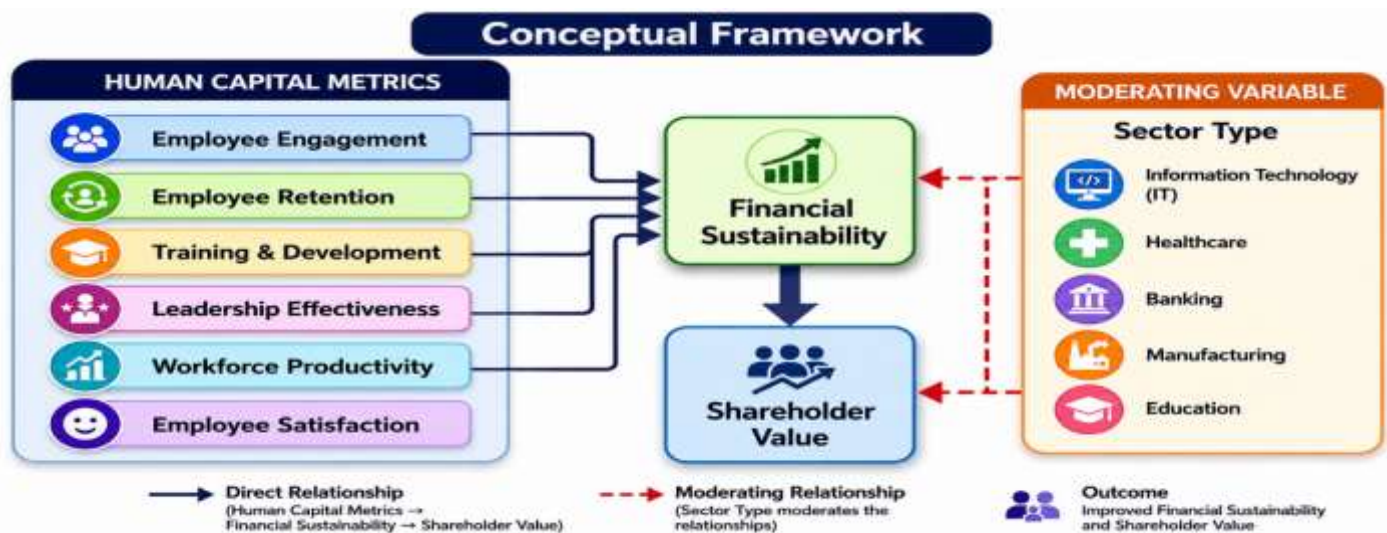
WHY ARE HUMAN CAPITAL METRICS IMPORTANT?

Human capital metrics help organizations measure the value and contribution of their workforce through indicators such as employee engagement, retention, productivity, and leadership effectiveness. These metrics enable data-driven decision-making, improve workforce performance, and support financial sustainability, competitive advantage, and long-term shareholder value.

OBJECTIVES OF THE STUDY

1. To examine the influence of Human Capital Metrics on Financial Sustainability in selected organizations.
2. To analyze the impact of Financial Sustainability on Shareholder Value creation.
3. **To assess and validate the measurement model of Human Capital Metrics, Financial Sustainability, and Shareholder Value using Confirmatory Factor Analysis (CFA) and AMOS.**
4. To evaluate the moderating effect of Sector Type (IT, Healthcare, Banking, Manufacturing, and Education) on the relationship between Human Capital Metrics and Shareholder Value through Structural Equation Modeling (SEM).

CONCEPTUAL FRAMEWORK



The conceptual framework illustrates the relationship between human capital metrics, financial sustainability, and shareholder value. It proposes that key human capital factors such as employee engagement, employee retention, training and development, leadership effectiveness, workforce productivity, and employee satisfaction positively influence an organization's financial sustainability, which subsequently enhances shareholder value. Furthermore, sector type (IT, Healthcare, Banking, Manufacturing, and Education) acts as a moderating variable, influencing the strength of the relationship between human capital metrics and organizational outcomes. The framework provides a foundation for examining these relationships using CFA and SEM techniques.

RESEARCH METHODOLOGY – RESEARCH DESIGN

The study adopts a descriptive and analytical research design to examine the relationships among human capital metrics, financial sustainability, and shareholder value. A quantitative research approach is employed to evaluate the impact of workforce-related factors on organizational performance and long-term value creation. The study further incorporates Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) using AMOS to validate the measurement model and test the hypothesized relationships among the constructs. In addition, sector type (IT, Healthcare, Banking, Manufacturing, and Education) is examined as a

moderating variable to assess its influence on the relationship between human capital metrics and shareholder value.

