Investigate the Impact of Employee Diversity on Resilience of External Crises: Evidence from A-share Listed Company

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Abstract. Resilience has emerged as a crucial measure of a company’s ability to withstand challenges in the current complex business environment. However, prior research indicates that employee diversity may not consistently lead to a positive impact on corporate resilience. This paper investigates the impact of diversity on resilience in the face of various external crises by examining the performance of Chinese listed companies during the 20-year period following their accession to the World Trade Organization. Employee diversity is operationalized in this study by changes in the number of employees in non-core departments, while resilience is represented by the fluctuation of the stock price minus the industry range fluctuation. Employing a fixed-effect model to analyze 20-year panel data, we find that an increase in employee diversity does not always lead to improved corporate resilience during external crises. The purpose of this paper is to examine the relationship between employee diversity and resilience in the face of different external shocks and explore why diversity may fail to enhance resilience during such circumstances. Keywords: Employment, Economics, Management, COVID-19, Growth rate.

1 Introduction

The global economy is currently facing challenges such as intensified price volatility of bulk commodities, global food and energy security issues. The International Monetary Fund (IMF) has downgraded its global growth projections three times, citing a potential threat of stagflation. The most recent forecasts indicate that global economic growth may drop below 5% by 2023[1]. Against this backdrop, the international community is looking towards China for a potential boost to global economic recovery. According to a recent article by Global Times [2] China will be the primary driver of global economic growth. This is mainly due to China’s impressive economic resilience in the face of difficult circumstances. As enterprises form the core of China’s economic activities, their capacity to maintain business continuity in spite of the uncertain times has further reinforced the Chinese economy’s ability to endure external shocks. Hence, examining the role of employee diversity in enhancing corporate resilience in the face of external shocks is vital for sustaining China’s economic growth.

Recent research has primarily focused on how CSR or ESG promotes resilience [3, 4]. However, this paper argues that it is essential to shift the focus towards understanding how
labor diversity can improve resilience within organizations and communities due to globalization and increased movement of people, since exploring Labor diversity’s impact on resilience offers a comprehensive understanding of the mechanisms that contribute to organizational and community resilience in our diverse and interconnected world.

Research conducted by Filatotchev and Toms [5], Sutcliffe and Vogus [6], and Hong and Page [7] has consistently demonstrated that employee diversity management is key to strengthening resilience. By bringing together individuals with varied backgrounds, experiences, and perspectives, organizations are better equipped to respond to challenges and facilitate sustainable growth. However, diversity is multifaceted, covering such dimensions as gender, race, and educational level, each of these elements provides unique impact to foster resilience. And all these dimensions of resilience are brought by their workforce. In this case, organizations are increasingly recognizing the importance of diversity in their workforce, with efforts to incorporate individuals from a range of backgrounds.

Pretty et al. [8] and Fleischmann et al. [9] posit that the phenomenon of employee diversity, which encompasses a multitude of individual characteristics, including but not limited to generational differences, gender identities, cultural backgrounds, nationalities, and educational backgrounds, has been shown to exert a profound impact on management practices and policies that are enacted within organizational settings. Employees, as the foundational components of organizational operations, contribute to the formation and implementation of such practices and policies. As a result, a diverse workforce, reflecting a range of backgrounds and perspectives, can provide organizations with novel insights and approaches that may enhance overall performance and adaptability in a dynamic business environment. Therefore, understanding the experiences and perspectives of employee diversity is crucial for building resilience within the organization.

However, most studies have focused on diversity in leaders rather than diversity in the workforce, and the existing literature has not yet arrived at a consensus regarding its impact. According to Williams and O’Reilly [10] and van Knippenberg and Schippers [11], diversity is believed to broaden the knowledge base and perspective from an information/decision-making standpoint, leading to positive impacts on problem solving and decision-making. Conversely, Horwitz [12] posits that social categorization can explain the negative impact of diversity, as it may restrict integration within a unit and lead to inter-group conflict.

