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Editorial and Reviewers' Board

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The current issue is the second of the twelfth volume of the *Athens Journal of Business & Economics (AJBE), published by the Business & Law Division and the Economics Unit of Athens Institute.*

Gregory T. Papanikos
President
Athens Institute

Athens Institute for Education and Research

A World Association of Academics and Researchers

20th Annual International Symposium on Economic Theory, Policy and Applications 29-30 June & 1-3 July 2026, Athens, Greece

The Economics Unit of Athens Institute, will hold its **19th Annual International Symposium on Economic Theory, Policy and Applications, 29-30 June & 1-3 July 2026, Athens, Greece** sponsored by the Athens Journal of Business & Economics. The aim of the conference is to bring together academics and researchers of all areas of economics and other related disciplines. You may participate as panel organizer, presenter of one paper, chair a session or observer. Please submit a proposal using the form available (https://www.atiner.gr/2026/FORM-ECO.doc).

Academic Members Responsible for the Conference

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- Dr. Henry Thompson, Head, Economics Unit, Athens Institute & Emeritus Professor, Auburn University, USA.
- Dr. Chris Sakellariou, Head, Economics Unit & Associate Professor of Economics, Nanyang Technological University, Singapore.

Important Dates

- Abstract Submission: **12 May 2026**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **1 June 2026**

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- Athens Sightseeing: Old and New-An Educational Urban Walk
- Social Dinner
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4-8 May 2026, Athens, Greece

The Business, Economics and Law Division (BLRD) of Athens Institute is organizing its **13th Annual International Conference on Business, Law & Economics, 4-8 May 2026, Athens, Greece,** sponsored by the Athens Journal of Business & Economics and the Athens Journal of Law. In the past, the six units of BLRD have organized more than 50 annual international conferences on accounting, finance, management, marketing, law and economics. This annual international conference offers an opportunity for cross disciplinary presentations on all aspects of business, law and economics. This annual international conference offers an opportunity for cross disciplinary presentations on all aspects of business, law and economics. Please submit an abstract (email only) to: atiner@atiner.gr, using the abstract submission form (https://www.atiner.gr/2026/FORM-BLE.doc)

Important Dates

- Abstract Submission: **17 March 2026**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **6 April 2026**

Academic Member Responsible for the Conference

- **Dr. Gregory T. Papanikos**, President, Athens Institute.
- **Dr. Michael P. Malloy**, Director, Business, Economics and Law Division, Athens Institute & Distinguished Professor & Scholar, University of the Pacific, USA.
- **Dr. David A. Frenkel**, LL.D., Head, Law Research Unit, Athens Institute & Emeritus Professor, Law Area, Guilford Glazer Faculty of Business and Management, Ben-Gurion University of the Negev, Beer-Sheva, Israel.

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Do Underserved and Underrepresented Communities pay a Higher Premium in Employer-Sponsored Healthcare Insurance?

By Susan M. Albring, Patricia N. Crawford± & Willie D. Reddic°*

We investigate the effect of socioeconomic disparities on healthcare coverage discrepancies within underserved and underrepresented communities, particularly examining the effects on average employer-sponsored health insurance premiums at the state level. Our focus analyzes a demographically homogeneous sample of individuals covered by employer-sponsored health insurance, where implicit biases within the healthcare system may be prevalent. Our results reveal that there are variations in employer-sponsored health insurance premiums across different racial and ethnic groups. Without controlling for additional socioeconomic factors, we find that underserved populations, particularly those identifying as Black, contribute a higher proportion of their income to employer-sponsored healthcare coverage compared to Whites and Hispanic groups, with disparities of 16.4 and 11.9 percent, respectively.

Introduction

In the U.S., healthcare gaps and injustices have continually affected marginalized groups, worsening social and health inequalities. Healthcare inequalities affect various aspects of health services, including outcomes, insurance availability, and access to medical care. As scholars and decision-makers have tried to understand the root causes of these inequalities, they have slowly moved toward finding possible solutions (Barr, 2014). Research underscores that impediments to accessing high-quality healthcare services are commonplace within immigrant communities, sexual and gender minorities, and racial and ethnic minority groups, thereby adversely impacting health outcomes. Kardashian et al. (2021) highlight the crucial role played by employer-sponsored healthcare coverage (ESHC)[1] in facilitating public access to treatment. However, Bittker's work (2020) offers a cautionary note, exposing racial and ethnic disparities in ESHC, suggesting there is potentially unequal access to health insurance benefits experienced by different ethnic groups.

Thus, our research aims to answer the following question: Do underserved and underrepresented minorities[2] pay a higher premium in ESHC than other ethnic racial groups? The research question carries significant importance, as comprehending

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[1]Employer-Sponsored Health Coverage, Employer-Sponsored Health Insurance, and Employer-Sponsored Health Premiums are interchangeable.
[2]We consider African Americans, Asian Americans, Hispanics or Chicanos/Latinos, and Native Americans as the underserved and underrepresented minority groups.

whether certain ethnic groups are subject to higher ESHC premiums becomes crucial within the context of financialization and structural racism in the healthcare setting. Historical and contemporary evidence underscores the existence of disparities in terms of access, outcomes, and affordability for marginalized groups. Should such an underserved and underrepresented individual indeed face elevated premiums, it would exacerbate systemic inequalities, further curtailing their access to quality healthcare. Tackling this matter is of utmost importance to establish an equitable healthcare landscape, eradicate discriminatory practices, and foster inclusivity. Ultimately, these efforts contribute to cultivating a healthcare system that embodies fairness and justice.

The main objective of our study is to determine whether marginalized groups, such as racial and ethnic groups incur higher rates for ESHC considering the issues discussed above. By investigating disparities in employer-sponsored health insurance premiums and the distribution of payment responsibilities between employers and employees across different marginalized demographics, our aim is to furnish health insurance providers with insights to reassess the fairness of the employer and employee-contributed segments of health insurance premiums among various ethnic groups within their organizations and overall population. Additionally, this study could guide healthcare professionals in reviewing the equity of health insurance costs within ethnic groups present in their institutions, aligning with the suggestions of Mahajan et al. (2021) who advocates for evaluating discrepancies in ESHC. From a policy standpoint, our findings highlight the unequal financial burdens placed on specific ethnic groups by employers offering disparate benefits, thereby informing regulatory adjustments aimed at fostering greater parity in healthcare coverage. Furthermore, our study stands to enhance comprehension of healthcare disparities by offering scholars and practitioners a more profound insight into the intricate interplay between social factors and healthcare accessibility.

Regarding the central focus of the primary study, we also identify additional factors that contribute to disparities within various marginalized groups. The additional factors encompass sexual and gender minorities, individuals with lower levels of education, varying income, and poverty levels, as well as older employees. We leverage a robust database encompassing demographic and economic data, healthcare expenses and allocations, health coverage for both insured and uninsured individuals, and household incomes. Our analysis directly focuses on discerning a homogenous subset of individuals who are covered by ESHC[3], which could potentially reveal implicit healthcare provider bias embedded within the healthcare system.

Our analysis indicates that, on a state-by-state basis, an increase in the Black population covered by employer-sponsored health coverage corresponds to a rise in the associated insurance premiums. Upon considering various socioeconomic factors, we further observe that the Black population allocates a larger proportion of their income toward employer-sponsored healthcare coverage compared to Whites, Hispanics, and Asians. The percentage ranges vary between 14.7% and 55.4%, contingent upon the specific ethnic group being compared.

Our findings offer health insurance providers valuable insights to reassess the fairness of health insurance premiums' employer and employee-paid components

[3]Our ability to observe findings is constrained to a state-by-state level due to HIPAA regulations, which prevent us from accessing individual-level data.

among ethnic groups within their organizations. Collectively, our findings hold significance for scholars, practitioners, and investors with concerns regarding racial inequity in employer-provided benefits and its potential impact on the firm's prospects. From a regulatory and standard-setting standpoint, a comprehensive understanding of the economic implications for specific ethnic groups arising from a company's uneven benefits package proves beneficial. Subsequent research could explore whether firms face market repercussions for offering disparate healthcare benefits to employees or if regulators impose penalties for such disparities.

The rest of the paper is organized as follows: Section 2 reviews the literature and develops the hypotheses; Section 3 discusses the empirical methods; Section 4 presents the results; and Section 5 concludes the paper.

Literature Review

The persistent disparities and inadequacies in healthcare among marginalized communities have been a longstanding issue in the United States, giving rise to both social and health inequities. These variations manifest in various aspects of healthcare, such as outcomes, insurance coverage, and the accessibility of medical treatments. Scholars and policymakers have devoted efforts to grasp the root causes of these discrepancies and explore potential solutions over the years (Barr, 2014). Many studies have shown that immigrant communities, sexual and gender minorities, and racial and ethnic minorities often face barriers to obtaining high-quality healthcare services, which affects their health outcomes. For instance, Greenwood et al. (2020) found differences in newborn death rates related to racial matching between doctors and patients. Because marginalized communities suffer more from health problems, Kardashian et al. (2021) emphasized the importance of addressing the social factors of liver diseases. Bittker (2020) found racial and ethnic discrepancies in employer-sponsored health insurance, demonstrating that different ethnic groups have unequal access to health insurance benefits. Furthermore, a considerable portion of the public's access to treatment is made possible mainly because of employer-sponsored health insurance. However, the data indicates that employer-sponsored health insurance varies.

The main goal of our study is to determine whether underserved communities incur higher rates for employer-sponsored medical insurance. The primary aim of this literature review is to systematically examine the disparities between health insurance premiums paid by employees and the extent of financial contributions provided by employers for the benefit of employees within diverse marginalized groups. Our research question significantly impacts multiple stakeholders, notably medical professionals, policymakers, businesses, and researchers. Our research has the potential to prompt healthcare professionals to reassess the fairness of health insurance pricing across racial ethnic groups within their organizations, as proposed by Mahajan et al. (2021), through an evaluation of the variations in employer-sponsored health coverage. Our results show how employers that provide unequal benefits packages create a financial hardship for ethnic groups and suggest policy changes that would promote more fairness in healthcare coverage. Additionally, our study can add to the

knowledge of healthcare disparities by giving academics and professionals an in-depth understanding of the intricate relationships between social factors and healthcare access.

Structural Racism in Historical and Modern Healthcare Policy

In a thorough investigation, Yearby et al. (2022) examine the existence and consequences of structural racism in both historical and contemporary U.S. healthcare systems. Their study highlights ways racial and ethnic minorities have experienced healthcare inequities because of discriminatory laws and procedures. The study stresses the critical need for legislative changes to destroy institutional barriers and advance equitable healthcare for everyone by examining the historical backdrop and current consequences of structural racism.

Greenwood, Hardeman et al. (2020) study how the race match between medical staff and patients affects the differences in mortality rates for neonates. For racial and ethnic minority populations, the research indicates that racial concordance, or aligning the ethnic or racial background of healthcare professionals with that of patients, can significantly impact healthcare outcomes. Their study highlights the need to resolve racial imbalances within the medical field and encourage inclusivity and diversity among medical professionals.

Definition of Healthcare Inequities and Disparities

The disparate allocation of healthcare assets, amenities, and health results among various demographic groups is referred to as healthcare inequalities and disparities. These inequalities in access to, use of, the standard of care, and medical outcomes depending on traits like color, ethnicity, socioeconomic status, gender, and immigrant status can take many forms. In her study on racial and ethnic discrepancies in employer-sponsored health insurance, Bittker (2020) emphasizes how some racial and ethnic groups can experience difficulties accessing sufficient health insurance benefits. The Affordable Care Act's effect on insurance coverage gaps was examined by Courtemanche et al. (2019), which sheds light on the ongoing disparities in the availability of health insurance. The breadth of discrepancies in healthcare outcomes is shown by Mahajan et al. (2021), who also looks at medical conditions and healthcare price variations across racial and ethnic groups.

Racial and Ethnic Disparities in Employer-Sponsored Health Coverage

It is well known that there are considerable racial and ethnic discrepancies in the quality and accessibility of health coverage provided by employers among various racial and ethnic groups. Bittker (2020) examines data from multiple population groups to extensively investigate racial and ethnic discrepancies in employer-sponsored health care. The authors find that some racial and ethnic minorities face more significant obstacles in obtaining health insurance through their employers. Several variables, including hiring methods, socioeconomic status, and location, impacted these differences. To promote fair access to healthcare, the study stresses the importance of addressing structural imbalances within employer-based health plans.

Mahajan et al. (2021) examine how health status, healthcare access, and cost changed in the U.S. by race and ethnicity, using a 20-year dataset spanning from 1999 to 2018. Their results show that there continue to be racial and ethnic gaps in insurance protection and cost (Mahajan et al., 2021). The study highlights that individuals from underprivileged racial and ethnic backgrounds face higher costs for medical treatments and have limited access to quality employer-sponsored health insurance coverage (Mahajan et al., 2021). This study emphasizes the importance of addressing the root causes of these inequalities to advance health equity. Specifically, a significant increase is observed in the estimated prevalence of adults who reported functional limitations. This increase is noted among Black, Latino/ Hispanic, and White individuals across all income levels (with a statistical significance of $P<0.0001$ for each group) and among low-income Asian individuals (with a significance of $P=0.03$. However, the estimated disparity between White and Asian individuals and Latino/Hispanic individuals remained relatively unchanged (Mahajan et al., 2021).

In 2018, the highest estimated prevalence of functional limitations was found among low-income White individuals, at 57.0% (with a 95% confidence interval of 54.8% to 59.2%). In contrast, Asian individuals with middle and high incomes recorded the lowest prevalence, at 20.4% (with a 95% confidence interval of 17.4% to 23.8%) (Mahajan et al., 2021). When examining the trends in racial and ethnic differences, similar patterns were observed regardless of whether physical tasks or social and leisure activities were analyzed separately. Further, the study shows a noticeably more significant estimated percentage of Latino/Hispanic people who lacked a regular source of medical care in comparison to White individuals (Mahajan et al., 2021). This trend was evident in the general population and across different income brackets. Specifically, the difference was statistically significant among the overall population and those in the middle and high-income groups (with a significance level of $P<0.001$), as well as among those in the low-income category (with a significance level of $P=0.002$) (Mahajan et al., 2021).

NORC (2022) agrees that employer-sponsored health insurance (ESHI) is one of the primary sources of health insurance in the U.S., providing coverage to nearly 155 million Americans, or about half of the country's total population. Despite its extensive reach, understanding the health conditions and outcomes of ESHI still needs to be clarified. Most research efforts related to ESHI have been directed toward understanding its economic importance, the expenses related to medical care and insurance (including personal expenditures), the utilization of healthcare services, and accessibility to medical care (NORC, 2022). In addition, the study of health inequalities and disparities within ESHI needs to be addressed more extensively. The need for historical data regarding aspects like race, ethnicity, and income in ESHI claims hamper what can currently be examined in claims-based analyses concerning health disparities. Many studies that use surveys or qualitative methods provide information on income, race, and sexual orientation. However, they often lack the necessary health-related details for a meaningful comparison of health behaviors or outcomes across different racial and income groups (NORC, 2022).

Moreover, Gangopadhyaya et al. (2020) report that more than three million people lost their ESHI coverage, and two million became uninsured. The report underscores the urgent requirement for focused efforts to lessen healthcare access

inequities while tackling the effects of the pandemic on disadvantaged communities. The gaps in healthcare were made worse by the exorbitant impact of these setbacks on already vulnerable communities. The study underscores the significance of preserving the availability of healthcare in times of economic hardship and a public health crisis. Mahajan et al. (2021) also indicate that despite a broad range of healthcare and social policies and a significant increase in healthcare spending, there needs to be more evidence of improvement in health inequities. Factors rooted in U.S. society, such as systemic racism and obstacles related to citizenship status, may contribute to these persistent disparities. Seccombe et al. (2014) add to this discussion by exploring the difference in the predictors and incidence of ESHI among Whites, Blacks, and Hispanics. Hispanics are least likely, and Whites are most likely to have insurance covered by employers. However, Hispanics are more likely to be uninsured, and the factors which increase the odds of receiving employer-sponsored coverage in one's own name are relatively similar across racial groups, though they differ substantially in magnitude.

The comprehensive literature review offers significant insights into the complexities of healthcare inequities in the U.S., particularly concerning employer-sponsored health insurance across various ethnic and racial groups. Evidence from multiple studies underscores the presence of disparities in employer-sponsored health insurance, with different ethnic groups experiencing unequal access to health insurance benefits. While Bittker (2020) identifies racial and ethnic disparities in access to employer-sponsored health insurance, Mahajan et al. (2021) reveals nuanced patterns, including inequalities in functional limitations and healthcare costs across racial lines. Contrarily, Seccombe, et al. (2014) suggest that the odds of receiving coverage on employer-sponsored insurance are the same across different races, but with a difference in magnitude. This conflicting evidence highlights the complex and multifaceted nature of healthcare inequities in employer-sponsored insurance. The literature emphasizes the need for policy interventions, structural changes, and further research to promote equity in healthcare coverage. While there are clear disparities in healthcare access and outcomes, the evidence on whether marginalized groups incur higher rates for employer-sponsored medical insurance is not uniform, pointing to the need for a more targeted and nuanced understanding.

Research Gap

Several restrictions exist, even if this literature analysis offers insightful information about healthcare inequities. First, most of the research discussed examines inequalities only inside the United States, restricting the generalizability of the results to other nations. Second, there may be additional variables and groups that have yet to be thoroughly examined, and the research that is currently available might not address every facet of healthcare inequalities. Research on these issues is needed to overcome the restrictions and deepen our understanding of healthcare disparities. Additional research is required to examine differences in healthcare access and coverage among different ethnic backgrounds, which were not included in the literature review. Further investigation of the effect of intersectionality on disparities in healthcare may also shed light on the experiences of disadvantaged groups. Evidence-based solutions must

also be informed by research on the efficacy of policies and interventions to eliminate healthcare disparities.

Healthcare professionals, decision-makers, and communities must all work together to develop a comprehensive strategy to address healthcare disparities. Achieving health equity requires acknowledging the role of institutional racism and implementing policies that support racial harmony in the provision of healthcare (Yearby et al., 2022; Greenwood et al., 2020). Additionally, as shown by Khatana and Groeneveld (2020) and Gangopadhyaya et al. (2020), targeted interventions and assistance for vulnerable individuals can help lessen the adverse effects of crises on access to healthcare. Healthcare professionals and policymakers must give the socioeconomic determinants of health top priority if they are to make significant progress in decreasing healthcare disparities (Kardashian et al., 2021; McMaughan et al., 2020). Stakeholders may develop a fairer and more accessible medical system by addressing problems with the movement of people, financial status, schooling, and other social factors.

Empirical Model

To examine our research question on whether marginalized groups incur higher rates for ESHC we employ the following model to test whether a specific ethnic group faces higher ESHC premiums as a percentage of total health premiums at the state level. We estimate the following regression:

$$\begin{aligned} EmployeeBC_{s,t} = {} & \beta_0 + \beta_1 Ethnic\ Group_{CAT,s,t} + \beta_2 UnemploymentRate_{s,t} \\ & + \beta_3 Age_{CAT,s,t} + \beta_4 Gender_{CAT,s,t} + \beta_5 Citizenship_{CAT,s,t} \\ & + \beta_6 Education_{CAT,s,t} + \beta_7 WorkStatus_{CAT,s,t} + \beta_8 Income_{CAT,s,t} \\ & + \beta_9 Poverty_{CAT,s,t} + \epsilon_{s,t} \qquad (1) \end{aligned}$$

where, CAT = categorial groups or levels, s = state, and t = time;

$EmployeeBC_{s,t}$ = Employer Sponsored Health Premiums divided by the Total Health Premiums by state;

$Ethnic\ Group_{CAT,t}$ = Different ethnic and racial groups with health insurance are segmented by the overall number of the insured population, followed by multiplication with the percentage of ESHI per state (e.g., *Black_Insured, White_Insured, Asian_Insured,* and *HispLat_Insured*);

$UnemploymentRate_{s,t}$ = Annual state-specific unemployment rate;

$Age_{CAT,t}$ = Different age groups with health insurance are segmented by the overall number of the insured population, followed by multiplication with the percentage of ESHI per state (e.g., *U18, 18-64_Insured, 65+_Insured,* and *19-25_Insured*);

$Citizenship_{CAT,t}$ = Different levels of citizenship with health insurance are segmented by the overall number of the insured population, followed by multiplication with the percentage of ESHI per state (e.g., *NativeBorn_Insured, ForeignBorn_Insured, NaturalBorn_Insured,* and *NoCitizen_Insured*);

$Education_{CAT,t}$ = Different levels of educational background[4] with health insurance are segmented by the overall number of the insured population, followed by multiplication with the percentage of ESPI per state (e.g., *LessHS_Insured, HSGrad_Insured, SomeCollege_Insured,* and *BSGrad_Insured*);
$WorkStatus_{CAT,s,t}$ = Different levels of work status[5] with health insurance are segmented by the overall number of the insured population, followed by multiplication with the percentage of ESPI per state (e.g., *LaborForce_Insured, NoLabor_Insured, LessFullTime_Insured,* and *DoNotWork_Insured*);
$Income_{CAT,s,t}$ = Different levels of income with health insurance are segmented by the overall number of the insured population, followed by multiplication with the percentage of ESPI per state (e.g., *SalaryU25k_Insured, Salary50_74k_Insured, Salary75_99k_Insured,* and *Salary100plus_Insured*);
$Poverty_{CAT,s,t}$ = Different levels of poverty[6] with health insurance are segmented by the overall number of the insured population, followed by multiplication with the percentage of ESPI per state (e.g., *Poverty138_199_Insured* and *Poverty200 +_Insured*).
Appendix A provides definitions of all variables used in the regressions.

We predict that the coefficient on *EthnicGroup* for underrepresented and underserved ethnic groups is positive and significant. Thus, we expect that marginalized groups pay higher employer sponsored health premiums as a percentage of total health premiums by state. We control for the annual state-specific unemployment rate and individual characteristics such as age, citizenship, education, work-status, income level, and poverty level.

Sample Selection

We identify data from several sources including the American Community Survey available on census.gov, National Association of Insurance Commissioners, as reported in the Insurance Department Resources Reports, and the U.S. Bureau of Labor Statistics bls.gov. Our final sample consists of a 9-year period covering 2013-2021 comprising 51 states, consisting of 459 total state-year observations.

[4]This calculation is grounded in the demographic of individuals aged 25 years or older within the civilian noninstitutionalized population.
[5]This calculation is grounded in the demographic of individuals aged 18 years or older within the civilian noninstitutionalized population.
[6]This calculation is grounded in the demographic of individual poverty levels in the past 12 months within the civilian noninstitutionalized population.

Results

Tables 1-8 present the results of this study. Table 1 presents results for the descriptive statistics for the dependent, explanatory, and control variables in equation (1). If a marginalized ethnic group faces higher employer sponsored health premiums divided by total health premiums on a state level basis, β_1 is expected to be positive. The dependent variable $Employee\ BC_{s,t}$, has a mean of 0.21 which suggests that employer sponsored health insurance premiums are approximately 21% of total health premiums on average per state. The average *Black_Insured* in our sample is 0.0550, *HispLat_Insured* is 0.0531, *White_Insured* is 0.3911 and *Asian_Insured* is 0.0220. The aforementioned variables suggest that in our sample, Whites are most likely to be insured and Asians are least likely to be insured.[7] Our control variables indicate that the mean unemployment rate over our sample time period is approximately 5 percent. The mean for insured individuals under the age of 18 is 0.1267, age 18-64 is 0.2991, for age 65 and over is 0.0872, and age 19-25 is 0.0454. The statistics suggest that individuals that are college-age are least likely to be insured, followed by the elderly, and then individuals over age 18. The age group 18-64 is most likely to be insured. The average of insured individuals that identify as *Male_Insured* (*Female_Insured*) is fairly similar at 0.2488 (0.2641).

When we examine citizenship, we find that the mean of insured native-born individuals is 0.4713, foreign born is 0.0417, natural born in 0.0235, and not having U.S. citizenship is 0.0182. Native born individuals are most likely to be insured in our sample by a large margin. Individuals who are not U.S. citizens are least likely to be insured. We next examine education level and find that the mean of insured individuals with less than a high school degree is 0.0459, a high school degree is 0.1385, some college is 0.1539, and a college degree is 0.1747, which suggests that as more education is attained an individual is more likely to be insured.

Individuals engaged in the labor force have a mean of 0.3744, while individuals not engaged in the labor force have a mean of 0.1385. As expected by the construction of our sample, this statistic documents that a higher percentage of working individuals have employer sponsored health insurance as compared to individuals that are not employed. To examine this univariate finding in more detail, we note that the average insured full-time workers in our sample is 0.2762, less than full time is 0.1247, and individuals that do not work is 0.1121. These statistics suggest that individuals that work more hours are more likely to be insured. The mean for insured individuals with less than an average annual household income of $25,000 is 0.0709, salary between $25,000 and $49,000 is 0.0955, salary between $50,000 and $74,000 is 0.0917, salary between $75,000 and $99,000 is 0.0748 and salary of $100,000 or more is 0.1802. These univariate statistics indicate that individuals with salaries on the lowest end of

[7]There are several factors of why Asians are less likely to have employer-sponsored health insurance. For example, *occupation distribution:* Asians are often concentrated in industries or occupations that may not offer comprehensive employee benefits, including health insurance. Some may work in small businesses or sectors with a higher likelihood of not providing health coverage. Another example, is related to *Immigration status:* the Asian population in the U.S. includes a significant number of immigrants. Immigrants, especially those who are not citizens, may face barriers to accessing employer-sponsored health insurance.

the scale are least likely to be insured, while individuals with the highest salaries on the scale are most likely to be insured. Lastly, we examine poverty level and find that the mean for insured individuals at the poverty level of 138% is 0.0931, between 138-199% is 0.1369 and 200% and above is 0.2830. These findings suggest that individuals at a higher poverty level are more likely to be insured.

Equation (1) is estimated from 2013 to 2021. The model includes year fixed effects and state fixed effects. 459 state-years are included in the model. The adjusted r-square is 0.3252, suggesting that the model explains employer sponsored health premiums fairly well. The coefficient on *Black_Insured* (*HispLat_Insured*) is 0.261 (0.142) and is significant at the one percent level. This finding suggests that insured Black and Hispanic/Latino individuals pay higher employer sponsored health premiums. The magnitude of the coefficient for *Black_Insured* is higher than the coefficient on the other ethnic groups, which suggests Black insured individuals pay the highest health insurance premiums. We further examine F-tests and find that the coefficient on *Black_Insured* is significantly higher than the coefficient on *White_Insured*. Similarly, a second F-test indicates that the coefficient on *HispLat_Insured* is higher than the coefficient on *White_Insured.* This baseline regression provides support for our research question that marginalized ethnic groups are paying higher employer sponsored health premiums. In Columns [2] and [3], we include additional socioeconomic control variables and run the regression separately for insured males and females. We find that the coefficient for both male and female *Black_Insured* individuals is positive and significant suggesting both genders are paying higher employer sponsored health care premiums. The coefficient for male black insured individuals is higher than for female black insured individuals, suggesting that male black individuals pay even higher health care premiums than females.[8] We find similar results for both male and female *HispLat_Insured* individuals. For the control variables, we find that *NativeBorn_Insured* employees pay lower health care premiums, effectively receiving a discount and employees with a lower education level pay higher health care premiums.

Table 3 further examines the effects of ethnic group and age on employer sponsored health premiums. The baseline model has an adjusted r-square of 0.3564. In columns [1]–[3], the age categories include insured individuals under age 18, over age 65 and between the ages of 19 to 25, respectively. The coefficient on *Black_Insured* is positive and significant, which suggests that black insured individuals are positively related to employer sponsored health premiums in each age category. The coefficient on *Black_Insured* is significantly higher than the other ethnic groups in each age category suggesting that black individuals are paying higher employer sponsored higher premiums than the other ethnic groups. The coefficient on *U18* is positive and significant in column [1] suggesting that younger individuals are paying higher employer sponsored health premiums.

[8]Prior research has shown gender inequity in wages earned, for example a gender earnings gap in the veterinary profession (Smith et al., 2021). Similarly, an inequitable difference in employer provided health insurance premiums affects the earnings gap because the wages employees receive in their net pay is lower when health care premiums are higher. Other prior research measures the opportunity cost of self-employment by the foregone income of a job that pays a wage (Papanikos, 2024). Future research could examine the foregone income of a job that pays a wage after benefits are deducted. For example, the foregone income of a job that pays a wage will be lower (higher) for individuals paying higher (lower) health insurance premiums.

We generally find similar results for the control variables as in the baseline model in Table 2. For example, we find that individuals with a lower education level, *HSGrad_Insured*, are positively related to employer sponsored health premiums, while native born individuals are negatively related to employer sponsored healthcare premiums.

Table 4 examines the effects of ethnic group and citizenship on employee sponsored health premiums. Column [1] examines individuals that are foreign born, *ForeignBorn_Insured*. The coefficient on *ForeignBorn_Insured* is positive and significant suggesting individuals born outside of the United States bear higher employer sponsored health care premiums. In Column [2], the coefficient on *NaturalBorn_Insured* is not significant. Similarly, in Column [3] the coefficient on *NoCitizen_Insured* is not significant. *Black_Insured* is the largest coefficient of the ethnic groups in each citizenship category.

Table 5 provides a multivariate regression of the effect of education by ethnic group on employer sponsored health premiums. The coefficients for *Black_Insured* are positive and significant if the individual has less than a high school degree Column [1], some college Column [2], or is a college graduate Column [3]. Consistent with prior results, this suggests that black individuals insured via their employer sponsored healthcare plan are paying significantly more for health insurance premiums. The coefficient on *LessHS_Insured* is positive and significant, while the coefficients on *SomeCollege_Insured* and *BSGrad_Insured* are negative and significant. These results collectively suggest that individuals with a lower education level are paying higher employer sponsored health care premiums, while individuals with relatively more education are earning a discount on premiums.

Table 6 includes the estimation of the effects of Ethnic Group based on their participation in the work force on employee sponsored healthcare premiums. In Column [1], we examine insured individuals that are not participating in the work force. In Column [2], we examine insured individuals that work less than full time. In Column [3], we examine insured individuals that do not work. We find that the coefficient on *Black_Insured* is the highest of the ethnic groups for each work status category.

Table 7 provides estimates of the effects of ethnic group and income level on employee sponsored healthcare premiums. Column [1] examines insured individuals with salaries less than $25,000. Column [2] includes insured individuals with $50,000-$74,000 salary levels. Column [3] examines individuals with salaries between $75,000-$99,000. Column [4] includes individual salaries greater than $100,000. The coefficient on *SalaryU25k_Insured* is positive and significant while the coefficients on the other salary categories are not significant. The results, together, suggest that individuals with the lowest salary levels are paying higher employer provided health insurance premiums.

Table 8 includes estimates of the effects of ethnic group and poverty level on employee sponsored healthcare premiums. The adjusted r-squares are 0.4206 and 0.4494 respectively, which suggests the models explain employer sponsored healthcare premiums well. Column [1] includes insured individuals in the 138-199 percent poverty level while Column [2] includes insured individuals in the 200 percent and above poverty level. We find the coefficient for black insured individuals is positive and significant in both categories of poverty and has the highest coefficient of the ethnic

groups. We also find the coefficient on 200 percent and above poverty level is positive and significant suggesting that individuals in greater poverty levels pay higher health insurance premiums.

