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美國失業補助與員工待遇對成本僵固性的影響

The Effects of Unemployment Insurance and Employee Treatment on Sticky Cost Behavior

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The Effects of Unemployment Insurance and Employee Treatment on Sticky Cost Behavior

本論文係劉奕妤君（R10722034）在國立臺灣大學會計學研究所完成之碩士學位論文，於民國 112 年 06 月 21 日承下列考試委員審查通過及口試及格，特此證明

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摘要

本研究旨在探討美國失業補助與員工待遇對成本僵固性的影響。其中，成本僵固性現象之一—成本黏性指的是當成本對銷售減少的反應小於成本對銷售增加的反應時出現的現象。過去的研究已提供了多種關於非對稱成本行為的解釋，而本研究透過探索與失業保險及員工待遇的關聯性，試圖解釋這種行為。雖然較高的失業保險福利可能會降低失業風險，但它同時也增加了員工從事不良行為的動機。本研究的結果顯示，更慷慨的失業保險福利與較高水平的成本黏性相關。此外，更高的失業保險福利結合更好的員工待遇，導致成本黏性水平的提升。即使在控制了公司層面的成本黏性決定因素、州級經濟條件以及不可觀察的時間不變州特徵後，這些發現仍然具有可靠性。總結而言，本研究顯示公司可能會對員工在工作場所的不良行為（例如偷懶）增加的風險做出更高水平的成本黏性反應。這意味著當失業保險福利提高時，公司更傾向於以提高成本黏性來應對員工不良行為所帶來的風險。

關鍵字： 美國失業保險，員工待遇，員工治理，成本黏性，成本習性

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Abstract

This study examines the effect of unemployment insurance (UI) benefits on the cost stickiness. Cost stickiness occurs when the response of cost decreases to sales decreases is smaller than the response of cost increases to sales increases. Prior studies have provided many explanations for the asymmetric cost behaviors. My study addresses the puzzling behaviors by exploring the relationship with UI. While higher UI benefits may reduce the unemployment risks, it increases employees' incentives to engage in adverse behaviors. My results show that more generous unemployment insurance benefits are associated with higher levels of cost stickiness. Additionally, higher unemployment insurance benefits, combined with better employee treatment, lead to higher levels of cost stickiness. These findings remain robust even after controlling for firm-level determinants of cost stickiness, state-level economic conditions, and unobservable time-invariant state characteristics. Overall, this study suggests that firms may react with higher cost stickiness to increased risk of employees' adverse behavior (e.g., shirking) at the workplace.

Keywords: unemployment insurance, employee treatment, employee governance, cost stickiness, cost behavior

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1. Introduction

Previous literature has highlighted the faster increase of costs during activity demand rises compared to their decrease in response to a decline in activity demand, termed "cost stickiness" (Noreen and Soderstrom, 1997; Anderson et al., 2003). The literature has explored factors (e.g., adjustment costs, managerial deliberate decision, agency problem) contributing to this asymmetry. However, limited attention has been given to examining the influence of external shocks, such as Unemployment Insurance (UI) benefits, on the behavior of SG&A costs.

To address the gap, the study examines the effect of UI on cost stickiness. UI is a social insurance program offered by the US government to individuals who are unemployed, with varying levels of benefit amount and duration across states. It provides a minimum standard of living to eligible unemployed individuals through direct payments. Since its establishment in 1935, UI has been extensively researched, revealing its various positive and negative impacts, as well as its indirect influence on firm behavior. These studies have examined the effects of UI and have identified both positive and negative impacts. On the positive side, UI has been found to reduce the need for managing employee perception and indirectly influence a firm's financial reporting choices (Dou et al., 2016; Ng et al., 2019), recognition and disclosure practices (Liu et al., 2020; Ji et al., 2016), and financing decisions (Agrawal and Matsa, 2013; Ben-Nasr, 2019; Shen, 2022). Furthermore, UI has been shown to contribute to the reduction of economic market volatility and the maintenance of consumer demand (Maggio and Kermani, 2016; Hsu et al., 2018; Beach and Lopresti, 2019). However, the effects of UI are not solely positive. It has been shown that UI can lead to adverse employee behavior, including shirking (Shapiro and Stiglitz, 1984), and encourage employees to explore alternative options (Acemoglu and Shimer, 2000), indirectly impacting a firm's productivity (Flammer and

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Luo, 2017; Darrough et al., 2019). Collectively, these findings highlight the significant influence of UI on employees, firms, and the overall economy.

I argue that UI can increase cost stickiness. First, implementing cost stickiness can serve as a mechanism to align the interests of employees and firms and mitigate adverse employee behavior associated with higher UI benefits. Shapiro and Stiglitz (1984) argue that the presence of high UI benefits can lower the punitive costs of termination, thus increasing the likelihood of employees engaging in shirking behavior. Supporting this notion, Ichino and Riphahn (2005) observed a decline in employee performance, manifested through decreased attendance and work engagement, following labor market reforms in Italy in 1990. Similarly, Scoppa (2010) identified an increase in employee laziness following the implementation of labor market regulations in Italy. Autor et al. (2006) found a negative impact on productivity resulting from the implementation of employment protection laws in the United States, while Bassanini et al. (2009) observed a similar phenomenon across OECD countries. Therefore, to address the adverse effects of UI benefits, Darrough et al. (2019) found firms strategically increase their investment in employee-related CSR initiatives. This includes offering work-life balance benefits and implementing health policies to help align incentives between employees and the company, as well as reduce the adverse behavior of employees.

However, there is also a possibility that firms with higher UI benefits may exhibit lower levels of cost stickiness. The positive effect of UI is that it reduces the management of employee perception by mitigating the financial loss and adjustment costs associated with unemployment. Consequently, higher UI benefits provide employees with increased flexibility during economic difficulties or company downsizing, which in turn reduces the pressure on firms to make significant adjustments. These arguments have the potential to reduce the level of cost stickiness.

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In addition, I argue that firms providing better treatment to employees are more likely to exhibit a higher degree of cost stickiness, particularly under the influence of higher UI benefits. This proposition draws from the understanding that as UI benefits increase, managers would strategically utilize cost stickiness as a mechanism to align employee and managerial interests. By prioritizing employee well-being and implementing CSR strategies, these firms cultivate a stronger sense of attachment and loyalty, reducing employees' inclination to seek alternative employment opportunities. As a result, the commitment fostered within the organization leads to lower turnover intentions and a decreased need for employee terminations or downsizing initiatives. The combination of higher UI benefits and better employee treatment encourages firms to prioritize cost stickiness practices, ultimately strengthening the alignment of interests between the company and its employees.

Following previous studies (Anderson et al., 2003; Banker et al., 2013), my study utilizes a cost asymmetric model by incorporating factors of interest, such as UI benefits and employee treatment scores. To conduct my tests, I utilize a sample of publicly traded firms in the United States from 1998 to 2021. The UI data is collected following the methodology of Dou et al. (2016) from the United States Bureau of Labor Statistics. It is measured by taking the logarithm of the product of the maximum duration of weeks that a state offers benefits to claimants, known as "max duration," and the maximum weekly benefit amount provided by the state. Subsequently, I employ a matching approach that leverages the headquarters location of firms and the corresponding state's UI benefits. And the firm-level data is collected from Compustat following most of studies.

The empirical findings of my study are consistent with my hypothesis, revealing that higher UI benefits are positively associated with increased levels of cost stickiness within firms. Specifically, as the level of UI benefits increases, firms demonstrate a higher degree

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of cost stickiness. Additionally, firms providing better treatment to employees are more likely to exhibit higher levels of cost stickiness in the presence of higher UI benefits. These results confirm the proposition that UI benefits have a significant impact on cost stickiness, and that employee treatment plays a crucial role in this relationship. To further enhance my analysis and assess the impact of UI policy, I employ the difference-in-differences (DID) technique, as outlined by Dou et al. (2016), to differentiate the treatment and control groups based on the magnitude of maximum UI benefit changes, specifically categorized as those exceeding or falling below 10%. Additionally, I employ different dependent variables, specifically focusing on the cost of goods sold. These methodological enhancements are aimed at providing a more comprehensive understanding of the relationship between UI policy changes and the extent of cost stickiness.

I contribute to literature in three ways. First, I offer a novel explanation and understanding by integrating the viewpoints of Shapiro and Stiglitz (1984) with my research findings. My study demonstrates that while Shapiro and Stiglitz (1984) suggest that UI may lead to employee shirking, under specific circumstances, such as providing better employee treatment and implementing corporate social responsibility strategies, firms can mitigate the negative effects and achieve alignment between employee and managerial interests through the adoption of cost stickiness measures. Thus, my research provides a fresh perspective for understanding the impact of UI on firm behavior and highlights the potential for firms to address the potential negative consequences through specific management strategies. This novel explanation and understanding hold significant theoretical and practical implications for the field of UI and employee behavior research. Second, my study contributes to the advancement of our comprehension of the determinants of cost behavior and their consequential effects on

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decision-making within firms. Specifically, I examine the influence of UI benefits on the phenomenon of cost stickiness, and further investigate the impact of a nation's UI policy implementation and subsequent changes on a firm's capacity to flexibly manage costs. This valuable contribution extends the existing body of knowledge in the field of cost management and decision-making. Third, my research elucidates the significant role of employee treatment within the framework of UI. By delving into the interplay among UI benefits, cost stickiness, and employee treatment, I underscore the critical importance of considering employee welfare and corporate social responsibility when addressing the implications of UI on firm behavior. This contribution enriches the evolving literature on employee treatment and its consequential effects on firm outcomes.