The study will begin by reviewing existing literature on resilience and diversity to define these terms and develop suitable indicators for the research. Next, a fixed effects (FE) model will be used to analyze panel data covering 20 years to examine the impact of diversity on resilience, while also considering relevant variables. The study will also investigate the effect of employee diversity on resilience in the context of three different types of external crises. A third objective is to explore the intricate association between diversity and resilience and investigate why diversity has varying effects on resilience in different crisis situations. The ultimate goal of this study is to provide empirical evidence that can explain why employee diversity may not always have a positive impact on organizational resilience and why diversity may sometimes fail to enhance resilience during a crisis.

2 Literature Review

As of late, there has been growing attention directed towards exploring the linkages between employee diversity and organizational resilience to effectively adapt and rebound from disruptive events or challenging circumstances. Numerous studies have investigated how diversity within work units can impact organizational outcomes, such as performance [13–15], yet the outcomes are complex.
2.1 Positive Effects of Employee Diversity on Resilience

A significant advantage of diversity within teams is the enhancement of creativity and innovation that it fosters. By drawing from the varied perspectives and experiences of diverse team members, a wider array of ideas and solutions emerges, ultimately contributing to improved firm performance [15]. Additionally, the presence of a diverse workforce allows organizations to gain a more comprehensive understanding of, and cater to, the needs of their heterogeneous customer base. This, in turn, results in heightened customer satisfaction and loyalty, further reinforcing the positive impact of diversity on performance [16]. Additionally, Roupakias and Dimou demonstrate that a diverse workforce may foster enhanced integration into global markets, attract foreign investment, and stimulate trade [17].

It is crucial to consider the role of external factors, such as CEOs’ beliefs, in determining the extent to which diversity positively affects resilience. Ng and Sears [18] demonstrated that CEOs play a pivotal role in shaping organizational culture and policies, and their personal values may substantially impact the success or failure of diversity initiatives. Consequently, the positive outcomes associated with workforce diversity can be further amplified by supportive leadership and an environment conducive to the effective implementation of diversity initiatives.

2.2 MIXED Effects of Employee Diversity on Resilience

Stahl et al. [19] highlight the complex and ambivalent relationship between diversity and team outcomes. The findings demonstrate that employee diversity can, on one hand, foster creativity, problem-solving, and decision-making, resulting in enhanced team performance. Conversely, employee diversity may also exacerbate communication challenges, misinterpretations, and conflicts, leading to detrimental consequences for team performance and satisfaction. The complexity of these results might be attributed to external factors, as Nishii [20] emphasizes the crucial role of factors such as organizational climate in shaping the outcomes of gender-diverse teams. The study demonstrates that an inclusive climate can facilitate positive outcomes for diverse teams by mitigating the negative effects commonly associated with diversity, including conflict and miscommunication.

2.3 Negative Effects of Employee Diversity on Resilience

Despite the potential benefits of workforce diversity, some research suggests that it could have negative implications for organizational resilience. This is because diversity may limit within-unit integration and is sometimes considered a source of intergroup conflict [11, 12]. For instance, Mayo et al. [21] found that while demographic diversity increased participation within the group, it also made it more challenging for members to accurately identify and rely on the most knowledgeable individuals. As a result, this hindered the overall effectiveness of expertise utilization in the decision-making process.

In summary, the literature indicates that employee diversity can exert a complex impact on organizational resilience, with certain aspects of diversity having either positive or negative influences depending on the context. This complexity may be attributed to external factors that shape the relationship between diversity and resilience. In the subsequent sections, we will use our data to demonstrate how diversity responds to different external shocks.
3 Methodology