Table 1. *Descriptive Statistics*

	Mean	Std. Dev.	Median	Min	Max
Dependent Variable					
EmployeeBC	0.2132	0.0302	0.2170	0.0845	0.2728
Independent Variable of Interests					
Black_Insured	0.0550	0.0521	0.0376	0	0.2496
White_Insured	0.3911	0.0891	0.4002	0.0486	0.6004
Asian_Insured	0.0220	0.0284	0.0147	0	0.204
HispLat_Insured	0.0531	0.0445	0.0406	0.0043	0.1925
Control Variables					
Unemployment Rate	0.0501	0.0174	0.0470	0.0200	0.1480
U18_Insured	0.1267	0.0196	0.1259	0.0158	0.2094
18-64_Insured	0.2991	0.0375	0.3026	0.0331	0.4598
65+_Insured	0.0872	0.0106	0.0883	0.0111	0.1224
19-25_Insured	0.0454	0.0075	0.0452	0.0049	0.0703
Male_Insured	0.2488	0.0280	0.2512	0.0289	0.3629
Female_Insured	0.2641	0.0270	0.2643	0.0301	0.3971
NativeBorn_Insured	0.4713	0.0559	0.4722	0.0539	0.6721
ForeignBorn_Insured	0.0417	0.0291	0.0318	0.0059	0.1226
NaturalBorn_Insured	0.0235	0.0180	0.0176	0.0031	0.0796
NoCitizen_Insured	0.0182	0.0115	0.0142	0.0025	0.0534
LessHS_Insured	0.0459	0.0109	0.0448	0.0064	0.0744
HSGrad_Insured	0.1385	0.0231	0.1397	0.0140	0.1989
SomeCollege_Insured	0.1539	0.0275	0.1517	0.0209	0.2436
BSGrad_Insured	0.1747	0.0420	0.1703	0.0188	0.3487
LaborForce_Insured	0.3744	0.0627	0.3760	0.0357	0.5260
NoLabor_Insured	0.1385	0.0406	0.1178	0.0243	0.2393
FullTime_Insured	0.2762	0.0467	0.2774	0.0243	0.3827
LessFullTime_Insured	0.1247	0.0216	0.1278	0.0125	0.1950
DoNotWork_Insured	0.1121	0.0356	0.1005	0.0232	0.2305
SalaryU25K_Insured	0.0709	0.0160	0.0695	0.0109	0.1166
Salary25K-49K_Insured	0.0955	0.0171	0.0974	0.0136	0.1360
Salary50K-74K_Insured	0.0917	0.0148	0.0910	0.0118	0.1435
Salary75K-99K_Insured	0.0748	0.0127	0.0743	0.0084	0.1180
Salary100K+_Insured	0.1802	0.0552	0.1788	0.0152	0.3303
Poverty138%_Insured	0.0931	0.0151	0.0931	0.0140	0.1336
Poverty138-199%_Insured	0.1369	0.0776	0.1702	0.0068	0.2991
Poverty200%+_Insured	0.2830	0.0921	0.2727	0.0392	0.5931

Refer to Appendix A for detailed definitions of all variables used in these analyses.

Table 2. *Estimation of the effects of Ethnic Group (Sex) on Employee Based Health Premiums (EmployeeBC)*

Dependent Variable: ***EmployeeBC***			
Variables	*Baseline*	*Male*	*Female*
Black_Insured	0.261***	0.438***	0.301***
	(9.04)	(8.06)	(3.82)
White_Insured	0.097***	0.291***	0.150**
	(4.95)	(4.75)	(2.11)
Asian_Insured	-0.009***	-0.116	-0.488***
	(-7.16)	(-1.01)	(-3.60)
HispLat_Insured	-0.142***	-0.276***	-0.137***
	(5.16)	(6.39)	(2.99)
Unemployment Rate		-0.146	-0.237**
		(-1.36)	(-2.22)
18-64_Insured		-0.102	-0.418***
		(-0.77)	(-2.76)
Male		-0.957***	
		(-3.37)	
Female			0.680**
			(2.36)
NativeBorn_Insured		-0.156*	-0.409***
		(-1.76)	(-5.27)
HSGrad_Insured		0.577***	0.530***
		(7.70)	(6.89)
LaborForce_Insured		0.358***	0.126
		(3.24)	(1.32)
Salary25K-49K_Insured		-0.042	-0.256
		(-0.22)	(-1.30)
Poverty138%_Insured		-0.159	-0.204
		(-0.96)	(-0.51)
Prob > F	0.0000	0.0000	0.0000
Year Fixed Effects	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes
Obs.	459	459	459
R-Square	0.3252	0.3683	0.4253

Note: This table presents multivariate regressions of Employee Based Health Premiums (*EmployeeBC*) on the different ethnic groups. Standard errors are robust. All variables are defined in Table 1. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The t-statistics are reported in parentheses.

Table 3. *Estimation of the effects of Ethnic Group (Age) on Employee based Health Premiums (EmployeeBC)*

Dependent Variable: ***EmployeeBC***			
Variables	*U18*	*65+_nsured*	*19-25 Insured*
Black_Insured	0.445***	0.447***	0.438***
	(9.15)	(8.41)	(8.06)
White_Insured	0.339***	0.308***	0.291***
	(5.65)	(4.92)	(4.75)
Asian_Insured	-0.055	-0.070	-0.116
	(-0.49)	(-0.58)	(-1.01)
Latino_Insured	0.255***	0.287***	0.276***
	(5.91)	(6.70)	(6.39)
Unemployment Rate	-0.112	-0.152	-0.146
	(-1.06)	(-1.44)	(-1.36)
U18	0.337***		
	(2.88)		
65+_Insured		-0.216	
		(-1.28)	
19-25_Insured			-0.102
			(-0.77)
Male	-1.386***	-1.066***	-0.957***
	(-4.63)	(-3.88)	(-3.37)
NativeBorn_Insured	-0.192**	-0.154*	-0.156*
	(2.17)	(-1.75)	(-1.76)
HSGrad_Insured	0.619***	0.610***	0.577***
	(8.17)	(7.65)	(7.70)
LaborForce_Insured	0.397***	0.324***	0.358***
	(3.75)	(3.11)	(3.24)
Salary25K-49K_Insured	-0.106	0.118	-0.042
	(-0.66)	(0.72)	(-0.22)
Poverty138%_Insured	-0.171	-0.296*	-0.159
	(-1.15)	(-1.83)	(-0.96)
Prob > F	0.0000	0.0000	0.0000
Year Fixed Effects	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes
Obs.	459	459	459
R-Square	0.3564	0.3943	0.4221

Note: This table presents multivariate regressions of Employee Based Health Premiums (*EmployeeBC*) on the different ethnic groups. Standard errors are robust. All variables are defined in Table 1. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. T-statistic is reported in parentheses.

Table 4. *Estimation of the effects of Ethnic Group (Citizenship) on Employee based Health Premiums (EmployeeBC)*

Dependent Variable: ***EmployeeBC***			
Variables	*ForeignBorn_Insured*	*NaturalBorn_Insured*	*NoCitizen_Insured*
Black_Insured	0.387***	0.371***	0.424***
	(6.76)	(6.48)	(7.49)
White_Insured	0.256***	0.248***	0.285***
	(4.10)	(3.97)	(4.53)
Asian_Insured	-0.210*	-0.238**	-0.114
	(-1.72)	(-1.99)	(-0.92)
Latino_Insured	0.233***	0.222***	0.286***
	(5.04)	(5.09)	(5.89)
Unemployment Rate	-0.164	-0.184*	-0.129
	(-1.53)	(-1.72)	(-1.20)
18-64_Insured	-0.174	-0.170	-0.129
	(-1.28)	(-1.28)	(-0.92)
Male	-1.131***	-1.150***	-1.181***
	(-4.92)	(-5.08)	(-4.98)
ForeignBorn_Insured	0.245***		
	(2.78)		
NaturalBorn_Insured		0.449	
		(3.49)	
NoCitizen_Insured			0.277
			(1.12)
HSGrad_Insured	0.570***	0.545***	0.583***
	(7.67)	(7.35)	(7.64)
LaborForce_Insured	0.365***	0.390***	0.342***
	(3.32)	(3.55)	(3.09)
Salary25K-49K_Insured	-0.051	-0.039	-0.081
	(-0.27)	(-0.21)	(-0.43)
Poverty138%_Insured	-0.121	-0.061	-0.194
	(-0.73)	(-0.37)	(-1.17)
Prob > F	0.0000	0.0000	0.0000
Year Fixed Effects	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes
Obs.	459	459	459
R-Square	0.3669	0.3625	0.3702

Note: This table presents multivariate regressions of Employee Based Health Premiums (*EmployeeBC*) on the different ethic groups. Standard errors are robust. All variables are defined in Table 1. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. T-statistic is reported in parentheses.

Table 5. *Estimation of the effects of Ethnic Group (Education) on Employee based Health Premiums (EmployeeBC)*

Dependent Variable: ***EmployeeBC***			
Variables	*LessHS_Insured*	*SomeCollege_Insured*	*BSGrad_Insured*
Black_Insured	0.281***	0.416***	0.585***
	(4.96)	(6.94)	(10.42)
White_Insured	0.259***	0.312***	0.441***
	(4.34)	(4.71)	(7.24)
Asian_Insured	-0.145	0.014	0.136
	(-1.32)	(0.11)	(1.22)
Latino_Insured	0.092**	0.170***	0.278***
	(2.22)	(3.90)	(6.20)
Unemployment Rate	-0.059	-0.020	-0.118
	(-0.57)	(-0.18)	(-1.08)
18-64_Insured	-0.064	-0.379**	0.381**
	(-0.50)	(-2.38)	(2.51)
Male	-1.452***	-0.087	-1.365***
	(-5.16)	(-0.25)	(-4.55)
NativeBorn_Insured	0.106	-0.087	-0.081
	(1.21)	(-0.95)	(-0.90)
LessHS_Insured	1.717***		-0.409***
	(9.65)		(-5.27)
SomeCollege_Insured		-0.404***	
		(-4.10)	
BSGrad_Insured			-0.458***
			(-6.31)
LaborForce_Insured	0.483***	0.209*	0.372***
	(4.42)	(1.84)	(3.26)
Salary25K-49K_Insured	0.248	0.444**	-0.069
	(1.38)	(2.26)	(-0.35)
Poverty138%_Insured	-0.860***	-0.272	-0.303*
	(-4.93)	(-1.56)	(-1.78)
Prob > F	0.0000	0.0000	0.0000
Year Fixed Effects	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes
Obs.	459	459	459
R-Square	0.3252	0.3808	0.3600

Note: This table presents multivariate regressions of Employee Based Health Premiums (*EmployeeBC*) on the different ethnic groups. Standard errors are robust. All variables are defined in Table 1. *, **, and ***indicate significance at the 10%, 5%, and 1% levels, respectively. The t-statistics are reported in parentheses.

Table 6. *Estimation of the effects of Ethnic Group (Work Force) on Employee based Health Premiums (EmployeeBC)*

Dependent Variable: ***EmployeeBC***			
Variables	*NoLabor_Insured*	*LessFullTime_Insured*	*DoNotWork_Insured*
Black_Insured	0.482***	0.415***	0.473***
	(8.52)	(6.94)	(8.14)
White_Insured	0.304***	0.274***	0.289***
	(4.76)	(4.45)	(4.52)
Asian_Insured	-0.086	-0.174	-0.114
	(-0.72)	(-1.50)	(-0.94)
Latino_Insured	0.292***	0.258***	0.290***
	(6.67)	(5.58)	(6.56)
Unemployment Rate	-0.183*	-0.191*	-0.197*
	(-1.69)	(-1.77)	(-1.78)
18-64_Insured	0.010	0.124	0.022
	(0.08)	(0.91)	(0.17)
Male	-0.482**	-0.386	-0.475*
	(-1.98)	(-1.55)	(-1.94)
NativeBorn_Insured	-0.141	-0.163*	-0.146
	(-1.58)	(-1.82)	(-1.64)
HSGrad_Insured	0.564***	0.494***	0.551***
	(7.37)	(6.38)	(7.10)
NoLabor_Insured	-0.184*		
	(-1.78)		
LessFullTime_Insured		-0.237	
		(-1.65)	
DoNotWork_Insured			-0.092
			(-0.92)
Salary25K-49K_Insured	0.002	-0.033	-0.013
	(0.01)	(-0.17)	(-0.07)
Poverty138%_Insured	-0.275*	-0.383**	-0.308*
	(-1.68)	(-2.48)	(-1.83)
Prob > F	0.0000	0.0000	0.0000
Year Fixed Effects	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes
Obs.	459	459	459
R-Square	0.4198	0.4304	0.4279

Note: This table presents multivariate regressions of Employee Based Health Premiums (*EmployeeBC*) on the different ethnic groups. Standard errors are robust. All variables are defined in Table 1. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The t-statistics are reported in parentheses.

Table 7. *Estimation of the effects of Ethnic Group (Income) on Employee based Health Premiums (EmployeeBC)*

Dependent Variable: ***EmployeeBC***				
Variables	*SalaryU25k_Insured*	*Salary50_74k_Insured*	*Salary75_99k_Insured*	*Salary100plus_Insured*
Black_Insured	0.402***	0.432***	0.432***	0.418***
	(7.35)	(8.31)	(8.07)	(7.65)
White_Insured	0.253***	0.294***	0.288***	0.292***
	(4.22)	(5.01)	(4.91)	(4.99)
Asian_Insured	-0.151	-0.120	-0.118	-0.136
	(-1.33)	(-1.06)	(-1.04)	(-1.19)
Latino_Insured	0.272***	0.273***	0.275***	0.268***
	(6.34)	(6.35)	(6.39)	(6.18)
Unemployment Rate	-0.164	-0.171	-0.149	-0.164
	(-1.53)	(-1.57)	(-1.39)	(-1.52)
18-64_Insured	-0.141	-0.198	-0.108***	-0.223
	(-1.30)	(-1.50)	(-0.91)	(-1.51)
Male	-0.694**	-0.812***	-0.936***	-1.051***
	(-2.30)	(-2.71)	(-3.24)	(-3.66)
NativeBorn_Insured	-0.201**	-0.134	-0.150*	-0.130
	(-2.28)	(-1.51)	(-1.69)	(-1.45)
HSGrad_Insured	0.492***	0.581***	0.576***	0.596***
	(6.15)	(7.97)	(7.88)	(7.99)
LaborForce_Insured	0.351***	0.363***	0.367***	0.377**
	(3.20)	(3.30)	(3.25)	(3.40)
SalaryU25k_Insured	0.751**			
	(2.39)			
Salary50_74k_Insured		-0.285		
		(-1.47)		
Salary75_99k_Insured			-0.110	
			(-0.44)	
Salary100plus_Insured				0.123
				(1.36)
Poverty138%_Insured	-0.756	-0.127	-0.188	0.001
	(-2.81)	(-0.98)	(-1.51)	(0.00)
Prob > F	0.0000	0.0000	0.0000	0.0000
Year Fixed Effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
Obs.	459	459	459	459
R-Square	0.3907	0.3575	0.3654	0.3463

Note: This table presents multivariate regressions of Employee Based Health Premiums (*EmployeeBC*) on the different ethnic groups. Standard errors are robust. All variables are defined in Table 1. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The t-statistics are reported in parentheses.

Table 8. *Estimation of the effects of Ethnic Group (Poverty Level) on Employee based Health Premiums (EmployeeBC)*

Dependent Variable: ***EmployeeBC***		
Variables	*Poverty138_199_Insured*	*Poverty200+_Insured*
Black_Insured	0.437***	0.411***
	(8.05)	(7.46)
White_Insured	0.307***	0.279***
	(5.12)	(4.61)
Asian_Insured	-0.093	-0.139
	(-0.82)	(-1.21)
Latino_Insured	0.265***	0.265***
	(6.33)	(6.35)
Unemployment Rate	-0.154	-0.143
	(-1.44)	(-1.34)
18-64_Insured	-0.227*	-0.235*
	(-1.74)	(-1.91)
Male	-0.911***	-1.094***
	(-3.19)	(-3.77)
NativeBorn_Insured	-0.159*	-0.153*
	(-1.82)	(-1.75)
HSGrad_Insured	0.577***	0.566***
	(7.71)	(7.57)
LaborForce_Insured	0.430***	0.404***
	(4.12)	(3.99)
Salary25K-49K_Insured	-0.096	0.030
	(-0.63)	(0.18)
Poverty138_199_Insured	-0.102	
	(-1.28)	
Poverty200+_Insured		0.144**
		(2.24)
Prob > F	0.0000	0.0000
Year Fixed Effects	Yes	Yes
State Fixed Effects	Yes	Yes
Obs.	459	459
R-Square	0.4206	0.4494

Note: This table presents multivariate regressions of Employee Based Health Premiums (*EmployeeBC*) on the different ethnic groups. Standard errors are robust. All variables are defined in Table 1. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The t-statistics are reported in parentheses.

Conclusion

This paper examines the effect of socioeconomic disparities on healthcare coverage discrepancies within underserved and underrepresented communities, particularly examining their effects on average employer-sponsored health insurance premiums at the state level. While other papers generally explore health inequities across all racial and ethnic groups, our study addresses a critical gap in the literature by specifically focusing on ethnic groups with employer-sponsored health insurance (ESHI).

The insights gained from our analysis at the state level underscore a crucial connection between the increase in Black population coverage by Employer-Sponsored Health Insurance (ESHI) and a simultaneous uptick in associated insurance premiums. Notably, when accounting for various socioeconomic factors, our findings reveal that this ethnic group allocates a higher percentage of their income to employer-sponsored healthcare coverage compared to Whites, Hispanics/Latinos, and Asians. This highlights the need to investigate into the "true" cost structure of ESHI for all ethnic and racial groups. As we consider these disparities, it becomes evident that future research and policy considerations should place heightened emphasis on understanding and addressing the unique challenges faced by different communities in accessing affordable healthcare coverage.

Moving forward, it is imperative for future research endeavors to explore deeper into this subject by employing individual-level data. By doing so, researchers can gain a more nuanced understanding of the factors influencing the disproportionate costs faced by marginalized groups in obtaining health insurance. Additionally, ongoing investigations can expand their scope through further cross-sectional analyses, exploring the broader impact of various socioeconomic factors on the disparate costs of health premiums for marginalized communities. Furthermore, expanding the dataset to include samples beyond the United States could provide valuable insights, allowing researchers to generalize findings and uncover similarities or differences in healthcare costs affecting marginalized groups in diverse populations. These avenues of inquiry hold the potential to inform more targeted and equitable healthcare policies.

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Appendix A. *Variable Definitions*

Variable		Definition
T_Total civilian noninstitutionalized population	=	The estimated population for a specific year in a U.S. state, estimated from the American Community Survey data available on census.gov.
T_ Employment-based health insurance	=	The estimated employment-based health insurance, encompassing multiple insurance plans, for a particular year within a U.S. state. This estimation is derived from data sourced from the American Community Survey, accessible on census.gov.
T_Employment based health insurance alone	=	The estimated health insurance coverage through employment alone for a particular year in a U.S. state, derived from the data provided by the American Community Survey on census.gov.
I_Total civilian noninstitutionalized population	=	The estimated number of insured individuals within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov.
Multiplier Employee-based health insurance	=	This matrix is derived by dividing the estimated employment-based health insurance, which includes multiple insurance plans, by the estimated number of insured individuals for a specific year within a U.S. state.
Multiplier Employee-based health insurance alone	=	This matrix is derived by dividing the health insurance coverage through employment alone by the estimated number of insured individuals for a specific year within a U.S. state.
Average Employee-based health insurance	=	The average health insurance expenditure for individual employees in a particular year within a U.S. state, derived from data sourced from the American Community Survey accessible on census.gov.
Health Premium	=	Employer-provided health premiums sourced from the National Association of Insurance Commissioners, as reported in the Insurance Department Resources Reports.
Average Health Premium	=	Calculated by dividing Health Premium by estimated number of insured individuals within a U.S. state for a particular year.
Unemployment Rate	=	Calculated by dividing the number of unemployed people by the total labor force, then multiply by 100. Source: U.S. Bureau of Labor Statistics (bls.gov)
EmployeeBC	=	Calculated by dividing Employee Sponsored Health Premiums by the Total Health Premiums for a particular year in a U.S. state, derived from the data provided by the American Community Survey on census.gov.
U18_Insured	=	Calculated by dividing the estimated number of insured individuals **under the age of 18** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.
18-64_Insured	=	Calculated by dividing the estimated number of insured individuals **between the ages of 18 and 64** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.
65+_Insured	=	Calculated by dividing the estimated number of insured individuals **equal or greater than the age of 65** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.
19-25_Insured	=	Calculated by dividing the estimated number of insured individuals **between the ages of 19 and 25** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-*

based health insurance alone.

Male_Insured = Calculated by dividing the estimated number of insured identified as **Male** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.

Female_Insured = Calculated by dividing the estimated number of insured identified as **Female** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.

White_Insured = Calculated by dividing the estimated number of insured individuals classify as **White** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.

Black_Insured = Calculated by dividing the estimated number of insured individuals classify as **Black** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.

Asian_Insured = Calculated by dividing the estimated number of insured individuals classify as **Asian** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.

HispLat_Insured = Calculated by dividing the estimated number of insured individuals classify as **Hispanic or Latino** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.

NativeBorn_Insured = Calculated by dividing the estimated number of insured individuals **Native Born** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.

ForeignBorn_Insured = Calculated by dividing the estimated number of insured individuals **Foreign Born** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.

NaturalBorn_Insured = Calculated by dividing the estimated number of insured individuals **Natural Born** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.

NoCitizen_Insured = Calculated by dividing the estimated number of insured individuals **not as US citizens** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.

LessHS_Insured = Calculated by dividing the estimated number of insured individuals **less than a High School diploma** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.

HSGrad_Insured = Calculated by dividing the estimated number of insured individuals **with a High School diploma** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.

SomeCollege_Insured = Calculated by dividing the estimated number of insured individuals **with some College experience** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.

BSGrad_Insured = Calculated by dividing the estimated number of insured individuals with a **Bachelor Degree** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone*.

LaborForce_Insured = Calculated by dividing the estimated number of insured individuals **that work in the**

		labor force population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone.*
NoLabor_Insured	=	Calculated by dividing the estimated number of insured individuals **that do not work in the labor force** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone.*
FullTime_Insured	=	Calculated by dividing the estimated number of insured individuals that are **Full Time Employee** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone.*
LessFullTime_Insured	=	Calculated by dividing the estimated number of insured individuals that are **Less than Full Time Employee** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone.*
DoNotWork_Insured	=	Calculated by dividing the estimated number of insured individuals that **Do Not Work Employees** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone.*
SalaryU25K_Insured	=	Calculated by dividing the estimated number of insured individuals **that receive a salary under $25,000 per year** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone.*
Salary25K-49K_Insured	=	Calculated by dividing the estimated number of insured individuals **that receive a salary between $25,000 and $49,000 per year** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone.*
Salary50K-74K_Insured	=	Calculated by dividing the estimated number of insured individuals **that receive a salary between $50,000 and $74,000** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone.*
Salary75K-99K_Insured	=	Calculated by dividing the estimated number of insured individuals **that receive a salary between $75,000 and $99,000** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone.*
Salary100K+_Insured	=	Calculated by dividing the estimated number of insured individuals **that receive a salary over $100,000 per year** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone.*
Poverty138%_Insured	=	Calculated by dividing the estimated number of insured individuals **that are at the 138% poverty level** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone.*
Poverty138-199%_Insured	=	Calculated by dividing the estimated number of insured individuals **that are between the 138% and 199% poverty level** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone.*
Poverty200%+_Insured	=	Calculated by dividing the estimated number of insured individuals **that are above 200% poverty level** population within a U.S. state for a particular year, derived from data obtained from the American Community Survey available on census.gov by *I_Total civilian noninstitutionalized population* then multiplying by the *Multiplier Employee-based health insurance alone.*

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A Framework for Future Human Resource Management Individual Competencies: An Integrative Review

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The advent of automation, artificial intelligence and disruptive technologies has affected the role of the Human Resource Management (HRM) professionals and taken over some HRM functions thereby imposing new sets of competencies for HRM professionals. Yet, there is limited research on the full spectrum of competencies needed to execute the HRM function successfully in an increasingly technologically dynamic environment. Hence, the purpose of this research was to develop a framework for future HRM individual competencies. This study used a qualitative integrative review approach. A thematic analysis approach using manual colour coding in Microsoft Excel was used to analyse the secondary data. The following four competency themes were found in this study: Intrapersonal and interpersonal competencies; information and technology competencies; ability to advance human capabilities and lastly, value-adding business competencies. The developed framework contributes to new future HRM knowledge and practical knowledge in the sense that HRM professionals are now made aware of the competencies needed to be future-ready.

Keywords: *competencies, framework, future, human resource management, technological disruptions*

Introduction

Digitalisation and automation have birthed major challenges within the workplace (Sima et al. 2020, Summerfield 2022), thereby compelling leaders to acquire new capabilities and competencies to be productive and efficient within a technological, virtualised, and competitive work environment (Morandini et al. 2023, Ross & Maynard 2021). Likewise, the execution of the HRM role has changed significantly to adapt to the ongoing disruptive transformations and the role of people practitioners is impacted by technology.

Thus, new sets of competencies are now required to fulfil the HRM role (Bryndin 2020, Margherita 2021). For these reasons, HRM practitioners need to evolve and learn to adapt, reframe, reshape, and rearticulate their roles and capabilities to be relevant in this digital era and beyond (Coetzee & Veldsman 2022, Meduri & Yadav 2021).

Few HRM professionals are "future-proofed" (Van Vulpen & Veldsman 2022, Radonjić et al. 2022) and much work is required to prepare people practitioners for

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sustainable success (Ekuma 2023, Orosoo et al. 2023). This lack of preparedness has created an urgent need to accelerate the upskilling, reskilling, and professional development of people practitioners to meet the changing business needs in the digital age (Coetzee & Veldsman 2022). Although HRM has great organisational prominence and is increasingly becoming a corporate priority, HRM professionals' capabilities, skills, and competencies still need to be upgraded (Paschen et al. 2020). The limited integrated research on future requirements for the HRM role (Cayrat & Boxall 2023, Pan & Froese 2023, Schultz 2021a) necessitates an elucidation of the competencies required by HRM professionals for the current and future technological disruptions (Ekuma 2023, Radonjić et al. 2022, Ulrich et al. 2021).

This research contributes to the current academic discourse on how the current technological revolution will affect the future of HRM. This article uses diverse literature around the world and leans on the role theory and AI job replacement theory to identify the competencies required to perform the HRM role in the technological era. Thus, adding to the theoretical knowledge of HRM competencies. Moreover, this paper highlights the need for the HRM professional to be multidisciplinary, with information and technology competencies and value-adding skills being critical for their success. Organisations can leverage the practical framework provided in this study to hire HRM practitioners in workplace environments where humans and technology increasingly coexist. The framework can also be used to assess current HRM professionals and their preparedness for the future. This can inform the design of relevant development initiatives to upskill HRM professionals and enable them to execute their roles successfully in an increasingly digitalised era. The framework can also guide educational institutions and professional bodies in aligning their HRM curriculum and qualifications to future competencies required to effectively perform the HRM role.

Research Problem and Objective

It is clear from the literature review that there is limited research conducted on the future of HRM individual competencies. This leads to the following research question: what competencies are required to successfully execute HRM roles in the future? The objective of this research was consequently to develop a framework for the future competencies of HRM professional using an integrative review approach which allowed us to obtain relevant and rich data on future HRM competencies from reliable sources as discussed later in the methodology section. Next, the literature review is presented.

Literature Review

Theoretical Background

This research is underpinned by two main theories: the role theory and the theory of artificial intelligence (AI) job replacement. Firstly, the role theory purports that every role has duties, expectations, norms, behaviours, and rights that the person who assumes that role must fulfil. Within the HRM context, a role refers to a pattern of behaviours reflecting the duties and responsibilities of any job/role occupant expected by others (Truss et al. 2002, Pritchard 2010). In this study the role theory allows the researchers to examine the competencies needed for the HRM professionals to successfully perform their duties and fulfil their role in this digital era.

Secondly, the theory of AI job replacement formulated by Huang and Rust (2018) and supported by Chen et al. (2024) and Shen (2024), specifies four facets of intelligence to deliver a service task – namely the mechanical, analytical, intuitive, and empathetic facets. Mechanical intelligence learns or adapts at the minimum, analytical intelligence learns and adapts systemically based on data, intuitive intelligence learns and adapts intuitively based on understanding, and empathetic intelligence learns and adapts empathetically based on experience. AI job replacement occurs primarily at the task level and not the job level, moving from lower intelligence tasks that are easier for AI to perform to higher intelligence levels over time. As mechanical tasks are automated and AI progressively takes over analytical tasks, intuitive and empathetic skills will become more important for service employees (such as HRM professionals) before the tasks are eventually taken over by AI, which will result in innovative ways of human-machine integration or, alternatively, threaten human employment (Huang & Rust 2018).

Concerning this study, the role theory helps to explain the changing role and expectations from HRM professionals as aligned to the new competency requirements to fulfil their roles. Likewise, the theory of AI job replacement clarifies the evolving role of the HRM professional based on the types of intelligence and competencies required for execution. Hence providing the rationale for the use of these two theories to support this research.

Conceptual Background

The Evolution of the HRM Profession

The emergence of the HRM function can be traced back to the late 19th century with the appointment of "welfare workers" whose roles were to improve the socio-economic well-being, financial and medical needs of workers in American and British factories (Kaufman 2014). However, the First World War and advances in scientific management repositioned the function as that of labour problem mitigators (e.g., labour turnover, high levels of absenteeism and accidents) and promoters of human productivity (Kaufman 2014, Niven 1967). From the early 20th century, progressive legislation, unionisation, growth, and complexity in workforce size increased the employment of personnel specialists and establishment of personnel departments (Kaufman 2014, Niven 1967) which began to perform a wider range of functions such

as recruitment, performance management, remuneration, training, joint consultation, and collective bargaining. However, it was a low-status occupation with predominantly administrative and advisory functions and therefore played a secondary and sometimes disrespected role. The personnel department was perceived as serving the needs of workers, giving transactional advice with no power to make decisions. Personnel managers only made decisions in conflict situations and in silos which clashed with the business. The lack of HRM metrics and analytics limited their power and resources because they were not able to prove that they made significant contributions to the organisation's success. However, the occupation's proponents advocated its recognition as a profession (Hodson & Sullivan 2012). This led to specialist educational courses with certification and accreditation procedures, professional associations, and the championing of personnel work as a fully-fledged profession (Kaufman 2014, Niven 1967). Later, the HRM role evolved into that of strategic partners who formulate, participate in, and execute business strategies; administrative experts who perform HRM processes; employee champions who advocate for employees; and change agents (Ulrich et al. 2021).

The HRM function is currently transitioning from being operational to being strategic in the sense that it is expected to create value and contribute towards shareholder returns (Cayrat & Boxall 2023, Bryndin 2020, Saha 2021, Schultz 2022). Also, technological disruptions have transformed the profession (Gallardo-Gallardo & Collings 2021, Laker 2022, Malik et al. 2020, Meduri & Yadav 2021) and the future of HRM seems to merge the human and digital elements (Margherita 2021, Schultz 2021a). HRM processes are increasingly AI-driven, and HRM supports the general digital transformation of the viable competitiveness of companies (Böhmer & Schinnenburg 2023). Generative AI, digitalisation and other technology can be a helpful HRM assistant for both strategic and operational tasks (Aguinis et al. 2024, Joseph et al. 2021). Most mechanical HRM tasks have been automated, and AI is progressively taking over analytical tasks; even intuitive and empathetic tasks may eventually be performed by AI (Chen et al. 2024, Huang & Rust 2018, Shen 2024). Although there are negative effects of the transition of HRM, workplaces processes and workers' organisations, these disadvantages are outweighed by its potential for competitive advantage of augmentation and automation of work (Böhmer & Schinnenburg 2023). The change in role requirements coupled with advances in technology requires HRM professionals to be equipped with new sets of competencies that will enable them to function within a perpetually disrupted environment (Ekuma 2023, Schultz 2021a).

Human Resource Competencies

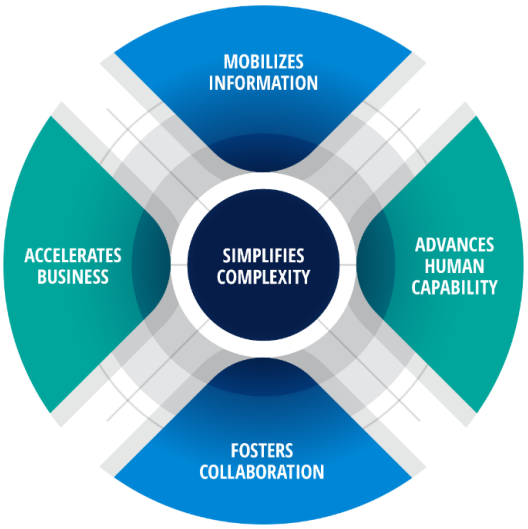
Competencies are a combination of demonstrable skills, knowledge, personal characteristics/traits, attitudes, self-concept, motives, and critical behaviours needed to effectively operate in a position, perform specific work tasks or functions, and increase job performance (Macchi Silva & Ribeiro 2020, Wong 2020). When matched with organisational goals, competencies can help to determine performance standards and evaluate the achievement and efficacy of employees and teams against the organisation's objectives (Macchi Silva & Ribeiro 2020). Competent human resources are very important for driving innovation, improving the HR department and being

proactive in meeting the future needs of the organisation and employees (Suša Vugec et al. 2024).