The organization of this paper is as follows: In Section 2, I review relevant background and literature. In Section 3, I develop the hypotheses. In Section 4, I describe the variable constructions and research design. In Section 5, I present my data collections and primary findings. In Section 6, I present additional analysis. Finally, in Section 7, I offer concluding remarks on this study.

2. Literature Review

2.1 Background of Unemployment Insurance

Unemployment Insurance (UI), also known as unemployment benefits, is a government-provided social insurance system. Enacted through the Social Security Act of 1935, its purpose is to provide temporary economic assistance to individuals who are involuntarily unemployed, thereby alleviating the financial burdens associated with unemployment and facilitating their search for new employment opportunities. UI has been in operation for nearly a century since its establishment through the Social Security Act of 1935, offering significant support to those facing unemployment. The program directly provides financial aid to eligible individuals, ensuring their basic living

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requirements are met.

Unemployment insurance is subject to the regulations of both the federal government and state governments. At the federal level, the government is responsible for establishing comprehensive guidelines and setting the basic framework and standards for the unemployment insurance program, including fundamental eligibility criteria. The federal government also provides financial support by collecting payroll taxes from employers to fund the program and subsidize state governments. Additionally, the federal government sets minimum requirements for unemployment insurance, but individual states have the flexibility to adjust beyond these requirements and customize specific benefit parameters.

On the state level, each state is responsible for implementing and managing its own unemployment insurance program while adhering to federal guidelines. They have the authority to determine specific program parameters, such as eligibility criteria, benefit durations, and weekly benefit amounts. State governments also collect payroll taxes from employers within their jurisdiction to fund their unemployment insurance programs. Furthermore, state governments determine the eligibility for unemployment benefits based on factors such as prior employment and income, and calculate the amount and duration of benefits for eligible individuals.

It is important to note that although the basic framework of unemployment insurance programs is consistent across all states, the substantial autonomy of individual states may lead to variations in program parameters and benefit levels.

2.2 Literature of Unemployment Insurance

Involuntary unemployment imposes significant burdens on employees (Gibbons and Katz, 1991; Gruber, 1997). The risk of unemployment is a critical concern for employees, who may encounter difficulties such as decreased consumption, finding comparable

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employment opportunities, prolonged joblessness, as well as negative physical and mental health effects. By providing additional welfare benefits, it can reduce the financial loss associated with unemployment for employees and, thus, lower the risk of unemployment. Therefore, the variation in UI benefits could have a significant impact on the level of unemployment risk faced by employees. In this section, a comprehensive literature review is provided with the aim of understanding the effects of UI policy and its impact on firms, employees, the overall labor market, and the economy. Figure 1 presents a simplified classification of the domain of UI literature, illustrating the different areas of research and their interrelationships.

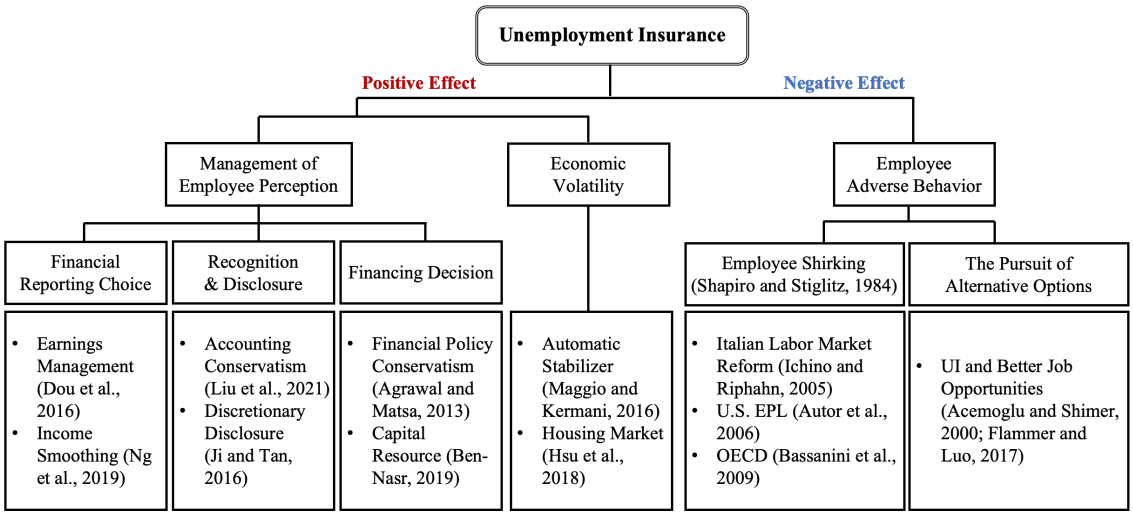

Figure 1. The domain of UI literature

2.2.1 Positive Effect: Management of Employee Perception

When it comes to unemployment, employees face the risk of job loss, and their perception of this risk is closely tied to the financial security of their employers. Employees use their employer's financial security as a benchmark for assessing their own risk (Brown and Matsa, 2016). Consequently, employers have an incentive to manage employees' perceptions of their financial security and take actions to ensure a positive perception. In the event of unemployment, employees experience significant financial losses, such as income reduction, loss of benefits, and diminished future employment

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opportunities. At the same time, companies incur various adjustment costs when conducting layoffs, including severance costs, training new employees, and reorganizing production lines or operations. These costs can have a negative impact on a company's financial condition and operational efficiency. Therefore, the financial losses borne by employees due to unemployment and the adjustment costs incurred by the company through layoffs can be seen as two interconnected aspects. When considering layoffs, companies typically weigh the financial losses incurred by employees against the adjustment costs. Companies may attempt to minimize adjustment costs while also seeking to reduce the financial losses faced by employees in the event of unemployment.

How does the emergence of UI affect these aspects? By providing UI benefits, it is possible to reduce the unemployment risk of employees and the associated financial losses they face during unemployment. From an employer's perspective, the provision of UI benefits leads to a reduction in the costs associated with employee layoffs, as well as a diminished incentive to actively manage employee perceptions due to decreased dependency of employees on their employers. As a result, the level of UI benefits has a positive impact on mitigating the need for active management of employee perception, thereby indirectly influencing the behavior of companies. I classify the relevant literature that explores the indirect impact of UI on firm behavior, based on the effect of UI in reducing the employer's need to manage employee perceptions.

Financial Reporting Choice

A company's financial reporting choices can be significantly influenced by the existence of UI program. Employees attach importance to the financial stability of their employers, as they gauge their own risk of unemployment by considering the financial security of their respective firms (Brown and Matsa, 2016). In this regard, the examination of financial reports serves as a critical approach employed by employees

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(Burgstahler and Dichev, 1997; Matsumoto, 2002; Graham et al., 2005; Qiang and Warfield, 2005). From this it can be seen that companies have a greater incentive to choose their financial reporting methods carefully to manage their employees' perception of unemployment risk, thereby strengthening their financial security and decreasing the expenses associated with unemployment risk.

Dou et al. (2016) conducted empirical research that supports this idea, finding substantial evidence of the following effects: a notable reduction in abnormal accruals, an increased recognition of special items and write-downs, and a higher probability of restatements aimed at reducing net income, all in response to an increase in UI benefits at the state level. This suggests that when higher UI benefits are provided, the risk of unemployment for employees decreases, thereby reducing the motivation for employers to manage employees' perceptions of unemployment risk. Additionally, Ng et al. (2019) found evidence indicating that higher UI benefits decrease the phenomenon of firm's income smoothing behavior. Taken together, it can be inferred that higher UI benefits bring a positive effect, leading to more accurate financial reporting by firms.

Recognition and Disclosure

The level of UI benefits can impact a company's recognition and disclosure of positive and negative news, as the recognition and disclosure of a firm's information is closely intertwined with employees' perception of the company's financial situation. The concept of conservatism in accounting suggests that accountants are more inclined to recognize losses rather than gains, leading to the immediate recognition of all bad news while delaying the recognition of all good news. Basu (1997) further defined conservatism as the tendency of accountants to require a higher level of verification for recognizing gains compared to losses, which has implications for how firms choose to report information.

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Building upon this definition, Liu et al. (2021) employed difference-in-differences analyses to examine the impact of increased UI benefits on accounting conservatism. Their study revealed a notable increase in accounting conservatism subsequent to the augmentation of UI benefits. These findings align with the conclusions drawn by Ji and Tan (2016), who found that the extent to which firms voluntarily disclose bad news forecast has also increased following the increase of UI benefits. To sum, the increase in UI benefits leads to a heightened level of accounting conservatism and a greater voluntary disclosure of negative forecasts by firms. These results can be attributed to the reduced motivation of employers to manage the disclosure practices of the firm, as higher UI benefits create a perception of lower unemployment risk among employees. Therefore, the availability of higher UI benefits diminishes the incentives for employers to maintain favorable financial information, thus influencing the firm's accounting conservatism and voluntary disclosure behavior. It can also draw a conclusion from these findings that the level of UI benefits has an impact on the transparency of corporate information disclosure and risk management capabilities.

Financing Decision

Studies have shown that an increase in UI benefits is associated with an increase in accounting conservatism (Liu et al., 2021). On the contrary, higher UI benefits lead to less conservative financial policies and higher leverage ratios for companies (Agrawal and Matsa, 2013). They argued that one of the reasons companies choose conservative financial policies is to mitigate the unemployment risk faced by employees by reducing the probability of financial distress through lower leverage ratios. By providing higher UI benefits, the costs borne by workers during layoffs are reduced, thereby decreasing the demand for higher wages from employees and its unemployment risk. As a result, companies have less incentive to use conservative financial policies to reduce workers'

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unemployment risk, allowing them to increase leverage and benefit from increased debt tax shields and other benefits associated with debt financing.

