

Article

Does the Inclusion of Disabled Employees Affect Firm Performance? Empirical Evidence from China

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Abstract: Disabled persons are the largest minority group in the world and an important part of the labor market. However, few studies use empirical methods to investigate the economic consequences of including disabled employees from the perspective of the demand side. Based on the background of China's employment quota system for the disabled, and using a sample of Chinese Listed Companies from 2016 to 2020, this paper empirically tests the influence of including disabled employees on firm performance. The results show that there is a U-shaped relationship between the inclusion of disabled employees and firm performance. Firm size and social donation have a negative incentive effect, while average employee compensation has a positive incentive effect on the relationship between disabled employees and firm performance. The above results provide empirical evidence for companies to arrange a diversified labor force, and also provide a new perspective for policymakers to adjust policies to promote the employment of the disabled.

Keywords: disabled employee; firm performance; diversified firm culture; CSR; sustainability



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1. Introduction

Employment is a fundamental human right of the disabled, and is also an important way for them to meet their survival needs, fully integrate into social life and realize their self-worth [1,2]. As a group with a total population of more than 1 billion [3], the difficulty of employment for the disabled has always been a matter of great concern to official organizations and scholars [4–6]. The OECD (2003; 2010) reported that disabled people were at twice the risk of unemployment and poverty compared to non-disabled people. Especially since the outbreak of the COVID-19, disabled groups have faced more serious inequality, and they often feel discriminated against and marginalized [7]. Since the mid-twentieth century, many countries have begun to establish education and employment support systems for the disabled in order to promote their employment [8]. The employment support system for persons with disabilities in various countries mainly includes two modes. One is to use non-specific laws to protect the equal participation of persons with disabilities in social life and employment (e.g., the Americans with Disabilities Act), while the other is the employment protection system to promote the employment of severely disabled persons (e.g., the employment quota systems in China and the Netherlands) [9].

Under the employment quota system, large organizations have quotas for employing persons with disabilities and face fines if they fail to meet the quotas. Many ESG rating agencies also regard the company's employment security for the disabled as one of the important standards for labor relations management and ESG rating. Although more and more organizations have realized that managing the labor force is very necessary in an increasingly diverse society, due to the lack of actual data on the employment of disabled persons by enterprises, few studies directly provide empirical evidence on the financial consequences of employing disabled persons [10]. Employers have some prejudice against

disabled employees because they have no way to know the actual impact of employing various types of disabled persons on firm performance.

In this study, we use the financial data publicly disclosed by Chinese listed companies to investigate the actual impact of including disabled employees on firm performance under the employment quota system. In 2015, the Chinese government issued a new regulation on promoting the proportional employment of persons with disabilities, requiring enterprises with more than 20 employees to complete the employment quota. If enterprises fail to meet the quota set by the local government, they must pay employment security fund for the disabled based on the average compensation level of employees on-the-job. When the number of disabled employees they employ exceeds the quota, the government will grant part of the subsidy as a reward. Since the implementation of the new regulation, more and more listed companies have disclosed the annual payment of employment security fund for the disabled in the notes to their financial statements, which provides data which supports us in calculating the number of disabled employees actually employed by the company.

The purpose of this study is to use the data of the disability insurance fund disclosed by Chinese listed companies since 2016 to calculate the number of disabled employees actually employed by companies and finally explore the impact of including disabled employees on the firm performance. Previous studies have proved that as long as the post setting is reasonable, the work performance of disabled employees is at least no lower than that of other employees [11], and that disabled employees themselves are more loyal [12], punctual and have a higher retention rate [13–15]. Such inclusive behavior will bring benefits such as customer loyalty [16,17], inclusive corporate culture [17,18] and better company image [19–21]. However, entrepreneurs often believe that people with disabilities are inefficient [22], and are unwilling to spend a lot of money on the construction of barrier-free measures and the medical security of disabled employees. In our sample, few companies have reached the employment quota for persons with disabilities. Many companies prefer to pay high amounts of employment security fund rather than provide jobs for the disabled. The annual payment of employment security fund for the disabled even exceeds the stamp tax in some companies. The impact of including disabled employees on firm performance, as well as whether entrepreneurs are unwilling to hire disabled employees due to their low efficiency or because of the entrepreneurs' own prejudice, are extremely important questions that demand verification.

Our main results show that there is a U-shaped relationship between the number of disabled employees and firm performance. Our explanation is that the employment decisions of companies depends on the trade-off between cost and benefit. When companies employ fewer disabled employees, they need to invest a lot in training, communication and barrier-free facilities. Employees may also have discriminating thoughts towards disabled employees which will affect the production efficiency to a certain extent. At this stage, there may be a negative correlation between inclusion of disabled employees and firm performance. However, when the number of people exceeds a certain threshold, the cost of barrier-free facilities will be diluted, companies will have gradually formed an inclusive corporate culture, and they will begin to enjoy the improvement of company image, inclusive cultural incentives and government policy dividends brought by employing disabled employees. At this stage, the correlation between inclusion of disabled employees and firm performance will be positive. In order to eliminate potential endogenous problems, we use the employment quota of the company specified by the local government as an exogenous instrumental variable, and our main results are still robust. Furthermore, we examine the moderating effect of corporate heterogeneity on the relationship between inclusion of disabled employees and firm performance, and find that our main results are more significant in companies with small size, without other social donation projects and with higher employee compensation.

We contribute to the literature in three ways. First, this paper uses the data of the employment security fund for the disabled paid by Chinese listed companies and enriches the empirical results of the economic consequences of employing disabled employees. Due to the lack of data, previous studies mostly took the form of interviews and case studies

to investigate the advantages and disadvantages of employing disabled persons [10–22]. This study calculates the number of disabled employees through the employment security fund for the disabled and conducts a large sample test on the economic consequences of including disabled employees. Second, we enrich the literature on the relationship between labor diversity and firm financial performance. As a group with more than 1 billion people, the disabled represent one of the largest sources of untapped talent in the labor force [10], but scholars pay less attention to this group from the perspective of corporate finance. Our research provides new evidence of the impact of diversification (especially the inclusion of persons with disabilities) on employees from the micro level of enterprises. Finally, there is little literature investigating CSR and ESG from the perspective of the employment arrangements of disabled employees. Our research provides a new perspective for follow-up study of CSR and ESG.

This study is also significant in practice. First, due to the lack of empirical evidence, entrepreneurs often think that people with disabilities are incompetent for most jobs. This study explores how the inclusion of disabled employees affects firm financial performance, and provides empirical evidence for entrepreneurs to manage labor relations, shape sustainable development and ESG competitiveness, and seek a win-win balance between social performance and company financial performance. Second, from the perspective of market mechanism and the demand side, this study explores the impact mechanism of disabled employees on firm performance, considers what kind of incentive policies can better encourage companies to hire disabled people, and provides specific policy suggestions for improving the employment quota system for the disabled.