Scholars have proposed different competency models over the years. Katz and Kahn (1966) classify competency components as technical and functional, managerial, human and conceptual, while Carroll and McCrackin (1997) demarcate competency dimensions as core, leadership/managerial and functional. Also, Cheetham and Chivers (1998) describe competencies as either cognitive, functional, personal, ethical/ values or meta-competencies. Le Deist and Winterton (2005) classify competencies as meta-competence, social competence, functional competence, and personal competence. Young and Chapman's (2010) review of generic competencies across Australia, New Zealand, the United States of America, Canada, the United Kingdom, and other European countries yielded basic skills, conceptual skills, personal skills, people skills, business skills and other skills such as understanding health and safety and freedom from substance abuse.

Koenig (2011) identifies the future HRM competencies and clusters them into intrapersonal and interpersonal competencies. Intrapersonal competencies are internal abilities that enable people to solve issues and socialise while interpersonal competencies help to relate and interact with others. A generic competency framework for labour/industrial relations management competencies was developed by Botha et al. (2018) and they found that strategic management and leadership, labour relations expertise, business acumen, collective bargaining management, change innovation, interpersonal relations, communication, emotional management and jurisprudence/ labour codes are essential labour/industrial relations management competencies. Van den Berg et al. (2020) explore key human resource competencies and highlight the ability to: understand, extract, analyse, interpret, apply, and design information; learn continuously; manage stakeholder relationships; and cultivate positive organisational practices. McCartney et al. (2021) develop a competency for the HRM analyst and identify consulting abilities that add value to stakeholders, storytelling and communication, technical knowledge of technological systems, data fluency and data analysis, business acumen, and research and discovery. Ulrich et al. (2021) propose an HRM competency model consisting of 5 major roles. The first HRM role pertains to accelerating business by generating competitive insights, influencing the business, driving agility, and getting the right things done. The second role centres on advancing human capability by elevating talent, delivering HRM solutions and championing diversity, equity, and inclusion. Thirdly, the HRM professional must simplify complexity through critical thinking to harness uncertainties. Fourthly, the HRM professional is expected to mobilise information by leveraging information technology and guiding the social agenda. The last HRM role is to foster collaboration, which involves self-management and relationship building. Hence, HRM practitioners need to: be self-aware and manage themselves effectively; relate with others and manage people; source, understand and process data for decision-making; be technologically savvy; possess value-adding knowledge that benefits the business and its stakeholders; and manage and develop people. The conceptual framework for this study is based on the HRM competency model of Ulrich et al. (2021).

Figure 1. *Conceptual Framework*



Source: Ulrich et al. 2021.

Dave Ulrich's influence on HR is evident in recent research. His model of HR roles has been applied to study employee engagement in remote work settings, demonstrating the significant impact of HR managers as employee champions, change agents, and strategic partners (Swaroop & Sharma 2022). Ulrich's work on organisational logic continues to shape an understanding of how organisations deliver value (Ulrich 2021). A systematic review of HR roles over 50 years revealed that while Ulrich's work has stimulated increased interest in HR roles, the transition to more strategic roles has been influenced by complex factors. This review also highlights the ongoing tensions in HR roles and the potential for synergy between strategic and operational functions (Cayrat & Boxall 2023). In addition, Ulrich is widely regarded as one of the most influential thought leaders in the field of Human Resources, often referred to as the "guru" of modern HR for his transformative contributions. He reshaped HR from a primary administrative function to a more strategic partner in organisational success. Ulrich is best known for developing the HR Business Partner model and rich HR competency model, which emphasises four key roles for HR professionals: strategic partners, change agents, employee advocates, and administrative experts. His model encourages HR to align practices with organisational goals, manage change, support employee engagement and well-being, and optimise administrative processes through technology. This comprehensive, adaptable framework remains highly relevant in the fast-evolving business landscape, helping HR professionals to navigate current and future challenges. Ulrich's work has had a profound and lasting impact on HR practices worldwide, and his contributions continue to shape both academic research and practical applications. As of December 12, 2024, Ulrich's academic influence was reflected in his impressive citation metrics on Google Scholar, with a total of 48,776 citations, including 13,206 since 2019. His h-index of 94, with 53 of these citations occurring since 2019, and an i10-index of 281, with 158 occurring since 2019, underscores his ongoing prominence and the continued relevance of his work in the HR field. These metrics highlight Ulrich's enduring impact as a leading figure in HR theory and practice (Google Scholar 2024).

As the HRM function transitions from one phase to another, the HRM roles change and there is a strategic shift in the HRM function (Saha 2021) together with new competencies required to successfully execute the HRM role (Van Vulpen & Veldsman 2022). HR professionals need to be able to reshape the workforce, align culture, design employee experience, and provide workforce insights relevant to drive organisational success amidst ongoing transformations (Balasundaram 2020). As technology and artificial intelligence gain ground and disrupt the work environment (Baakeel 2020, Chytiri 2019, Coetzee & Veldsman 2022, Mikalef & Gupta 2021), there is a need for a framework that presents new set of competencies required for the HRM in the future. This is vital for the HRM professional to continuously add value (Hewett & Shantz 2021, Paschen et al. 2020).

Methodology

We used an integrative review approach, which is an appropriate qualitative research method to evaluate and synthesise data from different sources to answer a research question (Fan et al. 2022, Kutcher and LeBaron 2022). This approach provides a comprehensive view of knowledge regarding HRM competencies. Integrative reviews allow researchers to use a non-systematic method to review, critique and/or synthesise literature to generate new perspectives (Cronin & George 2023, Snyder 2019, Torraco 2005). Data can include experimental, non-experimental, theoretical, and methodological research (Kutcher & LeBaron 2022, Toronto & Remington 2020) that can be integrated and/or critically evaluated to advance new knowledge, contribute insights and generate a new framework (Cronin & George 2023, Elsbach & van Knippenberg 2020, Snyder 2019).

Fan et al. (2022) purport that integrative reviews are shown to be replicable by disclosing the search, selection criteria, (i.e., when and where the searches were conducted, who conducted the searches, and keywords used), number of articles found as well as inclusion and exclusion criteria. Although there are different ways of conducting integrative reviews, researchers must follow accepted conventions for reporting on the way the study was conducted (Torraco 2005). To ensure the quality of the research process, the seven (7) steps suggested by Kutcher and LeBaron (2022). These steps were followed to ensure methodological rigour in the collection, analysis, and synthesis of the literature (Fan et al. 2022).

Step 1: Selecting a Concept

Limited research is conducted on the future competencies of HRM, and the researchers chose this concept to analyse.

Step 2: Determining the Aim of the Analysis

This analysis aimed to develop a framework for the future individual competencies of HRM.

Step 3: Performing the Literature Search

Inclusion and exclusion criteria guided the integrative review process to select the most appropriate articles (Fan et al. 2022, Snyder 2019) using the PRISMA protocol (Lefebvre et al. 2019).

First, we discuss the inclusion criteria. We developed a search strategy and conducted searches through 3 databases (Scopus, ScienceDirect and Google Scholar). The reason for choosing these databases is that numerous double-blind peer-reviewed HRM articles are published on these databases. The search string used was "automation" OR "digitalisation" "automatic technology" OR "artificial intelligence" AND "technological revolution" AND "human resource management" AND "competencies" "expertise" OR "skills" OR "capability". Open-access full-text articles published in English in peer-reviewed journals from January 2020 to April 2024 available on the 3 selected databases were included in this study. The 5 years' time frame is generally acceptable for academic citations as articles within that range are current. Also, the focus on literature within this time is due to the transformative changes in work caused by the COVID-19 pandemic and the increasing use of technology within the workplace. This period reflects significant shifts to online, hybrid, and flexible work environments, driving a need for HRM practices to adapt rapidly as organisations had to quickly adapt to new work modalities and technology-driven processes. Recent literature and studies from these years offer the most relevant insights into the competencies required for HRM professionals to manage new technological tools, remote work, and changing employee needs effectively. By examining this recent literature, the research captures up-to-date competencies, ensuring that the analysis is relevant to addressing emerging demands of the current and future HRM landscape.

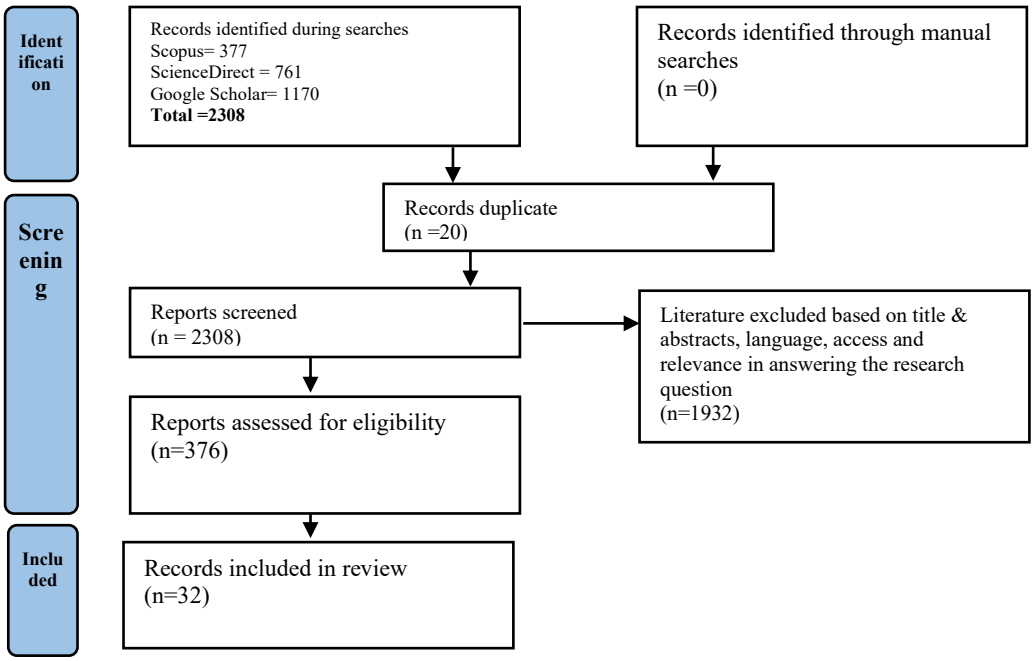
Second, the exclusion criteria are now discussed. Only Scopus, ScienceDirect and Google Scholar were used, and other databases were therefore excluded. Closed-access full-text peer-reviewed articles published in peer-reviewed journals were not considered. Open-access full-text peer-reviewed articles published before January 2020 and after April 2024 were also not considered. Open-access full-text articles published in a language other than English in peer-reviewed journals from January 2020 to April 2024 were not included. Books, working papers, conference proceedings and non-journal articles were excluded from the study. Although inclusion and exclusion criteria provide some limitations to the article, they are relevant for the credibility of the protocol (Lefebvre et al. 2019)

Step 4: Organising and Evaluating the Data

The initial population of possibly relevant studies comprised 2308 articles as presented in Figure 2. The results were screened by scanning the titles and abstracts to

assess relevance in answering the research question. Only articles which met the inclusion criteria and articles which the authors judged to be relevant in answering the research question (Snyder 2019) were read in full independently by one researcher and reviewed by the other two researchers independently. Duplicates in different databases were only considered once. At the end, 32 journal articles (refer to Figure 2).

Figure 2. *PRISMA Protocol*



Source: Lefebvre et al. 2019.

The 32 articles included in this study are presented in Table 1.

Table 1. *Information on the Articles Included in this Study*

	Authors	Article title	Year	Typology of study	Findings	Journal	Volume (Issue)	Impact factor of journal	Data base	Number of citations of article
1	Veldsman & Coetzee	Professional personas and capabilities of the future people practitioner: A thematic review.	2022	Literature review	Professional development is required for human resource professional and industrial/organisational psychologist in the technological era. These include four digital dexterous capabilities (i.e. intrapersonal, intra digital, interdigital, interpersonal) and professional personas (i.e. humanitarian champion, strategist, ethics custodian, business advisor, solution architect, and service champion)	South African Journal of Human Resource Management	20(0)	2.3	Scopus	3
2	Santana & Díaz-Fernández	Competencies for the artificial intelligence age: Visualisation of the state of the art and future perspectives.	2023	Bibliometric study using SciMat	To face AI developments from an HRM perspective, employees and HR professionals need the appropriate digital competencies for optimal organisational performance.	Review of Managerial Science	17	7.8	Scopus	43
3	Sakka, Maknouzi, & Sadok	Human resource management in the era of artificial intelligence: Future HR work practices, anticipated skill set, financial and legal implications	2022	Literature review	There is a need to equip and reskill HR departments and HR staff with an adequate knowledge of data science, and sophisticated interpersonal communication skills that will enable them to act as effective intermediaries between machines and humans.	Academy of Strategic Management Journal	21(1)	7.27	Scopus	61
4	Shet & Pereira	Proposed managerial competencies for Industry 4.0 – Implications for social sustainability.	2021	Literature review	Competencies identified as relevant in industry 4.0 include agility, entrepreneurial intelligence, business acumen, design thinking, disruptive leadership, collaborative mind-set, problem solving & decision-making, research orientation, connected technology architecture, data analytics, project leadership, robotic process automation, digital intelligence & modelling, and sustainability.	Technological Forecasting & Social Change	173(2021)	12.9	ScienceDirect	137
5	Samarasinghe & Medis	Artificial intelligence based strategic human resource management (AISHRM) for Industry 4.0.	2020	Literature review	Artificial intelligence within strategic human resource management requires skills in HR analytics Machine learning, skills in people development, AI algorithm development, ability to	Global Journal of Management and Business Research: G Interdisciplinary	20 (2)	-	Google scholar	56

					determine the strategic fit of AI with the business strategy and learning abilities.					
6	Chowdhury, Dey, Joel-Edgar, Bhattacharya, Rodriguez-Espindola, Abadie, & Truong	Unlocking the value of artificial intelligence in human resource management through AI capability framework.	2023	Literature review	To benefit from AI and its adoption Human resources in organisations need to develop human skills and competencies, leadership, team co-ordination, governance strategy, organisational culture and innovation mindset, and AI-employee integration strategies,	Human Resource Management Review	33(1)	8.2	Scopus	429
7	Alan	A systematic bibliometric analysis on the current digital human resources management studies and directions for future research.	2023	Systematic bibliometric analysis	The augmented use of digital technologies affects the competencies and expectations of the digital workforce.	Journal of Chinese Human Resource Management	14(1)	-	Scopus	7
8	Piwowar-Sulej	Human resources development as an element of sustainable HRM – With the focus on production engineers.	2021	Literature review	Long-term orientation and flexibility require the development of competencies of the future in HRM including environmental sustainability, value creation, decision making relationship, teamwork, adaptability, computer skills, digital competencies, analytic skills.	Journal of Cleaner Production		9.4	ScienceDirect	318
9	Conceição, Pereira, & Dias	The key competencies for the future of work – A bibliometric study.	2023	Bibliometric study	The future of work will require HR and professionals need to possess relationship and teamwork skills, keep employees motivated and committed, retain employees, understand digitalisation and digital transformation	Journal of Chinese Human Resource Management	14(1)	-	Scopus	7
10	Sengupta, Lalwani, Goswami, & Srivastava	Reinventing HR functions with SMAC technologies – An exploratory study.	2023	Quantitative	Digital tools are increasingly being used in the HR function and HR professional need to be on par with those developments	Materials Today: Proceedings	46(2021)	4.9	ScienceDirect	24
11	Harney & Collings	Navigating the shifting landscapes of HRM.	2021	Literature review	Requirements for the current era will require agile HR, HR disruption, strategic human capital, HR co-creation and global flexibility and interdisciplinary insight, finding motivation in practice,	Human Resource Management Review	31(2021)	8.2	ScienceDirect	160
12	Nawaz, Gomes, & Faisal	Is the revolution of technologies transforming human resources?	2021	Literature review	Emerging technology plays a major role in the execution of the HRM function and in the sustainable growth and development.	Journal of Management Information and Decision Sciences	24(3)	-	Scopus	4
13	Huang, Yang, Zheng, Feng, & Zhang	Personalised human resource management via HR analytics and artificial intelligence: Theory and implications.	2023	Literature review	Personalised human resource management using HR analytics and artificial intelligence will require technological competencies alongside	Asia Pacific Management Review	28(2023)	4.9	Scopus	72

					other HR competencies.					
14	Popo-Olaniyan, James, Udeh, Daraojimba, & Ogedengbe	Future-proofing human resources in the U.S. with AI: A review of trends and implications.	2022	Literature review	HR professionals must focus on developing AI-powered skillsets, skills in data analysis, AI literacy, effective human-AI collaboration, automation, and address ethical considerations of AI-powered HR solutions in a transparent, fair, private and accountable manner. This requires continuous learning and upskilling for HR professionals.	International Journal of Management & Entrepreneurship Research	4(12)	-	Scopus	37
15	Bukartaite & Hooper	Automation, artificial intelligence and future skills needs: An Irish perspective.	2023	Qualitative study	There is a continued need for life-long learning in soft and hard skills in the increasingly digitalised workplace governed by artificial intelligence (AI) and technology.	European Journal of Training and Development	47(10)	2.30	Scopus	18
16	Zirar, Ali, & Islam	Worker and workplace artificial intelligence (AI) coexistence: Emerging themes and research agenda.	2023	Literature review	Amidst distrust in that, there is a need for skills to help manage the human-artificial intelligence coexistence which are technical, human, and conceptual skills.	Technovation	124(102747)	11.1	ScienceDirect	112
17	Tripathi, Tripathi, Yadav, & Shastri	Gig economy: Reshaping strategic HRM in the era of Industry 4.0 and artificial intelligence.	2022	Literature review	To thrive in this AI-based technological world, HR professionals need to master new skills and obtain new knowledge.	Journal of Positive School Psychology	6(4)	-	Scopus	12
18	Singh & Malhotra	Workforce analytics: Increasing managerial efficiency in human resources.	2020	Literature review	Technology has become imperative in recent years causing workforce analytics to become imperative in HR	International Journal of Scientific and Technology Research	9(1)	-	Scopus	10
19	Sagaya & Momin	Global reverberation and prediction for HRM amid and after COVID-19: A technological viewpoint.	2020	Literature review	The impact of COVID-19 on various HRM functions fast-tracked application of technology in facilitating roles for HRM, Digital innovations such as AI, machine learning, cloud computing, IoT etc. are being harnessed to supplement the HRM function. HR needs new skills to execute its role	Materials Today: Proceedings	46(2020)	4.9	Scopus	33
20	Alfawaire & Atan	The effect of strategic human resource and knowledge management on sustainable competitive advantages at Jordanian universities: The mediating role of organizational innovation.	2021	Quantitative	Innovation, and knowledge management impact strategic human resource management and the sustainable competitiveness. Human resource managers need to have the required skills to operate effectively in the increasingly innovative environment	Sustainability	13	3.6	Scopus	103

21	Jani, Muduli, & Kishore	Human resource transformation in India: Examining the role digital human resource technology and human resource role.	2021	Quantitative	HR transformation using Digital human resource technology can enhance business outcomes if mediated by the right HR roles. That is strategic, employee champion, change agent and administrative expert	International Journal of Organizational Analysis	31(4)	-	Scopus	18
22	Cunha, Pina, Gomes, Mellahi, Miner, & Rego	Strategic agility through improvisational capabilities: Implications for a paradox sensitive HRM.	2020	Literature review	Strategic agility, improvisation improvisational capabilities are critical for HRs as the HRM in the contemporary environment plays both a partner role with others, and a core role in designing the strategic system	Human Resource Management Review	30(1)	8.2	ScienceDirect	101
23	Oehlhorn, Maier, Laumer, & Weitzel	Human resource management and its impact on strategic business-IT alignment: A literature review and avenues for future research.	2020	Literature review	Human resources management and support are critical for strategic information and technology alignment that meet organisational priorities.	The Journal of Strategic Information Systems	29(4)	8.7	ScienceDirect	50
24	Stuart, Spencer, McLachlan, & Forde	COVID-19 and the uncertain future of HRM: Furlough, job retention and reform.	2021	Literature review	HR managers need to create conditions for a more collaborative HRM that delivers for workers and business, job retention being a core priority	Human Resource Management Journal	31(4)	-	Scopus	45
25	Tuffaha & Perello-Marin	Artificial intelligence definition, applications, and adoption in human resource management: A systematic literature review.	2021	A systematic literature review	HRM needs to be able to adopt AI applications within the current technological space	International Journal of Business Innovation and Research	2021	-	Scopus	2
26	Vrontis, Christofi, Pereira, Tarba, Makrides, & Trichina	Artificial intelligence, robotics, advanced technologies, and human resource management: A systematic review.	2021	A systematic literature review	HRM should be able to foster human-robot/AI collaboration, decision-making and learning, and other HRM activities (such as recruiting, training and job performance) using technology	The International Journal of Human Resource Management	-	4.9	Scopus	412
27	Shet, Poddar, Samuel, & Dwivedi	Examining the determinants of successful adoption of data analytics in human resource management – A framework for implications	2021	Literature review	HR professionals are required to have analytical skills, quantitative abilities and be able to work with Different technological and analytical tools	Journal of Business Research	131(2021)	10.5	Scopus	67
28	Abdeldayem & Aldulaimi	Trends and opportunities of artificial intelligence in human resource management: Aspirations for public sector in Bahrain.	2020	Qualitative	The application of modern artificial intelligence is essential for organisations within an inconsistent environment. HR practitioners should be able to use it effectively.	International Journal of Scientific & Technology Research	9(1)	-	Scopus	100
29	Dzwigol, Dzwigol-Barosz, Miskiewicz, & Kwilinski	Manager competency assessment model in the conditions of Industry 4.0.	2020	Algorithmic "fuzzy logic" model	Cognitive abilities, creative potential, effective goal setting, people development, communicative, and leadership and management abilities are paramount in industry 4.0	Entrepreneurship and Sustainability Issues	7(4)	-	Scopus	146

30	Minbaeva	Disrupted HR?	2021	Literature review	Paradigm shifts are needed to equip HR professionals with the knowledge required to deal with disruptions	Human Resource Management Review	31	8.2	ScienceDirect	74
31	Lumi	The impact of digitalisation on human resources development.	2020	Literature review	The drastic changes in human resources and HR processes caused by digitalisation and technological developments necessitate new HR knowledge and competencies	Prizren Social Science Journal	4(3)	.88	Google Scholar	48
32	Schultz	The future and the role of human resource management in South Africa during the Fourth Industrial Revolution.	2021	Qualitative	HR has become technology-driven, data-driven, ethically driven, change driven, business-driven. There is also an increasing need for human–machine collaboration and resilience which require a new set of skills.	South African Journal of Human Resource Management	19(0)	2.3	Scopus	19

Source: Authors.

Step 5: Analysing and Synthesising the Findings

As recommended by Snyder (2019), thematic analysis was used to analyse the data. More specifically, the six (6) phase analytical process of Byrne (2022) was used to analyse the data:

Phase 1: Familiarisation with the Data

Each selected article was scrutinised, and the relevant parts of the articles were extracted and manually exported to a Microsoft Excel sheet. This allowed the researchers to familiarise themselves with the data.

Phase 2: Generating Initial Codes

Colour coding was used to identify the codes in the Microsoft Excel sheet. Inductive coding was used as new codes were found in the data and deductive codes that were derived from the literature review were also used. A combination of inductive and deductive coding, referred to as a blended approach, is mostly used (Graebner et al. 2012, p. 280).

Phase 3: Generating Themes

After coding all the related data, the researchers examined the data to ascertain how various codes might be combined by shared meanings to create themes or sub-themes.

Phase 4: Reviewing Potential Themes

Codes and themes were revised in this phase to yield a relevant and significant interpretation of the data; as such, it would be necessary to code more data items, combine or remove some codes or even promote some codes as sub-themes or themes. At this phase, it is common for codes and themes to be changed or eliminated to allow for the most insightful data analysis.

Phase 5: Defining and Naming Themes

At this stage, the researchers defined each theme and sub-theme concerning the dataset and the research question. This includes choosing which data items to use as extracts when summarising the analysed findings and submitting themes names for final review. Themes and subthemes were then developed (see Table 2).

Phase 6: Producing the Report

This phase can be seen as the completion and final inspection of the report, which the researchers have already begun writing even before undertaking the thematic analysis. The research findings from integrative reviews must be accurate, transferable, and transparent (Fan et al. 2022, Snyder 2019). As with all qualitative analysis, analytical honesty is a priority, the data analysis process is made transparent with rival explanations and spurious relationships thoughtfully explored (Whittemore & Knafl 2005). Also, to ensure the quality of the produced report and due to the qualitative nature of this study, it was not necessary to ensure reliability and validity, but it was essential to ensure trustworthiness. Rose and Johnson (2020) state that trustworthiness refers to the rigour of the research design, the credibility of the

researcher and how applicable the research methods used are. Trustworthiness involves the elements of credibility, dependability, confirmability and transferability (Bless et al. 2013):

- Credibility refers to the authenticity of the researchers' presentation coupled with a considerable narrative detailing all the analytical methods used (Bless et al. 2013). In this current study, we recorded notes in a reflective diary that were merged with the secondary data. We also acknowledged our personal biases and preconceptions throughout the research process as suggested by Ahmed (2024).
- To establish dependability, Shenton (2004) suggests that the processes used in the study should be fully conveyed to enable a future researcher to repeat the work and gain the same results. We therefore kept all details of the research procedures and decisions made during the study as suggested by Ahmed (2024).
- Confirmability is referred to as the degree of consistency in the findings and whether they can be repeated, which is "analogous to objectivity in quantitative research" (Connelly 2016). We engaged with other colleagues to review the interpretations and findings and to minimise bias as suggested by Ahmed (2024).
- Transferability denotes that research findings will be applicable in the future and the research findings will match findings in similar circumstances (Ghafouri & Ofoghi 2016). We kept detailed contextual information to enable readers to assess the transferability of our findings as suggested by Ahmed (2024).

Ethical Considerations

This research only considered secondary data; hence no ethics approval was required. All data was sourced from three reliable and well-known research engines namely ScienceDirect, Scopus and Google Scholar.

Results

Step 6: Summarising Results and Formulating Conclusions

The results from this review are summarised in Table 2.

Table 2. *The Future HRM Individual Competencies*

Competencies description	No. of occurrences	References
THEME 1: INTRAPERSONAL AND INTERPERSONAL COMPETENCIES		
Subtheme 1.1: Intrapersonal competencies		
Problem-solving abilities	9	Bukartaite & Hooper 2023; Conceição et al. 2023; Lumi 2020; Piwowar-Sulej 2021; Popo-Olaniyan et al. 2022; Samarasinghe & Medis 2020; Santana & Díaz-Fernández 2023; Shet & Pereira 2021; Tripathi et al. 2022
Lifelong learning abilities	9	Abdeldayem & Aldulaimi 2020; Bukartaite & Hooper 2023; Dzwigol et al. 2020; Minbaeva 2021; Sakka et al. 2022; Samarasinghe & Medis 2020; Santana & Díaz-Fernández 2023; Piwowar-Sulej 2021; Popo-Olaniyan et al. 2022
Flexibility	8	Abdeldayem & Aldulaimi 2020; Alan 2023; Bukartaite & Hooper 2023; Conceição et al. 2023; Piwowar-Sulej 2021; Santana et al. 2023; Singh & Malhotra 2020; Schultz 2021
Adaptability	8	Abdeldayem & Aldulaimi 2020; Bukartaite & Hooper 2023; Piwowar-Sulej 2021; Sakka et al. 2022; Santana & Díaz-Fernández 2023; Schultz 2021; Singh & Malhotra 2020; Veldsman & Coetzee 2022
Critical thinking	7	Bukartaite & Hooper 2023; Conceição et al. 2023; Popo-Olaniyan et al. 2022; Santana & Díaz-Fernández 2023; Schultz 2021; Veldsman & Coetzee 2022; Zirar et al. 2023
Resilience	6	Sakka et al. 2022; Conceição et al. 2023; Bukartaite & Hooper 2023; Minbaeva 2021; Sagaya & Momin 2020; Santana & Díaz-Fernández 2023
Emotional control	6	Conceição et al. 2023; Cunha et al. 2020; Santana & Díaz-Fernández 2023; Sakka et al. 2022; Shet & Pereira 2021; Tripathi et al. 2022
Creative thinking	6	Conceição et al. 2023; Lumi 2020; Piwowar-Sulej 2021; Santana & Díaz-Fernández 2023; Popo-Olaniyan et al. 2022; Zirar et al. 2023
Innovation	6	Alan 2023; Bukartaite & Hooper 2023; Conceição et al. 2023; Santana & Díaz-Fernández 2023; Schultz 2021; Tripathi et al. 2022
Decision-making abilities	5	Bukartaite & Hooper 2023; Conceição et al. 2023; Dzwigol et al. 2020; Lumi 2020; Zirar et al. 2023
Cognitive intelligence	4	Lumi 2020; Piwowar-Sulej 2021; Santana & Díaz-Fernández 2023; Zirar et al. 2023
Initiative and proactiveness	4	Bukartaite & Hooper 2023; Piwowar-Sulej 2021; Santana & Díaz-Fernández 2023; Zirar et al. 2023
Time management	3	Dzwigol et al. 2020; Jani et al. 2021; Shet & Pereira 2021
Design-thinking mindset	3	Bukartaite & Hooper 2023; Piwowar-Sulej 2021; Shet & Pereira 2021
Analytical thinking	3	Conceição et al. 2023; Piwowar-Sulej 2021; Zirar et al. 2023
Open-/ renewed mindedness	3	Minbaeva 2021; Santana & Díaz-Fernández 2023; Schultz 2021
Good human judgement	3	Conceição et al. 2023; Samarasinghe & Medis 2020; Zirar et al. 2023
Awareness and openness	3	Alan 2023; Oehlhorn et al. 2020; Shet & Pereira 2021
Professionalism	2	Dzwigol et al. 2020; Piwowar-Sulej 2021
Patience	2	Oehlhorn et al. 2020; Shet et al. 2021
Discipline and commitment	2	Dzwigol et al. 2020; Oehlhorn et al. 2020
Positive attitude	2	Bukartaite & Hooper 2023; Santana & Díaz-Fernández 2023
Take advice and respond to criticism in a constructive manner	1	Dzwigol et al. 2020
Prudence	1	Lumi 2020
Curiosity	1	Alan 2023
Activeness	1	Santana & Díaz-Fernández 2023
Privacy	1	Sakka et al. 2022
Honesty	1	Santana & Díaz-Fernández 2023