In addition, since UI benefits can reduce the unemployment risk borne by companies, thereby reducing the supervisory demands from banks and leading companies to rely more on bank loans for fundraising (Ben-Nasr, 2019). Other literature has also found that companies headquartered in states with higher UI benefits experience lower bank funding costs and better conditions (Shen, 2022).

It can be concluded that in an environment with higher UI benefits, companies are more inclined to adopt non-conservative financial policies, resulting in reduced leverage ratios, lower funding costs, and enhanced financial flexibility. These studies also highlight that the credit market evaluates workers' unemployment costs while approving and pricing loan contracts, and that employees' concerns over unemployment costs, which include economic costs, delayed job search, difficulty in landing another wage-equivalent job, and additional social costs, are no-negligible for firms' cost of borrowing.

2.2.2 Positive Effect: Economic Volatility

Not only does providing UI help unemployed individuals maintain their consumption demand, but it can also alleviate the sensitivity of local labor demand to fluctuations in economic activity (Maggio and Kermani, 2016). More generous UI benefits attenuate the volatility of economic fluctuation. Hsu et al. (2018) demonstrated the impact of UI on the housing market, as the UI program can protect the value of homes from labor market shocks and help prevent mortgage defaults. These studies emphasize an important positive externality of UI as an automatic stabilizer.

2.2.3 Negative Effect: Employee Adverse Behavior

Employee Shirking

The principal-agent framework is commonly employed in the economics literature

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to analyze the dynamics of the employee-employer relationship (Holmstrom, 1979). According to this framework, the employer (the principal) hires the employee (the agent) with the expectation that the employee will act in the best interest of the employer by exerting high effort. However, due to imperfect monitoring of employee effort, the employee may have an incentive to shirk and provide low effort.

Shapiro and Stiglitz (1984) developed a seminal model that explicitly examines the relationship between UI benefits and employee effort. Their comparative static analysis reveals a key finding: as UI benefits increase, employees tend to exert less effort, a behavior referred to as "shirking." The authors argue that the presence of UI benefits diminishes the perceived consequences linked to job termination, thereby mitigating the severity of the threat associated with being fired. In other words, employees are more likely to engage in shirking when UI benefits are higher, as the expected benefits of shirking outweigh the expected costs of job loss, which are reduced by the availability of UI benefits.

The influential research conducted by Shapiro and Stiglitz (1984) has sparked extensive investigations into the potential incentive effects of labor market institutions. Numerous empirical studies have demonstrated that safety nets for workers, such as the UI system and employee protection legislations (EPL), have a tendency to increase employees' propensity for engaging in adverse behaviors. Notably, Ichino and Riphahn (2005) observed a substantial rise in employee absenteeism and shirking following the Italian labor market reform in 1990. Similarly, Autor et al. (2006) found that the implementation of employment protection laws in the United States resulted in a decline in productivity. Bassanini et al. (2009) documented a similar pattern across OECD countries, while Darrough et al. (2019) established a negative association between UI benefits and firm-level productivity. These collective findings underscore the significance

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of labor market institutions in shaping employee behavior and firm performance.

Attractiveness of Alternative Options

While the economic literature emphasizes the necessity of providing relevant systems to recognize employees' excellent job performance, the management literature presents a different perspective on motivating employees, namely, aligning employees with organizational interests, which also contributes to the sustainability of competitive advantage (Castanias and Helfat, 1991, 2001; Coff, 1997; Gottschalg and Zollo, 2007). According to this literature, employees constantly evaluate alternative job opportunities. When employees perceive no superior alternative employment choices, their job motivation increases, reducing the likelihood of adverse behaviors (Rusbult et al., 1988).

The attractiveness of alternative options is positively correlated with the amount of UI benefits, as employees may receive higher benefits while pursuing other job opportunities (Flammer and Luo, 2017). Acemoglu and Shimer (2020) provide evidence that employees are more inclined to utilize more work time for seeking better job opportunities when they have higher levels of UI benefits due to the reduced opportunity cost. In a broader sense, the availability of generous UI benefits may weaken employees' motivation and dedication to their current employer, as alternative options become relatively more attractive in employees' minds (Flammer and Luo, 2017).

2.3 Asymmetric Cost Behavior

Asymmetric cost behavior refers to the non-symmetrical response of adjustment costs to changes in activity levels. It implies that the magnitude of cost adjustments is not equal when activity levels rise or fall. Figure 2 illustrates sticky and anti-sticky cost functions based on the example presented by Balakrishnan et al. (2004). The bold cost function represents sticky costs, assuming a high-capacity utilization level of Y_0. The dashed cost function represents anti-sticky costs, assuming excess capacity at activity

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level Y_0. Sticky costs are defined as having a smaller magnitude of cost reduction when the activity level decreases compared to the magnitude of cost increase when the activity level increases. In contrast, anti-sticky costs are defined as having a greater magnitude of cost reduction when the activity level decreases compared to the magnitude of cost increase when the activity level increases. Asymmetric costs primarily focus on changes in costs when the activity level decreases.

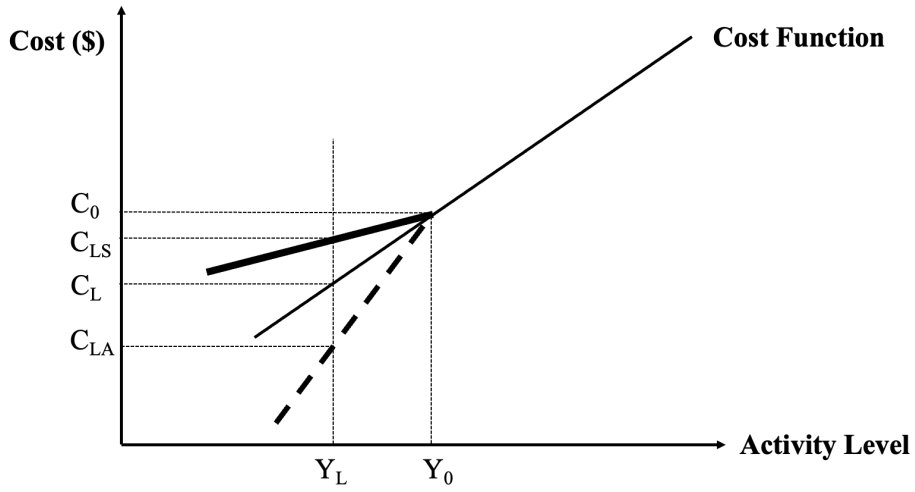

Figure 2. Cost asymmetry

In this section, I explore the literature on cost stickiness, covering its empirical evidence, determinants, and consequences. Figure 3 provides a simplified classification of the different aspects covered in the literature on cost stickiness.

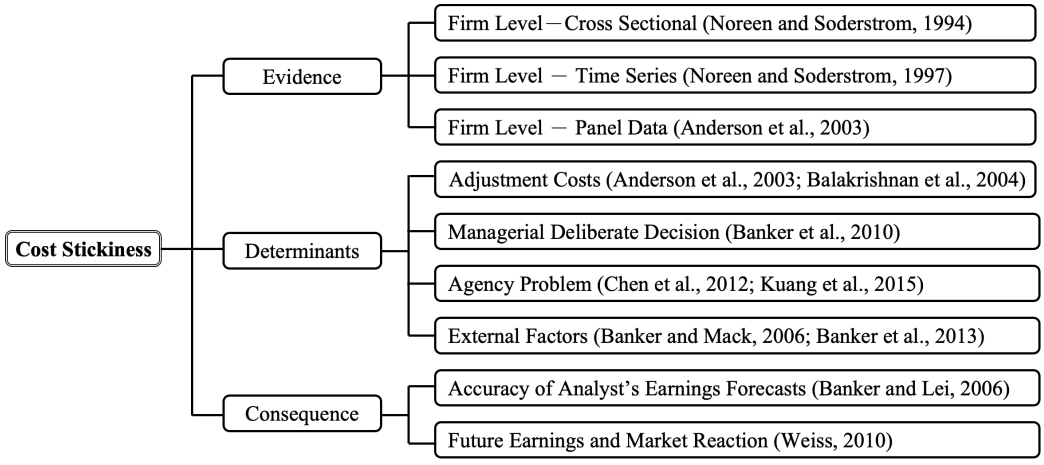

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Figure 3. The domain of cost stickiness literature

2.3.1 Evidence of Cost Stickiness

The issue of cost's disproportionality to its activity level is first addressed by Noreen and Soderstrom (1994). They conducted a study using cross-sectional data from various hospitals in Washington State to examine whether overhead costs are proportionate to the level of overhead activities. The traditional assumption in cost accounting suggests that a decision to reduce total activity by x% should result in a corresponding reduction of associated costs by x%. This assumption implies strict proportionality between costs and activity. However, Noreen and Soderstrom (1994) argue that the proportionality hypothesis does not hold for most overhead accounts. Their study successfully rejects the assumption of proportionality for overhead costs, providing evidence to support this rejection.