The paper proceeds as follows. The second part introduces China's employment security system for the disabled. In Section 3, we present the literature review and hypotheses. The fourth part is the research design. We describe the data and methods in detail. In Section 5, we show the empirical results and relate them to the hypotheses. In Section 6, we provide the evidence of further studies in which we test the relationship between disabled employees and labor productivity and the effects of employing the disabled in different industries on firm performance. Finally, we conclude our analysis and make suggestions for entrepreneurs and policy-making departments.

2. China's Disability Employment System

There are three main employment modes for the disabled in China: centralized employment, proportional employment and individual employment. Like other members of society, persons with disabilities also have the need for social interaction and have equal rights to work and development [2]. Previous studies have also shown that people employed in the open labor market have a higher quality of life than those employed in protective workshops [23]. Compared with centralized employment in welfare enterprises and individual job selection, proportional employment (employment quota system) can better protect the rights of the disabled to develop and promote social communication. In recent years, the Chinese government's policy system has also been gradually weakening its emphasis on centralized employment and emphasizing instead market-oriented models such as proportional decentralized employment [24].

China's employment quota system dates back to 1990. The 1990 law on the protection of the disabled mentions that employers should arrange the employment of the disabled according to a certain proportion. However, due to weak supervision, the proportional employment system has been ineffective. In September 2015, the Chinese government launched the Management Regulation of the Collection and Use of Employment Security Fund for the Disabled, redefining the employment quota for the disabled in enterprises and strengthening the collection of fines from enterprises that fail to meet the quota. According to the new regulation, enterprises with more than 20 employees are obliged to provide jobs for the disabled according to the quota, which ranges from 1.5% to 2% in different provinces. If the enterprises fail to achieve the quota, they must pay the employment security fund for the disabled based on the average compensation of on-the-job employees.

Conversely, enterprises that have overfulfilled the employment task can be rewarded with government subsidies.

According to our calculation, the employees' average monthly compensation of Chinese Listed Companies in 2021 is about 16,000 yuan; that is to say, compared with other countries' implementation of the employment quota system for the disabled, the quota required by the Chinese government is relatively low (e.g., the quota set by Germany is 6%, and the quota set by Austria is 4%) but the amount of employment security fund for the disabled is relatively high (e.g., Japan requires employers to pay a monthly amount of 50,000 yen per person short of their levy quotas if they are unable to achieve the quotas, equivalent to 2555 yuan). In the following four years, in order to reduce the economic pressure of enterprises, the Chinese government reduced the maximum amount of employment security fund for the disabled and in 2020 adopted the method of phased collection. However, the overall model of the employment quota system has not changed greatly.

In addition to employment security fund for the disabled, the Chinese government has also adopted tax relief for enterprises that provide jobs for the disabled. The wages paid to disabled employees can be 100% added and deducted when paying enterprise income tax. Disabled employees are also exempted from individual income tax, indirectly reducing an enterprise's labor cost.

3. Literature Review and Research Hypothesis

3.1. Literature Review

3.1.1. Labor Productivity of Disabled Employees

Studies have shown that employers believe the biggest challenge in recruiting people with disabilities is the worry that they cannot complete their work effectively [25]. This concern is mainly based on three considerations. First, the physical and mental conditions of disabled employees may lead to their higher absenteeism rate, shorter working hours and lower productivity [26]. Second, employers are worried that the disabled cannot complete manual work and desk work at the same time [27,28]. Third, sometimes the disabled cannot effectively use the equipment provided in the workplace [29], which will affect the communication between the disabled and other employees. Employers need more accurate and practical information, especially on the specific impact of different types of disability on productivity, in order to eliminate their preconceptions about persons with disabilities and concerns about the productivity.

In fact, as long as the work arrangement is reasonable, disability does not necessarily reduce work efficiency. For example, case studies have shown that deaf employees are fully competent for work on the production and assembly line [10]. Employees with physical disabilities are no different from other people in speech expression and can be fully competent for customer service [30]. Moreover, due to the difficulty of job hunting, disabled employees will cherish their work. They tend to be more loyal, punctual [12], work longer and have a lower turnover rate [13–15]. In addition, the construction of barrier-free facilities is the most important way to eliminate "environmental barriers" in the workplace and improve the labor productivity of disabled employees [31].

3.1.2. Employee Diversity and Firm Performance

The core issue of employee diversity discussion is the diversification effect brought by differences among employees. The differences among employees will affect their way of thinking and work attitude, impacting firm performance. For the impact of employee diversity on firm performance, information decision theory (Williams et al., 1998) [32] and social classification theory (Turner et al., 1987) [33] give two opposite explanations.

Information decision theory believes that diversity plays a positive role in promoting firm performance. When there are great differences within the group, the knowledge and skills brought by diversity can fully increase the cognitive resources of the group and improve firm performance [34]. These documents mainly focus on the gender composition of corporate governance. In the context of our study, employees with a disability contribute

new creative and other skills to the work environment and their role [19,20,35]. Disabled employees can think from the perspective of different customer groups and make the company's customer base more diversified [14,18,36]. In addition, the company's inclusion of disabled groups can make employees feel social altruism and personal satisfaction [16], creating a more inclusive workplace culture and thereby strengthening a company's overall workforce [5,18,20,37,38].

Social categorization theory believes that diversity has a negative effect on firm performance because diversity may lead to the decrease of team cooperation and the efficiency of the decision-making process [39]. In the context of the including disabled employees in the workforce, people are often reluctant to interact with those with mental health problems and equate mental illness with a tendency towards violence [40]. Similarly, employees have negative feedback on people with communication barriers, believing that they do not have enough ability in the fast communication environment and will affect the overall work performance of the team [41].

Furthermore, the literature shows that the specific impact of diversity on firm performance may vary depending on the environment in which the company operates [10]. For example, the study conducted by Duppati et al. (2020) shows that the market performance of female directors is better in countries that support gender equality [42]. The results of these studies show the positive effects of diversity to be stronger under a climate of supportive diversity conditions.

3.1.3. Corporate Social Responsibility and Firm Performance

With the rise of the concept of corporate social responsibility, CSR is gradually regarded by companies as an important strategic resource in improving financial performance. Corporates' fulfillment and disclosure of social responsibility can help establish a good reputation and corporate image [43,44]. Especially since the outbreak of COVID-19, investors and the public have paid more attention to the sustainable development ability of enterprises and their long-term commitment to fulfilling their social responsibilities [45]. From the perspective of risk management, continuous CSR behavior will bring positive moral capital, reduce the negative evaluation of consumers after negative events and play a buffer role in the event of crisis [46]. In addition, CSR is often regarded as an important way to obtain political connection and develop resources [47,48], playing a positive role in promoting firm performance.

Although the topic of CSR has a long history, few studies directly discuss the impact of CSR on firm performance from the perspective of including disabled employees. The inclusion of disabled employees is a form of CSR. Internal employees, including the disabled, can make employees aware of the company's efforts to fulfill social responsibility, which will result in lower turnover and improve the participation and potential of all employees [49]. For external stakeholders, the inclusion of disabled employees creates a positive corporate image [20,21]. Research by Henry et al. (2014) [18] confirms that companies that include employees with disabilities can gain a larger customer base and have the opportunity to win higher customer satisfaction and brand loyalty.