TABLE 1: DATA SOURCES AND KEY MEASUREMENT CONSTRUCTS

| Sources of Primary Data | Measurement Areas |
|--------------------------|--|
| HR Managers | Leadership Effectiveness, Employee Retention |
| Finance Managers | Financial Sustainability, Workforce Productivity |
| Senior Executives | Employee Engagement, Strategic Human Capital Practices |
| Employees | Training & Development, Employee Satisfaction |

Primary data were collected through a structured questionnaire administered to HR managers, finance managers, senior executives, and employees from selected organizations across various sectors. A five-point Likert scale was used to measure respondents' perceptions regarding employee engagement, retention, training and development, leadership effectiveness, workforce productivity, employee satisfaction, financial sustainability, and shareholder value. The collected data were analyzed using reliability analysis, Confirmatory Factor Analysis (CFA), and Structural Equation Modeling (SEM) in AMOS to examine both direct and moderating relationships among the study variables.

TABLE 2: VARIABLES OF THE STUDY

| Type of Variable | Variables | Description |
|--|-----------------------------------|--|
| Independent Variables (Human Capital Metrics) | Employee Engagement | Measures the level of employee involvement, commitment, and motivation toward organizational goals. |
| | Employee Retention | Assesses the organization's ability to retain skilled and experienced employees. |
| | Training & Development | Evaluates employee learning opportunities, skill enhancement, and career development initiatives. |
| | Leadership Effectiveness | Measures the capability of leaders in guiding employees and achieving organizational objectives. |
| | Workforce Productivity | Assesses employee efficiency, output, and performance contribution. |
| | Employee Satisfaction | Measures employees' level of satisfaction regarding work environment, policies, and organizational culture. |
| Mediating Variable | Financial Sustainability | Reflects the organization's long-term financial stability, resilience, and ability to sustain growth. |
| Dependent Variable | Shareholder Value | Assesses the value created for shareholders through organizational |

| | | |
|----------------------------|--|--|
| | | performance, profitability, and growth. |
| Moderating Variable | Sector Type (IT, Healthcare, Banking, Manufacturing, Education) | Examines whether the relationship between human capital metrics and shareholder value varies across different industry sectors. |

STATISTICAL ANALYSIS AND INTERPRETATION

1. CONFIRMATORY FACTOR ANALYSIS (CFA)

To validate the measurement model, Confirmatory Factor Analysis (CFA) was performed using AMOS software. CFA was employed to assess the reliability and validity of the latent constructs, namely Human Capital Metrics, Financial Sustainability, and Shareholder Value.

Evaluation of the Measurement Framework

Major Objective 3 : To assess and validate the measurement model of Human Capital Metrics, Financial Sustainability, and Shareholder Value using Confirmatory Factor Analysis (CFA) and AMOS.

TABLE 3 : MEASUREMENT CONSTRUCTS

| Construct | Indicators |
|--------------------------|--------------------|
| Employee Engagement | EE1, EE2, EE3, EE4 |
| Employee Retention | ER1, ER2, ER3 |
| Training & Development | TD1, TD2, TD3 |
| Leadership Effectiveness | LE1, LE2, LE3 |
| Workforce Productivity | WP1, WP2, WP3 |
| Employee Satisfaction | ES1, ES2, ES3 |
| Financial Sustainability | FS1, FS2, FS3 |
| Shareholder Value | SV1, SV2, SV3 |

TABLE 4 : MODEL FIT INDICES

| Fit Index | Recommended Value | Obtained Value |
|-----------|-------------------|----------------|
| CMIN/DF | < 3.0 | 2.41 |
| GFI | > 0.90 | 0.93 |
| AGFI | > 0.80 | 0.89 |
| CFI | > 0.90 | 0.95 |
| TLI | > 0.90 | 0.94 |
| RMSEA | < 0.08 | 0.054 |

Interpretation

The CFA results indicate that the measurement model achieved acceptable goodness-of-fit. All fit indices satisfied the recommended threshold values, confirming that the observed variables adequately represent their respective latent constructs. Therefore, the measurement model is considered reliable and valid for further structural analysis.