In another paper, Noreen and Soderstrom (1997) focused on investigating the time series behavior of overhead costs, as opposed to their cross-sectional behavior. This study represents the first extensive analysis of the time-series behavior of overhead cost accounts, and Noreen and Soderstrom were the pioneers in identifying that costs exhibit greater responsiveness to increases in activity compared to decreases in activity. Their findings shed light on the asymmetrical nature of cost changes in relation to activity fluctuations, highlighting that costs are more readily influenced by upward shifts in activity levels than downward shifts.

Anderson et al. (2003) coined the term "sticky" to describe a particular cost behavior and conducted an extensive investigation to gather evidence on how activity costs behave in response to changes in activity levels. Their study specifically focused on the behavior of selling, general, and administrative (SG&A) costs in relation to revenues, as sales volume has a significant impact on the various components of SG&A costs. To examine

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the presence of sticky cost behavior, the authors employed an empirical model that estimated the relationship between changes in SG&A costs and contemporaneous changes in net sales revenue. Notably, their model included an interaction dummy variable to distinguish between periods of decreasing revenue and periods of increasing revenue. It is worth mentioning that a majority of subsequent studies have replicated the model proposed by Anderson et al. (2003) model.

2.3.2 Determinants of Cost Stickiness

I provide an overview of studies that focus on identifying the determinants of cost stickiness. The majority of these "cost stickiness" studies aim to uncover the factors that influence the behavior of sticky costs. Anderson et al. (2003) posited that cost behavior is not mechanistic but rather influenced by deliberate adjustments made by managers. Other studies examining the determinants of cost stickiness primarily center on managerial decision-making. Watson and Subramaniam (2003) demonstrated that cost stickiness arises from managers' asymmetric response to significant changes in demand. The literature on cost stickiness also addresses specific factors pertaining to individual firms, including asset intensity, employee intensity, working capital intensity, debt intensity, and other variables that exhibit a significant association with asymmetric cost response. Furthermore, several important factors have been considered in the context of sticky cost behavior, such as adjustment costs, agency conflict, the core competency of the business, corporate governance factors, technological constraints, GDP growth, and capacity utilization. These factors have been recognized as influential determinants of cost stickiness in previous research. In the following sections, I will delve into some key aspects that have been widely recognized as influential determinants of cost stickiness in previous research. These aspects include adjustment costs, managerial deliberate decision,

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agency problem, and external factors. By examining the determinants of cost stickiness, I can gain valuable insight into the dynamics of cost behavior.

Adjustment Costs

Previous research argues that managers' discretion to retain resources in economic downturns is constrained by earnings and cash flow pressure (including incentives to reduce earnings volatility), so that factors that influence the adjustment costs of some resources may affect the resource preservation (Chang et al., 2021). When firms need to increase or decrease committed resources, they have to bear adjustment costs. In this case, in consistent with previous literature, adjustment costs make managers reluctant to reduce slack resources during periods of activity decline, and thus, increase the level of cost stickiness in firms (Anderson et al., 2003; Balakrishnan et al., 2004; Chen et al., 2012; Banker et al., 2013; Kama and Weiss, 2013; Anderson et al., 2015).

Managerial Deliberate Decision

Despite the assumption made by Anderson et al. (2003) that managerial intervention only influences costs during periods of sales decline, Banker et al. (2010) put forth a different perspective and provide evidence that managerial intervention impacts cost behavior in both directions, including periods of sales increase. The authors delve into the theory of deliberate decision-making by managers, taking into account capacity adjustment costs and the uncertainty surrounding future demand, and how these factors influence cost behavior. They demonstrate that managers' evaluation of demand uncertainty affects cost behavior not only during sales growth but also during sales decline. Employing various indicators to gauge managerial optimism, the authors reveal that the assessment of future demand uncertainty (optimism, pessimism, or neutrality) can actually reverse cost stickiness. Their study indicates that in cases where managers display optimism, the stickiness in selling, general, and administrative costs become more

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pronounced. These findings indicate that, when facing changes in activity levels, firms' resource adjustment decisions are influenced by multiple factors, which in turn impact managers' judgment in cost adjustment and drive intentional decision-making in this regard. As a result, cost stickiness phenomena arise.

Agency Problem

In situations where managers and shareholders have divergent interests, agency problems arise. Managers, having control over a larger share of company resources, may engage in activities that serve their own interests, resulting in decisions that maximize personal gains but may not align with the best interests of shareholders. An example of such behavior is the tendency towards empire building, wherein managers seek to expand the company beyond its optimal size or retain idle capacity to enhance their reputation, compensation, status, and power. This inclination towards empire building contributes to cost stickiness as managers have incentives to avoid activities that involve disposing of resources (Jensen, 1986; Stulz, 1990). Chen et al. (2012) provided empirical evidence supporting the association between managerial empire-building motives and the stickiness of selling and general administrative expenses. Another pertinent study by Kuang et al. (2015) investigated the influence of overconfident CEOs on cost stickiness. This phenomenon is also rooted in agency costs, as overconfident CEOs often hold excessively optimistic expectations about the company's future. Driven by the same empire-building motivations, they are reluctant to reduce idle capacity, resulting in increased agency costs and higher levels of cost stickiness.

However, the explanation of cost stickiness as a consequence of agency problems solely attributable to managers' selfish behavior presents a negative perspective on this phenomenon. Conversely, an alternative view proposed by another scholar suggests that even when the CEO's interests align with those of shareholders, it can still lead to an

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increase in cost stickiness (Alexander et al., 2014). In this context, cost stickiness is considered desirable as it indicates the absence of conflicting interests. Nevertheless, cost stickiness persists. Therefore, companies have the ability to influence cost stickiness and the financial decision-making behavior of CEOs through the implementation of equity incentive schemes.

External Factors

Given that this study aims to investigate the impact of UI benefits on cost stickiness, which is considered one of the external factors, this section focuses on exploring other external factors related to the labor market. Initially, Banker and Mack (2006) examined the influence of national labor market characteristics on the asymmetric cost behavior of firms, specifically focusing on cost stickiness. Through an analysis of various aspects of the labor market, they demonstrated that the structure of the labor market, policies, and cross-country differences are significant determinants of cost stickiness. Among these factors, labor unions play a crucial role in the labor market, and scholars such as Chang et al. (2021) suggested that labor costs are more difficult to adjust when facing strong union pressures. Another characteristic of the labor market is the policy differences across countries. Banker et al. (2013) proposed that the degree of cost stickiness is associated with the strictness of employment protection legislation (EPL) in the country. Specifically, the more stringent the EPL, the higher the level of cost stickiness for firms. Moreover, when minimum wages increase, firms need to pay higher wages to employees, leading to increased recruitment costs and a subsequent reduction in cost stickiness (Jiang et al., 2016).

Additionally, the political environment of a country also influences cost stickiness. Prabowo et al. (2018) found that countries often intervene in the decision-making processes of state-owned enterprises (SOEs) and prioritize socially and politically

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favorable activities, which may result in significant political costs. For instance, in order to gain political support, politicians may request that state-owned enterprises avoid layoffs to minimize the unemployment rate, thereby influencing their resource adjustment decisions. Furthermore, scholars have provided research on the relationship between the political institutional framework and cost stickiness. Kuo and Lee (2021) discovered that regions with stronger political institutions are associated with higher levels of cost stickiness, as firms face significant political costs. When the political institutional framework is strong, cost stickiness is more likely to be driven by economic influences, whereas when the political institutional framework is weak, cost stickiness is more likely to be driven by agency mechanisms.

In conclusion, through the literature review, we can deduce that external policies or pressures have a significant impact on firms' cost decision-making. The characteristics of the labor market, such as union pressures and policy differences across countries, as well as the political environment, including intervention in decision-making processes and the strength of the political institutional framework, all play crucial roles in cost stickiness. These research findings contribute to a deeper understanding of the mechanisms underlying cost stickiness and provide practical insights to assist firms in making more effective cost management and resource allocation decisions when facing uncertain external factors.

2.3.3 Consequence of Cost Stickiness

Several studies have investigated the association between cost stickiness and the accuracy of profit forecasting. Weiss (2010) found that a higher degree of cost stickiness is associated with less precise analyst forecasts. In a related study, Banker and Lei (2006) developed an earnings forecast model that decomposes earnings into two components, capturing (1) the variability of costs with changes in sales revenue, and (2) the stickiness

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of costs during sales declines. Their findings demonstrated that incorporating asymmetric cost behavior in earnings forecast models significantly improves their predictive accuracy.

Drawing from these findings, it can be inferred that the imprecise forecasts stemming from cost stickiness may heighten investors' perception of risk, consequently impacting their assessment of the firm. Investors may then demand higher rates of return, leading to an increased cost of capital for the company. As a result, cost stickiness may indirectly influence the cost of funds, especially when it contributes to forecast inaccuracies, subsequently influencing future earnings and market reactions.

3. Hypotheses Development

3.1 Unemployment Insurance and Cost Stickiness

When setting the amount and duration of unemployment insurance, most states take into account the unemployment rate as a determining factor.[1] When the unemployment rate exceeds a specific threshold, the benefit amount increases or the duration of unemployment assistance is extended, and vice versa. Therefore, it can be inferred that the UI benefit amount in a particular state reflects the unemployment rate to some extent, indicating the level of protection for the unemployed and the importance of social security by the state government. Based on this, it is plausible to suggest that higher UI benefits may impose higher political costs on businesses. According to the research by Kuo and Lee (2021), they found a positive relationship between the strength of political institutions and cost stickiness, as businesses face greater political costs. This provides evidence of the relationship between political costs and cost stickiness. The higher UI benefits are associated with government social security policies and political intervention, which may affect the cost stickiness of businesses. In order to protect the unemployed and maintain

[1] *US Department of Labor,* Cumulative Report on State Legislation, CY 2019 https://oui.doleta.gov/unemploy/content/strpt/2019/strpt19-Cumulative.pdf

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social stability, the government may limit businesses' cost adjustment behaviors, including employees' adjustment decisions.