3.2. Research Hypotheses

3.2.1. Disabled Employees and Firm Performance

Starting from the rational man hypothesis, the company's employment decisions should depend on the trade-off between cost and benefit. There are four categories of reasons why entrepreneurs employ people with disabilities. First, under reasonable job arrangements, the disabled have a labor productivity no lower than that of other people [10]. Additionally, they are more loyal and punctual and have a lower turnover rate [12–15], which will save the company's retraining costs. The second category is the creativity and diversified thinking in the workplace brought by the diversity of the labor force. Disabled employees can think more from the perspective of disabled customers, which may broaden the company's customer base [18–20]. The inclusion of disabled employees

may also enhance employees' recognition of the firm culture and improve the overall labor productivity. Third, the participation of disabled employees can create a good corporate image [43,44], improve the public and rating agencies' evaluation of CSR and ESG, and indirectly improve firm performance. Furthermore, in the context of the employment quota system, the number of disabled employees is directly linked to government fines or subsidies. Companies that fail to meet the employment quota for the disabled shall pay the employment security fund for the disabled based on the average compensation of employees on the job. Companies that exceed the quota will also receive government subsidies as compensation. In addition, the wages paid to disabled employees can be 100% added and deducted when paying enterprise income tax. In terms of government procurement, priority will also be given to companies that include more disabled employees, which will directly affect the company's profits.

Although they are aware of the many benefits that the inclusion of disabled employees can bring to companies, many entrepreneurs are still reluctant to provide jobs for persons with disabilities. Here, we summarize the reasons why entrepreneurs are reluctant to hire people with disabilities mentioned in previous studies. The first one is the fear that people with disabilities cannot effectively complete their required work [50]. We believe that this phenomenon may be caused by improper job arrangement or incomplete construction of barrier-free facilities. Second, as mentioned above, the impact of diversity on firm performance is related to the company's operating environment [10]. In an intolerant cultural environment, employees may have been distanced from the disabled, affecting the overall work performance [40,41]. The return on investment of implementing diversified management policy is a long-term process which may be difficult to measure and not immediately tangible [10]. Finally, the inclusion of disabled employees will bring a lot of direct physical expenses, including a large amount of investment in barrier-free facilities and training costs in the early stage, health care costs, workers compensation costs and litigation costs that the company faces during the employment of disabled persons [50].

In general, we find that most of the costs of including disabled employees need to be invested in the early stage of employment, but that most of the benefits occur in the later period of employment. When the number of disabled employees is small, the company needs a lot of investment in barrier-free facilities, training and diversified management policies. Other employees may reject disabled employees and the public will not regard the employment of individual disabled persons as "socially responsible". At this stage, the cost of including disabled employees exceeds the benefits. The correlation between the number of disabled employees and firm performance will be negative. When the number of disabled employees reaches a certain threshold, the company gradually forms an inclusive corporate culture, the cost of barrier-free facilities in the early stage is diluted, and the benefits brought by employee diversity and the effect of CSR reputation are gradually revealed. In addition, the inclusion of disabled employees also has the benefits of government subsidies and tax relief. At this stage, the benefits of including disabled employees gradually exceed the costs. The correlation between the number of disabled employees and firm performance should be positive. Based on the above discussion, we put forward the following hypothesis:

Hypothesis 1 (H1). *There is a U-shaped relationship between the number of disabled employees and firm performance.*

3.2.2. Moderating Effect

Furthermore, we discuss the moderating effect of corporate heterogeneity on disabled employees–firm performance relationship.

In the previous discussion, we mentioned that diversity is an important way of affecting the relationship between disabled employees and firm performance. Early research on the diversity–firm performance relationship found that the relationship was moderated by firm characteristics such as firm size [51]. Large companies may have more formal procedures, policies and personnel structures that hinder the integration of diverse cultures.

Compared with large companies, smaller companies are found to be more flexible and have less inertia [52,53]. They can integrate diversified practices better [10] and form an inclusive corporate culture faster. This means that although large companies can accommodate more disabled employees, small companies can integrate them more effectively to improve firm performance.

Based on the above analysis, we hold the opinion that small companies can better enjoy the benefits of including disabled employees. We put forward our second hypothesis:

Hypothesis 2 (H2). *The U-shaped relationship between the number of disabled employees and firm performance is more significant for small companies.*

Next, we consider the reputation effect and political connection effect of CSR. Inclusion of disabled employees can be regarded as a means for corporates to fulfill their social responsibilities. However, most of the existing literature on the impact of CSR mainly focus on the perspective of social donations [54] and environmental protection, especially carbon emissions [55,56]. Due to the lack of data, little published literature directly investigates the economic impact of CSR from the perspective of inclusion of disabled employees. Here, we further investigate the complementary effect of including disabled employees and other CSR behaviors. We chose the variable of social donation. If the reputation effect of CSR is indeed a mechanism that affects disabled employee–firm performance relationship, we predict that the inclusion of disabled employees and social donations will directly form a complementary relationship; that is, when the company does not have other social donation projects, the inclusion of disabled employees has a more significant reputation effect and political connection effect and the impact of disabled employees on firm performance is more significant. When the company has other social donation projects, the incremental contribution of including disabled employees to CSR reputation effect is relatively small and the impact on corporate performance is relatively weak. Next, we put forward our third hypothesis:

Hypothesis 3 (H3). *The U-shaped relationship between the number of disabled employees and firm performance is more significant for companies without other social donation projects.*

Government taxes, fines and subsidies are the direct factors that affect the employment of disabled persons by companies. Equation (1) in Section 4.2.2 shows the method for calculating the amount of employment security fund for the disabled that a company should pay. Under this calculation method, companies with high compensation will pay more security fund for failing to meet the quota. This undoubtedly increases the cost companies pay for not employing disabled employees. For companies with a higher average employee compensation level, employing a disabled person may cost a relatively low compensation and obtain the labor output of the employee. On the contrary, employing fewer disabled employees may cost a security deposit based on the average employee compensation. Under such conditions, the benefits of adding disabled employees will soon exceed the costs; therefore, we put forward our fourth hypothesis:

Hypothesis 4 (H4). *The U-shaped relationship between the number of disabled employees and firm performance is more significant for companies with higher employee compensation.*

4. Research Design

4.1. Sample Selection and Data Source

To construct our sample, we start with Chinese listed companies during the period of 2016–2020. Our sample begins with 2016 because the Chinese government redefined the collection method and collection intensity of employment security fund for the disabled at the end of 2015, and companies changed their voluntary disclosure behavior from then on. In order to calculate the number of disabled employees employed by the companies, we

manually collect the amount of employment security fund for the disabled disclosed in the notes of the company's financial statements and match the collection with employment policies for the disabled issued by provinces and cities. Other fundamental accounting data of Chinese listed firms is obtained from the China Stock Market and Accounting Research (CSMAR) Database. Our final sample includes 1646 firm-year observations due to the voluntary disclosure policy of the employment security fund for the disabled.