3.1 Modelling Employee diversity and firm resilience

This paper uses panel data, and the two-way fixed effects model is employed in order to control for both firm-specific and time-specific fixed effects, thereby addressing the endogeneity issue caused by omitted variables and eliminating the impact of macro-environmental variations across various years. Therefore, this study mainly employs this model to conduct the analysis. The specific formula for the model is presented below:

$$\text{resilience}_{i,t} = \beta_0 + \beta_1 \text{Dep}_{i,t-1} + \sum \phi_i \text{Controls}_{i,t-1} + \mu_i + \mu_{year} + \epsilon_{i,t}$$

$$\text{resilience}_{i,t} = \beta_0 + \beta_1 \text{Edu}_{i,t-1} + \sum \phi_i \text{Controls}_{i,t-1} + \mu_i + \mu_{year} + \epsilon_{i,t}$$

$$\text{resilience}_{i,t} = \beta_0 + \beta_1 \text{Dep}_{i,t-1} + \beta_2 \text{Edu}_{i,t-1} + \sum \phi_i \text{Controls}_{i,t-1} + \mu_i + \mu_{year} + \epsilon_{i,t}$$

The model above uses subscript $i$ and subscript $t$ to represent individual enterprises and years respectively; $\beta_0$ is the intercept, $\beta_1$ is the regression coefficient of the explanatory variable, and $\mu_i$ and $\mu_{year}$ represent fixed effects at the enterprise and year levels respectively; and $\epsilon_{i,t}$ is the residual term. Note that the explanatory variable $t-1$ indicates whether the change in diversity in the previous year affects the change in resilience in the next year. This is done to address issues of two-way causality and endogeneity.

3.2 Measurement of Variables

3.2.1 Employee Diversity

We used the proportion of non-core department employees to total employees as a proxy for workforce diversity. This indicator is representative because in the process of organizing the data, we found that while different industries require different departments, the establishment of finance, sales, technology, production, and operations departments can be seen in the vast majority of companies. However, departments such as public relations, advertising, and logistics are non-core departments for most companies and are not established by all companies. Therefore, we believe that non-core departments often represent specialized areas of the business that require specific skills and expertise. By having a diverse range of non-core departments, a company may be able to tap into a wider pool of talent and perspectives, which can lead to greater diversity in the workforce. Moreover, non-core departments can also represent areas of the business that are not traditionally associated with the company’s core competencies. By expanding into these areas, a company may be signaling its openness to new ideas and approaches, which can create a more inclusive culture. Thus, we believe that the rate of non-core departments can represent diversity.

3.2.2 Resilience

Organizational resilience is often conceptualized as either a static capability or a dynamic process, which encompasses an organization’s potential capacity to anticipate, avert, and adapt in response to environmental shocks [22]. In this study, the stability of a company’s share price serves as an indicator of resilience. Generally, resilience is defined as a company’s ability to withstand adverse conditions, with stock price fluctuations being a critical measure of its financial health and market performance. Consequently, changes in stock prices can, to some extent, reflect a company’s resilience.

Each industry has a corresponding index, the fluctuations of which provide a summary of the market performance of that industry. Consequently, when the difference between a company’s annual stock volatility and its industry index is considered, it objectively reflects the..
company’s unique performance without industry fluctuation. This difference can be regarded as an indicator of the company’s resilience.

### 3.2.3 Control variables

This study uses seven control variables: Size of the firm, Capital structure, Age, the growth rate of the firm, Rate of Return on Equity, The quality of cash flow, State owned or not. Controlling for these factors enables researchers to disentangle the impact of diversity on firm resilience from the effects of other variables. This practice allows researchers to evaluate whether diversity is a significant determinant of resilience, even after accounting for these other factors. Hence, controlling for confounding variables increases the precision of the estimates of the effect of diversity on resilience. Moreover, controlling for these variables is essential to reduce the risk of omitted variable bias, which can arise when significant variables that influence both the dependent and independent variables are not considered in the analysis, leading to inaccurate or misleading results.

### 4 Case Study

#### 4.1 Sample selection

The data used in this study were obtained from the Wind Information (WIND) and China Securities Market Research and Design Co. Ltd. (CSMAR) databases. Before conducting the empirical analysis, we applied winsorization to all continuous variables at the firm level to remove outliers that could potentially affect the regression results. Specifically, we truncated the variables at the 1st and 99th percentiles. Data analysis and processing were primarily conducted using Stata version 17.0 software.