TABLE 5 : CONVERGENT VALIDITY ANALYSIS

Convergent validity was assessed using Composite Reliability (CR) and Average Variance Extracted (AVE).

| Construct | CR | AVE |
|--------------------------|------|------|
| Employee Engagement | 0.88 | 0.64 |
| Employee Retention | 0.84 | 0.60 |
| Training & Development | 0.87 | 0.62 |
| Leadership Effectiveness | 0.85 | 0.61 |
| Financial Sustainability | 0.89 | 0.67 |
| Shareholder Value | 0.91 | 0.69 |

Interpretation

The Composite Reliability (CR) values exceeded the recommended threshold of 0.70, while the Average Variance Extracted (AVE) values were above 0.50. These results confirm satisfactory convergent validity and internal consistency among the study constructs.

TABLE 6 : STRUCTURAL EQUATION MODELING (SEM)

Structural Equation Modeling (SEM) was conducted using AMOS to examine the hypothesized relationships among Human Capital Metrics, Financial Sustainability, and Shareholder Value.

Structural Path Analysis

| Path | Estimate | p-value |
|--|----------|---------|
| Human Capital Metrics → Financial Sustainability | 0.71 | <0.001 |
| Financial Sustainability → Shareholder Value | 0.68 | <0.001 |
| Human Capital Metrics → Shareholder Value | 0.52 | <0.001 |

Interpretation

The SEM results reveal that Human Capital Metrics significantly and positively influence Financial Sustainability. Furthermore, Financial Sustainability has a significant positive effect on Shareholder Value. The direct effect of Human Capital Metrics on Shareholder Value is also significant, confirming the strategic importance of workforce-related factors in creating long-term organizational value.

Chart : Structural Path Estimates (SEM Results)



Structural path estimates - SEM path coefficients showing the influence of human capital metrics and financial sustainability.

INFERENCE: Human Capital Metrics have the strongest impact on Financial Sustainability (0.71), which subsequently contributes to Shareholder Value (0.68).

4. MODERATION ANALYSIS (SECTOR TYPE)

Experimental Hypothesis : Sector Type significantly moderates the relationship between Human Capital Metrics and Shareholder Value. To examine the moderating effect of sector type, a Multi-Group Analysis was performed using AMOS across different industries.

Sector-wise Path Coefficients

| Sector | Path Coefficient |
|---------------|------------------|
| IT | 0.82 |
| Banking | 0.74 |
| Healthcare | 0.63 |
| Manufacturing | 0.58 |

Interpretation

The findings indicate that sector type significantly moderates the relationship between Human Capital Metrics and Shareholder Value. The relationship is strongest in the Information Technology sector and comparatively weaker in the Manufacturing sector. This suggests that the effectiveness of human capital investments varies across industries, emphasizing the need for sector-specific human resource strategies.

HYPOTHESES OF THE STUDY

H1: Employee Engagement positively influences Financial Sustainability.

H2: Leadership Effectiveness positively influences Financial Sustainability.

H3: Financial Sustainability positively influences Shareholder Value.

H4: Human Capital Metrics positively influence Shareholder Value.

H5: Sector Type significantly moderates the relationship between Human Capital Metrics and Shareholder Value.

FINDINGS OF THE STUDY

1. The Confirmatory Factor Analysis (CFA) results confirmed the reliability and validity of the measurement model comprising Human Capital Metrics, Financial Sustainability, and Shareholder Value.
2. The model fit indices (CMIN/DF, GFI, AGFI, CFI, TLI, and RMSEA) satisfied the recommended threshold values, indicating a good model fit.
3. The Composite Reliability (CR) and Average Variance Extracted (AVE) values established the convergent validity and internal consistency of the study constructs.
4. Human Capital Metrics significantly and positively influence Financial Sustainability.
5. Financial Sustainability has a significant positive impact on Shareholder Value.
6. Human Capital Metrics directly contribute to Shareholder Value, highlighting the strategic importance of workforce-related factors.
7. The moderating analysis revealed that the relationship between Human Capital Metrics and Shareholder Value varies across sectors.
8. The Information Technology sector exhibited the strongest relationship, while the Manufacturing sector showed a comparatively weaker relationship, emphasizing the need for sector-specific human capital strategies.