4.2. Measurement of Variables

4.2.1. Measurement of Firm Performance

The main dependent variable is ROA, our proxy for firm performance. Referring to relevant research, firm performance can be mainly measured by financial performance and market performance, and financial performance more reliably reflects the real operating situation of the firm [57]. In this paper, we intend to measure the firm performance from the financial performance aspect. In line with Liu et al. [58], we used the ROA (i.e., return on assets) to measure firm performance. In the robustness test, ROE (i.e., return on equity) is substituted for the explanatory variable.

4.2.2. Measurement of Disabled Employees

In accordance with Mori et al. [8], we use the number of disabled employees as an independent variable to investigate the impact of employing disabled workers on firm performance. Because of China's employment security fund system for the disabled, we can calculate the number of disabled workers employed by the company in the current year through the amount of employment security fund for the disabled paid by the company, which is disclosed in the notes to the financial statements. Specifically, according to Management Regulation of the Collection and Use of Employment Security Fund for the Disabled launched by Chinese government in 2015, employment security fund for the disabled can be calculated as follows:

$$\text{ESFD} = (\text{Employee} \times \text{Pro-Disability}) \times \text{AveCom} \quad (1)$$

ESFD represents employment security fund for the disabled paid by companies; Employee means the number of employees in service; Pro is the proportion of disabled persons employed by companies stipulated by different provinces and cities under the background of China's employment quota system; Disability is our independent variable in this paper and means the number of disabled persons actually employed by companies; AveCom is average annual compensation of employee in-service in the company. After obtaining the basic financial and accounting information in the company's financial statements and notes to the financial statements, in accordance with the collection policies of various provinces and cities, we can calculate the number of disabled employees employed by the company.

4.2.3. Measurement of Moderating Variables

Firm Size is the level of total assets at the end of the period, which is expressed by the natural logarithm of total assets. We divide the sample into two groups according to the average firm size of the same industry in the same year to test the impact of disabled employees on firm performance, respectively. Social Donation is a dummy variable of whether there are social donation projects in the company. If there is, Social Donation is equal to 1; if not, it is equal to 0. We use the average compensation of the company's on-the-job employees to measure Employee Compensation. To test the impact of different groups, the sample is also divided into two groups according to the average employee compensation of the same industry in the same year.

4.2.4. Measurement of Control Variables

In addition, according to previous studies [58–60], the regression models also control the following variables: Size is defined as above; Lev is the ratio of asset-liability, which is expressed by the total liabilities divided by the total assets; Growth is operating income

growth rate, which is the increase amount of annual operating revenue scaled by the amount of operating revenue last year; Employee is expressed by the natural logarithm of total number of employees; Cash represents cash holdings of the corporate, which is expressed by the natural logarithm of amount of cash and cash equivalents held at the end of the period; Large10 is the equity ratio of the ten largest shareholders. The main variable definitions are shown in Appendix A.

4.3. Model Setting

We employ Equation (2) to examine the relationship between Disability and ROA after controlling for other factors that may affect the firm performance.

$$ROA_{it} = \beta_0 + \beta_1 Disability_{it} + \beta_2 Disability_{it}^2 + \sum Control_{it} + \varepsilon_{it} \quad (2)$$

Here, ROA is firm performance, and i and t are firm and year identifiers, respectively. $Control_{it}$ indexes the series of control variables mentioned above, and ε_{it} is the random error term. In the main regression, we use two methods: pooled regression and fixed effect model to test our Hypothesis 1. With the method of pooled regression, we control year fixed effect and industry fixed effect, and use the company level clustering robust standard error to control heteroscedasticity and intra-group autocorrelation. In order to eliminate the influence of other company characteristics that do not change with time, we further adapt the fixed effect model, controlling the year fixed effect and solving the potential heteroscedasticity problem by using the heteroscedasticity robust error.

Our first hypothesis predicts a U-shaped relationship between Disability and ROA. In Equation (2), we use the square term of Disability to describe the non-linear relationship. This paper mainly focuses on the coefficient of β_2 . If our hypothesis is confirmed, β_2 should be positive and β_1 should be negative.

H2–H4 test the moderating effects of firm size, company social donations and average employee compensation, respectively. In different tests, we divide the samples into two groups according to the standards mentioned in Section 4.2.3. H2–H4 predict that the U-shaped relationship between disabled employees and firm performance is more significant in smaller companies, companies without social donation projects and companies with higher average employee compensation. If our hypotheses are confirmed, β_2 should be larger in the groups mentioned above. Additionally, the coefficient difference between groups should be significant.

5. Empirical Results and Analysis

5.1. Descriptive Statistic

Panel A of Table 1 shows the descriptive statistical results of the main variables. The average value of ROA is 0.020 and the maximum value of ROA is 0.494. This number is lower than the average ROA of the whole sample of Chinese A-share listed companies, indicating that companies which voluntarily disclose employment security fund data for the disabled generally have a relatively low level of firm performance. The average value of Disability is 0.051, which shows that companies in our sample employ 51 disabled employees in average. The maximum and minimum values are 0.000 and 1.877, respectively, indicating that there are great differences in the number of disabled employees among different companies. The values and distributions of other variables such as Size and Lev are basically consistent with the existing studies, indicating that there is no sample selectivity deviation in size and asset liability ratio of the sample in this paper; instead, the sample selection in this paper is reasonable.

Panel B shows the industry distribution, industry sample mean and median of our independent variable Disability. As Table 1 shows, companies that voluntarily disclose employment security fund data for the disabled are mainly concentrated in the manufacturing industry, accounting for about 61.6% of the total sample, which is roughly equivalent to the overall proportion of manufacturing listed companies in China's Shanghai and Shenzhen

A-share listed companies. Companies employing more disabled employees are mainly concentrated in Arming, Forestry, Animal Husbandry and Fishery; Mining; and Health and Social Work. The first two industries employ more disabled employees, probably because they need more basic labor, and the latter industry may be endowed with more social responsibilities because of its industry characteristics.

Table 1. Descriptive Statistic.

Panel A						
Variable	N	Min	Mean	Median	Max	Sd
ROA	1646	−1.648	0.020	0.035	0.494	0.124
Disability	1646	0.000	0.051	0.022	1.877	0.097
Size	1646	18.070	22.140	22.000	27.670	1.235
Lev	1646	0.017	0.410	0.382	2.128	0.216
Growth	1646	−0.985	0.468	0.099	263.300	7.102
Employee	1646	2.996	7.558	7.508	11.710	1.219
Cash	1646	12.180	19.940	19.920	24.970	1.382
Large10	1646	0.179	0.589	0.606	0.924	0.144
Panel B						
Industry	N	Mean	Median			
Arming, Forestry, Animal husbandry and Fishery	21	0.243	0.033			
Mining	57	0.151	0.094			
Manufacturing	1014	0.045	0.021			
C1 Food and Clothing manufacturing	65	0.079	0.024			
C2 Wood processing, Printing, Fuel and Chemical manufacturing	286	0.038	0.202			
C3 Metal processing and Equipment manufacturing	626	0.046	0.021			
C4 Other manufacturing	37	0.023	0.011			
Power, Hot gas, Gas and Water production and supply	65	0.023	0.020			
Construction	17	0.029	0.023			
Wholesale and Retail	52	0.086	0.042			
Transportation, Storage and Postal service	41	0.051	0.040			
Accommodation and Catering	5	0.050	0.060			
Information transmission, Software and Information Technology services	153	0.032	0.020			
Finance	21	0.042	0.016			
Real estate	45	0.082	0.011			
Leasing and Business services	20	0.024	0.012			
Scientific research and Technology services	29	0.016	0.015			
Water conservancy, Environment and Public facilities management	28	0.021	0.015			
Education	14	0.073	0.029			
Health and Social work	13	0.157	0.046			
Culture, Sports and Entertainment	44	0.039	0.031			
Comprehensive	7	0.090	0.062			
Total	1646	0.051	0.022			
Panel C						
Year	N	Mean	Median			
2016	185	0.062	0.026			
2017	259	0.056	0.204			
2018	391	0.047	0.022			
2019	448	0.050	0.022			
2020	363	0.049	0.019			
Total	1646	0.051	0.022			