Regarding the sample, we collected data from all A-share listed companies that have been in continuous operation. Specifically, we required that companies have been listed on the A-share market between 2001 and 2019, with operational data available from 2001 to 2021. However, the data were unbalanced; for example, if a company was only listed in 2007, we would lack operational data for that company from 2001 to 2006.

The choice of data starting from 2001 was due to China’s accession to the World Trade Organization (WTO) in that year, which led to significant changes in the country’s economic policies and environment. In addition, as data on Chinese firms have become increasingly available over the years, it has become easier to collect data on financial metrics such as ROE starting from 2001. This enables more comprehensive analysis of long-term trends in a company’s financial performance.

### Table 1. Variable Definition and Description

<table>
<thead>
<tr>
<th>Variable Type</th>
<th>Variable symbol</th>
<th>Variable name</th>
<th>Meaning description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpreted variable</td>
<td>Res</td>
<td>Resilience</td>
<td>The stock yield in Yeart - The yield of SW industry index in Year(t-1)</td>
</tr>
<tr>
<td>Explanatory variable</td>
<td>Dep</td>
<td>The diversity of types of department staff</td>
<td>(Number of non core department employees)/(Total number of employees)</td>
</tr>
<tr>
<td></td>
<td>Edi</td>
<td>Degree of academic dispersion</td>
<td>Ln (SD (each number of people with different educational background))</td>
</tr>
<tr>
<td>Control variable</td>
<td>Size</td>
<td>The scale of a company</td>
<td>Ln (Total Assets)</td>
</tr>
<tr>
<td></td>
<td>Lev</td>
<td>Capital Structure</td>
<td>(Total liabilities)/(Total assets)</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>The years of establishment</td>
<td>(The last day of Yeart - Date of Establishment)/365</td>
</tr>
<tr>
<td></td>
<td>Growth</td>
<td>The growth rate of a company</td>
<td>√[Total operating revenue in Yeart - Total operating revenue in Year(t-5)]/Total operating revenue in Year(t-5)</td>
</tr>
<tr>
<td></td>
<td>ROE</td>
<td>Rate of Return on Equity</td>
<td>[(Net Profit)/(Net Assets)]/(1 + [(Net Profit)/(Net Assets)])</td>
</tr>
<tr>
<td></td>
<td>CF</td>
<td>The Quality of Cash flow</td>
<td>[(Net operating cash flow)/Total operating income]</td>
</tr>
<tr>
<td></td>
<td>SOE</td>
<td>State owned enterprise or not</td>
<td>1 is a state-owned enterprise, 0 is a non-state-owned enterprise</td>
</tr>
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</table>

The analysis of the dataset comprising 36,709 observations indicates that the mean resilience score is -3.518, with a wide range of variation from a minimum value of -262.55 to a maximum value of 351.869. The median resilience score is -.166, and the standard deviation...
Table 2. Summary Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>min</th>
<th>Median</th>
<th>max</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>resilience</td>
<td>36709</td>
<td>-3.518</td>
<td>-262.55</td>
<td>-0.166</td>
<td>351.869</td>
<td>53.658</td>
</tr>
<tr>
<td>Dep</td>
<td>36709</td>
<td>10.568</td>
<td>0</td>
<td>9.249</td>
<td>58.065</td>
<td>10.309</td>
</tr>
<tr>
<td>lsize</td>
<td>36709</td>
<td>12.256</td>
<td>8.344</td>
<td>12.055</td>
<td>18.723</td>
<td>1.665</td>
</tr>
<tr>
<td>leverage</td>
<td>36709</td>
<td>41.955</td>
<td>0</td>
<td>40.914</td>
<td>93.953</td>
<td>20.514</td>
</tr>
<tr>
<td>age</td>
<td>36709</td>
<td>14.986</td>
<td>0</td>
<td>14.71</td>
<td>37.54</td>
<td>6.497</td>
</tr>
<tr>
<td>cash</td>
<td>36709</td>
<td>13.529</td>
<td>-44.589</td>
<td>10.28</td>
<td>292.46</td>
<td>23.271</td>
</tr>
</tbody>
</table>