Subtheme 1.2: Interpersonal competencies		
Communication skills	10	Bukartaite & Hooper 2023; Dzwigol et al. 2020; Oehlhorn et al. 2020; Sakka et al. 2022; Sagaya & Momin 2020; Santana & Díaz-Fernández 2023; Shet & Pereira 2021; Singh & Malhotra 2020; Piwowar-Sulej 2021; Veldsman & Coetzee 2022
Collaborative mindset	8	Alfawaire & Atan 2021; Bukartaite & Hooper 2023; Lumi 2020; Oehlhorn et al. 2020; Shet & Pereira 2021; Santana & Díaz-Fernández 2023; Tripathi et al. 2022; Veldsman & Coetzee 2022
Strategic leadership abilities	6	Bukartaite & Hooper 2023; Conceição et al. 2023; Cunha et al. 2020; Jani et al. 2021; Oehlhorn et al. 2020; Tripathi et al. 2022
Emotional intelligence	6	Bukartaite & Hooper 2023; Conceição et al. 2023; Lumi 2020; Santana & Díaz-Fernández 2023; Shet & Pereira 2021; Zirar et al. 2023
Teamwork	5	Bukartaite & Hooper 2023; Cunha et al. 2020; Piwowar-Sulej 2021; Santana & Díaz-Fernández 2023; Zirar et al. 2023
Manage people and networks.	5	Bukartaite & Hooper 2023; Piwowar-Sulej 2021; Sakka et al. 2022; Santana & Díaz-Fernández 2023; Zirar et al. 2023
Social intelligence	4	Piwowar-Sulej 2021; Oehlhorn et al. 2020; Santana & Díaz-Fernández 2023; Shet & Pereira 2021
Inspiration and trust building	4	Bukartaite & Hooper 2023; Oehlhorn et al. 2020; Piwowar-Sulej 2021; Veldsman & Coetzee 2022
Negotiation and persuasion skills	4	Bukartaite & Hooper 2023; Conceição et al. 2023; Lumi 2020; Zirar et al. 2023
Strategic partnership development	3	Oehlhorn et al. 2020; Popo-Olaniyan et al. 2022; Veldsman & Coetzee 2022
Empathy	3	Sakka et al. 2022; Santana & Díaz-Fernández 2023; Shet & Pereira 2021
Interpersonal skills	3	Dzwigol et al. 2020; Minbaeva 2021; Piwowar-Sulej 2021
Delegation skills	2	Zirar et al. 2023; Dzwigol et al. 2020
Motivation skills	2	Sakka et al. 2022; Santana & Díaz-Fernández 2023
Coordination	2	Oehlhorn et al. 2020; Zirar et al. Ali & Islam 2023
Respect	2	Oehlhorn et al. 2020; Veldsman & Coetzee 2022
Supportiveness	2	Nawaz et al. 2021; Oehlhorn et al. 2020
Empower others	1	Oehlhorn et al. 2020
THEME 2: INFORMATION AND TECHNOLOGY COMPETENCIES		
Subtheme 2.1: Understanding and usage of technology		
Understand, use and implement the latest technology effectively	13	Bukartaite & Hooper 2023; Conceição et al. 2023; Jani et al. 2021; Minbaeva 2021; Popo-Olaniyan et al. 2022; Sakka et al. 2022; Santana & Díaz-Fernández 2023; Schultz 2021; Shet & Pereira 2021; Tripathi et al. 2022; Piwowar-Sulej 2021; Veldsman & Coetzee 2022; Zirar et al. 2023
Incorporate, integrate, implement and deploy the right technologies	8	Alan 2023; Bukartaite & Hooper 2023; Chowdhury et al. 2023; Jani et al. 2021; Minbaeva 2021; Singh & Malhotra 2020; Shet & Pereira 2021; Tripathi et al. 2022
Digital and technological literacy	5	Bukartaite & Hooper 2023; Piwowar-Sulej 2021; Popo-Olaniyan et al. 2022; Tripathi et al. 2022; Zirar et al. 2023
Subtheme 2.2: Promotion of the use of technology		
Promote the use of technology	6	Alan 2023; Chowdhury et al. 2023; Jani et al. 2021; Sagaya & Momin 2020; Shet & Pereira 2021; Veldsman & Coetzee 2022
Foster information and knowledge management	5	Chowdhury et al. 2023; Minbaeva 2021; Oehlhorn et al. 2020; Sakka et al. 2022; Zirar et al. 2023
Assess cost-benefit of HRM technology	3	Singh & Malhotra 2020; Shet et al. 2021; Tuffaha 2021

Subtheme 2.3: Promotion of technology – human collaboration		
Promote human-AI/ machine/technology collaboration	4	Popo-Olaniyan et al. 2022; Sakka et al. 2022; Schultz 2021; Tripathi et al. 2022
Understand when to rely on AI-generated insights or harness human judgment	2	Popo-Olaniyan et al. 2022; Sakka et al. 2022
Subtheme 2.4: Technology design		
Understand programming and technology design, e.g., natural language processing, machine learning algorithms, building prototypes and other AI programmes	9	Abdeldayem & Aldulaimi 2020; Bukartaite & Hooper 2023; Chowdhury et al. 2023; Conceição et al. 2023; Samarasinghe & Medis 2020; Santana & Díaz-Fernández 2023; Shet & Pereira 2021; Veldsman & Coetzee 2022; Zirar et al. 2023
Understand digital transformation and process automation	4	Abdeldayem & Aldulaimi 2020; Bukartaite & Hooper 2023; Popo-Olaniyan et al. 2022; Shet & Pereira 2021
Translate business challenges into mathematical equations to develop new models	2	Minbaeva 2021; Tripathi et al. 2022
Subtheme 2.5: Technology maintenance		
Systems evaluation and operational maintenance skills	4	Chowdhury et al. 2023; Conceição et al. 2023; Tripathi et al. 2022; Tuffaha & Perello-Marin 2021
Ability to solve technological problems	2	Bukartaite & Hooper 2023; Conceição et al. 2023
Subtheme 2.6: Technology-driven decision-making abilities		
Proficiency in statistical and technological analysis for actionable conclusions and decision-making	12	Alan 2023; Chowdhury et al. 2023; Huang et al. 2023; Minbaeva 2021; Popo-Olaniyan et al. 2022; Sakka et al. 2022; Santana & Díaz-Fernández 2023; Schultz 2021; Shet et al. 2021; Tripathi et al. 2022; Veldsman & Coetzee 2022; Zirar et al. 2023
Proficiency in data analytics (especially HRM analytics) that drive decision-making	8	Bukartaite & Hooper 2023; Popo-Olaniyan et al. 2022; Samarasinghe & Medis 2020; Sengupta et al. 2023; Singh & Malhotra 2020; Shet & Pereira 2021; Schultz 2021; Tripathi et al. 2022
Research and data mining skills	7	Bukartaite & Hooper 2023; Huang et al. 2023; Sakka et al. 2022; Samarasinghe & Medis 2020; Santana & Díaz-Fernández 2023; Sengupta et al. 2023; Singh & Malhotra 2020
Subtheme 2.7: Knowledge about the impact of technology		
Be abreast with the legal implications of ubiquitous technology on employees and the organisation and monitor it	4	Alan 2023; Popo-Olaniyan et al. 2022; Sakka et al. 2022; Santana & Díaz-Fernández 2023
Understand the capabilities and limitations of technology	3	Chowdhury et al. 2023; Shet & Pereira 2021; Popo-Olaniyan et al. 2022
Ensure cyber security	2	Bukartaite & Hooper 2023; Sagaya & Momin 2020
Ensure ethical and moral principles around AI-based solutions	3	Chang 2021; Chowdhury et al. 2023; Popo-Olaniyan et al. 2022
Subtheme 2.8: Social media leadership		
Master digital media	2	Piwowar-Sulej 2021; Santana & Díaz-Fernández 2023
Leverage social resources to innovate and respond to internal and external changes	1	Conceição et al. 2023

THEME 3: ABILITY TO ADVANCE HUMAN CAPABILITY		
Subtheme 3.1: HRM planning		
Agile and long-term Smart workforce Smart planning	4	Abdeldayem & Aldulaimi 2020; Popo-Olaniyan et al. 2022; Sagaya & Momin 2020; Tripathi et al. 2022
Allocate tasks/ responsibilities	3	Dzwigol et al. 2020; Jani et al. 2021; Oehlhorn et al. 2020
Resource allocation	3	Chowdhury et al. 2023; Conceição et al. 2023; Sakka et al. 2022
Plan digital HRM strategy and roadmap and implementation	2	Jani et al. 2021; Schultz 2021
Accurately plan HRM functional duties	1	Dzwigol et al. 2020
Subtheme 3.2: Staff recruitment		
Design and deliver efficient HRM staffing	2	Jani et al. 2021; Shet & Pereira 2021
Subtheme 3.3: People management		
Workforce management skills	4	Bukartaite & Hooper 2023; Lumi 2020; Schultz 2021; Singh & Malhotra 2020
Coordinate and motivate the workforce in line with work plan	3	Chowdhury et al. 2023; Sakka et al. 2022; Singh & Malhotra 2020
Design relevant people practice	2	Jani et al. 2021; Veldsman & Coetzee 2022
Define goals or agendas for employees in line with organisational objectives	2	Chowdhury et al. 2023; Shet & Pereira 2021
Design clear communication mechanisms with and among employees	1	Chowdhury et al. 2023
Subtheme 3.4: Culture development and maintenance		
Foster a culture of proactivity and forward-thinking	6	Alfawaire & Atan 2021; Chowdhury et al. 2023; Conceição et al. 2023; Cunha et al. 2020; Popo-Olaniyan et al. 2022; Sagaya & Momin 2020; Shet & Pereira 2021
Create a strong corporate culture	3	Chowdhury et al. 2023; Dzwigol et al. 2020; Veldsman & Coetzee 2022
Promote a culture where humans and machines can interact positively	3	Chowdhury et al. 2023; Popo-Olaniyan et al. 2022; Schultz 2021
Oversee a culture of continuous improvement and adaptation	3	Popo-Olaniyan et al. 2022; Schultz 2021; Stuart et al. 2021
Foster a collaborative and conducive working environment that encourages creativity and innovation	2	Chowdhury et al. 2023; Schultz 2021
Subtheme 3.5: Performance management		
Manage performance	5	Chowdhury et al. 2023; Jani et al. 2021; Sagaya & Momin 2020; Sakka et al. 2022; Stuart et al. 2021
Manage the flow and turnover of employees	3	Jani et al. 2021; Popo-Olaniyan et al. 2022; Veldsman & Coetzee 2022
Coaching and counselling	2	Bukartaite & Hooper 2023; Tripathi et al. 2022
Mentorship abilities	1	Tripathi et al. 2022
Subtheme 3.6: Compensation management		
Design and deliver efficient, rewarding and promoting strategies	1	Jani et al. 2021

Subtheme 3.7: Staff engagement		
Understand employee needs and possible outcomes	3	Abdeldayem & Aldulaimi 2020; Chowdhury et al. 2023; Tripathi et al. 2022
Able to deliver personalised HRM	2	Huang et al. 2023; Santana & Díaz-Fernández 2023
Be a trusted HRM champion	3	Jani et al. 2021; Stuart et al. 2021; Veldsman & Coetzee 2022
Develop HRM 4.0 policies for the next generation	2	Schultz 2021; Tripathi et al. 2022
Build mutual exchange between the firm and employees	2	Oehlhorn et al. 2020; Stuart et al. 2021
Subtheme 3.8: Talent development		
Promote continuous learning and development.	11	Alan 2023; Conceição et al. 2023; Cunha et al. 2020; Dzwigol et al. 2020; Popo-Olaniyan et al. 2022; Sagaya & Momin 2020; Santana & Díaz-Fernández 2023; Schultz 2021; Shet & Pereira 2021; Tripathi et al. 2022; Veldsman & Coetzee 2022
Design and deliver efficient training	4	Conceição et al. 2023; Jani et al. 2021; Samarasinghe & Medis 2020; Santana & Díaz-Fernández 2023
Identify current and future skill gaps	3	Abdeldayem & Aldulaimi 2020; Dzwigol et al. 2020; Popo-Olaniyan et al. 2022
Align training with organisational objectives to improve organisational performance	3	Conceição et al. 2023; Popo-Olaniyan et al. 2022; Veldsman & Coetzee 2022
Develop HRM 4.0 policy on emerging skill shortages in key areas	2	Popo-Olaniyan et al. 2022; Schultz 2021
Subtheme 3.9: Employee wellbeing, health and safety competence		
Ability to support employees' health and wellness	6	Bukartaite & Hooper 2023; Cunha et al. 2020; Sagaya & Momin 2020; Santana & Díaz-Fernández 2022; Sakka et al. 2022; Stuart et al. 2021
Subtheme 3.10: Industrial relations management		
Understand labour relations and legal requirements, including the use of artificial intelligence	2	Chowdhury et al. 2023; Sakka et al. 2022
Solve internal conflicts and employee grievances	2	Chowdhury et al. 2023; Sakka et al. 2022
Subtheme 3.11: Diversity, equity and inclusion competence		
Understand contemporary laws, legal instruments and requirements and establish safeguards to ward off materially discriminatory decisions and ensure transparency, accountability, and protection of workers' privacy	2	Bukartaite & Hooper 2023; Sakka et al. 2022
Equality, diversity, and inclusion	1	Bukartaite & Hooper 2023

THEME 4: VALUE-ADDING BUSINESS COMPETENCIES		
Subtheme 4.1: Business knowledge		
Multidisciplinary/cross-disciplinary knowledge	7	Bukartaite & Hooper 2023; Shet et al. 2021; Singh & Malhotra 2020; Tripathi et al. 2022; Piwowar-Sulej 2021; Veldsman & Coetzee; 2022; Vrontis et al. 2021
Align HRM practices to organisational strategy	6	Jani et al. 2021; Harney & Collings 2021; Sakka et al. 2022; Singh & Malhotra 2020; Tripathi et al. 2022; Popo-Olaniyan et al. 2022
Planning abilities	5	Alfawaire & Atan 2021; Dzwigol et al. 2020; Piwowar-Sulej 2021; Shet & Pereira 2021; Santana & Díaz-Fernández 2023
Understand business architecture	4	Chowdhury et al. 2023; Shet & Pereira 2021; Tripathi et al. 2022; Piwowar-Sulej 2021
Have financial intelligence	3	Sakka et al. Maknouzi & Sadok 2022; Samarasinghe & Medis 2020; Shet & Pereira 2021
Manage resources using a holistic system or integrated approach	2	Nawaz et al. 2021; Singh & Malhotra 2020
Influence decisions in the organisation	2	Shet & Pereira 2021; Veldsman & Coetzee 2022
Create value for stakeholders	2	Minbaeva 2021; Sakka et al. 2022
Possess global business intelligence	2	Cunha et al. 2020; Veldsman & Coetzee 2022
Effective project management	2	Popo-Olaniyan et al. 2022; Shet & Pereira 2021
Use multiple scenario analysis to address challenges	1	Cunha et al. 2020
Subtheme 4.2: Entrepreneurial capacities		
Entrepreneurial abilities	3	Bukartaite & Hooper 2023; Dzwigol et al. 2020; Santana & Díaz-Fernández 2023
Customer oriented	3	Conceição et al. 2023; Lumi 2020; Shet & Pereira 2021
Identify problems and opportunities	1	Shet & Pereira 2021
Design measures for competitive edge	1	Shet & Pereira 2021
Cope in complex and competitive environments	1	Alan 2023
Business development	2	Bukartaite & Hooper 2023; Shet & Pereira 2021
Have both focal and peripheral vision	1	Cunha et al. 2020
Subtheme 4.3: Change management		
Drive agility	7	Bukartaite & Hooper 2023; Jani et al. 2021; Minbaeva 2021; Oehlhorn et al. 2020; Popo-Olaniyan et al. 2022; Schultz 2021; Shet & Pereira 2021
Initiate, support and manage change	6	Bukartaite & Hooper 2023; Cunha et al. 2020; Jani et al. 2021; Sagaya & Momin 2020; Sakka et al. 2022; Tripathi et al. 2022
Drive sustainability for employees and the society HRM	3	Bukartaite & Hooper 2023; Piwowar-Sulej 2021; Shet & Pereira 2021
Manage disruptive change.	3	Bukartaite & Hooper 2023; Chowdhury et al. 2023; Santana & Díaz-Fernández 2023
Shape the workforce to thrive in the AI-driven future	2	Popo-Olaniyan et al. 2022; Veldsman & Coetzee 2022

Source: Authors from data analysis.

After achieving the results presented in Table 2, we used Artificial Intelligence (AI) to check the alignment of our findings with global research. First, we used Elicit, which is an innovative AI-powered tool designed to automate key tasks in the literature review process (Byun & Stuhlmüller 2023), thereby revolutionising how

researchers engage with academic literature. Elicit uses advanced language models to streamline literature retrieval, summarise key information, extract and synthesise data, classify articles into a structured research matrix, and provide citation graphs for critical evaluation (Kung 2023, Whitfield & Hofmann 2023). This allows researchers to quickly access research-backed searches, accelerate the literature review process, enhance the depth and rigour of research, and uncover patterns and trends that might otherwise go unnoticed. Hence, it saves time and effort and generates new perspectives and frameworks. Elicit provides more than just search results; it offers concise, actionable insights, bridging the gap between finding papers and understanding them in context. Search terminology was entered into Elicit to search for articles related to "future human resource management individual competencies." Search results pointed to strategic planning, change management, aligning HR objectives with business goals, resilience, critical thinking, employee engagement, cultural integration, talent development, diversity management, cross-cultural communication, adaptability, and digital literacy, which will require a combination of core, leverage, and role-specific skills within a remote work environment where men and machines interact (Elicit 2024).

Secondly, we used Poe which is a dynamic AI platform that accesses, stores, and organises literature and data with multiple AI entities and synthesises research across different platforms (Poe 2024). An instruction was given to Poe to provide information on the "future human resource management individual competencies". The following key future-oriented competencies for HR professionals emerged: digital and technological literacy, including HR tech platforms; familiarity with AI, machine learning, and automation in HR operations; leveraging predictive analytics for workforce planning and decision-making; understanding cyber security relevant to protecting sensitive employee data; as well as managing virtual collaboration platforms and remote work. They also need data-driven decision-making skills, an understanding of HR analytics and technical analytical tools, the ability to translate data into actionable strategies, and an understanding of HR metrics. Furthermore, they need emotional intelligence, along with strong interpersonal skills, to manage stakeholders and resolve conflicts across different generations. In addition, strategic thinking and business acumen are needed to contribute to overall business success. These include understanding key business drivers, designing workforce strategies, scenario planning, and risk assessment. They also need competencies in diversity, equity, and inclusion to deliver HR functions successfully. Future HR professionals need change management and agility competencies to lead organisational change and build resilience and adaptability. This will require them to be able to re-skill and up-skill the workforce and promote continuous learning. Ethical leadership and compliance are also essential in terms of knowing local and global labour laws and promoting ethical decision-making. HR professionals need talent management abilities to enhance employee experiences, design personalised career development plans, and performance management systems, engage employees, and promote employee well-being. Cross-cultural and global competencies are needed to understand and design policies in line with cultural nuances in multicultural teams. This will entail skills in communication, leadership, global mobility, and expatriate programmes. It is equally important that future HR professionals be able to conduct

future workforce planning, including workforce forecasting, identifying skills gaps, managing gig workers, freelancers, and contractors, as well as adapting to work-life integration trends. Lastly, HR professionals of the future need knowledge of sustainability and corporate social responsibility and should be able to integrate it into HR policies and environmental initiatives (Poe 2024).

Findings from the AI tool (i.e., Elicit and Poe) are in line with the findings from the manual analysis done using Microsoft Excel presented in Table 2. Hence, the use of Elicit AI tools validated the findings in this article and enhanced trustworthiness.

Discussion

A discussion of each theme is presented below.

Theme 1: Intrapersonal and Interpersonal Competencies

Table 2 shows that competencies that have to do with intrapersonal and interpersonal competencies. It indicates that the HRM professional needs intrapersonal and interpersonal competencies. On the one hand, HRM professionals must have self-knowledge, self-control, and professional abilities to exercise their HRM role effectively. They also need to be lifelong learners and self-starters as well as agile, resilient, objective, and motivated. The present-day HRM professional also needs cognitive intelligence, flexibility, analytical and critical thinking, design thinking and out-of-the-box thinking skills to make effective decisions, solve complex business problems, adapt to different environments, thrive during uncertain times, and drive innovation within the HRM function. On the other hand, they should possess interpersonal competencies such as emotional intelligence and team spirit that will enable them to relate, communicate, collaborate, partner and work with stakeholders from different cultures and backgrounds.

Previous findings confirm that key intrapersonal personal attributes of HRM professionals include self-confidence, humility, honesty, agility, respect, professionalism, commitment, proactiveness and ethical values (Botha et al. 2018, Chytiri 2019, Koenig 2011, Laker 2022, Saha 2021, Schultz 2022). In the same vein, research also emphasises interpersonal skills such as trust building, teamwork, networking skills, support, open communication, people management skills, collaboration, and cultural sensitivity (Chytiri 2019, Koenig 2011, Laker 2022, Schultz 2021a, Ulrich et al. 2021, Van den Berg et al. 2020). Previous scholars have also confirmed that cognitive intelligence, flexibility, as well as analytical and critical thinking are vital for the modern HRM professional as they enable them to be proactive, resilient and to solve problems (Chytiri 2019, Saha 2021, Schultz 2022). The HRM function is one that primarily deals with people, hence the need for robust intrapersonal and interpersonal competencies.

Theme 2: Information and Technology Competencies

The findings presented in Table 2 provide evidence that information and technology competencies are of essence for the future human resource manager professional. HRM professionals of the technological revolution should be digitally literate enough to use technology appropriately, integrate and implement the right technologies in a virtual environment, and encourage the use and adoption of technology within the organisation and the HRM department. Moreover, HRM professionals should promote knowledge sharing and technology–human collaboration. They need to understand and decide whether it is more beneficial for some functions to be performed by artificial intelligence or by humans. In addition, HRM professionals should be able to design programmes, technological systems, and models such as natural language processing and machine learning algorithms and build prototypes of AI programmes. This will empower them to understand process automation, scrutinise technology-generated data and solve technology-related challenges easily. More importantly, the HRM manager needs to understand the capabilities and limitations of technology and ensure that ethical standards, fairness, transparency, and accountability are in line with changing legal requirements about the use of technology and its output within the workplace. This will protect the organisation from legal disputes that may arise. Moreover, with social media gaining ground, the HRM professional needs to master and leverage digital media and social resources to innovate and respond to internal and external changes.

Past research has confirmed that the ability to use technology and technological tools is required in this technological era (Malik et al. 2020, Schultz 2021a). Prior scholars also affirm that HRM professionals should have digital skills and digital dexterity to be able to use technology to generate analytics to forecast and make data-driven decisions, increase productivity, drive business, and support the HRM function (Chytiri 2019, Mikalef & Gupta 2021, Schultz 2022, Ulrich et al. 2021, Van Vulpen & Veldsman 2022). Likewise, scholars also confirm that it is now imperative for the HRM professional to know how to plan and implement digital technologies (Chytiri 2019, Mikalef & Gupta 2021, Schultz 2022) and develop HRM automated systems and programmes (Malik et al. 2020, Schultz 2021a, Ulrich et al. 2021). In addition, previous research also highlights that the HRM professional should understand the capabilities and limitations of AI (Mikalef et al. 2021). This will enable them to detect possible security issues, privacy breaches, and discriminatory outcomes so that they can strategise and develop policies to deal with ethical ambiguity around technology-human collaboration (Botha et al. 2018, Coetzee & Veldsman 2022, Mikalef & Gupta 2021, Schultz 2021a). Information technology plays an increasingly critical role in shaping HRM. HR professionals must acquire competencies in using technology to optimise employee processes, manage data, and convert external trends into strategic insights (Aguinis et al. 2024, Böhmer & Schinnenburg 2023, Joseph et al. 2021). With the increasing use of technology within the workplace, HRM professionals can no longer sit back and watch, they need to take the lead to drive, design and implement technological systems within the HRM function.

Theme 3: Ability to Advance Human Capabilities

Competencies related to advancing human capabilities were also vital as presented in Table 2. Despite the evolution of the HRM role, HRM managers must still deliver on HRM planning, recruitment and selection, people management, performance management, compensation, staff engagement, industrial relations and employee wellbeing, health, and safety. These functions should be executed within an appropriate digital and learning culture. HRM managers must develop human competencies to improve individual talent and organisational performance by delivering effective and inclusive HRM solutions to achieve this. They need special knowledge of the present and future skills required for the organisation to succeed. HRM professionals should also be able to develop learning and development initiatives to increase performance and prepare the workforce for the future.

These findings are aligned with prior studies confirming that the HRM professional should continuously promote, empower, and invest in workforce development (Gallardo-Gallardo & Collings 2021, McCartney et al. 2021). Schultz (2021b) stresses the need for HR to foster engagement, employment relations, and resilience. This should be in line with the long-term business and performance goals of the organisation (Schultz 2021a, Sen 2020, Ulrich et al. 2021). Balasundaram (2020) also confirms the critical role of HR in workforce shaping, culture alignment, employee experience design, and workforce insights relevant for organisational success amidst workplace transformations. Furthermore, Chytiri (2019) agrees that although the HRM role has evolved to embrace technology, the roles of strategic partner, change agent, employee developer and employee champion are very relevant. These functions are incorporated into traditional HRM functions such as recruitment and selection, human resource planning, compensation, job analysis, performance appraisal, and development (Baakeel 2020). Thus, HRM professionals are still expected to execute conventional functions, as part of their duties in the digital economy.

Theme 4: Value-adding Business Competencies

We also discover from Table 2 that accelerating business results and adding value is now a viral competency for the HRM. HRM professionals should focus on business outcomes and have a peripheral vision to identify challenges and opportunities in the market to develop a competitive advantage for the organisation. They should also possess business and financial intelligence to influence business decisions. Moreover, they need to align HRM to operational and corporate strategies in ways that create value for stakeholders within a volatile environment. This will require cross-disciplinary knowledge in HRM, behavioural science, technology, mathematics, data science, information management and business.

These findings have been confirmed by previous research that discovered that in addition to standard HRM capabilities, the HRM professional must develop core business acumen to leverage business opportunities, contribute towards strategic decisions and position the HRM functions to serve corporate interests within an ever-changing environment (Botha et al. 2018, Chytiri 2019, Coetzee & Veldsman 2022, Van Vulpen & Veldsman 2022). Past research also confirms that this will require

cross-disciplinary competencies such as data analysis and business and project management (Malik et al. 2020, McCartney et al. 2021). This is in synchrony with Schultz's (2021a) finding that functional HRM competencies are no longer enough for successful HRM careers, as diverse skills are required for HRM managers to harness opportunities in this revolutionary era (Saha 2021, Ulrich et al. 2021, Van den Berg et al. 2020). Hence, HRM professionals need business competencies that will enable them to add value to business operations at a strategic level.

Hence, the future of HRM requires professionals to develop competencies in several areas, including intrapersonal and interpersonal skills, technology proficiency, human capability development, and business alignment. With the increasing complexity of work, rapid technological advances, and organisational change, HR professionals must continuously acquire new competencies that will enable them to effectively navigate challenges, enhance organisational success, and maintain relevance in a rapidly changing business environment.

We therefore present framework for future HRM competencies for HR personnel in Figure 3.

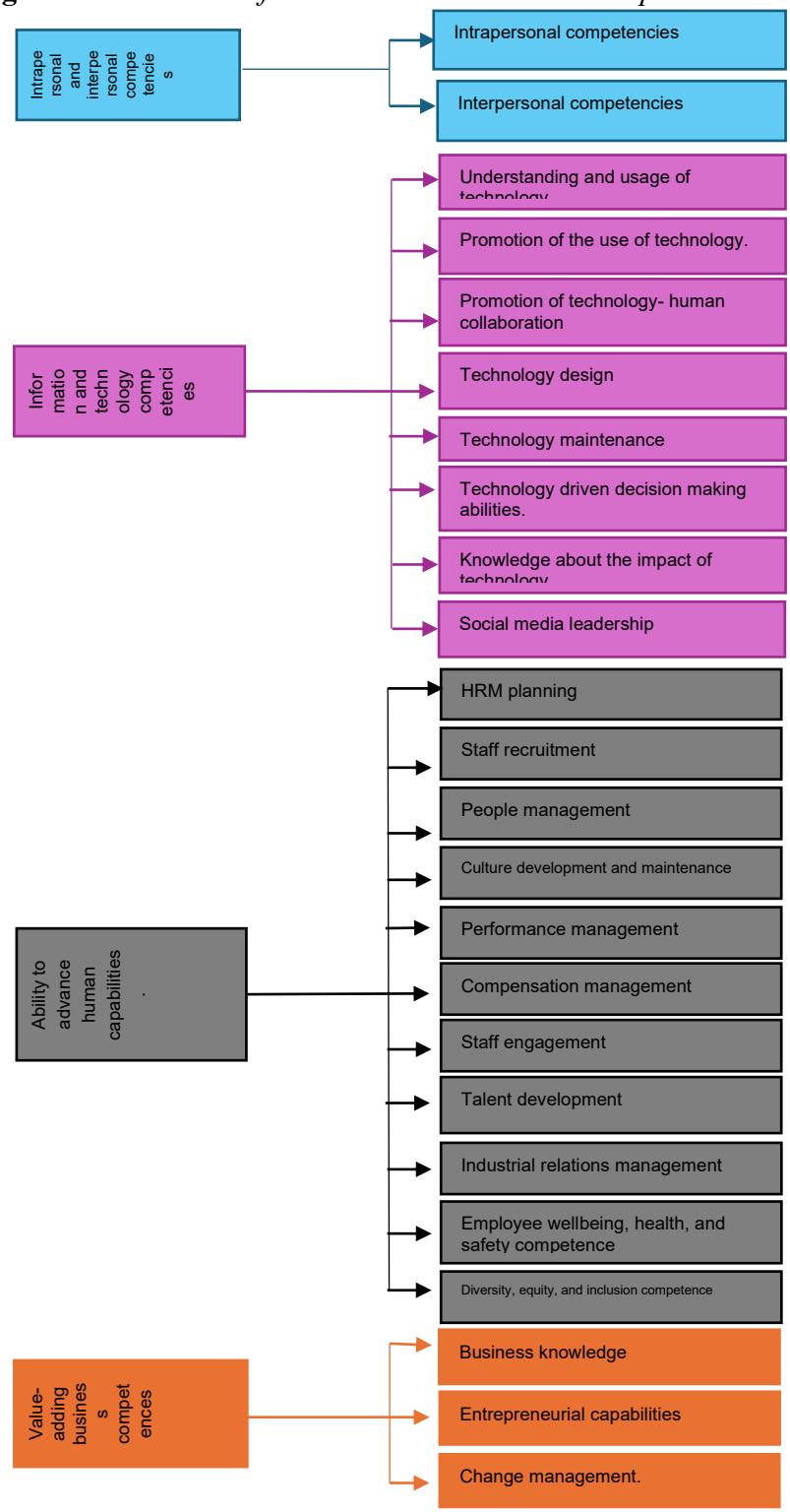
In summary, findings from this study (see Figure 3) reveal that the main future HRM competencies include intrapersonal and interpersonal, information and technology, the ability to advance human capabilities, and value-adding business competencies. In addition to the alignment of findings from this article to previous research discussed above, findings are also aligned to the HRM competency model of Ulrich et al. (2021) discussed in the conceptual background section. This also ties in AI search results (Elicit 2024, Poe 2024) as presented in the result section.

Step 7: Disseminating the Findings

The last step of the integrative review is to distribute the findings among scholars and HRM practitioners. To achieve this purpose, this article will be published in this journal.

The last part of this paper provides the limitations of this research, future orientation, recommendations, and conclusion.

Figure 3. *A Framework for Future HRM Individual Competencies*



Source: Authors.

Limitations and Future Orientation

Firstly, the findings cannot be generalised due to the limitation of the articles reviewed which were selected using specific selection criteria. For example, only peer-reviewed journal articles from selected databases published in English within the set timeframe were searched using specific keywords. This could have restricted the access of the Boolean operators to some relevant other publications. Also, books were not included and possible valuable information from books would be missing.

Future research should be oriented towards identifying the future human resource management competencies based on empirical data within a specific setting. Findings from this study can be used to develop a questionnaire or interview guide to investigate the demographic differences in how HRM professionals perceive future HRM competencies. Other reviews can include books and articles in other languages to broaden the scope of findings.

Practical Recommendations

Practical recommendations, based on each identified theme, are discussed below:

- Theme 1: Intrapersonal and interpersonal competencies: To thrive in the future, HRM professionals cannot afford to work in silos, and they should therefore collaborate with internal and external stakeholders to ensure they address their needs. HRM professionals therefore need to obtain intrapersonal and interpersonal competencies to assist them in properly executing their functions.
- Theme 2: Information and technology competencies: We are already in Industry 4.0 and HRM professionals cannot afford to be left behind when it comes to technology such as AI, automation and augmentation. HRM professionals should ensure that they get the necessary training to equip them to use information and technology in their work environments optimally.
- Theme 3: Ability to advance human capabilities: HRM professionals should obtain knowledge and skills to enable them to ensure proper HRM planning, staff recruitment, managing people, developing and maintaining the organisational culture, managing performance, managing compensation, engaging with staff, developing talent, ensuring employee wellbeing, health and safety, managing industrial relations as well as managing diversity, equity and inclusion,
- Theme 4: Value-adding business competencies: As business partners, HRM professionals should ensure that they understand the business to add value. The necessary training to be business savvy is therefore essential.