Panel C shows the year distribution, year sample mean and median of our independent variable Disability. The annual distribution of independent variable shows an increasing trend in general. The Chinese government reduced the maximum amount of employment security fund for the disabled paid by companies twice in 2017 and 2018. Affected by national policies, the average number of disabled employees employed by companies decreased from 2016 to 2018.

5.2. Correlation Analysis

The correlation coefficients of the main variables are shown in Table A2 of Appendix A. The Pearson correlation coefficient is shown in the lower left part and the Spearman correlation coefficient is shown in the upper right part. Without controlling other variables, Disability is significantly positively correlated with ROA, which is different from previous studies using data of other counties. A simple OLS regression is performed on Equation (2), whose maximum of the variance expansion factor (VIF) is 5.69 and mean of the variance expansion factor (VIF) is 2.63, indicating that there is no serious multicollinearity problem in this study.

5.3. Regression Results

The regression results of Equation (2) are shown in Table 2. Column (1) and Column (2) use the pooled regression method to test the impact of employing disabled employees on firm performance. Column (1) is the regression result considering control variables and Column (2) is the regression result considering control variables, industry fixed effect and year fixed effect. It can be seen that whether or not industry fixed effect and year fixed effect are controlled, the coefficient of $Didability^2$ is significantly positive, at least at the 1% level. The inflection point of the model appears when the independent variable is equal to 0.807, which is within the sample interval of Disability, proving the existence of the U-shaped relationship in our sample. To better control the impact of company characteristics that do not change with time, in Column (3) we use the fixed effect model and control year fixed effect. The coefficient of $Didability^2$ remains significantly positive at the 5% level. This result shows that when companies employ relatively fewer disabled employees, the addition of disabled employees will reduce the financial performance of companies due to the existence of barrier-free facilities, training costs and cultural conflicts. When the number of disabled employees reaches a certain threshold, due to the influence of diversified corporate culture, the reputation effect of CSR and government subsidies, the benefits brought by employing disabled employees will gradually exceed their costs, and employing more disabled workers will improve the financial performance of the enterprise. Thus, the hypothesis H1 is established.

Column (1) and Column (2) in Table 3 confirm H2. In the small firm group, the coefficient of $Didability^2$ is 2.124 and is significant at the 5% level. This number is much larger than the coefficients of the big firm group. Within the small firm group, the inflection point of the model is 0.262, which means that small companies are more flexible and more easily form an inclusive corporate culture, and the benefits of employing disabled people will exceed the costs faster. The results are in line with our expectation. Column (3) and Column (4) confirm H3. In the group with no social donation, the coefficient of $Didability^2$ is 0.780 and is significant at the 5% level. Meanwhile, the coefficient of $Didability^2$ in the group with social donation is insignificant. Similarly, when investigating the inflection point, we find that ROA increased when Disability exceeded 0.405 in the group without social donation, which is much smaller than that in the group with social donation. Column (5) and Column (6) confirm H4. In the high-level compensation group, the coefficient of $Didability^2$ is 0.984 and is significant at the 1% level. Meanwhile, the coefficient of $Didability^2$ in the high compensation group is relatively small and insignificant. The result also indirectly proves that the employment security fund for the disabled is indeed one of the impact mechanisms of employing disabled employees on enterprise performance.

Table 2. Disabled employees and firm performance.

Dependent Variable	ROA		
	(1)	(2)	(3)
Disability	−0.242 *** (−2.623)	−0.276 *** (−2.770)	−0.648 *** (−2.683)
Didability ²	0.161 *** (3.353)	0.171 *** (3.351)	0.254 ** (2.554)
Size	−0.010 (−1.147)	−0.016 * (−1.706)	0.168 *** (4.962)
Lev	−0.198 *** (−7.851)	−0.212 *** (−8.386)	−0.424 *** (−6.914)
Growth	0.000 (−0.802)	−0.001 (−1.158)	0.002 ** (2.237)
Employee	0.024 *** (3.684)	0.029 *** (3.997)	−0.014 (−0.733)
Cash	0.027 *** (3.452)	0.030 *** (3.667)	0.004 (0.706)
Large10	0.058 *** (2.961)	0.052 ** (2.408)	−0.092 (−0.851)
Constant	−0.428 *** (−4.561)	−0.328 *** (−3.309)	−3.387 *** (−5.417)
Year	No	Yes	Yes
Industry	No	Yes	No
Firm	No	No	Yes
Observations	1646	1646	1646
R-squared	0.233	0.263	0.251
Adj R ²	0.230	0.250	0.245

Notes: *t*-Statistics are based on firm-cluster errors. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 3. Moderating effect.

	Firm Size		Social Donation		Employee Compensation	
	Big	Small	Yes	No	High	Low
Disability	−0.197 (−1.093)	−1.161 *** (−2.979)	−0.020 (−0.213)	−0.632 *** (−2.755)	−0.844 *** (−2.698)	−0.054 (−0.528)
Didability ²	0.129 (1.644)	2.124 ** (2.455)	0.049 (1.118)	0.780 ** (2.255)	0.984 ** (2.149)	0.053 (1.201)
Size	−0.022 * (−1.927)	−0.004 (−0.326)	−0.018 *** (−3.060)	−0.017 (−1.535)	−0.020 (−1.100)	−0.008 (−1.292)
Lev	−0.205 *** (−7.134)	−0.210 *** (−5.186)	−0.101 *** (−3.222)	−0.215 *** (−7.671)	−0.201 *** (−5.125)	−0.228 *** (−6.565)
Growth	0.002 (1.439)	−0.001 ** (−2.075)	0.015 (1.574)	−0.001 (−1.246)	−0.001 *** (−3.498)	0.001 ** (2.428)
Employee	0.031 ** (2.124)	0.035 *** (3.362)	0.013 ** (2.058)	0.037 *** (3.681)	0.037 *** (2.933)	0.017 * (1.874)
Cash	0.029 ** (2.319)	0.030 *** (4.227)	0.019 *** (3.735)	0.032 *** (3.396)	0.044 *** (2.716)	0.019 *** (4.268)
Large10	0.006 (0.222)	0.094 *** (3.084)	−0.007 (−0.304)	0.051 * (1.935)	0.036 (0.935)	0.054 *** (2.638)
Constant	−0.217 (−1.331)	−0.638 *** (−2.683)	−0.018 (−0.220)	−0.397 *** (−3.311)	−0.612 *** (−3.031)	−0.192 ** (−1.978)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Observations	851	795	281	1362	804	847
R-squared	0.337	0.243	0.353	0.272	0.282	0.296
Adj R ²	0.313	0.214	0.284	0.256	0.255	0.271
Coef diff	5.57 (0.018)		4.29 (0.038)		4.52 (0.033)	

Notes: *t*-Statistics are based on firm-cluster errors. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

5.4. Robustness Tests

5.4.1. Replace Dependent Variables

Following Azeez (2015) [60], this paper re-measures firm performance using ROE (return on equity), defining this as net return divided by total equity. The regression result is shown in Table 4. As Column (1) shows, the coefficient of $Didability^2$ is significantly positive at the 5% level. The main findings above remain unchanged.