Moreover, the implementation of cost stickiness can serve as a mechanism to align the interests of employees and the firm, thereby enhancing employee engagement and mitigating undesirable behaviors associated with generous UI benefits. Prior literature emphasizes the establishment of a competitive advantage through the alignment of individual and organizational interests, which serves to motivate and enhance employee engagement (Flammer and Luo, 2017). Specifically, generous UI benefits have two detrimental effects: employee shirking and the inclination to explore alternative options. Shapiro and Stiglitz (1984) developed a seminal model that explicitly examines the relationship between UI benefits and employee effort, demonstrating that as UI benefits increase, employees tend to exert less effort. Furthermore, Acemoglu and Shimer (2020) point out that employees are more likely to allocate additional work hours towards searching for a better job when they have higher unemployment insurance (UI) benefits, as the opportunity cost decreases. The motivation and loyalty of employees towards their current employer are weakened due to the provision of more generous UI benefits, as alternative options become more attractive. Cost stickiness, in the presence of inflexible costs that are not easily reducible, can signal to employees that the firm is unlikely to terminate or lay off employees easily, creating a perception that the firm they are employed with is superior to other options. When employees perceive the employer as fair-minded based on the firm's cost stickiness, a sense of belonging is developed, and their future actions are oriented towards reinforcing this identification. Therefore, cost stickiness can serve as a mechanism to reduce adverse employee behaviors. Based on the arguments, I believe the cost stickiness would be stronger with more generous UI benefits.

However, on the other hand, the significance of UI benefits as an automatic stabilizer

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in maintaining economic stability and consumer demand has been widely emphasized in numerous studies (Hsu et al., 2018; Beach et al., 2019; Maggio et al., 2022). By partially mitigating the financial losses associated with unemployment, UI benefits foster a sense of security among employees and reduce their reliance on employers for economic support (Dou et al., 2016). This reduced reliance on employers can have implications for managers' evaluation of adjustment costs, which is seen one of the main determinants of cost stickiness (Anderson et al., 2003). Higher levels of UI benefits enable employees to display greater flexibility in times of economic hardship or organizational downsizing, without necessitating immediate demands for higher wages or job retention from employers. Similarly, businesses encounter reduced pressures and costs when confronted with economic challenges or the necessity for cost adjustments.

Building upon the aforementioned insights, I remain steadfast in the view that in the presence of more generous UI benefits, the manifestation of cost stickiness is likely to be more pronounced. This is attributed to the expectation that companies would actively seek to mitigate the detrimental effects of adverse employee behaviors, including diminished productivity, on the overall organizational performance. By implementing cost stickiness, companies can strategically align the interests of the company and its employees, thereby fostering a harmonious and mutually advantageous relationship. Thus, I formulate my first hypothesis as follows:

H1: Cost stickiness is higher in firms with higher UI benefits.

3.2 The Role of Employee Treatment of Firm

Given the close relationship between UI programs and employees, I decide to further investigate the relationship between employee treatment, UI benefits, and cost stickiness. With the increasing significance of sustainability issues, organizations are placing greater emphasis on the protection and equitable treatment of their employees, as evidenced by

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the incorporation of labor management into environmental, social, and governance (ESG) ratings. These ratings are influenced by initiatives related to workforce reduction, highlighting the importance of evaluating employee treatment as a critical indicator of employer-employee relationships. This indicates that how a company treats its employees is crucial in shaping its image and maintaining its reputation.

Flammer and Luo (2017) identify three crucial dimensions that are influenced by the implementation of corporate social responsibility (CSR) initiatives. Firstly, CSR programs have the potential to widen the competitive gap between firms, enhancing their attractiveness and competitive advantage to employees. Secondly, CSR initiatives can improve information flow and transparency between employees and employers. Lastly, the incentive mechanisms between firms and employees can be aligned through the promotion of employee fairness (Colquitt et al., 2001) and identification with the company (Tajfel et al., 1979) that are fostered by the implementation of CSR programs.

Based on our first hypothesis, I expected that as UI benefits increase, managers would utilize the mechanism of cost stickiness to mitigate the negative effects of generous UI benefits, ultimately aligning the interests of employees and managers. This alignment can be achieved through various practices, such as implementing employee-welfare policies. Supporting this perspective, Darrough et al. (2019) provide evidence that employing employee-welfare policies as a governance tool can effectively address the decline in firm-level productivity resulting from generous UI benefits, thus reinforcing the importance of aligning interests.

Drawing from these findings, firms with higher UI benefits and better employee treatment are more likely to exhibit stronger cost stickiness. These companies prioritize Corporate Social Responsibility (CSR) strategies and employee well-being to counteract the potential negative consequences associated with higher UI benefits. By emphasizing

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employee well-being, these firms cultivate stronger attachment and loyalty, reducing the inclination of employees to seek alternative employment opportunities. Consequently, this heightened commitment fosters a work environment characterized by lower turnover intentions, leading to a reduced need for employee terminations or downsizing initiatives. In summary, the combination of higher UI benefits and better employee treatment encourages firms to prioritize CSR strategies, employee well-being, and align the interests of the company and its employees, ultimately strengthening the implementation of cost stickiness practices. Based on these insights, I formulate my second hypothesis as follows:

H2: Cost stickiness is stronger in higher UI benefits firms with better employee treatment.

4. Research Design

4.1 Variable Constructions

Measurement of Cost Stickiness

To access cost stickiness, I utilize the original model formulated by Anderson et al. (2003) as the measurement framework:

$$\Delta ln(SGA)_{i,t}=\alpha_0+\alpha_1\Delta ln(Sales)_{i,t}+\alpha_2 Dec*\Delta ln(Sales)_{i,t}+\varepsilon_1 \quad (1)$$

where i represents firm i and t for year t; $\Delta ln(SGA)_{i,t} = ln(SGA_{i,t} / SGA_{i,t-1})$, which denotes the log change in selling, general and administrative (SG&A) costs from year t - 1 to year t; $\Delta ln(Sales)_{i,t} = ln(Sales_{i,t} / Sales_{i,t-1})$, which denotes the log change in sales from year t - 1 to year t; *Dec*, an indicator variable which equals 1 if sales from firm i decreased in year t relative to year t - 1, and 0 otherwise. Following Anderson et al. (2003), I adopt the logarithmic form of $SGA_{i,t} / SGA_{i,t-1}$ and $Sales_{i,t} / Sales_{i,t-1}$ to enhance the comparability of sales across firms and mitigate potential issues arising from heteroskedasticity.

The coefficient α_1 quantifies the percentage change in SG&A costs corresponding

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to a 1% increase in sales. With *Dec* being equal to 1 in the event of sales decline, the combined effect of coefficients ($\alpha_1 + \alpha_2$) represents the percentage reduction in SG&A costs associated with a 1% decrease in sales. The presence of a positive and statistically significant α_1 coefficient, along with a significantly negative α_2 coefficient, supports the phenomenon of cost stickiness, indicating a limited cost adjustment in response to sales downturns (Chen et al., 2012).

Cost categories such as operating costs or total costs encompass a range of expenses, incorporating resource costs and monetary adjustment costs. The stickiness of SG&A costs has been extensively addressed in the literature due to their distinct characteristics (Anderson et al., 2003; Chen et al., 2012). Firstly, SG&A costs typically encompass expenditures associated with sales, administration, and general management, which are indispensable for daily operational activities. Secondly, certain components within SG&A costs may consist of fixed costs, such as rent and salaries, which are not easily adaptable in the short term. Furthermore, in some instances, firms may have fixed or contractual obligations that necessitate ongoing payments even during periods of declining sales. Conversely, operating costs pertain to the day-to-day maintenance and management of a business. They comprise the direct costs of goods sold as well as other operating expenses commonly referred to as SG&A costs, encompassing rent, payroll, overhead costs, raw materials, and maintenance expenses.

I aim to examine the stickiness of both SG&A costs and operating costs, providing a broader perspective compared to solely focusing on SG&A costs. To achieve this, I include the log change of operating costs, denoted as $\Delta ln(OC)_{i,t}$, as an additional dependent variable. Notably, operating costs exhibit a close relationship with labor adjustment costs, as the latter forms a substantial portion of the former. Through this investigation, my study contributes to a more comprehensive comprehension of cost

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behavior and its implications for financial management within organizations.

UI Benefits

I measure *UI* by taking the logarithm of the product of the maximum duration of weeks that a state offers benefits to claimants, referred to as "max duration," and the maximum weekly benefit amount provided by the state. Subsequently, I employ a matching approach that leverages the firms' headquarters location and the corresponding state's UI benefits.

Employee Treatment

The Employee Treatment Score (*ETS*) functions as a metric for assessing the labor management performance of firms. It assesses the level of risk that companies face in terms of workflow disruptions resulting from labor unrest or reduced productivity caused by low job satisfaction.[2] Higher scores on this key issue are assigned to companies that offer robust employment benefits, performance incentives, and employee engagement and professional development programs. Conversely, companies that have a higher risk of labor unrest due to recent layoffs or operations in markets prone to work stoppages and lack strong employee engagement initiatives and employment benefits receive lower scores on this benchmark. The score ranges from 0 to 10.