The future of HR faces significant challenges and opportunities due to technological advancements, globalisation, and changing workforce dynamics presenting both opportunities and challenges for HR professionals thus requiring new competencies and strategies (Daraojimba et al. 2023, Schultz 2021b, Vandy &

Mohanty 2023). Key trends include automation, AI, remote work, and the gig economy, which are transforming traditional work structures and necessitating new HR competencies (Schultz 2021b, Vandy & Mohanty 2023). HR must be competent to deal with, and adapt by developing strategies for reskilling, upskilling (Daraojimba et al. 2023, Schulte, 2024), and managing diverse, geographically dispersed workforces to ensure employee adaptability and well-being in a rapidly evolving job market (Daraojimba et al. 2023, Timane & Wandhe 2023, Vandy & Mohanty 2023). Ethical considerations, such as data privacy and employee well-being (Pastor-Escuredo et al. 2021, Daraojimba et al. 2023) and algorithmic bias (Schulte 2024), are becoming increasingly important. Ethical behaviour has become crucial for organisations; however, ethical competencies are often absent from competency models due to ideation, conceptualisation, and implementation challenges (Dutta et al. 2022).

The role of HR is evolving from a transactional function to a strategic partner in organisational decision-making, aligning human capital with corporate goals (Daraojimba et al. 2023). To prepare for the future, HR professionals need to focus on engagement, employment relations, and resilience while embracing innovative practices and collaborating with diverse stakeholders (Schultz 2021b, Vandy & Mohanty 2023).

Conclusion

The purpose of this article was to develop a framework for future HRM individual competencies. Through the lens of the role theory and the AI job replacement theory, we conducted an integrative review to integrate the competencies required to successfully execute the HRM role now and in the future technological era. Firstly, findings reveal that HRM practitioners should possess intrapersonal and interpersonal competencies. Secondly, they should be able to mobilise information and use technology to make data-driven decisions. Thirdly, they need competencies that will enable them to develop human capabilities within the firm. Fourthly, HRM professionals should have the requisite business knowledge to add value to the organisation. In conclusion, the HRM profession is becoming multidisciplinary, with increasing demands for technological, information, business, behavioural, data and change management skills which are relevant to the ever-changing business and technological spaces. Hence, for future HRM professionals to successfully perform their roles and functions in this dynamic technological environment, they will need to add other critical competencies to their conventional HRM knowledge as depicted in the future HRM individual competency framework proposed in this study.

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The Market Development of Chinese Enterprises in the European Union: Past, Present and Future

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After investigating the economic landscape of Chinese enterprises entering the European market across three distinct phases: pre-COVID-19 (2016-2019), during the pandemic (2020-2022), and the post-pandemic era (2023 onwards), the study analyzes the investment trends of China's Outward Foreign Direct Investment (OFDI) into the European Union (EU). It focuses on the total investment volume, regional distribution, and industrial allocation. By delving into industry reports and case studies of Huawei and BYD's market development in the EU, the authors highlight the challenges posed by the pandemic and geopolitical tensions on Chinese enterprises' development efforts, as well as the opportunities arising in the post-pandemic period. Meanwhile, the analysis of statistics and media discourses reveals the specific impacts on Chinese enterprises' globalization efforts and the new opportunities and challenges faced by both China and the EU. The findings offer constructive recommendations for Chinese enterprises to navigate the post-pandemic landscape and seize market opportunities in the EU, while also providing insights for policymakers in both the EU and China to promote win-win cooperation between China and Europe.

Keywords: *Market development, Chinese enterprises, European Union, OFDI, going global*

Introduction

Globalization, an unstoppable, sustainable force, has been reshaping the world landscape (Olivié and Gracia 2020, Papanikos 2024). For one thing, the pace of global economic integration is accelerating with the improvement of production technology as well as the emergence of a large proportion of multinational capital (Coulibaly and Mekongcho 2018). For another, due to the prevalence of international trade frictions and trade barriers, the world is experiencing the "slowbalisation" (Della Posta 2023, Gong et al. 2022), which is a slowing down of the pace of global integration. In view of this, "going global" acts as an essential consideration for enterprises to align with the evolving demands of the contemporary era, thus coping with the intricacies of global competition. Therefore, it is imperative for Chinese enterprises to go out (Howell et al. 2020). As a priority for Chinese companies, the European Union (EU)

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features beneficial resources such as a mature economic system, legal support and strong purchasing power. Specifically, the year of 2020 sees a stable Sino-EU trade relationship. Table 1 illustrates China replaced the United States as the EU's largest trading partner for the first time in the COVID-19 context, which fully demonstrates the strong resilience of Sino-EU economic and trade cooperation. China's economic status exerts a positive influence on the European economy, especially in the context of subdued prices for energy, agricultural produce, and raw materials[9]. Furthermore, there is a marked complementarity between China and Europe regarding their industrial structures, levels of technological advancement, and market demands. The deepening practical cooperation across a spectrum of domains has yielded substantial mutual benefits, underscoring the significant allure that Chinese enterprises hold within the European market[10].The World Health Organization (WHO) declared COVID-19 a global pandemic on March 11, 2020 and "no longer a public health emergency of international concern (PHEIC)" on May 5, 2023 (World Health Organization: WHO, 2020; 2023). Given the circumstances, this research explores the economic landscape for Chinese enterprises expanding into the European market across three phases: prior to the pandemic (2016-2019), during the pandemic (2020-2022), and in the post-pandemic period (2023 onwards). Studying the ramifications of the pandemic on the European expansion efforts of Chinese firms and scrutinizing its effects on their international ventures as well as the implications for business operations abroad would be significant for all international enterprises across the world to consider how to adapt to these changes and capitalize on emerging opportunities in the post-pandemic era.

Table 1. *Top 10 Countries for EU International Trade in 2020*

Ranking	Partners	Imports in million of ECU/EURO
1	China except Hong Kong	384,970.2
2	United States	201,100.5
3	United Kingdom	169,091.5
4	Switzerland	108,911.4
5	Russia	94,777.5
6	Türkiye	62,465.1
7	Japan	54,955.5
8	Norway	42,481.6
9	South Korea	44,213.4
10	Vietnam	34,541.9

Source: Eurostat.

Based on the insightful examination of Chinese enterprises' journey into the European market across three unique phases: pre-COVID-19 (2016-2019), during the pandemic (2020-2022), and the post-pandemic era (2023 onwards), as they navigate China's Outward Foreign Direct Investment (OFDI) trends within the EU, the authors

[9]https://www.robert-schuman.eu/en/european-issues/0376-the-impact-of-china-s-economic-situation-on-europe

[10]https://china-cee.eu/2024/08/03/china-eu-economic-trade-and-investment-cooperation-status-quo-issues-and-prospects/

wish to extend their analysis on investment volume, regional presence, and industry allocation so as to provide insights on economic resilience and sustainability for both Chinese enterprises and European market. In addition, the case studies of Chinese enterprises in the European market are presented to provide insights for other private firms. This study is dedicated to addressing the following two research questions: 1) What are the principal challenges that Chinese enterprises encounter in their development within the European Union market, and have these challenges varied between the pre-pandemic, pandemic, and post-pandemic periods? Furthermore, how have these enterprises strategized to address these challenges across these different stages? 2) In the post-pandemic era, how have Chinese enterprises adapted to and capitalized on emerging market opportunities within their globalization efforts in the European Union?

Literature Review

Extensive research has been conducted on Chinese enterprises from a multitude of perspectives, yielding a rich and diverse academic literature. Scholars have delved into various topics concerning Chinese enterprises, including overseas mergers and acquisitions, globalization strategies, Chinese corporate culture, and the internationalization of enterprises (Zhang et al. 2020, Wei et al. 2023, Zhao and Xu 2024, Yang et al. 2022). These studies have primarily been conducted within the research areas of business economics (Peng et al. 2020, Wang et al. 2024), international relations (Marcoux and Sylvestre-Fleury 2022, Mazé and Chailan 2020), and public administrition (Peng et al. 2023), offering a comprehensive understanding of the intricacies of Chinese enterprises.

Chinese enterprises' going global can be traced back to the late 1970s, when China embarked on its reform and opening-up policies (Zhang 2021). Since then, Chinese enterprises have expanded their production and business operations to the global market, effectively integrating domestic and international markets and resources. This has led to the gradual formation of a globalized operation system, characterized by significant progress in various aspects such as product and service quality, technology, capital, operation, business models, and branding (Luo and Hou 2024). The academic community has responded to this trend by conducting numerous studies on Chinese enterprises' going global, with a particular focus on FDIs (Foreign Direct Investments) and globalization strategies. Zhang et al. (2020), for instance, have explored the considerations of Chinese enterprises in their globalization endeavors. Additionally, control rights and property rights in the context of Chinese enterprises' going global have been thoroughly examined by scholars such as Luo (2020) and Liu & Xiong (2024).

As for the studies of Chinese enterprises' going global to the EU, the existing studies on this topic primarily explore FDIs and the central and eastern European countries. Liu (2024), for example, has analyzed the new changes in the European economic situation and the path of Chinese enterprises' going global in Europe. Xu et al. (2024) have concentrated on the current situation, development environment, and policy suggestions for Chinese enterprises in the European Union. Li (2018) has

discussed the new characteristics and promotion strategies of economic and trade cooperation between China and the European Union. Furthermore, KPMG China (2024) has highlighted the forging ahead of Chinese new-energy vehicles in Europe.

On the challenges Chinese companies expanding into the EU, previous studies focus on three aspects: the EU's regulatory hurdles, cultural diversities, and competitive pressures in the EU market.

Specifically, the European marketplace, especially within the EU, is distinguished by its stringent regulatory requirements that are uniformly enforced across all member nations, as noted by Ruohonen (2022). To navigate the stringent EU regulatory landscape, which includes compliance with the General Data Protection Regulation (GDPR) and many other rules varying by member state, these companies often invest in local regulatory expertise and build robust compliance infrastructures, thereby adapting to the evolving regulatory environment (Goddard 2017).

Additionally, cultural differences pose significant barriers to Chinese companies in the EU (Ranta 2018). These companies should adapt to different consumer tastes and business practices in varied contexts. To address these issues, Xu and Shi (2020) companies invest in local regulatory expertise and build compliance infrastructure, in order to adapt to the evolving regulatory environment.

Europe's affluent consumer market, coupled with its advanced infrastructure and technological prowess, positions it as an ideal hub for high-value, innovation-led enterprises, as highlighted by Blanchard, Leandro, and Zettelmeyer (2021). These attributes not only attract foreign investment but also foster an environment ripe for innovation and business growth.

Given a considerable amount of research on Chinese enterprises, Chinese enterprises' going global, and Chinese enterprises' going global to the EU, there is a relative scarcity of studies specifically focusing on the latter. However, given the growing economic and trade cooperation between China and the EU, it is anticipated that more and more studies will emerge in this field in the future, further enriching our understanding of Chinese enterprises and their globalization endeavors.

Above all, future research should delve deeper into how these companies strategically address these challenges in practice, considering the dynamics of the challenges and the need for adaptive strategies, which will further the understanding of their international expansion endeavors. Therefore, in this study, the authors will analyze the challenges and opportunities of Chinese companies going out to the EU, along with case studies to provide insights of overcoming the problems.

Data and Research Methods

Data

The primary sources of secondary data include official statistics from international organizations such as the European Commission, the United Nations Conference on Trade and Development (UNCTAD), and the World Bank, as well as reports from industry associations, market research firms, and academic journals. Official statistics are a crucial component of the data used in this study. They are

composed of the following three parts, bilateral trade data, FDI data, and Economic Indicators.

To be specific, we summarize the selections of official statistics used in this study in Table 2.

Table 2. *Selections of Official Statistics*

Data Source	Type of Data	Description
European Commission & Chinese Customs	Bilateral Trade Data	Volume and trends of trade between China and the EU
OECD & Eurostat	FDI Data	Number, value, and success rate of Chinese FDI projects in the EU
European Commission & National Statistical Offices	Economic Indicators	GDP growth, inflation rates, and unemployment figures

Industry reports and market research provide valuable insights into the market entry strategies and performance evaluations of Chinese companies in the EU. These reports are sourced from consulting firms such as McKinsey, Deloitte, and PwC, as well as industry associations and research organizations. The reports cover a range of sectors, including energy, finance, manufacturing, and advanced technology. While specific industry reports and market research data are not presented in this section, they are integrated into the analysis and discussion throughout the study.

Academic journals and conference proceedings are another important source of data in this study. Peer-reviewed articles and conference papers on Chinese enterprises' going global, with a focus on the EU market, provide valuable insights and issues for understanding the opportunities and challenges faced by Chinese enterprises. Moreover, reports from the UNCTAD, the Chinese government's National Bureau of Statistics, and Eurostat are used specifically for analyzing the trends of China's Outward Foreign Direct Investment (OFDI) into the EU. This analysis includes the total investment volume, regional distribution, and industrial allocation, with a focus on the profound shifts observed in recent years. The selected academic journals and conference proceedings used in this analysis are summarized in Table 3.

Table 3. *Selected Academic Journals and Conference Proceedings*

Data Source	Type of Data	Description
Peer-reviewed articles & conference papers	Academic Journals & Conference Proceedings	Insights and theoretical frameworks on Chinese enterprises' going global, with a focus on the EU market
UNCTAD, National Bureau of Statistics, & Eurostat	OFDI Reports	Trends in China's Outward Foreign Direct Investment (OFDI) into the EU, including total investment volume, regional distribution, and industrial allocation

Overall, the data used in this study is comprehensive and diverse, providing a robust foundation for analyzing the opportunities and challenges faced by Chinese enterprises expanding into the EU.

Research Methods

Data Analysis Tools and Techniques

In this study, extensive research on Chinese enterprises has been conducted from a multitude of perspectives, which yields a rich and diverse dataset. To analyze this data, a combination of quantitative and qualitative methods is employed. Descriptive statistics are used to summarize trends in bilateral trade, FDI (Foreign Direct Investment) flows, and economic indicators across three distinct phases: pre-pandemic, pandemic, and post-pandemic. This approach allows for a comprehensive understanding of the changes and patterns that have emerged over time.

Case Studies

Case studies of Chinese enterprises in the EU, such as Huawei and BYD, are also conducted in this study. The top two representative Chinese enterprises going global are Huawei and BYD (He et al. 2019, Liu 2021). The overall performance of Huawei and BYD in the EU is steady and positive. Both have achieved significant results in the European market with their respective technical strengths and marketing strategies, and have made positive contributions to the EU economy and social development.

These case studies provide a detailed examination of the key factors that contribute to the success or failure of Chinese investments in the EU. The case studies focus on a range of factors, including market entry strategies, cultural differences, regulatory challenges, and competitive dynamics. This approach allows for a comprehensive understanding of the factors that influence the market performances of Chinese enterprises in the EU, providing valuable insights for both researchers and practitioners.

The research methods employed in this study are rigorous and comprehensive. The combination of quantitative and qualitative methods, along with the use of specialized software tools and a mixed-methods approach, ensures that the analysis is robust, reliable, and provides valuable insights into the opportunities and challenges faced by Chinese enterprises expanding into the EU.

Analysis and Discussion on Chinese Enterprises' Going Global to the EU

An accurate measurement of China's OFDI presents a formidable challenge due to the diverse methodologies employed in recording and disseminating such information across public and private sectors in China, Europe, and other regions. The analysis is unfolded from a holistic perspective of total investment volume, regional distribution, and industrial allocation, focusing on the pre-pandemic and pandemic periods. It is noted that relevant data for 2023 and 2024 have not been released publicly as of the completion date of this paper, October 16, 2024. The profound investing shifts observed in recent years are analyzed. Then, case studies of representative Chinese enterprises such as Huawei and BYD and their performance in the European market are explored. On account of the analyses, the authors offer recommendations and considerations for Chinese enterprises in the post-pandemic era,

aiming to navigate the new landscape of China's investment and EU economic development.

Past Trends of Chinese Enterprises' Going Global to the EU

Prior to the Pandemic (2016-2019)

Prior to the pandemic, there was significant fluctuation in China's direct investment outflow into the EU from 2016 to 2019, with a slight decline in 2018 (see Table 4). Although the development of Chinese investment in Europe was unstable during this period, Chinese enterprises were still injecting vitality into the development of EU countries with investments that were efficient and well-aligned with Europe's development direction. This can be observed from the following two dimensions: key export hubs and industrial distributions in the following sections.

Table 4. *China's FDI Outflows into EU Countries, 2016-2022 (Millions of USD)*

Year	China's FDI Outflows into EU Countries *(Millions of USD)*
2016	100
2017	103
2018	89
2019	107
2020	101
2021	79
2022	69

Source: China's OFDI (Outward Foreign Direct Investment) from 2016-2022

In the following Table 5, the diversity of main investment destinations shows that Chinese companies' investment strategies in the EU involve different countries. In addition, we can observe that the following six countries are pivotal for Chinese companies to go overseas in the EU between 2016 and 2019: Germany, the Luxembourg, the Netherlands, the United Kingdom, Sweden, and France. Specifically, Germany emerges as a consistent top destination for Chinese OFDI over the period, indicating a sustained interest and potentially a strategic fit within China's outward investment portfolio. The United Kingdom's presence in 2016 and its absence in subsequent years may reflect the impact of Brexit-related uncertainties on investment flows. Besides, Sweden and France on the list as emerging investment destinations could indicate a strategic investment opportunity during that year.

Table 5. *Ranking of the Top Three Countries of China's OFDI into the EU, 2016-2022*

Year / Country	2016	2017	2018	2019	2020	2021	2022
Germany	1	1	2	3	3	1	2
Luxembourg	2	3	1			3	1
France	3						
The United Kingdom		2					
Sweden			3	2	2		3
The Netherlands				1	1	2	

Source: China's Outward Foreign Direct Investment.
(Note: The empty spaces in this table indicate that the country did not rank in the top three for that particular year.)

In terms of the industrial distributions, the following Table 6 presents a snapshot of the sectors attracting Chinese enterprises' investments in the EU, indicating a multifaceted approach to capital allocation to tapping into various segments of the EU economy. Concretely speaking, the manufacturing sector appears to be a significant recipient of Chinese investment, which may reflect the EU's strong industrial base and the potential for technological exchange and market access. What's more, wholesale and retail trade, along with leasing and business services, are consistently highlighted, indicating the importance of these sectors in facilitating Chinese enterprises' market entry and expansion in the EU. Information transmission/ software and information technology services are noted, which may suggest an emphasis on high-value-added sectors and the integration of innovative technologies within Chinese investments. The production and supply of electricity/heat/gas and water are mentioned, revealing potential investments in critical infrastructure, which are vital for long-term economic development. Scientific research and technical services were reported on the list suggesting that Chinese investments are not only market-driven but also oriented towards knowledge acquisition, R&D, and technological advancement. Moreover, the attention paid by Chinese enterprises to resident services, repairs, and other services shows a broad spectrum of investments that extend beyond the primary industries for producing raw materials and into consumer-oriented services.

Table 6. *Ranking of the Top Five Industries of China's OFDI in the EU, 2016-2022*

Industry \ Year	2016	2017	2018	2019	2020	2021	2022
Manufacturing	1	1	1	1	1	1	1
Leasing and Business Services	3	2	2	2	5	4	
Information Transmission/Software and Information Technology Services		4		3	3	3	
Scientific Research and Technical Services	4			4			4
Wholesale and Retail Trade	2	3	3	5	4		3
Mining					2		
Finance	5	5	4			2	2
Production and Supply of Electricity/Heat/Gas and Water			5				5
Resident Services,Repairs and Other Services						5	

Source: China's Outward Foreign Direct Investment.
(Note: The empty spaces in this table indicate that the industry did not rank in the top five for that particular year.)

During the Pandemic (2020-2022)

In 2020, due to the severe impact of the COVID-19 pandemic, international investment exchanges decreased and the world economy shrank by 3.3%[11]. Chinese companies going overseas are unable to withstand the negative impact of COVID-19. It should be noted in Table 4, the year 2020 marked a pivotal moment with an OFDI value of 100 units, reflecting a downturn from the previous year's 107 units. This decline could be attributed to the advent of the COVID-19 pandemic, which disrupted global economic activities and imposed unprecedented constraints on international investment flows. As the world grappled with the pandemic's ramifications in 2021, Chinese OFDI to the EU slightly rebounded to 101 units, suggesting a degree of resilience and adaptation among Chinese enterprises to the new investment climate. However, this modest recovery was short-lived, as the OFDI value retreated to 89 units in 2022. This reduction may be indicative of a complex interplay of factors, including the lingering effects of the pandemic, evolving geopolitical tensions, and an increasingly stringent investment screening process within the EU.

In respect of the popular export countries, as the largest economy within the European Union[12], Germany is likely to continue getting Chinese investors according to Table 5. Despite the uncertainties brought about by the pandemic, the market size and mature industrial base of Germany are on the list of Chinese investments. The Brexit of the United Kingdom may have had an impact on the flow of investments within the EU (Portes 2022). Investments that have originally been directed to the UK

[11]http://finance.people.com.cn/n1/2020/0522/c1004-31718764.html
[12]https://cn.chinadaily.com.cn/a/202211/01/WS63610417a310817f312f40ba.html

could have been redirected to other EU member states, such as Germany, Sweden, and the Netherlands (Donnelly 2022).

As to the trending industries in 2020-2022, the manufacturing sector continues to be a defining area for Chinese investment, underscoring the EU's robust industrial foundation and the mutual benefits of technological synergy and market penetration. Leasing and business services sectors are consistently emphasized, reflecting the demand for flexible business models and the pursuit of operational efficiency. Investments in the production and supply of electricity/heat/gas and water are noted, indicating a strategic engagement with critical infrastructure sectors that are essential for sustainable economic growth.

It's evident that the shift from the first phase to the second phase illustrates the evolving strategies and priorities of Chinese enterprises in the face of global crises, which underscores the need for a nuanced understanding of the multifaceted factors that influence international investment flows. It highlights the importance of agility and adaptability in strategic investment planning and the continuous evaluation of the geopolitical and economic contexts within which these investments are made, typically from three perspectives: total investment volume, regional distribution as well as industrial allocation.

The shifts of Chinese enterprises in the EU during the pre-pandemic and pandemic phases have been shaped by a complex interplay of political, economic, and cultural factors, each exerting unique influences on the direction and magnitude of China's OFDI. Politically, the fluctuating landscape has been marked by regulatory shifts and heightened scrutiny of foreign investments within the EU[13], particularly in sectors deemed critical to national security and public order. The EU has been introducing the *European Economic Security Strategy*[14] in an attempt to progressively expand and instrumentalize the concept of "de-risking"[15]. This approach has led to an increasing number of member states interpreting the concept of "de-risking" from a negative perspective (Alayrac and Thyrard 2024), perceiving Chinese-funded enterprises as a common security threat (Babic and Linsi 2024). Furthermore, geopolitical tensions, such as the US-China trade frictions, have also steered Chinese enterprises to seek more stable and predictable investment climates within the EU[16]. Additionally, the Brexit has cast a shadow of uncertainty over the UK's investment appeal, potentially redirecting capital flows towards other EU member states[17].

Such a shift can be further elaborated from economic and cultural perspectives. Economically, the COVID-19-induced recession has compelled Chinese investors to reassess risk profiles and financial viability, leading to a more circumspect approach to capital deployment (Liu 2020). The pandemic has also accelerated digital transformation across industries, prompting increased investments in high-tech sectors[18], biotechnology, and digital infrastructure. Moreover, the surge in demand for

[13]http://ies.cass.cn/cn/work/comment/202307/t20230727_5670830.shtml
[14]https://op.europa.eu/en/publication-detail/-/publication/2dab2b60-149c-11ee-806b-01aa75ed71a1/language-en
[15]https://www.thepaper.cn/newsDetail_forward_23617214
[16]https://cn.chinadaily.com.cn/a/202306/09/WS6482d059a310dbde06d22aef.html
[17]http://world.people.com.cn/n1/2019/0130/c1002-30597630.html
[18]https://www.imf.org/en/Blogs/Articles/2023/03/21/how-pandemic-accelerated-digital-transformation-in-advanced-economies

healthcare (Tommaso et al. 2020), e-commerce, and online education has created new market opportunities that agile Chinese enterprises have been quick to exploit. Culturally, the pandemic has catalyzed a shift towards remote work and digital solutions, fostering a culture of innovation that resonates with Chinese enterprises. The emphasis on research and development within the EU has also attracted Chinese investments in the scientific research and technical services sectors (Ramasamy and Yeung 2020), reflecting a mutual appreciation for innovation and technological advancement.

Beyond these factors, the pandemic has underscored the vulnerabilities in global supply chains, prompting a strategic reevaluation of supply chain configurations by Chinese enterprises. The rapid pace of technological progress has opened new avenues for investment in areas such as 5G, artificial intelligence, and big data, while the adaptive management practices adopted in response to the pandemic have enabled Chinese enterprises to face the intricate surroundings.

Huawei and BYD in the EU Market

In the following, the market development of Huawei and BYD is analyzed respectively in three periods: prior to the pandemic (2016-2019), during the pandemic (2020-2022), and in the post-pandemic era (2023-onwards).

Market Development of Huawei in Europe

According to the revenue statistics from annual reports of Huawei Investment Holding Company Limited, although the specific annual revenue for Huawei in Europe, the Middle East, and Africa has been generally going down slightly for the three periods from 27% to 21.3% to 20.6%, the annual revenue for Huawei in Europe, Middle East, Africa region is developing comparing with the revenue proportion of 20.3% in 2020, with some changes within different periods as follows (see Table 7).

Table 7. *Huawei's Annual Revenue in Europe, the Middle East and Africa Region and in Total (in RMB million)*

Year	Revenue of Europe, Middle East and Africa	Total Revenue	Proportion
2016	156,509	521,574	30.0%
2017	163,854	603,621	27.1%
2018	204,536	721,202	28.4%
2019	206,007	858,833	24.0%
2020	180,849	891,368	20.3%
2021	131,467	636,807	20.6%
2022	149,206	642,338	23.2%
2023	145,343	704,174	20.6%

Source: Annual Reports of Huawei Investment Holding Company Limited, 2016-2023.

Market performance, R&D investment, and market entry are analyzed in the pre-pandemic Era (2016-2019) in brief. Firstly, during this period, Huawei emerged as a pivotal player in the European telecommunications landscape. Its strategic

partnerships with numerous European telecom operators facilitated its robust market penetration. Notably, according to EU statistics, Huawei's market share in European telecommunications equipment consistently increased, showcasing its technological prowess and high customer satisfaction rates. Secondly, Huawei's commitment to research and development was highlighted by its sixth-place ranking in the EU Commission's 2017 Industrial R&D Investment Scoreboard, which evaluated the R&D spending of 2,500 large global companies in 2016, with Huawei advancing two places from the previous year, surpassing Apple (ranked seventh with 9.5 billion euros), and notably being the only Chinese company in the "Top 50 Global Companies for R&D Investment in 2017", while its overall ranking rose over 200 places between 2004 and 2017[19]. This investment underscored Huawei's dedication to technological innovation and advancement. Finally, Huawei effectively positioned itself in the European market by offering tailored solutions to meet specific customer needs and actively participating in industry expos and forums. These measurements significantly enhanced the company's brand recognition and established its presence in the EU region.

The market response and adaptability of Huawei in the EU during the pandemic era (2020-2022) remained positive and productive. On the one hand, amidst the pandemic, Huawei maintained its market position amidst the shifting economic landscape. The surge in remote work and online learning fueled demand for its networking equipment and smartphones, ensuring stable market demand. On the other hand, the company exhibited remarkable adaptability by swiftly adjusting its marketing and service strategies. Huawei ensured uninterrupted support for its European clients and contributed to local COVID-19 relief efforts, thereby solidifying its reputation and customer loyalty.

Nevertheless, Huawei consistently maintained a high level of R&D investment in both the EU and globally before and during the COVID-19 pandemic period, and it ranked among the top in global corporate R&D investment in EU market, demonstrating its strong strength in technological innovation. Currently, Huawei also has extensive market applications in the fields of communication equipment and smart terminals in the EU. Its cutting-edge technologies such as 5G, cloud computing, and artificial intelligence are favored by European customers. Huawei convened its prestigious annual event in Paris, HUAWEI CONNECT 2024, to delve into the pivotal role of digital and intelligent technologies in catalyzing Europe's transition towards a greener and more digital future[20]. At the same time, Huawei actively participates in the construction of digital infrastructure in Europe, driving local digital transformation. Its business operations in the EU have created a large number of job opportunities and made positive contributions to economic growth. In the post-pandemic era (2023-onwards), Huawei's market expansion and collaboration as well as competition have been growing dramatically. Given the pandemic receding, Huawei has intensified its efforts to diversify its portfolio. The company has ventured into smart automotive solutions, cloud computing, and other emerging sectors in the EU market, demonstrating its ability to adapt to changing market demands. Meanwhile, in navigating intense competition from global players, Huawei has

[19]http://www.360doc.com/content/17/1217/19/224530_713890167.shtml
[20]https://e.huawei.com/eu/news/2024/eu/working-together-for-a-greener-and-more-intelligent-future

fostered strategic partnerships and differentiated itself through product innovation and customer-centric services. This approach has allowed the company to maintain its competitive edge and expand its market presence.

Market Development of BYD in Europe

Since the inception of BYD Europe in 1998, as the first overseas subsidiary of the BYD company, BYD has grown from a relatively unknown brand in Europe to a compelling new energy vehicle industry leader within over 20 years of development. According to its annual reports, BYD has been developing rapidly on the way of going global with its overseas revenue proportion of the total revenue (see Table 8), which shows BYD's continuous and grand development of its European market.

Based on the annual reports of BYD together with related industrial reports and studies, the overall growth of the European market is summarized in the following table (Table 8), which shows that BYD has been continuously establishing and developing its presence in the European market with its European market turnover increasing annually.

Table 8. *BYD's Annual Revenue in Europe and in Total (in RMB million)*

Year	Annual Revenue in Europe	Total Revenue	Proportion
2016	1,430	100,208	1.40%
2017	2,191	102,606	2.10%
2018	3,123	130,055	2.40%
2019	3,654	127,739	2.90%
2020	7,204	156,598	4.60%
2021	11,023	216,142	5.10%
2022	22,410	424,061	5.30%
2023	28,911	602,315	4.80%

Source: Annual Reports of BYD Company Limited, 2016-2023.

Prior to the pandemic (2016-2019), BYD strategically ventured into the European market by launching electric buses that garnered significant attention owing to their eco-friendliness and impressive performance metrics. For instance, BYD's electric buses in Europe were reported to have reduced CO2 emissions by substantial margins compared to traditional diesel buses. This initial success paved the way for the subsequent introduction of passenger electric vehicles (EVs) in the region. During this period, BYD prioritized localization strategies, establishing a comprehensive sales network across key European markets and enhancing after-sales services to align with the expectations of European consumers. Specifically, BYD invested in training programs for local dealerships and service centers to ensure high-quality customer support.

Despite the disruptions caused by the pandemic (2020-2022), BYD's EV sales in Europe experienced a notable surge. It is reported that by November 2022, BYD's monthly overseas sales surpassed the 10,000 units, reaching 12,318 units, with the

sales having continued to exceed 10,000 units in December, totaling 11,320[21]. Notably, the European market for BYD achieved a remarkable 400% growth, driven by favorable government policies promoting green vehicles and increasing consumer awareness of environmental issues. The company capitalized on this trend by highlighting its advanced technology and commitment to sustainability, further enhancing its brand reputation in the region.