is 53.658, implying a significant degree of dispersion in the data. Additionally, the mean “Dep” is found to be 10.568, with a minimum value of 0 and a maximum value of 58.065. The median “Dep” value is 9.249, and the standard deviation is 10.309, indicating a moderate level of variation.

In terms of the other variables, the mean values are as follows: "Dep" is 10.568, "lsize" is 12.256, "leverage" is 41.955, "age" is 14.986, "growth" is 10.99, "roe" is 14.442, and "cash" is 13.529. It is worth noting that the minimum values for "Dep", "leverage", and "cash" are 0, indicating the presence of firms with zero values for these variables within the sample. In contrast, the maximum value for "roe" is 71.055, indicating the existence of firms with a high return on equity. With the exception of "leverage," which has a standard deviation of 20.514, the standard deviation values for the other variables are relatively low, ranging from 1.665 to 23.271.

4.2 Result Analysis

Table 3 presented outlines the results of a regression analysis exploring the influence of various shocks and crises on firm resilience, as measured by alterations in the "resilience" variable. The sample is divided into four subsets according to the occurrence of the full sample, financial crises, trade wars, and the COVID-19 pandemic.

To investigate whether the relationship between diversity and resilience has been altered by a particular impact, this paper introduce a time dummy variable and interact it with diversity. Subsequently, the association between diversity and resilience pre- and post-event is assessed by analyzing the coefficient of the interaction term in an academic context. The findings reveal a significant and positive impact of workforce diversity on resilience in the context of financial crises. Conversely, in the context of trade wars, the effect is negative, indicating that workforce diversity undermines resilience. However, no significant effect of workforce diversity on resilience is found in the context of pandemic events.

The divergent effects of employee diversity on firm performance under distinct economic shocks can be ascribed to the unique influence of these shocks on various facets of firm operations. Financial crises [23, 24], trade wars [25], and pandemics [26–29] are regarded as severe adverse events. These events are characterized by their unpredictability, suddenness, and the serious threats they pose to organizations. Each exert a distinct impact on the economic and business landscape, affecting diverse operational areas within an organization. For instance, a financial crisis may result in constrained credit and diminished access to financing, potentially hindering a company’s financial management. Conversely, a trade war might precipitate increased tariffs and trade barriers, potentially disrupting supply chains and suppressing demand for specific products. Meanwhile, a pandemic could necessitate public
health interventions such as lockdowns, potentially disrupting supply chains, dampening demand, and escalating costs. It is precisely the distinct impacts of various external stressors on enterprises that lead to the differing outcomes of employee diversity on resilience amid disparate external crises.
4.3 Discussion

4.3.1 Financial Crisis

In the context of a financial crisis, a diverse workforce can significantly contribute to an organization’s ability to navigate economic turbulence by enhancing its cash flow and market share. Employees from varied backgrounds bring a wealth of knowledge, skills, and perspectives to the table, which can lead to the development of innovative strategies and solutions for managing cash flow more effectively. By optimizing working capital, reducing costs, and identifying new revenue streams, a diverse workforce can help maintain a healthy cash flow even during challenging economic times.

Additionally, employee diversity can enable companies to better understand and cater to the needs of a broader customer base, leading to an increased market share. By leveraging the unique insights and experiences of a diverse team, organizations can develop more targeted marketing strategies, tailor their products and services to suit the preferences of various customer segments, and expand their reach into new markets. As a result, companies can strengthen their competitive position and secure a larger share of the market, further bolstering their resilience in the face of financial crises.