Table 4. Robustness tests.

Dependent Variable	(1) ROE	(2) ROA	(3) ROA
Disability	−1.691 *** (−2.587)	−0.294 *** (−3.157)	−0.284 ** (−2.323)
$Didability^2$	0.769 ** (2.512)	0.181 *** (3.834)	0.169 *** (2.814)
Size	−0.037 (−0.448)	−0.014 (−1.510)	−0.018 (−1.560)
Lev	−1.692 *** (−3.754)	−0.150 *** (−6.281)	−0.217 *** (−8.128)
Growth	−0.001 (−0.671)	0.000 (−0.612)	0.002 ** (2.093)
Employee	0.165 *** (2.630)	0.025 *** (3.599)	0.032 *** (3.685)
Cash	0.155 ** (2.533)	0.019 ** (2.305)	0.030 *** (3.058)
Large10	−0.183 (−1.156)	0.003 (0.149)	0.044 * (1.841)
CSR		0.005 *** (11.050)	
Constant	−2.487 ** (−2.452)	−0.221 ** (−2.354)	−0.0323 *** (−2.777)
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
Observations	1637	1625	1248
R-squared	0.141	0.385	0.288
Adj R ²	0.126	0.373	0.271

Notes: *t*-Statistics are based on firm-cluster errors. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

5.4.2. Considering Other CSR Behavior

This test is mainly to distinguish between companies' efforts to promote the employment of people with disabilities and other CSR behaviors. As discussed above, many studies have focused on the firm performance implications of CSR activities, while most studies have confirmed that CSR will have a significant positive impact on firm performance [43–46,57,59]. Corporate social responsibility activities will produce a reputation effect [43,44] and improve the relationship with other stakeholders such as government and consumers [47,48], which is often related to higher financial performance.

The existing literature on CSR mainly considers the five dimensions of shareholder responsibility, employee responsibility, supply chain responsibility, environmental responsibility and public welfare responsibility. Few studies focus on corporate social responsibility from the perspective of employing disabled employees. Generally speaking, companies with high CSR level will also hire more disabled employees and have a higher level of firm performance. In order to distinguish the impact of employing disabled employees and other CSR activities on financial performance, we add CSR as a control variable in this model. In this paper, we use the final grade of companies' corporate social responsibility given by Hexun to measure CSR. Result is shown in Column (2), Table 4. After controlling CSR, the main findings remain unchanged.

5.4.3. Sample without Big City

In order to eliminate the sample bias caused by the economic impact of big cities, we drop the sample of China's three most economically developed provinces and cities, Beijing, Shanghai and Guangdong. A total of 1248 samples remain. The results are shown in Column (3), Table 4. After considering the influence of big cities, the results are still significant.

5.4.4. Instrumental Variable

When we measure the impact of disabled employees on firm performance, a potential concern is that there are some missing variables that change over time, and that these will affect employment decision-making and financial performance. For example, companies with a profit-oriented culture believe that disabled employees are inefficient, and are unwilling to hire more disabled employees due to their profit-seeking characteristics [8]. There is an inevitable reverse causal effect between disabled employees and firm performance which will lead to overestimation of the negative correlation between them.

In this paper, we use the company employment quota stipulated by the state under China's proportional employment system as an instrumental variable and perform a model of 2SLS (GMM estimation is also used to solve the potential heteroscedasticity problem, and results are similar as using 2SLS). If the company fails to meet the employment quota stipulated by the government, it must pay a fine based on the average compensation of the on-the-job employees. We believe that the number of disabled employees in the company should be highly related to the employment quota. As for the exogenous nature of our instrumental variable, as mentioned above, the company employment quota shall be equal to the employment proportion of the disabled stipulated by the local government, which ranges from 1.5% to 2%, multiplied by the number of on-the-job employees of the company. The local government decides the company's employment quota for the disabled mainly based on the local economic and social development level, and companies cannot affect the formulation of government policies. In other words, when we control the number of on-the-job employees, the employment quota becomes a strictly exogenous instrumental variable.

The results using the instrumental variable are reported in Table 5. In the first step, employment quota is highly correlated with the independent variable Disability at the 1% level; in the second step, the coefficient between $Didability^2$ and ROA is significantly positive at the 1% level. F-statistic is 385.645, indicating that there is no weak IV problem in this model. The results are basically consistent with our main regression analysis, and the research conclusion of this paper is relatively stable.

Table 5. Instrumental variable.

	Second Step ROA	First Step Disability	$Didability^2$
Disability	−0.253 ** (−2.285)		
$Didability^2$	0.168 *** (2.848)		
Quota		0.805 *** (13.22)	−0.187 ** (−2.362)
$Quota^2$		0.061 *** (2.683)	0.982 *** (29.426)
Size	−0.016 * (−1.693)	−0.001 (−1.309)	0.000 (0.021)

Table 5. Cont.

	Second Step ROA	First Step Disability	Didability ²
Lev	−0.212 *** (−8.435)	0.004 (1.412)	0.004 (1.165)
Growth	−0.001 (−1.168)	0.000 (0.653)	0.000 (0.637)
Employee	0.028 *** (3.670)	0.001 (0.712)	0.005 ** (2.018)
Cash	0.030 *** (3.648)	0.001 (0.931)	0.000 (0.856)
Large10	0.051 ** (2.427)	−0.002 (−0.540)	−0.002 (−0.592)
Constant	−0.325 *** (−3.248)	0.030 (1.431)	−0.015 (−0.678)
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
Observations	1646	1646	1646
R-squared	0.263		
F statistic	385.645		

Notes: *t*-Statistics are based on firm-cluster errors. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

6. Further Discussion

6.1. Disabled Employees and Labor Productivity

As mentioned above, one of the most important factors that hinders entrepreneurs from hiring disabled persons is the worry that they cannot complete their work effectively. Disabled people are often considered to be unable to use workplace equipment well [29] and to have lower production efficiency [26]. However, we hold the opinion that the labor productivity of disabled employees is at least no lower than that of other employees. They will cherish their work more and have lower absenteeism. The low productivity of individual disabled employees may be caused by unreasonable post settings and incomplete barrier-free facilities in the workplace. In order to further verify our conjecture and exclude the alternative explanation that the early decline of the U-shaped model is caused by the low labor productivity, in this section, we further verify the relationship between the number of disabled employees and firm labor productivity.