Notably in recent years, BYD has accelerated its market expansion in the EU, continuously enhancing its brand influence and market share in Europe by establishing production bases, increasing sales and service outlets, etc. Its electric vehicle products have been recognized and favored by more and more European consumers. It possesses leading technical strength in the field of battery energy storage, and its products have high competitiveness in the EU market. BYD holds a significant share of the EU's battery energy storage market, demonstrating its strong strength in this field. Although having faced some market challenges such as tariffs and quality concerns in the past, BYD actively responds to these challenges by continuously improving product quality and optimizing pricing strategies. Meanwhile, with the increasing demand for sustainable energy and electric vehicles in Europe, BYD still has broad development prospects in the EU market.

In the post-pandemic era (2023-onwards), BYD has unveiled ambitious investment and production plans in Europe. The company has announced a significant investment of several billion euros, which includes the establishment of a state-of-the-art factory in Hungary. Additionally, BYD plans to expand its distribution network and marketing efforts, aiming to increase its market share in Europe. To further consolidate its position in the region, BYD intends to introduce more models tailored to the European market, leveraging its extensive experience in electric vehicle technology and battery innovation. For example, BYD is reportedly developing new EV models with advanced battery technology that offers improved range and faster charging capabilities, specifically designed to meet the demands of European consumers. According to its plan, BYD's overseas exports are expected to be in the range of 250,000 to 300,000 units in 2023, and the export volume may reach 1 million units in 2024[22].

Lessons Learnt from Huawei and BYD's Investment in Europe

Huawei, a leading global provider of information and communications technology (ICT) solutions, has made significant strides in the telecom industry. Its success can be attributed to several key factors. Advanced technologies and strong R&D capabilities have been instrumental in positioning Huawei as a technological leader. The company's continuous investment in research and development has enabled it to develop cutting-edge technologies such as 5G and AI, which have attracted customers and partners in the European market. Additionally, Huawei's adaptive market strategies have allowed it to navigate changing market conditions effectively. For instance, during the pandemic, the company swiftly adjusted its approach to ensure uninterrupted support for clients while also contributing to local COVID-19 relief efforts. Deep industry ties with telecom operators, research institutions, and government bodies across Europe have

[21]https://www.yoojia.com/ask/12-1166636079211565878 2.html
[22]https://www.qi-che.com/guoneicheshi/15480.htm

facilitated collaboration and partnerships, enhancing Huawei's market presence and credibility. Lastly, Huawei's customer-centric approach, which prioritizes understanding and addressing customer needs, has helped build loyalty and trust among European customers.

Despite its success, Huawei has faced several challenges in the EU market. Geopolitical tensions, particularly in relation to concerns over national security and data privacy, have led to trade restrictions and bans on Huawei equipment in some European countries. These tensions have impacted Huawei's operations and competitiveness. Furthermore, the imposition of tariffs and other trade restrictions by some European countries has increased Huawei's operational costs. Negative media coverage and misconceptions about Huawei's business practices have also affected its reputation in some quarters. Addressing these issues through transparency and engagement with stakeholders is crucial for Huawei's continued success in Europe.

As for BYD, a pioneering Chinese electric vehicle (EV) manufacturer, it has achieved remarkable success in the global automotive market. Its technological leadership in EVs has been a significant factor in attracting European customers. BYD offers high-performance and environmentally friendly vehicles, which align with the growing consumer awareness of environmental issues and government incentives for green vehicles in Europe. The company's timely market entry has allowed it to capitalize on the growing demand for sustainable mobility solutions. BYD has also prioritized localization, establishing sales networks and enhancing after-sales services to cater to the specific needs of European consumers. This approach has helped BYD build a strong presence in the region. Lastly, BYD's commitment to environmental sustainability resonates well with European consumers, further enhancing its brand image and market appeal.

While BYD has achieved significant success, it faces several challenges in the European market. Tariffs and regulatory barriers in some European countries can increase its operational costs and limit its market penetration. Additionally, BYD competes with well-established European and global automakers in the electric vehicle market. This intense competition requires BYD to continuously innovate and differentiate its products to maintain its market position. Global supply chain disruptions can also impact BYD's ability to meet demand in Europe, potentially leading to stockouts or delays in delivery. Managing these risks effectively is crucial for BYD's continued success in the region.

Future Investment Trends for China in the EU

In 2023, global trade is confronted with multiple pressures and persistently sluggish market demand. Both the total value of imports and exports between China and the EU have experienced a decline compared to the same period last year, yet it has still demonstrated a certain degree of resilience. China remains the EU's second-largest trading partner, the largest source of imports, and the third-largest export market; conversely, the EU is China's second-largest trading partner, the second-

largest source of imports, and the second-largest export market[23]. Exchanges between China and the EU in this period at various leadership levels have been continuously strengthened, yielding positive outcomes. High-level interactions have provided direction for the cooperative development between the two sides, continuously deepening collaboration in green, digital, as well as economic and trade fields[24], which can be flawed windows for Chinese enterprises into the EU market.

The EU's commitment to a green economy and sustainable development has opened avenues for Chinese enterprises in renewable energy and energy-saving and environmental protection sectors. *The European Green Deal* and other policies provide incentives and funding support, aligning with China's competitive edge in technologies such as wind and solar energy, and electric vehicles.

The accelerated trend of digital transformation during the pandemic has catalyzed a surge in market demand for information transmission, software, and information technology services. Chinese firms specializing in these areas are well-positioned to tap into the expansive opportunities presented by the EU's drive towards digitalization, bolstered by policy support such as the *Digital Europe Programme*[25] and the proliferation of cross-industry integrations.

Despite pandemic-induced challenges, the resilience and potential of Sino-EU trade are evident, with the progression of trade agreements like the China-EU Comprehensive Agreement on Investment (CAI) facilitating reduced trade barriers and enhanced market access (Casarini and Otero-Iglesias 2021, Yan 2022). The reconfiguration of global supply chains post-pandemic offers Chinese enterprises the opportunity to integrate and optimize their operations to better serve the EU market.

In the post-pandemic era, Chinese enterprises expanding into the EU are confronted with a variety of challenges that demand strategic adaptability[26]. Firstly, the enhanced investment scrutiny by the EU and its member states[27], particularly for investments in critical infrastructure and sensitive technologies, introduces a more complex approval process for Chinese investors. Additionally, market access barriers have become more stringent, with the EU's high standards for technical, environmental, and labor regulations necessitating significant adjustments to Chinese products and services. Furthermore, geopolitical risks pose uncertainties due to fluctuations in diplomatic relations and trade policies, which can impact the stability of Chinese investments and operations in the EU[28]. In addition, multiple cultural issues also cause great challenges for Chinese companies. The EU comprises multiple member states, each with its unique culture, resulting in significant differences in consumption values and preferences among people from different countries. While facing economic and political risks, Chinese enterprises often overlook cultural differences, which can be fatal. Enterprises are inevitably influenced and constrained by the sociocultural environment in various activities. Therefore, enterprises should

[23]https://ec.europa.eu/eurostat/databrowser/view/ext_st_eu27_2020sitc__
[24]http://eu.mofcom.gov.cn/article/gchf/202312/20231203458927.shtml
[25]https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/programmes/digital
[26]https://www.21jingji.com/article/20240227/bfd281c680c8ff6a70addd56d9893a42.html
[27]https://www.eca.europa.eu/en/publications?ref=SR-2023-27
[28]https://www.spglobal.com/en/research-insights/market-insights/geopolitical-risk

understand and analyze the local cultural environment and make corresponding decisions based on local conditions.

Moreover, the supply chain restructuring required by the pandemic's exposure of global vulnerabilities compels Chinese companies to reassess their supply chain configurations within the EU, focusing on enhancing resilience and agility. Concurrently, the intensified competition as the global economy rebounds means Chinese firms must compete on multiple fronts[29], including innovation, quality, and brand reputation. Additionally, regulatory compliance within the EU's comprehensive legal framework is crucial to avoid legal repercussions and reputational damage.

As far as the EU trade surrounding is concerned, it is not optimistic in recent years. The EU has formulated a protectionist policy toolbox to increase the difficulty for foreign companies to invest, acquire and participate in public procurement in the EU, and launched anti-subsidy investigations without sufficient evidence, interfering with the industrial chain and supply chain cooperation of companies inside and outside the EU, resulting in restrictions on the normal production and operation activities of many companies in Europe. The survey from Academy of China Council for the Promotion of International Trade[30] shows that 60.74% of the surveyed companies believe that the EU business environment is average, 34.07% believe it is good, and 5.19% believe it is poor.

Under *the Regulation <EU> 2022/2560 of the European Parliament and of the Council on Foreign*[31], foreign-invested enterprises are required to fulfill more compliance obligations than domestic enterprises, and will be placed in a disadvantageous competitive position[32]. Since the scope of subsidies involved in the Regulation is relatively wide, it means that after the Regulation is formally implemented, it will have a significant negative impact on Chinese enterprises participating in mergers and acquisitions and public procurement in the EU.

Considerations for Chinese Enterprises Going to the EU Market

In the post-pandemic epoch, Chinese enterprises navigating the EU market must adopt an integrated framework that addresses political, economic, cultural, and policy dimensions. Politically, active engagement with government initiatives is paramount, as it provides a foundation for leveraging trade agreements, investment promotion, and diplomatic support to enhance international business capabilities. Economically, the uncertainties of the post-pandemic market necessitate a robust investment risk management approach, involving comprehensive assessments and proactive strategies to mitigate legal, financial, and political risks, ensuring sustainable growth. Culturally, the implementation of ''localisation" is essential for Chinese enterprises to resonate with the EU market, requiring the adaptation of products and services to local

[29] https://www.weforum.org/agenda/2024/06/why-china-is-making-innovation-the-new-engine-of-growth/
[30]http://www.ccpit-academy.org/Content-151-1158.html
[31]https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022R2560
[32]https://www.consilium.europa.eu/en/press/press-releases/2022/11/28/council%EF%BF%BEgives-final-approval-to-tackling-distortive-foreign-subsidies-on-the-internal-market/%E3% 80%82/

preferences and compliance with EU regulations, thereby building local workforces and fostering market acceptance.

Strengthening capacity cooperation aligns with China's going global, facilitating deeper economic engagement through collaborative opportunities in manufacturing, technology, and infrastructure development within the EU. Technologically, the focus on collaboration and innovation is imperative, as it accelerates the adoption of cutting-edge technologies, thereby driving business growth and enhancing the competitiveness of Chinese enterprises in the digital age.

Expanded Scope of Subsidy Identification: The EU considers certain state-owned equity investment institutions' equity investments as subsidies, increasing the likelihood of higher anti-dumping duties being imposed on Chinese enterprises investing in the EU. Thus, Chinese enterprises should notice that the EU has strengthened its trade remedy tools, making it easier for Chinese enterprises to be identified as dumping and receiving subsidies. For example, the EU has introduced the concept of "significant market distortions," continued to use the "surrogate country" approach, partially abandoned the "lesser duty" principle, and set a minimum target profit margin (Du, 2022).

Industry Access Restrictions: In certain sectors, such as communications, the EU sets market access barriers through legislative and administrative means, limiting the development of Chinese enterprises in Europe. European enterprises emphasize that, overall, unclear regulations and China's unpredictable legislative environment are the main regulatory challenges they face. Moreover, embracing sustainable and responsible business practices is crucial for aligning with the EU environmental and social standards, encompassing the adoption of green technologies, ethical supply chain management, and contributions to local communities, which in turn enhances the enterprise's reputation and market acceptance.

However, for the EU side, there are also two important considerations. First, it is recommended that the EU maintain a free market for international trade. Specifically, the EU should adhere to the concept of openness and free trade that it has always upheld, be a good advocate and practitioner of multilateralism, support and strengthen the multilateral trading system with the WTO at its core, and promote the establishment of a fair, reasonable and transparent international economic and trade rules system. Based on the common rules established by the WTO and *the 2024 Annual Single Market and Competitiveness Report*[33], the EU should abide by and fulfill the commitments made in the negotiations and implement trade liberalization in a regular manner. Secondly, in the face of Sino-EU trade relations, the EU should adhere to strategic autonomy and independent and fair judgment, avoid ideological confrontation on economic and trade issues with China, focus on mutual benefit and win-win, abandon the "zero-sum game" mentality, and do not restrict Sino-EU business trade cooperation. In addition, the EU should stop promoting various policies to contain Chinese companies under the "de-risking" framework, try to eliminate the negative impact of "de-risking" and other measures on Sino-EU economic and trade fields, and maintain the orderly, smooth and efficient connection of Sino-EU industries. It is recommended that the EU actively build a fair, non-discriminatory and

[33]https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM:2024:77:FIN

predictable market[34], stop discriminatory law enforcement against Chinese companies in Europe, and avoid undermining the enthusiasm of Chinese companies to invest and do business in Europe.

The investment framework for Chinese enterprises in the EU is underpinned by a multidimensional approach that integrates political support, economic prudence, cultural adaptation, policy utilization, technological advancement, and sustainable practices. This holistic strategy is vital for not only withstanding the challenges of the post-pandemic era but also for achieving long-term success and sustainable growth in the EU market.

Conclusion

This study examines the market expansion of Chinese enterprises in the EU across three distinct periods: pre-COVID-19 (2016-2019), the pandemic era (2020-2022), and the post-pandemic period (2023-onwards). It analyzes trends in China's OFDI into the EU, with a focus on investment volume, regional distribution, and industrial allocation. The research provides insights into the growing presence of Chinese firms in the EU market, supported by case studies of Huawei and BYD. The study also identifies challenges arising from the pandemic and geopolitical tensions that have affected Chinese enterprises' development in the EU. Despite these impediments, the post-pandemic era offers new opportunities for Chinese companies to adapt to the evolving market and capitalize on EU opportunities. Drawing on statistical data and media discourses, the research presents strategic recommendations for China's OFDI and Chinese enterprises to address these challenges and foster win-win cooperation with the EU. These recommendations are essential for policymakers and investors aiming to enhance sustainable and mutually advantageous economic relations between China and the EU.

In addition, the authors offer five strategic solutions for Chinese enterprises to mitigate risks associated with overseas investments: 1) Enterprises should conduct comprehensive research into the policies, legal frameworks, and regulations of the target market. Engaging in active dialogue and cooperation with local authorities and institutions is crucial. Establishing adaptable operational and investment models can help manage policy and legal risks. 2) To mitigate risks associated with reliance on a single market, Chinese firms should consider a diversified investment strategy across multiple countries and regions. This approach helps in spreading risks and enhancing the resilience of the investment portfolio. 3) Forming strategic alliances with local partners in various regions is essential. These partnerships can leverage local expertise, resources, and networks, thereby reducing operational risks and enhancing market penetration. 4) It is imperative to establish robust mechanisms for market research and information gathering. This enables prompt analysis of market trends, competitive dynamics, and the flexible adjustment of investment strategies to address market and competitive risks. 5) Enterprises should seek support from both domestic and host governments. This support can come in the form of tax incentives, financial subsidies,

[34]https://www.mfa.gov.cn/web/wjdt_674879/fyrbt_674889/202309/t20230925_11149568.shtml

and preferential credit facilities, which can significantly reduce the risks associated with overseas investments. Additionally, improving the overseas investment insurance system can provide enterprises with risk-sharing mechanisms.

In conclusion, addressing the complexities of overseas investments, especially during periods of global uncertainty such as pandemics, requires a collaborative approach involving enterprises, governments, and other stakeholders. Through these measures, Chinese enterprises can navigate the challenges of OFDI in the EU more effectively.

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The Multidimensional Nature of Consensus in Business Economics: From Social Contract to Digital Transformation

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The contribution addresses consensus in business economics, analyzing its theoretical foundations, empirical manifestations, and strategic implications. Consensus is defined as an invisible infrastructure that supports the modern enterprise, configured not only as a formal agreement but as a social construct that permeates internal and external organizational relationships. The analysis begins with the theoretical roots of consensus, traceable to contractualist and institutionalist traditions, and then examines the fundamental contribution of stakeholder theory. The document illustrates how consensus manifests concretely in organizational dynamics through governance systems, decision-making processes, communication strategies, and change management. Particularly significant is the conceptualization of consensus as a strategic resource capable of generating sustainable competitive advantage, characterized by value, rarity, and non-substitutability according to the Resource-Based View. The contribution also addresses challenges and opportunities for consensus management in the digital era, highlighting how technologies and social media have transformed the architecture of corporate communication and accelerated the processes of consensus formation and dissolution. A new paradigm of organizational consensus is outlined, characterized by the need to balance potentially conflicting requirements (univocality and pluralism, stability and innovation, control and participation), emphasizing the importance of developing contextual approaches that recognize the diversity of legitimate practices and distinguish between authentic consensus and manipulation.

Keywords: *consensus; consensus building; consensus processes; organizational sustainability; stakeholder engagement.*

Introduction

The concept of consensus in business economics represents an important pillar in both theory and managerial practice. Consensus is not merely a formal agreement but constitutes the invisible infrastructure that supports the foundations of the modern enterprise (Rossi, 2003). This definition evokes the dual nature of consensus: a pragmatic governance tool and, simultaneously, a social construct that permeates intra-organizational and extra-organizational relationships. According to Kellermanns et al. (2011), strategic consensus is defined as a shared understanding and agreement on

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strategy-relevant content by a group of individuals, including high, middle, and low-level managers. This type of consensus improves cooperation and coordination after a decision, facilitating strategy implementation and improving organizational performance.

In a context characterized by increasing complexity and systemic uncertainty, consensus assumes a crucial role as a strategic resource for the success of business initiatives. The lack of strategic consensus among managers can lead to poor shared understanding and limited commitment, hindering effective strategy implementation. Consensus, on the other hand, promotes alignment of objectives and organizational communication, positively contributing to business performance.

Consensus is not limited to being a simple formal agreement; it represents a collaborative process that involves all interested parties. Consensus-based decision-making requires inclusivity and participation, valuing the perspectives of all team members and promoting innovative and sustainable solutions. This approach not only improves the quality of decisions but also strengthens team cohesion and builds a positive organizational culture.

According to Knight et al. (1999), consensus building is generally accepted as one of the first steps in the strategy formation process. The same authors define strategic consensus as the degree to which individual mental models of team members overlap, thus highlighting the link between consensus and managerial cognitive processes. Dong et al. (2018) add that the pursuit of consensus represents a fundamental element in group decision-making processes, where different actors with potentially divergent interests must converge towards shared solutions.

This contribution aims to analyze the concept of consensus in a multidimensional perspective, exploring its theoretical roots, empirical manifestations, and managerial implications. In particular, the research intends to answer the following questions:

1. What are the theoretical foundations of consensus in business economics and how have they evolved over time?
2. How does consensus empirically manifest in organizational practices?
3. How can consensus be configured as a strategic resource capable of generating sustainable competitive advantage?
4. What challenges and opportunities emerge for consensus management in the digital era?

These questions reflect the multifaceted nature of the phenomenon, requiring an analytical approach that integrates different disciplinary and methodological perspectives.

The work is structured in eight main sections. After this introduction, the second section explores the theoretical roots of consensus from social contract to business contract. The third section examines the centrality of consensus in Stakeholder Theory. The fourth analyzes the empirical manifestations of consensus in businesses. The fifth discusses consensus as a strategic resource and its managerial implications. The sixth section deals with the ethical dimensions of strategic consensus management, especially in the modern digital era. Before the conclusions, the seventh section addresses the challenges and opportunities for consensus management in the digital era.

From a methodological perspective, the contribution adopts a literature analysis approach with interpretative and constructive characteristics (Hart, 1998). This method allows for the integration of different disciplinary perspectives to analyze consensus as a strategic resource capable of generating sustainable competitive advantages. Unlike a simple literature review, the literature analysis aims to synthesize, evaluate, and reinterpret existing knowledge, identifying gaps, inconsistencies, and new research directions. The analysis focuses on relevant academic publications in the field of management and organization, favoring studies that offer a solid theoretical perspective and rigorous empirical evidence.

The research also explores challenges and opportunities related to consensus management in the digital era, where technologies and social media have transformed corporate communication dynamics and accelerated the processes of consensus formation and dissolution. In this context, reference is made to the literature on Knowledge Management (KM) and Social Network Analysis (SNA) to understand how digital platforms influence the dissemination of information and opinion formation inside and outside businesses (Nonaka and Takeuchi, 1995; Wasserman and Faust, 1994). In particular KM offers tools and methodologies to analyze how knowledge is created, shared, and applied within businesses, with a specific focus on the role of digital technologies in facilitating these processes (Davenport and Prusak, 1998). Knowledge Management platforms, such as corporate intranets, wikis, and document management systems, can support the creation of informed consensus, providing organization members with easy and timely access to information relevant to the decision-making process. However, it is important to consider that the mere availability of information does not automatically guarantee consensus formation; active engagement by leaders and organization members is necessary to promote knowledge sharing and open discussion (Alavi and Leidner, 2001).

Social Network Analysis provides a conceptual framework and analytical tools to study relationships between individuals, groups, and organizations (Wasserman and Faust, 1994).

Social Network Analysis can be used to identify key nodes in the corporate communication network, i.e., individuals who have a central role in the dissemination of information and in influencing opinions. Understanding the structure and dynamics of social networks can help managers identify opportunities to promote consensus, for example by involving informal leaders in decision-making processes or facilitating communication between groups with divergent opinions (Borgatti et al., 2009).

Furthermore, SNA can be used to monitor the evolution of consensus over time, analyzing how relationships between actors change and how ideas and opinions spread through the network.

The objective is to develop a conceptual model that integrates the different dimensions of consensus (cognitive, affective, and behavioral) and that takes into account the specificities of the digital context, characterized by high speed, interconnection, and volatility of information.

The Theoretical Roots of Consensus: From Social Contract to Business Contract

The notion of consensus has its roots in various intellectual traditions that have contributed to shaping economic-business thought. The path of this analysis must begin with the classical contractualist tradition, which provided the first conceptual tools for understanding the consensual nature of economic relationships.

The theory of social contract, elaborated by thinkers such as Hobbes, Locke, and Rousseau, has profoundly influenced the modern conception of businesses. According to Donaldson and Dunfee (1999), businesses can be interpreted as moral communities founded on an implicit second-level social contract. This perspective suggests that businesses operate on the basis of tacit consensus that legitimizes their existence and defines the limits of their operations.

Zingales (2000) has further elaborated this perspective, proposing a vision of the business as a "nexus of specific investments" rather than merely a "nexus of contracts". In this vision, consensus is not limited to the formal agreement between parties but implies a deeper commitment involving specific investments and fiduciary relationships. According to this approach, the business survives and prospers not by virtue of contractual coercion, but thanks to the ability to generate consensus around a shared vision of the future.

In business management, Farjaudon and Morales (2013) examine the role of accounting in the production of consensus, highlighting how accounting systems can serve as tools to define and reproduce dominant interests. The authors argue that consensus often masks power asymmetries in businesses, where some actors manage to impose their interests on others. Consensus, in this sense, denies positional conflicts, influencing power dynamics between organizational groups.

This conceptual evolution reflects the transition from a merely transactional conception of business economics to a more relational vision, in which consensus becomes a constitutive element of organizational identity itself. Consensus is not only a prerequisite for economic action but also its most precious result, capable of generating that fiduciary capital that no formal contract could ever guarantee (Zamagni, 2008).

The institutionalist tradition, from Commons (1934) to North, has made a decisive contribution to the understanding of consensus as a socially constructed phenomenon. North (1990) has highlighted how institutions, both formal and informal, emerge from processes of social consensus that reduce uncertainty and facilitate economic exchange. In this perspective, consensus is not just an agreement between parties, but a complex process of mutual legitimation that involves cultural, cognitive, and normative aspects.

DiMaggio and Powell (1983), in their analysis of institutional isomorphism, have highlighted how consensus often manifests through the adoption of practices considered legitimate within a particular organizational field. According to the authors, businesses compete not only for resources and customers but also for institutional legitimacy and social acceptance. In this perspective, consensus becomes a strategic resource that can confer significant competitive advantages, especially in contexts characterized by high uncertainty.

Masini (1979), in his fundamental contribution to Italian economic-business doctrine, emphasized the institutional nature of the business as an economic institution

destined to endure, highlighting how business continuity largely depends on the ability to maintain the consensus of relevant stakeholders. According to this vision, the economic institution endures as long as it is able to renew consensus around its economic and social mission.

Dong et al. (2018) emphasize the importance of consensus in group decision-making processes in social network contexts, highlighting how consensus achievement is facilitated by trust relationships and opinion evolution mechanisms. The authors classify consensus paradigms into two main categories: those based on trust relationships and those founded on opinion evolution, showing how both contribute to the formation of shared decisions.

The Stakeholder Theory and the Centrality of Consensus

A fundamental contribution to understanding consensus in the business context comes from stakeholder theory, initially elaborated by Freeman (1984). This theoretical perspective has shifted attention from shareholder value maximization to value creation for all stakeholders, emphasizing the relational and consensual nature of the business.

Mitchell, Agle, and Wood (1997) have proposed a model for classifying stakeholders based on three attributes: power, legitimacy, and urgency. This framework allows us to understand how consensus is not uniformly distributed among all stakeholders but is influenced by power dynamics and legitimation processes. Thus, stakeholder consensus is not a static quantity but a dynamic variable that requires a constant process of negotiation and renegotiation.

Phillips (2003) introduced the concept of "stakeholder fairness", emphasizing how consensus must be founded on principles of distributive and procedural equity. Consequently, consensus can emerge only in contexts characterized by reasonable informational symmetry and genuine respect for the dignity of all actors involved. This ethical perspective on consensus enriches the discussion, introducing normative considerations that transcend the purely strategic dimension. Knight et al. (1999) highlight how demographic diversity within top management teams (TMTs) can negatively influence strategic consensus. According to their empirical study, functional and educational diversity tends to reduce consensus, while group processes can mitigate these negative effects, facilitating the emergence of a shared strategic vision. This suggests that consensus is not simply the result of demographic similarities but can be actively built through effective collaborative processes.

Empirical Manifestations of Consensus in Businesses

After exploring the theoretical roots of the concept of consensus, it is appropriate to analyze how it concretely manifests in organizational dynamics. This section aims to examine the various empirical dimensions of consensus, from governance practices to decision-making processes, from communication strategies to organizational change management.

The governance system represents one of the main areas in which consensus assumes practical relevance. Corporate governance can be interpreted as the set of mechanisms that define decision-making powers within businesses and that influence managers' decisions (Charreaux, 2004:2). In this perspective, consensus is not limited to the formal approval of decisions by corporate bodies but implies a broader alignment of interests among the various actors involved.

Empirical research has highlighted how more inclusive and participatory governance structures tend to generate greater consensus and, consequently, superior performance. Specifically, heterogeneity in board composition not only improves the quality of decisions but also increases the perceived legitimacy and internal and external consensus around strategic choices (Adams and Ferreira, 2009). This evidence suggests that consensus is not just a result but also an enabling condition for the effectiveness of governance processes.

In advanced economies, there is growing attention to governance models that facilitate the emergence of consensus through stakeholder engagement practices. Contemporary governance is characterized by a progressive expansion of the audience of subjects involved in decision-making processes, not as a mere concession by corporate leaders but as a strategic response to growing pressures from the external environment. This evolution reflects the awareness that consensus represents a strategic resource capable of conferring legitimacy and sustainability to business choices.

Decision-making processes constitute a privileged area for observing the dynamics of consensus building. Management literature has identified various ways through which businesses seek to generate consensus around strategic decisions, from explicit negotiation to implicit persuasion, from co-optation to manipulation.

A significant contribution in this area comes from Mintzberg's (1983) studies on power in businesses. The author has highlighted how consensus often emerges from complex power games in which different organizational actors mobilize resources and skills to influence collective decisions. Organizational consensus rarely emerges spontaneously; more often, it is the result of skillful negotiation strategies and a wise balancing of divergent interests.

The research of Eisenhardt and Bourgeois (1988) on political dynamics in managerial teams has further enriched this perspective, showing how consensus building is influenced by contextual factors such as time pressure, environmental uncertainty, and power distribution. In conditions of high environmental turbulence, participatory and consensus-oriented decision-making processes tend to produce higher quality decisions compared to more authoritarian processes.

A particularly interesting aspect concerns the distinction between substantial consensus and procedural consensus. Strategic consensus can manifest both as agreement on the content of decisions (substantial consensus) and as agreement on the ways in which such decisions are made (procedural consensus) (Amason, 1996). This distinction is crucial, as it suggests that businesses characterized by high internal diversity can still achieve significant forms of consensus, focusing on the rules of the game rather than on specific results.

Furthermore, communication represents a fundamental vehicle for building and maintaining consensus in businesses. Indeed, communication is not just a means to transmit information but constitutes the connective tissue that allows the emergence of

organizational consensus (Invernizzi, 2000), emphasizing the constitutive nature of communication, which does not merely describe organizational reality but actively contributes to creating it.

Empirical studies have highlighted how transparent and inclusive communication practices tend to generate greater consensus and trust. Businesses that invest in two-way and symmetrical communication not only improve the quality of relationships with stakeholders but also increase their perceived legitimacy and their ability to influence the external environment (Cornelissen, 2020). This evidence underscores the strategic importance of communication as a tool for building consensus.

A particularly relevant aspect concerns the role of language in consensus formation. Indeed, managerial discourse not only reflects but also constructs organizational reality, defining what is considered legitimate and desirable (Alvesson and Kärreman, 2000). In this perspective, consensus emerges through discursive processes that define the boundaries of what is thinkable and sayable within businesses.

Organizational change processes represent a crucial testing ground for businesses' ability to generate and maintain consensus. Empirical research has highlighted how resistance to change is often the result of a failure in building consensus rather than a rational opposition to new practices. What is labeled as resistance is frequently the symptom of a change process that has not adequately involved organizational actors in defining objectives and implementation modalities (Ford, Ford, and D'Amelio, 2008). This perspective suggests that consensus is not just a prerequisite for change but must be actively built throughout the entire process.

According to Gioia and Chittipeddi (1991), consensus building passes through processes of signification in which organizational leaders propose new interpretations of reality that can be accepted, negotiated, or rejected by members of the business. Strategic change implies a renegotiation of the psychological contract between the business and its members, a process that requires significant time, resources, and relational skills.

A relevant perspective in the analysis of empirical manifestations of consensus concerns the role of Knowledge Management and Social Network Analysis as interpretative paradigms and operational tools.

Knowledge Management, understood as a systematic process of identification, organization, and sharing of knowledge within the business (Davenport and Prusak, 1998:5), offers a fundamental key to understanding the mechanisms of consensus building based on knowledge sharing. The creation of organizational knowledge is configured as a spiral process involving continuous interactions between tacit and explicit knowledge, a shared space that serves as a foundation for knowledge creation (Nonaka and Takeuchi, 1995). This shared space can be physical, virtual, or mental, but it always represents the context in which the socialization of knowledge occurs, an essential element for building organizational consensus.

The KM perspective allows for interpreting consensus not only as an alignment of interests but also as a cognitive convergence based on shared mental models. Individuals within a business can generate new insights or knowledge when they interact and share their tacit knowledge, or when they articulate their tacit knowledge in explicit forms (Alavi and Leidner, 2001:108). This process of articulation and

knowledge sharing facilitates the emergence of a common understanding of organizational reality, an essential prerequisite for authentic consensus.

Businesses that invest in Knowledge Management practices tend to develop what Tsoukas and Vladimirou (2001) define as "collective understanding", i.e., a collective ability to interpret and respond to events in a coordinated manner. This collective understanding does not imply uniformity of thought, but rather the emergence of an integration of different perspectives within a coherent framework. The consensus that emerges from these processes is not the result of imposition or manipulation, but of a genuine co-construction of meanings.

Social Network Analysis, on the other hand, provides analytical tools to map and understand the communicative and relational flows through which consensus is formed and diffused in businesses. SNA focuses on the relationship between social entities, and on the patterns and implications of these relationships. Applied to the organizational context, this methodology allows for identifying the central actors in consensus formation processes, emerging coalitions, and potential breaking points (Wasserman and Faust, 1994:20).

Moreover, the structure of social networks significantly influences the diffusion of information, opinions, and practices within businesses. In particular, the role of "hubs" and "brokers" in the processes of knowledge dissemination and translation is crucial. Hubs are nodes characterized by a high number of connections, which amplify the reach of messages, while brokers connect otherwise separate or isolated groups of the network, facilitating the translation of ideas between different communities. Both of these figures play a determining role in building organizational consensus, serving as catalysts or bridges between potentially divergent perspectives (Borgatti et al., 2009).