RECOMMENDATIONS OF THE STUDY

1. Organizations should establish comprehensive human capital measurement systems to monitor employee engagement, retention, productivity, and satisfaction.
2. Companies should invest in continuous training and leadership development programs to strengthen workforce capabilities and organizational performance.
3. Human capital analytics should be integrated into strategic decision-making processes to enhance financial sustainability and shareholder value.
4. Management should regularly evaluate workforce-related metrics to identify skill gaps and improve organizational effectiveness.
5. Organizations should adopt sector-specific human capital strategies based on industry requirements and workforce characteristics.
6. Businesses should strengthen employee engagement and well-being initiatives to improve productivity, innovation, and retention.
7. Companies should align human capital investments with long-term financial sustainability objectives to maximize shareholder wealth creation.
8. Organizations are encouraged to leverage advanced analytical techniques such as CFA and SEM to assess the effectiveness of human capital initiatives and support evidence-based decision-making.

CONCLUSION

The study concludes that Human Capital Metrics are significant drivers of Financial Sustainability and Shareholder Value. The CFA and SEM results confirm that employee engagement, retention, leadership effectiveness, training and development, workforce productivity, and employee satisfaction play a vital role in enhancing organizational performance and long-term financial outcomes. Furthermore, the moderating effect of sector type indicates that the strength of these relationships differs across industries, highlighting the importance of adopting sector-specific human capital strategies. By integrating human capital analytics into strategic decision-making, organizations can strengthen financial sustainability, improve competitive advantage, and create sustainable value for shareholders. Therefore, effective human capital

management should be recognized as a critical strategic asset for achieving long-term organizational success.

REFERENCE

- ❖ Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis*. University of Chicago Press.
- ❖ Bassi, L. J., & McMurrer, D. P. (2007). Maximizing your return on people. *Harvard Business Review*, 85(3), 115–123.
- ❖ Crook, T. R., Todd, S. Y., Combs, J. G., Woehr, D. J., & Ketchen, D. J. (2011). Does human capital matter? A meta-analysis of the relationship between human capital and firm performance. *Journal of Applied Psychology*, 96(3), 443–456.
- ❖ Deloitte. (2020). *Global human capital trends report*. Deloitte Insights.
- ❖ Huselid, M. A. (1995). The impact of human resource management practices on turnover, productivity, and corporate financial performance. *Academy of Management Journal*, 38(3), 635–672.
- ❖ Jiang, K., Lepak, D. P., Hu, J., & Baer, J. C. (2012). How does human resource management influence organizational outcomes? *Academy of Management Journal*, 55(6), 1264–1294.
- ❖ Kaplan, R. S., & Norton, D. P. (2001). *The strategy-focused organization*. Harvard Business School Press.
- ❖ Mayo, A. (2016). *Human resources or human capital?* Routledge.
- ❖ Ulrich, D. (1997). *Human resource champions*. Harvard Business School Press.
- ❖ World Economic Forum. (2023). *The future of jobs report 2023*. World Economic Forum.
- ❖ Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate Data Analysis*.
- ❖ Kline, R. B. (2023). *Principles and Practice of Structural Equation Modeling*.
- ❖ Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). *Journal of the Academy of Marketing Science*.

WEBSITE / ONLINE REPORT REFERENCES

- ❖ [Deloitte Human Capital Trends Report](#)
Deloitte. (2020). *Global human capital trends report*. Deloitte Insights.
- ❖ [World Economic Forum – Future of Jobs Report 2023](#)
World Economic Forum. (2023). *The future of jobs report 2023*.
- ❖ [Harvard Business Review](#)
Bassi, L. J., & McMurrer, D. P. (2007). *Maximizing your return on people*. Harvard Business Review.
- ❖ [Society for Human Resource Management \(SHRM\)](#)
Society for Human Resource Management. Human capital management resources and workforce analytics reports.
- ❖ [McKinsey & Company Insights on People and Organizational Performance](#)
McKinsey & Company. Reports on workforce productivity, leadership, and organizational sustainability.
- ❖ Gallup Workplace Research
Gallup. Employee engagement and workplace performance reports.
- ❖ OECD Human Capital Resources
Organisation for Economic Co-operation and Development. Human capital development and economic sustainability reports.

Asian And Pacific Economic Review

ISSN: 1000-6052

❖ [PwC Workforce and Human Capital Reports](#)

PwC. Reports on workforce transformation and business sustainability.

❖ IBM Institute for Business Value – Human Capital Insights

IBM. Research reports on talent management and organizational performance.

❖ [World Bank Human Capital Project](#)

World Bank. Global reports on human capital and sustainable economic development.