We use a simple linear regression model to test the relationship between the number of disabled employees and labor productivity. We define labor productivity according to Wang and Zhao (2021) [61]. The specific definitions can be seen in Appendix A. The result in Table 6, Column (1) shows that there is a weak positive correlation between the number of disabled employees and the labor productivity of the companies, although this relationship is not very significant. This result confirms that under reasonable post arrangements and barrier-free facilities, the labor productivity of disabled employees is at least no lower than that of other employees, and entrepreneurs' reluctance to hire people with disabilities stems largely from their own personal prejudices. This result also excludes the alternative explanation that the early decline of the U-shaped relationship is due to the low productivity of the disabled.

Table 6. Further discussion.

	LP	R&D Intense		Labor Intense	
		High	Low	High	Low
Disability	0.034 (0.161)	−0.510 ** (−2.307)	−0.285 ** (−2.100)	−1.849 * (−1.765)	−0.265 ** (−2.499)
Didability ²		0.628 ** (2.321)	0.154 *** (2.590)	4.559 (1.654)	0.165 *** (3.117)
Size	0.530 *** (13.458)	−0.004 (−0.749)	−0.028 * (−1.707)	−0.004 (−0.264)	−0.017 (−1.415)
Lev	−0.539 *** (−4.388)	−0.201 *** (−6.296)	−0.236 *** (−6.029)	−0.275 *** (−4.820)	−0.185 *** (−6.836)
Growth	0.011 *** (3.026)	−0.001 *** (−4.378)	0.002 * (1.771)	−0.001 *** (−9.352)	0.002 ** (2.205)
Employee	−0.514 *** (−14.900)	0.025 *** (3.015)	0.038 *** (3.052)	0.049 ** (2.017)	0.028 *** (3.596)
Cash	0.076 *** (2.996)	0.026 *** (3.770)	0.034 ** (2.509)	0.024 *** (3.218)	0.029 *** (2.597)
Large10	0.555 *** (4.336)	0.078 *** (2.823)	0.016 (0.570)	0.106 ** (2.146)	0.036 (1.466)
Constant	2.472 *** (4.798)	−0.535 *** (−3.006)	−0.158 (−1.492)	−0.621 * (−1.808)	−0.310 *** (−3.261)
Year	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes
Observations	1514	887	759	354	1292
R-squared	0.520	0.257	0.326	0.322	0.250
Adj R ²	0.511	0.231	0.299	0.298	0.233
Coef diff		3.00 (0.083)		2.64 (0.104)	

Notes: *t*-Statistics are based on firm-cluster errors. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

6.2. Disabled Employees in Different Industries

Due to some labor characteristics of disabled employees, next we consider the impact of employing disabled employees on the firm performance under the production factor input characteristics of different companies. Here, we consider two characteristics, R&D investment and labor investment. For R&D-intensive companies, they have more technical personnel and higher average compensation levels. Less employment of disabled employees may lead to higher pay. Thus, the U-shaped relationship will be more significant for these companies.

For labor-intensive companies, the employees generally engage in some basic labor. As long as the post setting is reasonable, the labor output of disabled employees shall not be lower than that of other employees. Therefore, for labor-intensive companies, we expect that the benefits of employing disabled employees will exceed their costs faster, the marginal benefits of adding disabled employees are higher, and there is a more significant U-shaped relationship between Disability and ROA.

Table 6 verifies the above assumptions. In Column (2) and Column (3), we divide the samples into high R&D Intense group and low R&D Intense group according to the median of the company's R&D investment proportion in the same year and the same industry. The results are consistent with our expectations, and the coefficient of Didability² is higher in high R&D Intense group. This proves that for companies with higher R&D investment, employing disabled employees can bring more benefits as the number of disabled employees increases. However, in terms of labor market supply, the overall education level of the disabled is relatively lower [62]. According to *Statistical Yearbook of China's Undertakings for the Disabled*, by the end of 2020, among China's disabled population, only 6733 people have a bachelor's degree or above, far less than the number of disabled people that listed companies should hire in proportion according to national regulations.

In Column (4) and Column (5), referring to Huang (2009) [63], we divide the sample into a high Labor Intense group and a low Labor Intense group. The coefficient of

Didability² is higher in the high Labor Intense group, which may prove that in basic labor positions, disabled employees have a work efficiency no lower than that of other employees. Entrepreneurs usually believe that disabled employees affect the financial performance of companies and are unwilling to hire employees with disabilities, which is more due to the personal bias of entrepreneurs themselves.

7. Conclusions and Policy Implication

7.1. Conclusions and Discussion

Disabled persons are the largest minority group in the world and an important part of the labor market. Starting from the demand side of employment, this paper explores the real impact of including disabled employees on firm performance from the perspective of the market. Is the phenomenon of profit-seeking entrepreneurs being unwilling to hire disabled employees caused by the inefficiency of the disabled or just the personal prejudice of entrepreneurs themselves?

The empirical results show that there is a U-shaped relationship between the number of disabled employees and firm performance. There may be a lot of investment in barrier-free facilities and inclusive culture at the initial stage of companies' inclusion of employees with disabilities, which may reduce firm performance. However, with the increase in the number of disabled employees and the gradual improvement of barrier-free facilities, the inclusive culture, the reputation effect of CSR and the subsidy bonus under the employment quota system gradually appear. The benefits of inclusive disabled employees exceed the costs. This behavior will improve firm performance and be conducive to companies' sustainable development. Moreover, we examine the moderating effect of firm heterogeneity on the U-shaped relationship from three aspects: inclusive corporate culture, reputation effect of CSR and the direct impact of government penalties and subsidies on profits. The empirical results show that the U-shaped relationship between disabled employees and firm performance is more significant in small companies, companies without other social donation projects and companies with higher employee compensation.

Our conclusion is consistent with the existing literature on the impact of diversity culture and CSR. As Duppati et al. (2020) [43] show, the positive impact of diversity on organizations is more significant in a culture that supports diversity. Most of the existing studies on diversity consider age, gender, educational background and race. We creatively explore the economic consequences of labor diversity from the perspective of the disabled. Since the outbreak of COVID-19, investors and the public have paid more attention to the commitment of corporate social responsibility and ESG performance. Labor management should be an important part of CSR and an important standard for rating agencies to determine the ESG rating of enterprises. We consider CSR and ESG from the perspective of including disabled employees and try to find a win-win balance between social benefits and economic benefits for enterprises.