A particularly relevant contribution of SNA concerns the understanding of social influence mechanisms in organizational networks. Individuals tend to align their opinions and behaviors with those of their peers. This phenomenon can accelerate the diffusion of consensus within homogeneous groups, but it can also contribute to polarization between different groups. Awareness of these dynamics is essential for managers interested in promoting authentic and transversal consensus (Contractor and Monge, 2002).

SNA also allows for analyzing the temporal evolution of consensus networks, highlighting how alliances, coalitions, and interest groups form, consolidate, or dissolve over time. This longitudinal approach is particularly valuable for understanding the impact of critical events, such as organizational changes or crises, on cohesion and internal consensus.

The integration between Knowledge Management and Social Network Analysis offers a particularly fruitful perspective for understanding the empirical processes of consensus building. While Knowledge Management provides the conceptual framework for analyzing the creation and sharing of knowledge, SNA offers methodological tools for mapping the paths through which such knowledge spreads and generates alignment or divergence. Together, these approaches allow for developing a deeper and more nuanced understanding of the empirical mechanisms through which consensus emerges, consolidates, or disintegrates in contemporary businesses.

Consensus as a Strategic Resource: Managerial Implications

After examining the theoretical roots and empirical manifestations of consensus, it is appropriate to analyze its strategic implications for business management. This section aims to explore how consensus can be configured as a distinctive resource, capable of generating sustainable competitive advantages and positively influencing business performance.

In the perspective of the Resource-Based View (Barney, 1991:105-112), consensus can be interpreted as an intangible resource potentially capable of generating competitive advantages. Resources capable of generating sustainable competitive advantages are typically characterized by value, rarity, inimitability, and non-substitutability. Consensus, understood as an alignment of interests and expectations between internal and external stakeholders, largely presents these characteristics.

First, consensus is undoubtedly a valuable resource, as it allows for reducing transaction costs, mitigating reputational risks, and facilitating the mobilization of critical resources. Businesses exist because they provide a social context that favors the creation and transfer of knowledge through consensus on shared values and practices (Kogut and Zander, 1996). This perspective underscores the fundamental value of consensus as a social infrastructure that enables value creation processes. Second, authentic consensus is a relatively rare resource in the contemporary competitive context. Despite the rhetoric on the centrality of people, many businesses continue to operate according to logics that generate alienation and misalignment rather than consensus and commitment (Pfeffer, 2010). This evidence suggests that businesses capable of generating genuine consensus can distinguish themselves in a context of growing cynicism and disaffection. Third, consensus presents characteristics of inimitability, as it emerges from complex social interactions rooted in organizational history and culture. Organizational culture, when characterized by uniqueness and causal ambiguity, can represent a source of sustainable competitive advantage (Barney, 1986:663). Consensus, as a manifestation of a cohesive and inclusive culture, shares these properties of path dependency and causal ambiguity that make it difficult to replicate (Chatman et al., 2014). Finally, consensus presents a high degree of non-substitutability, as few other mechanisms can perform the same integrative and legitimizing functions. In terms of organizational legitimacy, social consensus cannot be simply substituted with forms of coercion or incentivization without incurring significant economic and reputational costs (Suchman, 1995). This consideration underscores the distinctive nature of consensus as a mechanism of social coordination.

The relationship between consensus and business performance has attracted the attention of numerous researchers, generating a significant but not unambiguous body of empirical evidence. The empirical literature highlights that the relationship between internal/external consensus and business performance is influenced by the adoption of balanced measurement systems (Eccles, 1991), the ability to integrate multiple perspectives (Neely, 1999), and consistency with environmental dynamics (Smith and Bititci, 2017), configuring itself as a significant but not deterministic link.

The relationship between performance and strategic consensus in management teams suggests that moderate levels of consensus are associated with superior performance compared to situations of excessive consensus (groupthink) or excessive

dissent (decision paralysis) (Dess and Priem, 1995). Consequently, optimal consensus does not necessarily imply unanimity, but rather a balance between diversity of perspectives and the ability to converge on shared decisions. This perspective suggests the existence of a curvilinear relationship between consensus and performance.

In the field of marketing and brand management, the consensus among consumers regarding brand values and positioning is positively associated with indicators of customer equity and brand loyalty (Keller, 2003). Consequently, the strongest brands are those that manage to generate widespread consensus around a distinctive set of mental associations, creating communities of consumers who share meanings and values. This evidence underscores the strategic importance of consensus in market relationships.

In the context of studies on corporate sustainability, businesses capable of generating consensus around their social responsibility practices tend to enjoy greater legitimacy and resilience, as in a context of growing public interest, stakeholder consensus represents a form of insurance against reputational and regulatory risks (Scherer and Palazzo, 2011). This perspective underscores the relevance of consensus as a factor of protection and risk mitigation.

Given the strategic importance of consensus, it is fundamental for managers to understand which strategies can facilitate its construction and maintenance. Management literature has identified various potentially effective practices that can be adapted to different organizational and environmental contexts.

A first strategy concerns the implementation of structured and systematic stakeholder engagement practices. Stakeholder engagement requires a shift from occasional consultation to a continuous and two-way dialogue, founded on mutual respect and transparency (Greenwood, 2007:324). This perspective underscores the importance of creating institutionalized spaces for confrontation and negotiation with relevant stakeholders.

A second strategy concerns the development of inclusive and participatory governance systems. Governance models that integrate different perspectives and interests tend to generate greater consensus and legitimacy, as effective governance is not limited to protecting shareholders' interests but creates value through the dynamic balancing of expectations of different stakeholders (Aguilera and Jackson, 2003). A third strategy concerns investment in transparent and responsible communication practices, through corporate communication that must evolve from a unidirectional persuasion tool to a platform for authentic dialogue, in which listening becomes as important as speaking (Christensen and Cheney, 2015). This perspective underscores the importance of communication practices that not only inform but also actively involve stakeholders in the co-construction of shared meanings.

A fourth strategy concerns the alignment between words and actions, i.e., the coherence between corporate rhetoric and concrete practices, given that businesses that enjoy greater consensus are those that avoid misalignment between what they say and what they do, demonstrating an authenticity that resonates with stakeholder values (Sisodia et al., 2007). This perspective underscores the importance of integrity as a foundation of authentic consensus.

Despite the potential benefits associated with consensus, it is important to adopt a critical perspective that also highlights its possible risks and limitations. Excessive

consensus can lead to a deterioration of the decision-making effectiveness of groups, suppressing constructive dissent and critical evaluation of alternatives (Janis, 1972). This consideration invites a distinction between authentic consensus, founded on genuine dialogue, and pseudo-consensus, resulting from conformist pressures or manipulation.

The presence of dissenting minorities within decision-making groups can improve the quality of decisions, stimulating more divergent and creative thinking, as dissent, when expressed in a constructive manner, can serve as a catalyst for innovation and organizational learning (Nemeth, 1986). This perspective suggests that a certain degree of tension and diversity of opinions can be functional to the vitality of businesses.

In the context of the debate on corporate social responsibility, CSR practices oriented exclusively towards image can generate an apparent consensus that masks substantial conflicts of interest and perpetuates asymmetric power relationships (Fleming and Jones, 2013). This critique underscores the importance of distinguishing between authentic consensus and mere impression management strategies.

Managerial practices oriented towards consensus can sometimes be configured as forms of "normative control" that limit the autonomy and critical capacity of organization members (Alvesson and Willmott, 2002). Because of this, the contemporary emphasis on organizational culture and value alignment can translate into subtle forms of manipulation that colonize workers' subjectivity.

Ethical Dimensions of Strategic Consensus Management

The digital transformation has fundamentally altered the ethical landscape of consensus building, introducing novel moral complexities that demand systematic examination. The proliferation of artificial intelligence and algorithmic decision-making systems in organizational contexts raises profound questions about the authenticity and autonomy of consensus formation processes (Floridi et al., 2018). When consensus emerges through AI-mediated platforms that curate information and shape discourse, traditional notions of voluntary agreement become problematic, as stakeholders may be unknowingly influenced by algorithmic biases embedded in these systems.

The phenomenon of "manufactured consensus" (Woolley, 2023) represents a particularly insidious challenge in the digital era. Tufekci (2017) demonstrates how sophisticated data analytics can be employed to manipulate public opinion through micro-targeted messaging, creating an illusion of organic consensus while actually orchestrating predetermined outcomes. This instrumentalization of digital technologies for consensus manipulation raises fundamental questions about the moral legitimacy of business practices that exploit cognitive vulnerabilities and information asymmetries.

Furthermore, the emergence of "surveillance capitalism" (Zuboff, 2019) introduces new ethical dimensions to stakeholder engagement, as businesses increasingly extract behavioral data to predict and influence stakeholder preferences. The collection and utilization of such data for consensus-building purposes creates a moral tension between economic efficiency and respect for individual autonomy and privacy. Organizations must navigate the delicate balance between leveraging data

insights to better understand stakeholder needs and avoiding manipulative practices that undermine genuine democratic participation.

The concept of "algorithmic accountability" becomes crucial in this context (Diakopoulos, 2016). Businesses utilizing AI-driven consensus-building tools must ensure transparency in their algorithmic processes, allowing stakeholders to understand how their data is being used and how conclusions are being drawn. This transparency requirement extends beyond mere legal compliance to encompass moral obligations toward maintaining the integrity of democratic discourse within organizational boundaries.

Digital platforms also introduce challenges related to digital divides and inclusive participation (Van Dijk, 2019). The shift toward digital consensus-building mechanisms may inadvertently exclude stakeholders who lack digital literacy or access to advanced technologies, potentially creating new forms of organizational inequality. Ethical consensus management in the digital era therefore requires active measures to ensure that technological adoption does not compromise the inclusivity and representativeness that characterize authentic democratic processes.

Consensus in the Digital Era: New Challenges and Opportunities

The advent of digital technologies and social media has profoundly transformed the modalities of building and managing consensus in businesses. This section aims to explore the new challenges and opportunities that emerge in this rapidly evolving context, analyzing how businesses are adapting their consensus strategies to the peculiarities of the digital environment.

Social media have radically modified the architecture of corporate communication, shifting from a predominantly unidirectional and controlled model to a more open and participatory system. As suggested by Kaplan and Haenlein's (2010) analysis, social media have democratized corporate communication, transforming every stakeholder into a potential producer and distributor of brand-related content. This evolution has expanded the audience of actors participating in consensus building, making the process more complex and less predictable.

Social media have created reputational arenas in which different actors compete to define the meanings associated with brands and businesses (Aula, 2010). In the digital era, consensus emerges from the interaction between official narratives and counter-narratives generated by users, in a dynamic process of continuous negotiation.

A particularly relevant aspect concerns the temporal acceleration of the processes of consensus formation and dissolution, as social media have compressed the life cycle of consensus, making businesses more vulnerable to sudden reputational crises but also more capable of rapidly mobilizing support around their initiatives (Cova and Dalli, 2009). This temporal dynamic requires greater agility and reactivity in consensus management, with significant implications for organizational structures and decision-making processes. Digital technologies have exponentially increased the visibility of business practices, reducing information asymmetry between businesses and stakeholders. In the era of transparency, businesses operate in a glass house where every action is potentially visible to the public eye (Tapscott and Ticoll, 2003). This

condition of radical transparency has profound implications for consensus-building strategies, which must be adapted across different sectors. For example, in the luxury industry sector, there is a "tendency to opt for omnichannel strategy, and the use and optimization of data and digital innovations to leverage the customer experience" (Bertrand and Glebova, 2024:183). This approach illustrates how specific industries develop consensus around digital transformation strategies. As Jones demonstrates in his study of German retailers, businesses increasingly recognize that "digitization offers great opportunities, but also possible risks must be considered" (Jones, 2023: 375), leading to industry-specific frameworks for balancing economic imperatives with social responsibility in digital environments.

Christensen's (2002) research has highlighted how transparency can serve as a disciplining mechanism that aligns organizational behavior with stakeholder expectations. Indeed, the awareness of being constantly observed modifies the cost-benefit calculation of businesses, making practices that could generate dissent and controversy more costly. This dynamic can facilitate the emergence of forms of consensus based on a genuine convergence of interests rather than on manipulation or information asymmetry.

On the other hand, Etzioni (2010) has warned against the potential perverse effects of transparency, highlighting how excess information can paradoxically reduce the capacity for understanding and critical evaluation. According to this perspective, transparency does not in itself guarantee a more informed consensus if it is not accompanied by tools that help stakeholders interpret and contextualize information. This consideration underscores the importance of disclosure practices that not only provide data but also facilitate their understanding and contextualization.

A particularly problematic aspect of the digital ecosystem concerns the role of algorithms in the formation of public opinion and social consensus. Algorithms that personalize the online experience tend to create echo chambers that amplify existing beliefs and reduce exposure to different perspectives (Pariser, 2012). This dynamic can favor polarization and make it more difficult to build authentic consensus based on confrontation between different positions.

Sunstein's (2017) research has deepened this phenomenon, highlighting how the fragmentation of the informational ecosystem can undermine the very foundations of social consensus. In a highly personalized media environment, individuals tend to select information sources that confirm their existing beliefs, reducing opportunities for exposure to different perspectives. This tendency can translate into increasing difficulty for businesses in building transversal consensus around their initiatives and values.

On the other hand, Bennett and Segerberg (2012) have highlighted how digital technologies can also facilitate forms of connective action based on shared identities rather than formal organizational memberships. Digital platforms allow the formation of temporary communities united by shared interests or values, capable of rapidly mobilizing around specific causes. This dynamic can offer businesses new opportunities to build consensus through alignment with causes and values that resonate with their stakeholders' identities.

The digital context requires the development of new skills for the effective management of organizational consensus. According to Van Dijck and Poell (2013), the logic of social media requires a radically different approach to communication,

based on authenticity, interactivity, and co-creation rather than on control and unidirectionality. This evolution implies a rethinking of the skills and professional roles associated with consensus management.

Kietzmann et al. (2011) have identified a set of critical skills for managing organizational presence in the digital ecosystem, which include capabilities of active listening, conversation management, sharing, and reputation. The effective management of consensus in the digital era requires a balance between immediate reactivity and strategic vision, between openness to dialogue and value coherence. This perspective underscores the complexity of the role of communication professionals in the digital era.

A particularly relevant aspect concerns the ability to use data to understand and influence consensus formation processes. Big data analysis allows businesses to monitor stakeholder sentiment in real-time and adapt their engagement strategies in an agile and personalized manner (Davenport, 2014). This evolution suggests the emergence of more scientific and data-driven approaches to consensus management, which integrate managerial intuition and quantitative analysis.

Towards an Integrated Conceptual Framework: Dimensions and Dynamics of Organizational Consensus

The analysis conducted highlighted the multidimensional and contextual nature of consensus in businesses. This section aims to integrate the various theoretical perspectives and empirical evidence into a coherent conceptual framework, capable of capturing the fundamental dimensions of consensus and their dynamic interrelations.

The proposed conceptual framework is articulated around three fundamental dimensions of organizational consensus: the cognitive dimension, the affective dimension, and the behavioral dimension. These dimensions are not independent but influence each other reciprocally, configuring a complex and dynamic system.

The cognitive dimension of consensus refers to the sharing of mental models, interpretative schemas, and frames of reference among organization members. As highlighted by the contributions of Knowledge Management (Nonaka and Takeuchi, 1995; Alavi and Leidner, 2001), this dimension manifests through the creation and diffusion of explicit and tacit knowledge. Cognitive consensus does not necessarily imply uniformity of thought, but rather the ability to integrate different perspectives into a coherent sense framework.

Empirical research has highlighted how cognitive consensus is influenced by factors such as demographic and functional diversity (Knight et al., 1999), knowledge-sharing practices (Davenport and Prusak, 1998), and collective sensemaking processes (Gioia and Chittipeddi, 1991). This dimension of consensus is particularly relevant in strategic decision-making processes, where convergence on shared objectives and visions facilitates coordination and effective implementation.

The affective dimension of consensus, on the other hand, concerns the sharing of values, emotions, and feelings within the business. This dimension finds theoretical foundation in the institutionalist perspective (DiMaggio and Powell, 1983) and in Stakeholder Theory (Freeman, 1984), which have highlighted the importance of emotional and value legitimation in organizational dynamics.

Affective consensus manifests through members' identification with the business, interpersonal trust, and commitment towards shared objectives. Empirical research has shown how this dimension is influenced by factors such as transformative leadership (Bass and Avolio, 1993), organizational culture (Schein, 2010), and internal communication practices (Cornelissen, 2020). The affective dimension of consensus is particularly relevant in organizational change processes, where resistance is often rooted in emotional rather than cognitive dynamics.

The behavioral dimension of consensus, finally, concerns the alignment of concrete actions and practices of organization members. This dimension finds theoretical foundation in the perspective of the Resource-Based View (Barney, 1991) and in theories of organizational action (Weick, 1995), which have highlighted the importance of coherence between intentions and actions in building sustainable competitive advantages.

Behavioral consensus manifests through coordinated practices, shared routines, and stable interaction models. Empirical research, in particular that based on Social Network Analysis (Wasserman and Faust, 1994; Borgatti et al., 2009), has highlighted how this dimension is influenced by factors such as the structure of relational networks, incentive mechanisms, and organizational control systems. The behavioral dimension of consensus is particularly relevant in strategic implementation processes, where effectiveness depends on the ability to translate shared visions into coordinated actions.

The three dimensions of consensus identified do not operate in isolation but influence each other reciprocally in complex dynamics of reinforcement or tension.

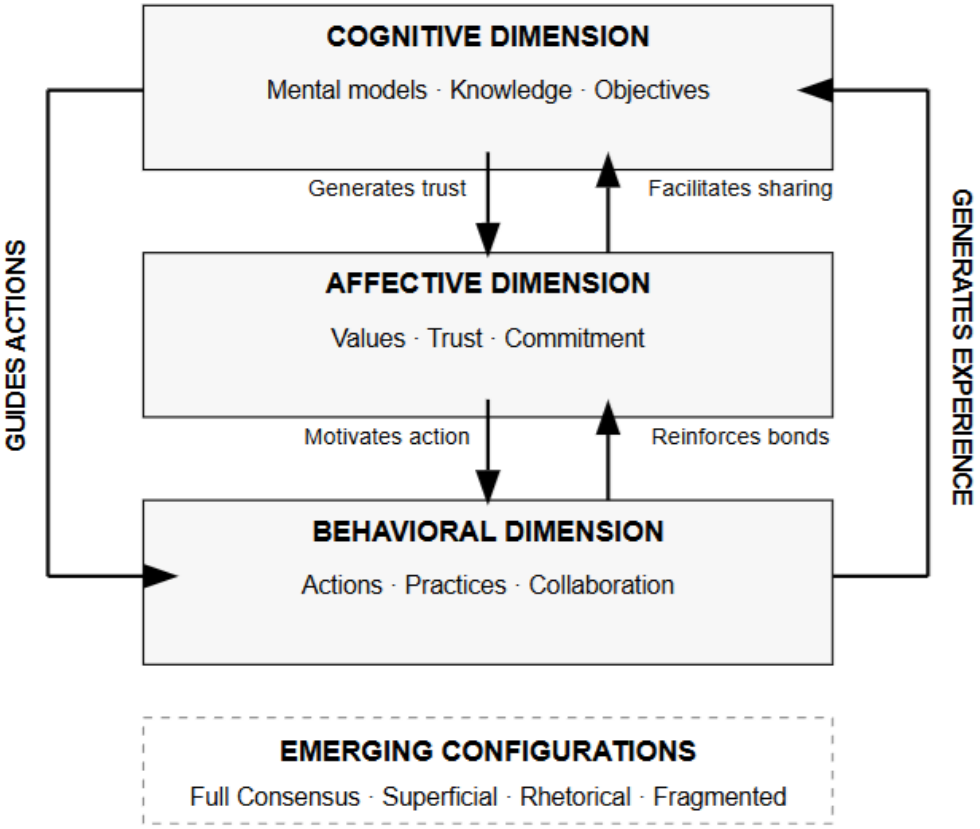
For example, strong cognitive consensus can facilitate the emergence of affective consensus, creating a sense of belonging and shared identity.

Similarly, solid affective consensus can sustain behavioral alignment, motivating organization members to translate shared values into coherent actions.

On the other hand, tensions can emerge between the different dimensions of consensus. For example, strong behavioral consensus imposed through rigid control systems can coexist with weak affective consensus, generating superficial conformity but limited commitment. Similarly, high cognitive consensus in the absence of behavioral alignment can result in a misalignment between espoused theory and theory-in-use (Argyris and Schön, 1978), undermining organizational credibility and effectiveness.

The articulation of organizational consensus increases further when one considers the diversity of stakeholders involved. As highlighted by Stakeholder Theory (Mitchell et al., 1997), different businesses can attribute different priorities to different stakeholder groups, generating specific consensus configurations. Moreover, different stakeholders can value different dimensions of consensus: while investors might privilege behavioral alignment oriented to results, employees might attribute greater importance to the affective and value dimension. The following qualitative overview represents a conceptual model that highlights the three fundamental dimensions of consensus in businesses: cognitive, affective, and behavioral, in a vertical structure that suggests a progression from shared thinking, through values and emotions, to concrete practices.

Figure 1. *A Conceptual Model of the Three Fundamental Dimensions of Consensus in Businesses*



The cognitive dimension generates trust in the affective dimension, while the latter facilitates knowledge sharing in the former. Similarly, the affective dimension motivates action in the behavioral dimension, which in turn strengthens emotional ties in the affective dimension. The external transversal connections highlight how the cognitive dimension directly guides actions in the behavioral dimension, while the practical experience of the latter generates new shared knowledge in the cognitive dimension.

The lower section of the model introduces the configurations emerging from the interaction between the three dimensions:

- full consensus, characterized by strong alignment in all dimensions;
- superficial consensus, which presents behavioral alignment not supported by the other dimensions;
- rhetorical consensus, distinguished by cognitive agreement that does not translate into coherent practices;
- fragmented consensus, in which alignment is present only in some areas or groups of the business.

In the digital era, characterized by pervasive connectivity and accelerated information flows, the dynamics of consensus building undergo profound transformations. As highlighted in the analysis of consensus in the digital era, communication technologies and social media redefine the boundaries between internal and external, accelerating the processes of consensus formation and dissolution and making the management of different dimensions more complex.

In this context, the need emerges for an integrated approach to consensus management, which recognizes the multidimensional nature of the phenomenon and adopts differentiated strategies for the various dimensions.

Knowledge Management provides valuable tools to manage the cognitive dimension, facilitating the creation and diffusion of shared knowledge.

Social Network Analysis offers methodologies to map and influence the relational networks that support the behavioral dimension, while transformative leadership and value communication practices can support the affective dimension. The integration of these perspectives suggests a consensus management model characterized by multiple factors such as:

- contextuality: the recognition of the specificities of the organizational and environmental context, with adaptation of strategies to the distinctive characteristics of the business and its ecosystem;
- multidimensionality: balanced attention to the cognitive, affective, and behavioral dimensions of consensus, with awareness of their dynamic interrelations;
- processuality: vision of consensus not as a static final state but as a continuous process of negotiation and renegotiation between different actors;
- authenticity: distinction between genuine consensus, based on authentic convergence of interests and values, and pseudo-consensus, resulting from manipulation or coercion;
- inclusivity: active involvement of diverse stakeholders in consensus-building processes, with attention to power dynamics and information asymmetries.

This integrated conceptual framework offers not only an interpretative lens to understand the empirical dynamics of consensus in contemporary businesses but also operational guidelines for managers and leaders interested in promoting forms of authentic and sustainable consensus.

In future perspective, research on organizational consensus could benefit from mixed methodological approaches that integrate the quantitative analysis of social networks, typical of SNA, with the qualitative exploration of processes of knowledge creation and sharing, central to Knowledge Management.

Conclusions: Towards a New Paradigm of Organizational Consensus

Consensus represents a fundamental dimension of contemporary business economics, characterized by increasing interdependence. The exploratory path conducted has allowed for outlining an articulated framework that embraces the

theoretical, empirical, and strategic aspects of the phenomenon, highlighting its multidimensional and contextual nature.

The pursuit of consensus in contemporary business economics is configured as a dialectical process that must balance potentially contrasting needs: univocality and pluralism, stability and innovation, control and participation. The contemporary enterprise is called to navigate the paradoxical tension between the need for internal cohesion and openness to the diversity of perspectives that fuels innovation (Mintzberg, 2009). This consideration underscores the dynamic and processual nature of consensus, which cannot be reduced to a static result or a standardized procedure.

Technological and social evolution has introduced new challenges and opportunities for building and maintaining consensus. In the era of the network society, power is increasingly exercised through the ability to influence meaning-making processes rather than through direct control of material resources (Castells, 2009). This evolution requires a profound rethinking of consensus management strategies and practices, which must adapt to a context characterized by greater transparency, connectivity, and participation.

The ethical implications of consensus management in the digital era open several promising avenues for future research. First, empirical studies investigating the effectiveness of ethical frameworks for AI-mediated consensus building could provide valuable insights for practitioners seeking to implement responsible digital engagement strategies. Such research might explore how different algorithmic transparency measures affect stakeholder trust and participation quality (Ananny and Crawford, 2018).

Second, comparative cross-cultural studies examining how different societies approach the ethical challenges of digital consensus building could illuminate the cultural contingency of moral standards in organizational contexts. Given the global nature of digital platforms, understanding how cultural values shape perceptions of legitimate consensus practices becomes increasingly important for multinational organizations (Jobin et al., 2019).

Third, longitudinal research tracking the evolution of stakeholder attitudes toward AI-mediated organizational communication could help identify emerging ethical concerns and best practices. As digital natives become more prominent in organizational hierarchies, their expectations regarding transparency, participation, and ethical data use may fundamentally reshape consensus-building paradigms.

In future perspective, it is possible to identify some development directions that deserve particular attention both in academic research and in managerial practice. First, the deepening of the modalities through which different businesses build and maintain consensus in different cultural and institutional contexts appears crucial. Consensus-building practices are profoundly influenced by cultural variables such as power distance and orientation to collectivism or individualism (Hofstede et al., 2010). This perspective invites the development of contextual approaches that avoid inappropriate generalizations and recognize the diversity of legitimate practices.

Second, the importance emerges of exploring the relationship between consensus and innovation, with particular attention to the ways in which businesses can balance continuity and change. Disruptive innovation often requires the ability to challenge the dominant consensus, proposing alternative visions that initially meet resistance but

may prove visionary in the long term (Christensen, 1997). This consideration invites a dynamic vision of consensus, which recognizes the value of constructive dissent as an engine of renewal and adaptation.

Finally, it appears fundamental to deepen the ethical implications of consensus-building practices, with particular attention to the distinction between authentic consensus and manipulation. Legitimate consensus can emerge only from shared processes characterized by participatory symmetry and absence of coercion (Habermas, 1984). This normative perspective invites the development of consensus-building practices founded on principles of mutual respect, transparency, and genuine openness to confrontation.

Authentic consensus represents not only a strategic resource for contemporary businesses but also an indicator of their ability to contribute positively to economic and social development. This consideration underscores the relevance of the theme not only in an instrumental perspective but also in terms of social responsibility and long-term sustainability.

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Load Shedding in South Africa: Implications for Financial Sustainability of Manufacturing Companies

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South Africa has been experiencing constant power disruptions since 2007. Manufacturing companies that rely on a steady supply of electricity for their production may find other source of energy supply, which can provide a competitive advantage. On the other hand, the alternative source of energy may result in extra expenses which may have a negative impact on their performance. This study explored the impact of power outages on the financial performance of South African listed manufacturing companies. A secondary quantitative research approach was employed in the study, looking at financial data from 107 companies for ten years (2012 to 2021). The research used data collected from McGregor BFA and the Department of Energy. Fixed and random effect regression approaches were used to analyse data. Return on assets and Tobin's Q were selected as the dependent variables. The findings demonstrated a negative and significant relationship between load shedding and financial sustainability, demonstrating that an increase in load shedding hours decreases financial performance. This finding indicates that frequent power outages in South Africa decrease the profitability and market value of manufacturing companies. The findings call into question, the notion that the manufacturing companies can maintain their profit levels by passing the extra cost of alternative power onto customers. The study further identified the important role of firm-specific factors such as sales, company age, size, risk, and retention rate in influencing financial performance. The study calls for urgent action from industry stakeholders and policymakers to address the energy supply challenges, emphasising the need for investments in reliable electricity infrastructure and alternative energy solutions.

Keywords: *manufacturing companies, power shortages, average electricity price, total load shedding hours and financial performance*

Introduction

Over the past 16 years, load shedding has been a problem in South Africa, which has impacted all citizens and causing operational challenges to both the public and private sectors. Load shedding is defined as the planned or unplanned loss of electricity supply. The manufacturing sector is no exception. Load shedding and power shortages are among the critical issues these manufacturing businesses must deal with (Meles 2020, Pillay and Andrisha 2023). In South Africa, the manufacturing industry depends on a steady supply of reliable electricity. There are many areas in which load shedding impacts the operations of the manufacturing companies. Power

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outages cause additional costs, which pushes businesses to improvise or pass those costs along to customers.

Companies in this industry either find alternative energy sources or cease operations during load shedding. In this context, the manufacturing companies face a trade-off between absorbing the costs of power outages and investing in costly alternative energy solutions. Running generators is the common energy alternative, but this incurs additional fuel and maintenance costs (Afolabi and Laseinde 2019). Others decide to cut back on staff or operating hours, particularly during pre-planned power outages. Power outages can lead to costly downtime, forcing production to halt. Some businesses choose to operate on weekends, which increases labour costs. Thus, dependable power sources are essential to manufacturing businesses (Meyer and Habanabakize 2019). Similarly, when the demand for a product declines, the supply follows suit, which has an adverse effect on employee morale and creates an unfavourable work environment with decreased production levels (Andrade et al. 2020, Niever et al. 2021, Chaime 2023).

The rising operational costs, reduced productivity, and supply chain disruptions from load shedding translate into weakened profitability, declining investor confidence, and financial strain for manufacturing firms. However, companies with adequate financial resources can choose alternate forms of energy production. These extra costs through alternative energy capacity helps to provide a competitive advantage as their competitors may not have the resources to provide alternative energy to maintain operations. This suggests that manufacturing companies that spend extra resources to provide alternative power supply would be able to meet the needs of their existing customers, attract new customers, increase their turnover and eventually improve their financial performance.

The power outages in the South African manufacturing sector raise significant questions, including the following. Who ultimately bears the cost associated with load shedding? Do customers absorb these costs? Do manufacturing companies include the cost of power outages in their product prices? Do these manufacturing companies factor power outages into product pricing, or do they pass these costs directly to customers? These questions provide a complex understanding relating to the effect of the load shedding on the financial performance of manufacturing companies in South Africa. The issue that needs to be resolved is whether the performance of manufacturing companies is impacted by the power shortages in South Africa (Fakih et al. 2020).

While previous studies such as those of Naidoo (2023), Mabunda et al. (2023), Bello-Pierre et al. (2023) and Klishi (2024) have explored the general effects of load-shedding on business operations and economic growth in South Africa, there is a lack of focused research on its specific impact on the financial sustainability of manufacturing companies. Prior studies rely on survey-based or descriptive analyses, which, while useful, lack the statistical rigour of panel data regression models. Our study aims to address this gap by applying quantitative econometric techniques, ensuring a more objective and data-driven assessment of financial sustainability. In addition, existing literature overlooks how power outages influence long-term financial health and the market value within the manufacturing sector. This study aims to fill this gap by providing a detailed analysis of the financial implications of load-shedding on JSE-listed manufacturing companies, offering valuable insights into both

the operational and financial adaptations required to navigate South Africa's energy crisis, from 2013 to 2022. Extending research over a longer period would provide insights into whether firms adapt and recover financially over time or if persistent load shedding leads to permanent financial distress.