Control Variables

I control for relevant variables based on previous researches (Anderson et al., 2003; Chen et al., 2012; Dou et al., 2016). *LEV* represents the ratio of total liabilities to total assets, which is a financial leverage level that captures financial pressure. *ASINT* is asset intensity, defined as the log-ratio of total assets to sales. *EMPINT* is employee intensity, defined as the log-ratio of number of employees to sales. The higher the intensity of assets and employees, the greater the corresponding adjustment costs, leading to an elevated

[2] MSCI ESG Rating, https://www.msci.com/our-solutions/esg-investing/esg-ratings

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level of cost stickiness. *SucDec* equals 1 if there is a decrease in sales from the previous year in both year t - 1 and year t, and 0 if there is no such decrease. The purpose of introducing *SucDec* is to consider the possibility of managers holding a pessimistic outlook towards future demand, since continuous drops in sales revenue can lead to negative performance expectations and consequently incentivize firms to make adjustments to their slack resources, leading to a decrease in the degree of cost stickiness. *FCF* is calculated from operating activities' cash flow minus common and preferred dividends scaled by total assets, which is a common proxy for the agency problem that results in empire-building incentives; *SmallProfit* is an indicator variable which equals 1 in year t for which the net income scaled by the year-beginning total assets is greater than or equal to zero but less than one percent, and 0 otherwise. *SGDP* represents state-level GDP growth rates. *UNEMP* represents state-level unemployment rates. *UITAX* represents ratio of taxable to total wages. The detailed variable definitions are available in Appendix 1.

4.2 Main Research Design

Test for H1

To test my first hypothesis regarding the impact of UI benefits on the level of cost stickiness, I adopt the approach utilized by Anderson et al. (2003) and construct my regression models as presented below:

$$\begin{aligned}\Delta ln(SGA)_{i,t}=&\beta_0+\beta_1\Delta ln(Sales)_{i,t}+\beta_2 Dec*\Delta ln(Sales)_{i,t}+\beta_3 UI_{i,t}\\&+\beta_4 UI_{i,t}*\Delta ln(Sales)_{i,t}+\beta_5 UI_{i,t}*Dec*\Delta ln(Sales)_{i,t}+\beta_6 LEV_{i,t}\\&+\beta_7 ASINT_{i,t}+\beta_8 EMPINT_{i,t}+\beta_9 SucDec+\beta_{10} FCF_{i,t}+\beta_{11} SmallProfit\\&+\beta_{12} SGDP_{i,t}+\beta_{13} UNEMP_{i,t}+\beta_{14} UITAX_{i,t}+\varepsilon_2\end{aligned} \quad (2)$$

$$\begin{aligned}\Delta ln(OC)_{i,t}=&\gamma_0+\gamma_1\Delta ln(Sales)_{i,t}+\gamma_2 Dec*\Delta ln(Sales)_{i,t}+\gamma_3 UI_{i,t}\\&+\gamma_4 UI_{i,t}*\Delta ln(Sales)_{i,t}+\gamma_5 UI_{i,t}*Dec*\Delta ln(Sales)_{i,t}+\gamma_6 LEV_{i,t}\\&+\gamma_7 ASINT_{i,t}+\gamma_8 EMPINT_{i,t}+\gamma_9 SucDec+\gamma_{10} FCF_{i,t}+\gamma_{11} SmallProfit\\&+\gamma_{12} SGDP_{i,t}+\gamma_{13} UNEMP_{i,t}+\gamma_{14} UITAX_{i,t}+\varepsilon_3\end{aligned} \quad (3)$$

Model (2) and model (3) share an identical structure, with the only difference being the

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selection of the dependent variable, namely $\Delta ln(SGA)_{i,t}$ and $\Delta ln(OC)_{i,t}$, respectively. My primary interest lies in examining the coefficient of $UI_{i,t}*Dec*\Delta ln(Sales)_{i,t}$, which captures the effect of UI benefits on cost stickiness during periods of sales decline. To confirm H1, which posits that firms in states with higher UI benefits will exhibit lower cost stickiness, I expect the corresponding coefficient of $UI_{i,t}*Dec*\Delta ln(Sales)_{i,t}$ to be positive and statistically significant.

Test for H2

To examine my second hypothesis regarding the influence of UI benefits and employee treatment on the extent of cost stickiness, I incorporate the variable *ETS* (Employee Treatment Score) into both model (2) and model (3), as illustrated below:

$$\begin{aligned}\Delta ln(SGA)_{i,t}=&\delta_0+\delta_1\Delta ln(Sales)_{i,t}+\delta_2 Dec*\Delta ln(Sales)_{i,t}+\delta_3 UI_{i,t}\\&+\delta_4 UI_{i,t}*\Delta ln(Sales)_{i,t}+\delta_5 UI_{i,t}*Dec*\Delta ln(Sales)_{i,t}+\delta_6 ETS_{i,t}\\&+\delta_7 ETS_{i,t}*\Delta ln(Sales)_{i,t}+\delta_8 ETS_{i,t}*Dec*\Delta ln(Sales)_{i,t}\\&+\delta_9 ETS_{i,t}*UI_{i,t}+\delta_{10} ETS_{i,t}*UI_{i,t}*Dec*\Delta ln(Sales)_{i,t}+\delta_{11} LEV_{i,t}\\&+\delta_{12} ASINT_{i,t}+\delta_{13} EMPINT_{i,t}+\delta_{14} SucDec+\delta_{15} FCF_{i,t}+\delta_{16} SmallProfit\\&+\delta_{17} SGDP_{i,t}+\delta_{18} UNEMP_{i,t}+\delta_{19} UITAX_{i,t}+\varepsilon_4\end{aligned} \quad (4)$$

$$\begin{aligned}\Delta ln(OC)_{i,t}=&\theta_0+\theta_1\Delta ln(Sales)_{i,t}+\theta_2 Dec*\Delta ln(Sales)_{i,t}+\theta_3 UI_{i,t}\\&+\theta_4 UI_{i,t}*\Delta ln(Sales)_{i,t}+\theta_5 UI_{i,t}*Dec*\Delta ln(Sales)_{i,t}+\theta_6 ETS_{i,t}\\&+\theta_7 ETS_{i,t}*\Delta ln(Sales)_{i,t}+\theta_8 ETS_{i,t}*Dec*\Delta ln(Sales)_{i,t}\\&+\theta_9 ETS_{i,t}*UI_{i,t}+\theta_{10} ETS_{i,t}*UI_{i,t}*Dec*\Delta ln(Sales)_{i,t}+\theta_{11} LEV_{i,t}\\&+\theta_{12} ASINT_{i,t}+\theta_{13} EMPINT_{i,t}+\theta_{14} SucDec+\theta_{15} FCF_{i,t}+\theta_{16} SmallProfit\\&+\theta_{17} SGDP_{i,t}+\theta_{18} UNEMP_{i,t}+\theta_{19} UITAX_{i,t}+\varepsilon_5\end{aligned} \quad (5)$$

I examine H2 by evaluating model (4) and model (5). Based on my theoretical proposition that firms with higher UI benefits and better employee treatment are more likely to exhibit higher levels of cost stickiness, I anticipate observing a negative and statistically significant relationship in the coefficient of $ETS_{i,t}*UI_{i,t}*Dec*\Delta ln(Sales)_{i,t}$. Such an outcome would confirm any variations in the impact when incorporating the employee treatment factor alongside UI benefits. This analysis allows me to compare these results with the findings obtained in H1.

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5. Empirical Results

5.1 Data and Sample Collection

I conduct hypothesis testing using a sample of publicly-held companies in the United States, covering the period from 1998 to 2021. To gather data on UI, I obtain from the United States Bureau of Labor Statistics. Firm-level variables' data are collected from the Compustat Fundamentals annual file. I utilize a matching approach based on the firms' headquarter location and the corresponding state's UI benefits. To assess labor management performance, I obtain data from MSCI. To account for economic factors, state-level GDP data from the Bureau of Economic Analysis and unemployment data from the United States Bureau of Labor Statistics are acquired. I conduct a merging of the aforementioned datasets, followed by the removal of any observations containing missing values for the variables of interest. Furthermore, I exclude the financial sector from my analysis. Additionally, to enhance the reliability and validity of my research, I exclude data from two outlier areas, namely Puerto Rico and the Virgin Islands.

5.2 Descriptive Statistics and Pairwise Correlations

Descriptive Statistics

Descriptive statistics for the variable employed in the regression analyses are presented in Table 1. $\Delta ln(SGA)_{i,t}$ has a mean value of 0.06 with a standard deviation of 0.19, and $\Delta ln(Sales)_{i,t}$ has a mean value of 0.06. These indicate that both sales and SG&A costs, on average, increase during the sample period. The mean value of *UI*, which measures the log of state's maximum UI benefits, is 9.36 with an interquartile range from 9.19 to 9.60, suggesting variation in UI benefits in our sample. These descriptive statistics provide an overview of the central tendencies and dispersion of the variables in the analysis.

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[Insert Table 1 here]

Pairwise Correlations

Table 2 reports the pairwise correlations for the variable used for the regression analyses. The correlation coefficient of 0.034 ($p < 0.01$) between $\Delta ln(SGA)_{i,t}$ and *UI* suggests a very weak positive relationship between the changes in SG&A costs and the state's UI benefits. The statistically significant positive correlation indicates that, on average, as UI benefits increases, there is a slight tendency for SG&A costs to increase as well. However, it is crucial to exercise caution when interpreting this finding, as correlation does not imply causation. There may be underlying factors or mechanisms that drive both SG&A costs and UI benefits simultaneously.