4.3.2 Trade War

In contrast, during a trade war, the challenges faced by enterprises are distinctly different from those encountered during a financial crisis. In these situations, the diverse cultural backgrounds resulting from employee diversity may lead to a multitude of opinions on crisis management, stemming from varied experiences, values, and beliefs. This divergence in perspectives can potentially escalate conflicts within the organization, as employees struggle to reach a consensus on the best course of action.

Such conflicts may increase operational costs due to the necessity of resolving disputes, investing in additional training, or even restructuring teams to minimize disagreements. Moreover, these conflicts can hinder organizational efficiency and coordination, as the time and resources devoted to addressing internal disagreements could be better allocated to addressing the external challenges posed by the trade war. In some cases, prolonged disputes could result in sunk costs if the organization is unable to adapt and respond effectively to the rapidly changing environment.

4.3.3 Pandemic

Moreover, the impact of workforce diversity on resilience may not be significant in certain circumstances, such as during a pandemic. This lack of significance could be attributed to the fact that public health measures, such as lockdowns or social distancing, may overshadow the potential benefits of diversity. For instance, strict public health regulations could limit the opportunities for diverse teams to interact and collaborate effectively, which could negatively affect their ability to leverage their unique perspectives and resources. Additionally, the shift to remote work during a pandemic could further reduce the opportunities for diverse teams to collaborate and capitalize on their unique perspectives and resources. With employees working from isolated locations, it may become more challenging for organizations to facilitate the exchange of ideas and knowledge that typically drives the positive influence of diversity on resilience. Consequently, under such circumstances, the impact of workforce diversity on organizational resilience may not be as significant as in other contexts.

As a final point, it is essential for firms to consider the external environment when managing workforce diversity. By adopting this approach and adapting to different situations,
companies can optimize the benefits of workforce diversity and strengthen their resilience in the face of diverse external shocks.

5 Conclusion

Conclusively, this study offered valuable insights into the association between employee force diversity and firm resilience in the face of diverse economic shocks. Regarding data, we collected and organized changes in the number of employees and stock prices of listed companies in China from 2001 to 2021. We innovatively used the proportion of employees in non-core departments as a diversity indicator, and the relative volatility of a company’s stock price as a resilience indicator. Methodologically, we employed multiple regression models and fixed effect models to analyze the relationship between employee diversity and firm resilience. Additionally, we created crisis-specific groups and multiplied diversity and time dummy variables to examine the correlation between employee diversity and firm resilience before and after the impact, as indicated by the coefficient of the multiplicative term. Our results demonstrated that the effect of employee diversity on firm resilience varied depending on the type of economic shock. Specifically, while employee diversity had a positive influence on firm resilience in the context of financial crises, it had a negative impact on firm resilience during trade wars and did not have a significant effect during the COVID-19 pandemic.

This research was noteworthy for several reasons. First, it used a large dataset of A-list companies, providing robust and reliable evidence for the relationship between employee diversity and firm resilience. Second, this study examined the nuanced relationship between employee diversity and firm resilience under different economic shocks, which had not been extensively explored in the literature. Third, the study creatively employed the proportion of employees in non-core departments as a measure of employee diversity, which enriched the diversity measurement methods in the field. Overall, our research had significant implications for firms and policymakers, suggesting that employee diversity may not always be an effective strategy for enhancing firm resilience, especially during certain types of economic shocks.

While this study provides valuable insights into the relationship between employee force diversity and firm resilience, several avenues for future research can be explored. In this study, the proportion of employees in non-core departments served as the measure of employee diversity. However, to further enhance the understanding of the relationship between employee diversity and firm resilience, future research can investigate additional measures of employee diversity such as educational background, age, gender, and ethnicity. Incorporating these measures can provide a more comprehensive and detailed analysis of the impact of employee diversity on firm resilience. This expanded approach can lead to a deeper understanding of how firms can better prepare and respond to various economic shocks, as well as inform policies and practices that promote diversity and enhance resilience.

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