Load Shedding and Electricity Generation in South Africa

Load shedding, often known as power shortages, is the loss of network supplies or electrical power to the end user. Basic supply and demand theory can be used to explain load shedding (Kazmi et al. 2019, Andrade et al. 2020). To prevent system bottlenecks, load shedding rations the electrical grid otherwise, there can be a complete blackout. A blackout is an unexpected lack of electricity that happens in an emergency (Klishi 2024). Load shedding on the other hand, is planned or unplanned loss of electricity supply, irrespective of the type of energy loss. Its occurrence disrupts energy transmission, distribution, and generation; therefore, mitigation mechanisms need to be applied to prevent a blackout. This loss affects not only the public but the business community at large (Meles 2020). Load shedding often results in equipment failure, damage to power plants, and maintenance concerns. According to Milin et al. (2022), load shedding is a worldwide phenomenon; hence many countries are seeking alternative energy sources to supplement their current energy supplies because an uninterrupted electricity supply is essential for the survival of all countries, organisations, businesses, and people. Load shedding significantly affect production, with various economic and social consequences. Electricity is now a valuable resource whose scarcity impacts the livelihoods of all people, in all countries. A stable electricity infrastructure is essential for a nation's ability to transition its industries from being labour-intensive to capital-intensive and for them to continue to grow (Bowman 2020).

Load Shedding in South Africa

Load shedding is a problem for South Africa and many other African countries. Eskom, the state-owned producer, transmitter and distributor of electricity in South Africa has implemented load shedding because of energy deficiencies and dilapidated energy infrastructure. This impacts all citizens of South Africa because over 95% of South Africa's power is produced, transmitted, and distributed exclusively by Eskom (Bowman 2020). The power company utilises load shedding as a preventative measure to keep the electrical grid from completely collapsing. This rolling black out typically happens when the amount of electricity available is less than needed (Eskom 2020). The energy provider then applies load shedding to safeguard the system. Energy experts say power rationing is primarily implemented to protect the system from a total blackout (Bowman 2020).

Load shedding in South Africa began in 2007, with 2022 having the most annual load shedding hours of 1949, which is equivalent to 81 days (Ayamolowo et al. 2022). Eskom, transmitter and distributer uses load shedding and load reduction measures when there is a system restriction in the networks for electricity generation,

transmission, or distribution (Styan 2019). Such strategies are often necessary during energy shortages because South Africa also exports electricity to neighbouring African nations (Bowman 2020). The impact of such drastic load shedding on households and businesses has been severe, as Eskom supplies over 95% of the electricity in South Africa (Inglesi 2023, Naidoo 2023, Mabunda et al. 2024). Moreover, despite the implementation of load shedding, Eskom has consistently needed business rescue from the government. By 2020, the company owed over 450 billion South Africa Rands to the South African Government (Analytica 2020).

Some scholars and commentators trace the load shedding crises in South Africa to the Reconstruction and Development Programme (RDP), which was created in 1994. This programme was one of the many methods employed by the post-apartheid government to address the socioeconomic housing issue in South Africa (Bowman 2020). Housing and electricity access was one of the primary goals of the plan. This programme was considered transformative because twelve million South Africans lacked proper housing during the time of independence in 1994. The RDP built about 5 million homes between 1994 and 2001. After that milestone was reached, the next topic on the agenda was electricity access. About 1.75 million additional houses were connected to the national grid due to South Africa's nationwide electrification project (Akadırı et al. 2021). Eskom then advised the authorities that due to the strain caused by the newly connected houses on the electricity grid, new capital expansion projects were required for increased capacity to handle the additional consumers. The South African government and Eskom agreed to construct additional power plants and generators. While there was a 36 700 MW (megawatts) demand for electricity, Eskom could supply 38 500 MW. The above MW appears adequate in theory, but according to international best practices, the company should be able to produce 15% more than required (Masibi 2015).

Planned power interruptions are essential for the manufacturing sector's production schedule to run effectively. However, public and commercial electricity consumers, who are referred to as "end users," claim that load shedding schedules are unpredictable (Gehringer et al. 2018). When there is load shedding, labour costs go up since manufacturing enterprises must still pay employee salaries and other fixed costs that cannot be avoided even when work is halted due to load shedding (Nkosi & Govender 2022). This raises the cost of production per unit.

Theoretical Review

Several theories attempt to explain how load shedding and financial sustainability of companies are related. The impact of load shedding and the financial sustainability of companies can be explained using the resource-based view (RBV) theory. The RBV theory emphasises the value of successfully utilising internal resources for formulating future strategic decisions (Barney 1991, Helfat et al. 2023). According to Barney (1991), load shedding has a negative effect on a company's financial sustainability. However, when strategically positioned, a company's unique qualities might provide the company with a competitive advantage over its competitors. For instance, an entity with extra resources such as cash can afford backup generators for a steady operations

and supplies. As a result, companies that operate without interruptions during load shedding can maintain happy customers and increase revenue. This may therefore result in that business having better financial performance than its rivals during load shedding.

Resources, according to the RBV theory, are any assets, business processes, capabilities, firm attributes, knowledge, or information that a company has. Barney (1991) suggested that these unique resources are controlled by companies which are employed to understand and carry out strategies to increase effectiveness and efficiency. The resources used by a company can come from both internal and external sources. Some examples of internal sources are research and development capabilities, logistics, brand management, and low-cost procedures. The function of suppliers is an example of an external resource. The RBV theory can be used to explain how companies that are resourceful perform better during load shedding because they can use their resource to acquire alternative source of energy. On the other hand, companies with limited resources will be affected negatively because they would stop operation, leading to increase cost and low productivity.

Empirical Literature Review

The results of previous studies have highlighted the connection between load shedding and business performance. There is broad agreement among academics that load shedding adversely affect a company's financial performance. For instance, Masibi (2015) examined the effects of load shedding on small medium micro-enterprise information and communication technology companies in the Matlosana, South Africa. The study was qualitative and provided evidence that suggests that load shedding has a negative effect on SMMEs and that the brand of the SMMEs suffered because of frequent power outages. Similarly, Lenoke (2017) and Afolabi and Laseinde (2019) further conducted different studies in South Africa to assess the effects of load shedding on the country's economic development and showed a negative correlation between load shedding and economic expansion. These studies highlight negative effects of load shedding on the overall productivity and the concomitant effects on financial performance.

Examining sector-specific impacts Goldberg (2015) took a different angle and evaluated the effects of an uneven power supply on South African retailers. The research revealed that numerous retailers had purchased backup generators, spending millions of Rands in the process. A comparable study by Botha (2019) focused on how power outages affected the efficiency of a food shops in Nelson Mandela Bay. Using a quantitative analytical approach, the survey revealed that 93% of the businesses had invested in alternate power sources and 73% of the businesses responded that power outages negatively influenced their productivity. Similarly, Grainger and Zhang (2019), extended this discussion to a sample of 4500 manufacturing companies in Pakistan. It was found that unstable power supply negatively affects the performance of businesses. The results from Grainger and Zhang's (2019) study reaffirm that power instability negatively impacts business performance. In a related study, Mabunda et al. (2023) analysed the effect load shedding has on a small and medium enterprises in South

Africa and demonstrated that load shedding impacted the operations of businesses and had a negative financial impact on them.

Load shedding has become a defining challenge for South African businesses, particularly in the manufacturing sector, where a steady power supply is essential for productivity and financial stability. Naidoo (2023) painted a bleak picture of the energy crisis in South Africa, linking the frequent power outages to declining industrial output, job losses, and dwindling investor confidence. Naidoo (2023) highlighted that Eskom faces aging energy infrastructure and persistent governance failures, leaving businesses to grapple with unpredictable disruptions that make long-term financial planning nearly impossible. Inglesi-Lotz (2023) further highlighted how the impact of load shedding negatively affects smaller businesses, which lack financial strength. The authors reported that manufacturing firms that cannot afford expensive backup power supply find themselves stuck in a cycle of lost revenue, rising operational costs, and reduced competitiveness, making it difficult to survive.

The reality of the impact of load shedding on business performance is even harsher for SMEs. Mabunda et al. (2024) revealed that during load shedding, many small businesses operate at just 39% of their usual revenue, which forces them to lay off workers, scale back production, or shut down operations entirely. This, in turn, has a ripple effect: unemployment rises, local economies weaken, and municipal revenue collection drops. In a similar study, Pillay and Beharry-Ramraj (2024) highlight that without reliable electricity, many small businesses do not survive beyond their third year, suggesting that load shedding accelerates business failure rates.

Beyond South Africa, Tembe and Hlengwa (2022) expanded the discussion beyond and provided a cross-national perspective, highlighting that load shedding was seen as a major problem that affected not only local companies but also international companies. The authors examined how power interruptions affected business sales in various African nations. The findings confirmed a negative correlation between power interruptions and company revenue using firm data from 14 countries from the World Bank Enterprise Survey. The results also revealed that businesses without backup power sources, such as generators, were negatively impacted by power outages.

Despite the prevailing view that load shedding is detrimental, some studies suggest a more nuanced perspective. A study by Cole et al. (2018) introduced an interesting perspective to the discussion by reporting that businesses relying on alternative electricity supply during power outages are impacted differently than those that do not have access to alternate energy sources. This is because, businesses that use alternative energy sources can keep operating during power disruptions. There will be an extra charge for this. The authors however, highlighted that a problem arises when power disruptions are less common where there are no communicated schedules for power outages, which poses a threat since these companies cannot plan for power outages.

Despite most of the past studies providing evidence to show a positive relationship between load shedding and financial performance, some studies suggest a potential positive relationship between load shedding and financial performance. For instance, a study by Fakih et al. (2020) revealed a positive and significant correlation between planned power outages and financial performance, indicating that some businesses may adapt and even thrive under certain predictable conditions. The literature reviewed has provided evidence of the negative impact of load shedding on

the financial sustainability of manufacturing companies and other sectors. Most studies agree that load shedding disrupts operations, increases costs, and ultimately hinders economic growth. However, the evidence showed that there are some exceptions where planned power outages, under specific conditions, might have a positive impact on financial performance.

The conflicting findings highlights the complexity of the issue and suggests that while load shedding generally harms companies' financial sustainability, certain adaptive strategies or circumstances might mitigate these effects. This creates notable gaps in the literature as there is limited research on the long-term financial implications of load shedding on manufacturing companies in South Africa. Additionally, the previous studies mostly adopted a descriptive approach, relying on primary data through interview and questionnaires. An examination of this load shedding phenomenon using secondary data has not been fully explored. Addressing these gaps would contribute to an understanding of how load shedding impacts financial sustainability and what strategies could help mitigate its adverse effects.

Research Design and Methods

This study adopted a quantitative inferential research approach. The study targeted 201 manufacturing companies in South Africa listed on the Johannesburg Stock Exchange (JSE). The period of interest was: 2013 to 2022. The period was chosen because it coincided with the period South Africa experienced intense load shedding hours. Companies or businesses that engage in manufacturing and rely on energy for production are those that have been included in the current study. A random purposive sample of 107 out of 201 manufacturing companies was selected based on inclusion and exclusion criteria, ensuring they were listed on JSE, rely on electricity for production, and were affected by constant power outages. The study adopted two criteria to select the companies included in the study. First, companies selected were those with financial data from 2013 to 2022 were selected to ensure the integrity of panel data analysis. This criterion as adopted to address issues relating to missing data. Second, the companies had to be listed for not less than 5 years, to ensure a robust longitudinal analysis. Based on the criteria, 107 firms were selected for the study. Secondary data was employed for the study. Data were collected from two main sources, financial and load shedding data. The financial data of the companies was gathered from McGregor BFA, and the data on load shedding was obtained from the websites of Eskom and the Department of Energy. The study employed a multiple regression estimation technique was used to estimate the impact of load shedding on the firms' financial performance.

Econometric Model

Econometric models were used to estimate the impact of power outages on the financial performance and the manufacturing companies' value. Panel data regression analysis method was employed for the current investigation. Equations 1 and 2 below were used for the estimation. The equations were developed using the modified Ohlson (1995) value-relevant model. The study adopts the modified Ohlson (1995) model as the primary framework for measuring firm financial performance. Ohlson's model is widely used to assess firm valuation by incorporating accounting and market-based measures (Pantow et al. 2015). The model is particularly relevant for this study as it integrates both profitability (ROA) and market valuation (Tobin's Q) as dependent variables, providing a dual perspective on financial performance. ROA and Tobin's Q were used as dependent variables for Models 1 and 2 respectively.

$$ROA_{it} = \beta_0 + \beta_1 TLH_{it-1} + \beta_2 Sales_{it} + \beta_3 RR_{it-1} + \beta_4 Size_{it} + \beta_5 Age_{it} + \beta_6 Risk_{it} + \varepsilon_{it} \quad 1$$

$$TobinQ_{it} = \beta_0 + \beta_1 TLH_{it-1} + \beta_2 Sales_{it} + \beta_3 RR_{it-1} + \beta_4 Size_{it} + \beta_5 Age_{it} + \beta_6 Risk_{it} + \varepsilon_{it} \quad 2$$

The variables used in the models are explained below.

Dependent Variables

Return on Assets (ROA) and Tobin's Q were selected as financial performance indicators due to their distinct but complementary measurement capabilities.

ROA: ROA represents the return on assets of the companies. ROA is a financial ratio that measures a company's profitability in relation to its total assets. The percentage of net income on total assets was used to calculate the ROA. ROA was employed as it measures the operational efficiency and profitability of firms and captures the immediate financial impact of load shedding on firm earnings. Pantow et al. (2015) regard ROA as a reliable indicator of a company's profitability.

Tobin's Q: The Q ratio is another name for Tobin's Q ratio. It was calculated as ratio of the market value of equity to the book value of all assets. Companies determine their financial success using Tobin's Q ratio. Salehi et al. (2022) state that using Tobin's Q to measure company value is commendable because it is not affected by practices in the accounting space and also performs better than other accounting ratios. When the ratio is greater than one, it signifies that the company's market value is greater than its total assets, and the company may thus be overvalued (Ishaq, Islam and Ghouse, 2021). A Tobin's Q value below 1 indicates that the company is undervalued.

Retention Rate (RR): The retention rate is the percentage of net income kept on hand to expand the manufacturing business. The term "plough back" is another name for

the retention ratio. The other option is to distribute the income in the form of dividends. This ratio helps decision-makers understand how much cash the organisation is holding back to reinvest in the enterprise. The researcher was curious to learn if these manufacturing companies had decided to reinvest in the business based on the findings of the current investigation. This might be an indication that companies were investing more in alternative energy sources to address the problem of power interruptions rather than giving dividends to shareholders.

Total Load shedding Hours (TLH): The TLH refers to the number of hours for the length of power outages. Kilowatt-hours were used to measure the load shedding time. The load shedding hours were obtained from the websites of Eskom and the Department of Energy and classified according to the various load shedding stages, from stage 1 to stage 6.

Sales: Sales is the amount of revenue a company has generated. Using McGregor BFA, the sales of the manufacturing companies were retrieved for a ten-year period. According to Shawar and Siddiqui (2019), sales have been widely used to predict financial performance. This view is consistent with those of Panda (2015) and Cole et al. (2018), who note that most academics have selected sales as one of the top influencers of a company's performance. As a result, the current study has chosen sales as a metric for assessing the factors that influence the financial performance of manufacturing companies.

Age: Age is a measure of how long a company has existed since its establishment.

Risk: Risk gauges how vulnerable a business is to outside financial influence and control. The debt-to-equity capital ratio was used to calculate risk.
Size: Size is measured as the natural logarithm of the total asset of the company (Salehi et al. 2022). The size of a company has a significant impact on the profitability of companies. Many scholars utilise company size to estimate a company's performance (Salehi et al. 2022). Meles (2020) suggests that a company's financial performance increases with size.

Results & Discussion

Descriptive Statistics

The summary statistics of the variables are presented in Table 1.

Table 1. *Descriptive Statistics*

Variable	Obs.	Mean	Std. Dev.	Min	Max
ROA (%)	916	6.83	25.41	-176.75	47.22
Tobin's Q	916	1.36	1.87	0.26	12.04
TLH (hours)	916	249.01	340.08	0.00	1949.00
Sales (billions of rands)	916	1.75	8.99	0.13	35.86
RR (%)	916	85.16	13.62	13.70	100.00
Size (billions of rands)	916	0.77	73.46	0.16	47.93
Age (years)	916	40.00	27.00	12.00	128.00
Risk (%)	916	47.72	14.56	9.87	518.30

Table 1 shows that the mean total load shedding hours (TLH) is 249.01 hours, indicating that over a ten-year period, businesses lost an average of 249 hours per year due to load shedding. The average sales were R1.75 billion, with an average return on assets (ROA) of 6.83% and a Tobin's Q of 1.36. Additionally, manufacturing companies had a high retention rate (RR) of 85.16%, suggesting a preference for retaining earnings rather than distributing them as dividends to shareholders. The average company size was R0.77 billion, with an average age of 40 years, and a risk percentage of 47.72%.

Multicollinearity Test

Regression analysis should only be performed following the test for multicollinearity among the independent variables (Alabi et al. 2020). The findings of the multicollinearity between the independent variables are shown in Table 2.

Table 2. *Correlation Results*

	TLH	Sales	RR	Size	Age	Risk	VIF
TLH	1.000						**3.82**
Sales	-0.010	1.000					**6.75**
RR	-0.018***	0.019**	1.000				**2.03**
Size	-0.008**	0.569*	-0.003	1.000			**3.58**
Age	-0.005	0.091***	0.0278	-0.018**	1.000		**5.92**
Risk (%)	-0.056*	0.039	0.036***	-0.015	-0.036*	1.000	**4.71**

Note: *** = significance at 0.01; ** = significance at 0.05; * = significance at 0.1

The correlation coefficients demonstrate that the relationship between the independent variables are weak. Table 2 shows that the highest coefficient is 0.569, representing the relationship between size and sales. The weak correlation coefficients show no multicollinearity problems because all the coefficients are below 0.70 which is the acceptable threshold. The VIF results further confirm the absence of multicollinearity as all the coefficients are below the acceptable threshold of 10.

The Regression Results

The study examined the impact of load shedding on the financial sustainability of the manufacturing companies in South Africa. The study employed fixed effects and random effect estimation techniques for the analysis. The study also implemented a two-step system Generalized Method of Moments (GMM) estimator to address potential endogeneity issues arising from unobserved heterogeneity and simultaneity bias. The GMM approach ensured that the results remained consistent even in the presence of autocorrelation or omitted variable bias. The findings from this estimation reinforce the negative impact of load shedding on financial performance, which highlights the robustness of our conclusions.

The financial performance of the companies was measured using two different metrics; ROA and Tobin's Q. Table 3 presents the result of the impact of load shedding on ROA.

Table 3. *The Impact of Load Shedding on Financial Performance*

	Random Effect	**Fixed Effects**	**SYS-GMM**
ROA_{it-1}			0.421*** (6.94)
TLH_{it}	-0.012*** (-3.74)	-0.004** (2.07)	-0.286*** (-4.27)
$Sales_{it}$	-0.006 (-0.11)	-0.021 (-0.37)	-0.273* (-1.85)
RR_{it}	0.156*** (7.82)	0.139*** (6.60)	0.087** (2.04)
$Size_{it}$	-0.794 (-1.47)	-0.026 (-0.32)	-0.384 (-1.17)
Age_{it}	0.000** (1.97)	0.000** (2.35)	1.234*** (8.18)
$Risk_{it}$	-17.322*** (-4.35)	-4.129 (-1.59)	2.392 (1.14)
Constant	151.282*** (4.09)	33.053* (1.82)	7.998 (9.05**)
Observations	916	916	906
R-squared	0.8492	0.8965	
Adjusted R^2	0.8107	0.8528	
F-stats	172.825	164.07	
Prob. of F-stats	0.000	0.000	
Prob. of Hausman Test	0.106	0.106	
Durbin-Watson stats.	2.291	1.683	
AR2			0.271
Hansen stat			0.359

The results of the influence of load shedding on the ROA of manufacturing companies are summarized in Table 3. The insignificant p-value (0.106) of the Hausman test suggests that the random effect estimation technique is appropriate. Table 3 shows a coefficient of total load shedding hours of -0.0118, with a p-value of 0.000. The result demonstrates that load shedding has a negative and statistically significant impact on ROA. This result suggests that TLH has a significant inverse impact on the financial performance of the manufacturing companies in South Africa.

There are several possible reasons for this relationship. The financial burden of load shedding is twofold: direct costs related to alternative energy sources and indirect costs such as reduced production efficiency and supply chain disruptions. First, load shedding leads to frequent power outages, which disrupts the production processes of the manufacturing companies. This operational disruption results in reduced output, which directly affects the companies' ability to generate revenue. This would reduce their ROA. In this circumstance, companies that use alternative energy sources could also be impacted by the higher input costs as a result of employing alternative energy sources. Consistent with the RBV, companies with greater financial flexibility may invest in renewable energy solutions such as solar or battery storage systems, thereby mitigating operational disruptions.

Conversely, companies with limited access to capital may resort to cost-cutting measures, including workforce reductions and lower inventory levels, which can further impact financial stability. These results are consistent with previous studies by Goldberg (2015), Cole et al. (2018), Mabunfa et al. (2023), Botha (2019), and Tembe and Hlengwa (2022), who reported a significant negative impact of load shedding on company performance across various sectors. On the contrary, these findings contradict with those of Fakih et al. (2020), who found a positive and significant relationship between load shedding and financial performance.

Interestingly and surprisingly, result shows that sales have a negative and insignificant relationship with ROA. This result implies that a decrease in sales has no significant impact on ROA. The reason may be that load shedding may have forced the companies to incur extra cost to improve their revenue. The extra cost incurred to increase revenue may have been more than their commensurate return. The result further demonstrates the coping mechanism of the companies during the load shedding period. As presented in Table 3, the retention rate (RR) variable also has a coefficient of 0.1559 and a p-value of 0.000, showing a positive and statistically significant relationship between RR and ROA. This result suggests that a rise in the RR leads to an increase in ROA. The finding is in line with those of studies by Sasidharan et al. (2022), but contradicts with those of Banerjee and Majumdar (2018), who discovered that the RR had no effect on ROA.

Additionally, the risk variable displays a negative coefficient (-17.3217) and statistically significant p-value (0.000). This result demonstrates that reducing risk-related variables lead to an increase in ROA, indicating that the lesser the risk and uncertainties caused by load shedding, the better the financial performance of manufacturing enterprises. Therefore, manufacturing companies must reduce risks to a manageable level. The result further shows that age of the companies also has a positive and statistically significant impact on ROA. The conclusion is that organisations with a long history are well known, and greater reliance is placed on their resources and goodwill to drive the company's performance. The longer these companies have been in business, the more profitable they become. The prediction ability of the model is demonstrated by the R-squared (R^2). The R^2 of the model is 0.9247, suggesting that the independent variables can predict the dependent variable up to 92.47%. This demonstrates the model's strong predictive ability. The F-statistics test and the p-value of the model are 172.825 and 0.000, respectively. This result suggests that the model is fit for the estimation.

The Impact of Power Outages (Hours) on Company Value

The study also assessed the impact of load shedding on the value (Tobin's Q) of manufacturing companies in South Africa. Table 4 presents the results from the study.

Table Error! No text of specified style in document.**.** *The Impact of Load Shedding on Companies' Value*

Variables	Random Effect	Fixed Effects	SYS-GMM
TQ_{it-1}			0.953*** (7.49)
TLH_{it}	-0.0002 (-1.47)	0.001 (0.32)	-0.085** (-2.07)
$Sales_{it}$	0.0037 (0.91)	0.003 (0.85)	-0.072* (-1.85)
RR_{it}	0.0028** (1.99)	0.002** (2.16)	0.116** (2.16)
$Size_{it}$	-0.0092 (-1.25)	-0.217*** (6.22)	-0.043 (-1.09)
Age_{it}	0.000 (1.41)	0.000 (1.85)	0.086*** (5.95)
$Risk_{it}$	0.0501** (2.23)	-0.354** (-2.22)	0.149 (1.05)
Constant	1.1468** (3.72)	12.838*** (4.71)	7.195 (9.05*)
Observations	916	916	906
R-squared (R^2)	0.9018	0.8891	
Adjusted R^2	0.8702	0.8517	
F-stats	107.29	137.21	
Prob. > F-stats	0.000	0.000	
Prob. of Hausman Test	0.217	0.217	
Durbin-Watson stats.	2.194	2.378	
AR2			0.618
Hansen stat			0.334

Tobin's Q is used in Table 4 to analyse the impact of the load shedding on company value. The random effect model was used to estimate the variables under investigation since the Hausman test probability was insignificant (p-value = 0.217). The results show that the coefficient of TLH in Table 4 is -0.0002 with a p-value > 0.05. This finding demonstrates a negative and statistically significant association between the two variables. According to this finding, an increase in TLH corresponds to a decrease in Tobin's Q. The result is aligned with economic reasoning. First, load shedding disrupts manufacturing processes, which causes production delays, increased operational costs, and inefficiencies. These events decrease the overall productivity and profitability of the companies and negatively impact their value.

In addition, the companies experiencing load shedding often incur additional unplanned expenses such as cost of backup power sources including generators, or repairs for damaged machinery. These unplanned expenses negatively affect the financial resources of companies and reduce their profits margins. When this happens, investors may perceive these companies as higher-risk investments, leading to a

decline in their stock prices and, consequently, a lower Tobin's Q. This conclusion aligns with the findings of Goldberg (2015), who examined the effects of power outages on South African retail businesses.

The results also show a positive but insignificant relationship between sales and Tobin's Q. This result implies that an increase in sales might lead to an increase in company value. The Retention Rate exhibits a coefficient of 0.0028 with a p-value of 0.046, indicating that a higher retention rate positively influences Tobin's Q. Additionally, the coefficient of the risk variable highlights a negative and significant relationship between risk and Tobin's Q. This finding suggests that reducing risk levels could lead to an increase in company value. This view is consistent with the conclusions of Abebe and Abera (2019), who found that risk negatively impacts Tobin's Q. The implication of this finding is that manufacturing companies experience better financial performance at lower risk levels.

The size variable, with a coefficient of -0.00092 and a p-value greater than 0.05, demonstrates a negative but insignificant relationship between company size and value. These findings align with Zuhroh (2019), who reported a similar negative and insignificant association. This suggests that a decrease in total assets does not substantially affect company value. Similarly, the age of the manufacturing company shows a positive and significant coefficient. Manufacturing companies should consider investing in reliable infrastructure and alternative energy sources to mitigate the effects of load shedding. This could help stabilise production and protect company value. The post-estimation test results confirm to the model's and the variables' reliability. The R^2 for the regression model is 0.9018, indicating that the independent variables are responsible for about 90.18% of the variance in the value of the manufacturing companies. The model is significant and valid at 0.000 according to the F-statistics test, which has a value of 107.29.

The study's findings reveal a negative and statistically significant relationship between load shedding and financial performance, measured by ROA and Tobin's Q. This aligns with existing literature that demonstrates how energy instability disrupts business operations and erodes financial sustainability (Grainger & Zhang 2019, Mabunda et al. 2023). However, the degree of financial impact varies across firms, suggesting differences in strategic responses.

The random effects model revealed a statistically significant negative relationship between total load shedding hours (TLH) and ROA but an insignificant effect on Tobin's Q. This discrepancy can be explained by the nature of these two financial measures:

ROA measures internal profitability and is directly affected by operational disruptions. Load shedding increases production costs (e.g., generator fuel, downtime losses), which immediately reduce profitability, leading to a significant decline in ROA. Tobin's Q, however, is a market-based measure influenced by investor expectations and broader market conditions. Investors may already price in energy instability risks, meaning load shedding does not cause immediate valuation fluctuations. This aligns with prior studies showing that long-term investor sentiment may be less reactive to short-term operational inefficiencies (Salehi et al. 2022).

Additionally, some firms mitigate the impact of load shedding by raising product prices or investing in alternative energy sources, offsetting short-term profitability

losses. Investors may perceive these adaptive strategies as neutralizing the financial impact of load shedding, explaining why Tobin's Q remains statistically insignificant despite significant ROA effects.

The positive and significant relationship between retention rate (RR) and ROA suggests that firms with higher retained earnings reinvest in operational efficiency and alternative energy solutions, improving short-term profitability. This is consistent with research highlighting retention-driven reinvestment as a key factor in firm resilience (Sasidharan et al. 2022).

However, the insignificance of RR in Tobin's Q indicates that retained earnings do not immediately influence market valuation. Investors may not view high retention rates as a decisive factor in stock valuation unless there is clear evidence that retained earnings translate into long-term growth and competitive advantage. This suggests that while internal financial performance improves through retained earnings, investor sentiment remains unaffected in the short run.

A critical question arising from the findings is whether firms' financial responses to load shedding reflect short-term coping mechanisms or long-term strategic adjustments. The high retention rate (85.16%) observed in the dataset suggests that many companies prioritized reinvestment over dividend payouts, aligning with long-term adaptation strategies (Sasidharan et al. 2022). This trend indicates that companies did not merely absorb costs or transfer them to consumers but actively restructured financial resources to enhance energy resilience. Moreover, the negative correlation between risk and financial performance highlights the financial pressures imposed by load shedding. This suggests that companies that fail to mitigate energy risks experience declining returns, which reinforces the argument that energy security is a critical component of financial sustainability (Salehi et al. 2022).

The findings suggest that firm-level strategies alone may not be sufficient to mitigate the financial risks of load shedding. Policymakers must play an active role in developing energy infrastructure and regulatory frameworks that support private sector investment in alternative energy sources. Lessons from other energy-intensive economies suggest that government incentives for renewable energy adoption can significantly reduce financial strain on businesses (Akadırı et al. 2021). For corporate managers, the results highlight the importance of energy risk management as part of financial planning. Firms with higher energy dependency must integrate energy cost forecasting into their financial models, ensuring that investment in alternative energy solutions is factored into long-term growth strategies.

The findings contradict Fakih et al. (2020), who argued that firms could adapt to frequent power outages and improve financial performance. One possible explanation for this discrepancy is the predictability of power outages in different regions. While firms in the MENA region may have leveraged predictable outages for strategic planning, South African firms face highly erratic load shedding schedules, making long-term planning more difficult (Bowman 2020).

This inconsistency underscores the need to differentiate between adaptive efficiency and financial resilience. While some firms may implement short-term cost-cutting measures, long-term financial sustainability requires structural investments in energy resilience. The significant negative relationship between load shedding and

Tobin's Q suggests that investors perceive energy instability as a long-term risk, potentially reducing firm valuation.

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Conclusion

South Africa has experienced persistent challenges with its electricity supply in the past decade. As a result of this challenge, load shedding has become a frequent occurrence in the country. Companies have adopted several strategies and coping mechanisms including reduction in operation, shutting down plants during load shedding hours, investment in alternative power supply and pushing the cost to consumers. The study examined how load-shedding has affected the financial sustainability of manufacturing companies listed on the Johannesburg Stock Exchange. The study relied on secondary data from 2013 to 2022 and employed a multiple regression to examine how power outages influenced the financial performance and value of these companies between.

The findings revealed a negative relationship between load shedding and financial sustainability, implying that as load-shedding hours increased, key financial indicators like return on assets (ROA) and Tobin's Q decreased. This result indicates that frequent power outages negatively impact the ability of manufacturing companies to generate profits and increase their market value. The findings further imply that the companies should invest in alternative energy sources to reduce the financial impact associated with load-shedding. Additionally, the negative relationship between ROA and retention rate indicates that some companies have responded to the negative impact of load shedding by reducing dividend and reinvesting profits into energy solutions. This move may help ensure their long-term sustainability.

The broader implications of the study highlight serious economic and policy concerns for South Africa. First, without significant improvements in the country's energy supply, the manufacturing sector will continue to struggle and the economy will suffer. Moreover, the department of energy need to focus on developing energy infrastructure and alternative green energy sources such as solar and wind energy to stabilize the power supply, which is essential for maintaining the growth and competitiveness of South Africa's manufacturing sector. The findings of the study would enable informed investment decisions based on firms' energy resilience strategies. In addition, it highlights risk factors associated with power outages and financial performance. The study offers empirical evidence for energy policy

formulation and infrastructure investment. It further supports government intervention programs to enhance industrial energy security. In summary, while load shedding has been a major issue in South Africa, this study sheds light on its practical effects on the financial performance of manufacturing companies. It underscores the need for both businesses and the government to take proactive steps in resolving this challenge. By understanding and mitigating the impact of load shedding, manufacturing firms can better navigate the current environment and strengthen their sustainability.

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