[Insert Table 2 here]

5.3 The Effect of UI Benefits on Cost Stickiness

Table 3 presents the regression results for H1. Columns (1) and (2) present the results of regression model (2), with column (1) including only the main variables and column (2) incorporating additional control variables in the regression analysis. By adopting this approach, I aim to understand the independent effects of the main variables before controlling for other potential influencing factors, thus ensuring the accuracy and interpretability of the research findings. Both columns display significantly negative coefficients for $UI*Dec*\Delta ln(Sales)_{i,t}$, with values of -0.307 ($p < 0.01$) in column (1) and -0.304 ($p < 0.01$) in column (2), indicating a consistent and statistically significant negative relationship. Consistently, when utilizing regression model (3) and employing operating costs as the dependent variable, I consistently observe significantly negative coefficients for $UI*Dec*\Delta ln(Sales)_{i,t}$,. Specifically, the coefficient in column (3) is -0.07 ($p < 0.1$), and in column (4) it is -0.069 ($p < 0.1$). Based on these findings, H1 is supported,

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indicating that cost stickiness is stronger in firms with higher UI benefits. Furthermore, this association remains valid for both SG&A costs and operating costs, with a stronger effect observed in the case of SG&A costs.

[Insert Table 3 here]

5.4 The Effect of Employee Treatment on Cost Stickiness

Results for H2 are shown in columns (2) and (4) of Table 4, where I incorporate the employee treatment score (*ETS*) factor into both model (2) and model (3). To support H2, my main focus is on the coefficients of $ETS*UI*Dec*\Delta ln(Sales)_{i,t}$. Notably, both columns exhibit significantly negative coefficients for $ETS*UI*Dec*\Delta ln(Sales)_{i,t}$, with values of -0.058 ($p < 0.1$) in column (2) and -0.119 ($p < 0.01$) in column (4). These results demonstrate a consistent and statistically significant relationship, even without controlling for other variables. Based on these findings, H2 is supported, indicating that cost stickiness is stronger in firms with higher UI benefits and better employee treatment. Also, this association holds true for both SG&A costs and operating costs, with a more pronounced effect observed in the case of operating costs. This finding can be attributed to the fact that employee-related costs constitute a significant portion of operating costs. Therefore, higher UI benefits and better employee treatment are likely to lead to a higher degree of stickiness in operating costs.

[Insert Table 4 here]

6. Additional Analysis

6.1 Difference-in-Differences (DID) Analysis

In general, the dependent variable is subject to numerous factors that may not be completely observable, and endogeneity issues may arise. In my main results, the use of state's maximum total UI benefits as a proxy for external policy factors has limitations in

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detecting the policy effect, making additional testing advisable. One effective method is the difference-in-differences (DID) analysis, which allows controlling for the comparison between treatment and control groups, thereby eliminating the influence of other factors on the dependent variable and presenting the desired policy effect. Hence, it is recommended to employ the DID analysis to scrutinize the influence of UI benefits on firms' cost behavior. Utilizing the DID approach, by comparing the treatment and control groups, it becomes feasible to ascertain the extent to which UI benefits affect firms' cost behavior, thereby enhancing my comprehension of this phenomenon.

For my additional analysis, I employ a matched sample methodology. First, I identify state-years where the maximum limit of UI benefits increases by more than 10% (referred to as "the event"), in line with the approach used by Dou et al. (2016). The 10% threshold is established by identifying the 85th percentile of the distribution of annual changes in the maximum limit of UI benefits. This allows us to strike a balance between capturing meaningful changes and ensuring an adequate sample size. Subsequently, I pair each event-year with at least one neighboring state that does not undergo a significant rise in maximum UI benefits in both the same year and the previous year. As a result of this matching process, there are a total of 245 state-years that correspond to the 67 event-years. It is worth noting that in certain instances, a state may be matched with multiple states within a particular year. Table 5 displays a sample of 67 event-years covering the period from 1998 to 2021, in which there is an increase in maximum total benefits exceeding 10% without a significant increase in UI benefits in the pre-event year. The dataset used for DID additional analysis comprises 2,835 firm-year observations.

[Insert Table 5 here]

Consequently, by substituting *UI* with *Treat, Post* and *Treat*Post,* I obtain the following model:

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$$\Delta ln(SGA)_{i,t}=\lambda_0+\lambda_1\Delta ln(Sales)_{i,t}+\lambda_2 Dec*\Delta ln(Sales)_{i,t}+\lambda_3 Treat$$
$$+\lambda_4 Treat*\Delta ln(Sales)_{i,t}+\lambda_5 Treat*Dec*\Delta ln(Sales)_{i,t}$$
$$+\lambda_6 Post+\lambda_7 Post*\Delta ln(Sales)_{i,t}+\lambda_8 Post*Dec*\Delta ln(Sales)_{i,t}$$
$$+\lambda_9 Treat*Post*\Delta ln(Sales)_{i,t}+\lambda_{10} Treat*Post*Dec*\Delta ln(Sales)_{i,t}$$
$$+\lambda_{11} LEV_{i,t}+\lambda_{12} ASINT_{i,t}+\lambda_{13} EMPINT_{i,t}+\lambda_{14} SucDec+\lambda_{15} FCF_{i,t}$$
$$+\lambda_{16} SmallProfit+\lambda_{17} SGDP_{i,t}+\lambda_{18} UNEMP_{i,t}+\lambda_{19} UITAX_{i,t}+\varepsilon_6 \quad (6)$$

$$\Delta ln(OC)_{i,t}=\mu_0+\mu_1\Delta ln(Sales)_{i,t}+\mu_2 Dec*\Delta ln(Sales)_{i,t}+\mu_3 Treat$$
$$+\mu_4 Treat*\Delta ln(Sales)_{i,t}+\mu_5 Treat*Dec*\Delta ln(Sales)_{i,t}$$
$$+\mu_6 Post+\mu_7 Post*\Delta ln(Sales)_{i,t}+\mu_8 Post*Dec*\Delta ln(Sales)_{i,t}$$
$$+\mu_9 Treat*Post*\Delta ln(Sales)_{i,t}+\mu_{10} Treat*Post*Dec*\Delta ln(Sales)_{i,t}$$
$$+\mu_{11} LEV_{i,t}+\mu_{12} ASINT_{i,t}+\mu_{13} EMPINT_{i,t}+\mu_{14} SucDec+\mu_{15} FCF_{i,t}$$
$$+\mu_{16} SmallProfit+\mu_{17} SGDP_{i,t}+\mu_{18} UNEMP_{i,t}+\mu_{19} UITAX_{i,t}+\varepsilon_7 \quad (7)$$

Consistent with the H1 formulated in Section 3, I employ the DID models (6) and (7) to examine whether a significant increase in UI benefits leads to an increase or decrease in both SG&A costs and operating costs stickiness. My additional analysis incorporates two indicator variables: *Treat*, which takes a value of 1 if a firm-year is located in a state with a significant increase in UI benefits (> 10%) and 0 otherwise, and *Post*, which takes a value of 1 if a firm-year is after the UI benefits increase and 0 otherwise.

The primary variable of interest is $Treat*Post*Dec*\Delta ln(Sales)_{i,t}$, which represents the effect of the UI policy during periods of sales decline that I am examining, commonly known as the "difference-in-differences" effect. Thus, my primary interest lies in investigating the coefficient $Treat*Post*Dec*\Delta ln(Sales)_{i,t}$, which captures the effect of UI benefits following a significant increase on cost stickiness during periods of sales decline, relative to firms located in states without a large increase. The results are shown in Table 6. Consistent with my earlier findings, my additional findings provide further evidence that a substantial increase in UI benefits for the treatment group during a period of sales downturn leads to a more pronounced exacerbation of cost stickiness. These effects are reflected in the negative and statistically significant coefficient of $Treat*Post*Dec*\Delta ln(Sales)_{i,t}$. By separating the treatment and control groups from the policy effect, this method yields more accurate results of the policy impact, which

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enhances the robustness of my results.

[Insert Table 6 here]

6.2 Cost of Goods Sold as a Dependent Variable

Cost of goods sold (COGS), being a critical cost component, holds significant importance in comprehending the cost behavior of businesses as it is directly associated with their production and sales activities. Previous studies, such as Watson and Subramaniam (2003), have identified COGS as exhibiting stickiness, alongside SG&A costs and operating costs. Furthermore, the lack of standardized guidelines contributes to substantial variations in the composition of SG&A and COGS across different companies, exemplifying the scenario where SG&A costs for one company may correspond to COGS for another (Mintz, 1994; Lazere, 1995). Therefore, incorporating COGS into additional testing is necessary and can effectively address such issues.

To achieve this objective, I employ the main model approach by considering COGS as the dependent variable and controlling for other relevant variables to examine its response to external policy changes, specifically UI variations. The results are shown in Table 7. The additional findings corroborate my previous results, demonstrating that cost stickiness is stronger with higher UI benefits and better employee treatment. It is worth noting that when utilizing COGS as the dependent variable, a more pronounced effect is observed ($p < 0.01$).

Incorporating COGS into the analysis enhances my understanding of cost behavior and provides a comprehensive evaluation of factors influencing cost stickiness. Furthermore, investigating the stickiness of COGS in conjunction with other cost components allows for a more comprehensive and in-depth analysis of firms' cost dynamics. In summary, the additional analysis focuses on the cost stickiness of COGS, providing a deeper insight into the behavioral patterns of this particular cost component

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in the face of UI variations. This supplementary analysis complements the results of my main model and enriches my understanding of firms' cost behavior.