More importantly, our conclusion contributes to the literature on the employment of the disabled using an empirical method. Due to the lack of data, few studies use empirical methods to consider the economic consequences of including disabled employees from the demand side. The most relevant literature is the research of Mori and Sakamoto (2018) [8] and Lips (2018) [10]. Mori and Sakamoto (2018) use a sample of companies in the Japanese manufacturing industry and conclude that the employment of the disabled has nothing to do with firm performance. Meanwhile, Lips (2018) adopts the form of a questionnaire and concludes that employing the disabled reduces firm performance. Based on China's employment quota system, and using the data of employment security fund for the disabled disclosed by Chinese listed companies, we calculate the number of disabled employees actually employed by enterprises. Our research conducted a large sample empirical test for the whole industry and creatively proposed the U-shaped relationship between disabled employees and firm performance—a first in the existing research—and may provide some ideas for future follow-up literature on the employment of the disabled.

7.2. Managerial Implication and Policy Suggestions

Our research has three implications for enterprises. (1) Disability does not equal inefficiency. Some entrepreneurs are biased against disabled employees. They prefer to pay high employment security fund rather than hire disabled employees. Our results prove that there is a U-shaped relationship between the number of disabled employees and firm performance; that is, when the number of disabled employees reaches a certain threshold, the inclusion of disabled employees will produce reputation effect, promote firm innovation and improve firm performance. Entrepreneurs should eliminate discrimination and prejudice and reasonably arrange the labor structure in their companies. (2) Improve barrier-free facilities in the workplace. The low productivity of some disabled employees may be caused by unreasonable post arrangement and imperfect barrier-free facilities. Improving barrier-free facilities in the workplace is not only the embodiment of corporate social responsibility, but also the public commitment of inclusive corporate culture. (3) Build a diversified corporate culture. Diversified corporate culture is conducive to stimulating innovative thinking. Although diversified management facilities require a lot of input in the short term and the effect cannot be immediately reflected in net profit, diversification is conducive to the sustainable development of enterprises in the long term.

We also have two implications for policymakers. China's current proportional employment policy for the disabled requires all employers who have not completed the quota to pay employment security fund for the disabled, which virtually increases the economic burden of small and micro enterprises and violates the original intention of the policy. Here, we suggest that we can adopt a variety of incentive methods. (1) Subsidize enterprises' investment in barrier-free facilities. The construction of barrier-free facilities represents a large amount of investment that is one-time in the early stage and cannot obtain short-term benefits. Subsidies for barrier-free facilities rather than compulsory arrangement of employment quotas can reflect the employment equality and the "social model for the disabled" advocated by the WHO. (2) For different industries, companies should be allowed to replace mandatory quotas with other ways of promoting the social integration of persons with disabilities. For companies with high average compensation and high R&D investment, employing disabled people may have a greater impact on the firm performance, but the reality is that there is insufficient supply in the labor market and there are not enough disabled workers with a matching education level. Companies should be appropriately allowed to adopt other ways to promote the social integration of persons with disabilities, such as donation cooperation with organizations of persons with disabilities.

7.3. Limitations and Future Research

The limitations of this study provide an avenue for future research. First, we use the data of employment security fund for the disabled voluntarily disclosed by Chinese listed companies to calculate the number of disabled employees. Only about 11% of the companies have disclosed this data, and the ROA of these companies is generally lower. Other new scenarios and measurements need to be explored in future research. It is worth mentioning that the Chinese government mentioned in the policy document in March 2022 that enterprises are encouraged to include their efforts to promote the employment of persons with disabilities in their CSR report, which may provide new data for future research. Second, due to the availability of data, we have no way to distinguish the specific impact of different types of disability on firm performance, which is an important topic for entrepreneurs' employment decision-making and is worthy of further exploration. Third, this paper only examines the impact of inclusion of disabled employees on firm performance. Future research can examine more economic consequences, such as labor productivity, adjustment cost, labor investment efficiency, etc.

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Appendix A

Table A1. Variable Definitions and Data Source.

Variable	Definition	Data Source
ROA	Return on assets, $ROA = \text{net return}/\text{total assets}$	CSMAR
Disability	Number of disabled employees, $\text{Disability} = \text{total number of disabled employees}/1000$	Hand-collected
Size	Firm size, $\text{Size} = \ln(\text{total assets})$	CSMAR
Social Donation	Dummy variable of whether there are social donation projects in the company. If there is, Social Donation equal to 1; if not, equal to 0	CSMAR
Employee compensation	Average compensation of on-the-job employees, $\text{Employee compensation} = \text{Current credit amount of employee compensation payable}/\text{total number of employees on the job}$	CSMAR
Lev	Asset-liability ratio, $\text{Lev} = \text{liabilities}/\text{total assets}$	CSMAR
Growth	Operating income growth rate, $\text{Growth} = (\text{current amount of operating revenue} - \text{amount of operating revenue in the same period of last year})/(\text{amount of operating revenue in the same period of last year})$	CSMAR
Employee	Number of employees, $\text{Employee} = \ln(\text{total number of employees})$	CSMAR
Cash	Cash holdings, $\text{Cash} = \ln(\text{amount of cash and cash equivalents held at the end of the period})$	CSMAR
Large10	Top ten shareholders, $\text{Large 10} = \text{total shareholding ratio of top ten shareholders}$	CSMAR
ROE	Return on equity, $ROE = \text{net return}/\text{total equity}$	CSMAR
CSR	Corporate Social Responsibility, companies' final grade of corporate social responsibility	Hexun
Quota	Quota of disabled persons to be employed by companies, $\text{Quota} = \text{total number of employees in the company} * \text{the employment proportion of disabled persons stipulated by the local government}$	Hand-collected
LP	Labor productivity, $LP = \ln[(\text{operating profit} + \text{financial expenses} + \text{employee compensation payable})/\text{number of employees}]$	CSMAR
R&D Intense	$R\&D \text{ Intense} = R\&D \text{ investment}/\text{total investment}$	CSMAR
Labor Intense	Labor intensive industry, as defined by Huang (2009)	Hand-collected

Table A2. Correlation analysis of main variables.

	ROA	Disability	Size	Lev	Growth	Employee	FCF	Large10
ROA	1.000	0.087 ***	−0.058 **	−0.397 ***	0.357 ***	0.109 ***	0.176 ***	0.282 ***
Disability	0.098 ***	1.000	0.666 ***	0.330 ***	0.076 ***	0.967 ***	0.608 ***	0.047 *
Size	0.081 ***	0.517 ***	1.000	0.450 ***	0.021	0.696 ***	0.736 ***	0.021
Lev	−0.325 ***	0.203 ***	0.431 ***	1.000	−0.045 *	0.334 ***	0.173 ***	−0.126 ***
Growth	−0.02	−0.006	−0.008	−0.012	1.000	0.066 ***	0.072 ***	0.065 ***
Employee	0.179 ***	0.681 ***	0.698 ***	0.275 ***	−0.014	1.000	0.635 ***	0.071 ***
FCF	0.284 ***	0.485 ***	0.750 ***	0.117 ***	−0.003	0.638 ***	1.000	0.113 ***
Large10	0.165 ***	0.101 ***	0.076 ***	−0.126 ***	0.050 **	0.115 ***	0.159 ***	1.000

Notes: This table reports the Pearson (Spearman) correlation coefficients of the main variables. The left below triangle represents Pearson coefficients and the right upper triangle represents Spearman coefficients, *, **, *** indicates significance levels at 0.01, 0.05, and 0.10, respectively.

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