[Insert Table 7 Here]

7. Conclusion

In this research, I explore the impact of progressively increasing unemployment insurance (UI) benefits on the asymmetric cost behavior demonstrated by firms. My primary objective is to examine the resource adjustment decisions made by firms and how UI benefits impact the cost shift during periods of reduced demand. To measure the extent of UI benefits, I utilize data from the United States Bureau of Labor Statistics, calculating the UI benefit measure by multiplying the maximum weekly benefit amounts and the maximum number of benefit weeks for each state. I estimate my models using data spanning from 1998 to 2021. My first hypothesis posits that an increase in UI benefits may increase the degree of cost stickiness. Additionally, in my second model, I integrate the employee treatment factor. My second hypothesis posits that both higher UI benefits and better employee treatment contribute to an increase in cost stickiness.

The empirical results are consistent with my hypotheses, demonstrating that higher UI benefits and better employee treatment lead to increased cost stickiness. Furthermore, I conduct additional analyses to address the gaps in my hypotheses. Firstly, I employ a difference-in-differences (DID) analysis to capture the effect of UI policy. This involves categorizing my sample into treatment and control groups based on the magnitude of maximum UI benefit changes, specifically those exceeding or falling below 10%. Moreover, I utilize different dependent variable. By employing these rigorous analytical techniques, I aim to uncover the underlying mechanisms and dynamics that contribute to the observed effects, thereby enhancing my understanding of how UI policy influences cost behavior within firms.

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My research makes three key contributions. Firstly, by integrating the viewpoints of Shapiro and Stiglitz (1984) with my findings, I offer a fresh perspective on the impact of UI on firm behavior. I demonstrate that, contrary to previous beliefs, firms can mitigate the negative effects of UI by providing better employee treatment and implementing corporate social responsibility strategies, thus achieving alignment between employee and managerial interests through cost stickiness measures. This novel explanation has important theoretical and practical implications for understanding the role of UI in shaping firm behavior. Secondly, my study enhances our understanding of cost behavior determinants and their implications for decision-making in firms. I examine the influence of UI benefits on cost stickiness and investigate how a nation's UI policy implementation and changes affect a firm's flexibility in managing costs. This contributes to the broader literature on cost management and decision-making. Lastly, my research sheds light on the significance of employee treatment in the context of UI. By exploring the relationship between UI benefits, cost stickiness, and employee treatment, I highlight the importance of considering employee welfare and corporate social responsibility in managing the impact of UI on firm behavior. This contributes to the growing literature on employee treatment and its effects on firm outcomes.

My results are subject to limitations that should be considered when interpreting the findings. Firstly, my study focuses on a specific context and may not be generalizable to other industries or regions. Additionally, the use of retrospective data and econometric modeling techniques introduces potential measurement errors and endogeneity concerns. Moreover, the impact of UI benefits on cost behavior may be influenced by other factors not accounted for in my analysis. Lastly, the dynamic nature of the economic environment and policy landscape may affect the long-term sustainability of the observed effects. Future research could address these limitations by incorporating additional variables,

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conducting longitudinal studies, and exploring the role of contextual factors in shaping cost behavior.

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Appendix: Variable Definitions and Sources

Variable	Definition	Source
Dependent Variables		
$\Delta ln(SGA)i,t$	Log change in selling, general and administrative expense from year $t-1$ to year t	Compustat
$\Delta ln(OC)i,t$	Log change in operating expense from year $t-1$ to year t	Compustat
$\Delta ln(COGS)i,t$	Log change in cost of goods sold from year $t-1$ to year t	Compustat
Measure of UI Benefits		
UI	Log of maximum number of weeks that a state provides benefits to claimants (Max Duration), multiplied by the maximum weekly benefit amount (Max Weekly Benefit)	United States Bureau of Labor Statistics
Treat	An indicator variable which equals to 1 if a firm year is in the state with significant unemployment insurance increase (> 10%), and 0 otherwise	United States Bureau of Labor Statistics
Post	An indicator variable which equals to 1 if a firm year is after the unemployment insurance increase, and 0 otherwise	United States Bureau of Labor Statistics
Measure of Employee Treatment		
ETS	MSCI employee treatment score LABOR_MGMT_SCORE: Labor Management Score. This key issue evaluates the extent to which companies are at risk of workflow disruptions due to labor unrest or reduced productivity due to poor job satisfaction. Companies that face high risk of labor unrest due to recent layoffs or operations in markets with high propensity to work stoppages and do not offer strong employment benefits and employee engagement programs score lower on this benchmark (Score: 0-10).	MSCI
Control Variables		
$\Delta ln(Sales)i,t$	Log change in sales from year $t-1$ to year t	Compustat
Dec	An indicator variable which equals 1 if sales revenue from firm I decreased in year t relative to year $t-1$, and 0 otherwise	Compustat
LEV	Total liabilities scaled by total assets	Compustat
ASINT	Asset intensity, defined as the log-ratio of total assets to sales	Compustat
EMPINT	Employment intensity, defined as the log-ratio of number of employees to sales	Compustat
SucDec	An indicator variable which equals 1 if sales decrease in year $t-1$ (i.e., sales in year $t-1$ < sales in year $t-2$), and 0 otherwise	Compustat

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FCF	Cash flow from operating activities minus common and preferred dividends scaled by total assets, which is a common proxy for the agency problem that results in empire-building incentives	Compustat
SmallProfit	An indicator variable which equals 1 in year *t* for which the net income scaled by the year-beginning total assets is greater than or equal to zero but less than one percent, and 0 otherwise	Compustat
SGDP	State-level GDP growth rates	Bureau of Economic Analysis
UNEMP	State-level unemployment rates	United States Bureau of Labor Statistics
UITAX	Ratio of taxable to total wages	United States Department of Labor

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Table 1 Descriptive Statistics

Variable	*N*	Mean	P25	P50	P75	SD
UI	9643	9.36	9.19	9.37	9.60	0.41
$\Delta ln(SGA)_{i,t}$	9643	0.06	-0.01	0.05	0.12	0.19
$\Delta ln(Sales)_{i,t}$	9643	0.06	-0.01	0.05	0.13	0.22
LEV	9619	0.58	0.42	0.56	0.71	0.26
ASINT	9643	1.44	0.75	1.17	1.75	1.36
EMPINT	9622	0.00	0.00	0.00	0.00	0.01
SucDec	9643	0.27	0.00	0.00	1.00	0.45
FCF	9632	0.09	0.05	0.09	0.13	0.08
SmallProfit	9643	0.03	0.00	0.00	0.00	0.17
SGDP	9643	0.04	0.03	0.04	0.05	0.03
UNEMP	9643	6.12	4.40	5.70	7.60	2.17
UITAX	9643	0.25	0.18	0.22	0.27	0.12
ETS	9643	5.05	3.90	5.00	6.22	1.84

Note:
This table presents descriptive statistics for the sample. *UI* is the log of maximum number of weeks that a state provides benefits to claimants (max duration), multiplied by the maximum weekly benefit amount (max weekly benefit). $\Delta ln(SGA)_{i,t}$ is the log change in selling, general and administrative expense from year $t-1$ to year t. $\Delta ln(Sales)_{i,t}$ is the log change in sales from year $t-1$ to year t. *LEV* is the total liabilities scaled by total assets. *ASINT* is the log-ratio of total assets to sales. *EMPINT* is the log-ratio of number of employees to sales. *SucDec* is an indicator variable which equals 1 if sales decrease in year $t-1$ (i.e., sales in year $t-1$ < sales in year $t-2$), and 0 otherwise. *FCF* is calculated as the cash flow from operating activities minus common and preferred dividends scaled by total assets. *SmallProfit* is an indicator variable which equals 1 in year t for which the net income scaled by the year-beginning total assets is greater than or equal to zero but less than one percent, and 0 otherwise. *SGDP* is the growth rates of state-level GDP. *UNEMP* is the state-level unemployment rates. *UITAX* is the ratio of taxable to total wages. *ETS* is the MSCI employee treatment score.

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Table 2 Pairwise Correlations

Variable	*UI*	$\Delta ln(SGA)_{i,t}$	$\Delta ln(Sales)_{i,t}$	*LEV*	*ASINT*	*EMPINT*	*SucDec*	*FCF*	*SmallProfit*	*SGDP*	*UNEMP*	*UITAX*	*ETS*
UI	1.000												
$\Delta ln(SGA)_{i,t}$	0.034***	1.000											
$\Delta ln(Sales)_{i,t}$	0.040***	0.694***	1.000										
LEV	-0.061***	-0.070***	-0.064***	1.000									
ASINT	0.029***	0.049***	0.002	-0.033***	1.000								
EMPINT	-0.037***	-0.009	-0.048***	0.039***	-0.080***	1.000							
SucDec	0.002	-0.139***	-0.105***	0.041***	0.022**	-0.015	1.000						
FCF	0.024**	0.069***	0.120***	-0.082***	-0.144***	0.020*	-0.156***	1.000					
SmallProfit	0.014	-0.017*	-0.035***	0.037***	0.030***	0.015	0.037***	-0.073***	1.000				
SGDP	-0.021**	0.191***	0.283***	-0.029***	-0.010	-0.022**	0.050***	0.001	0.001	1.000			
UNEMP	0.010	-0.053***	-0.077***	-0.072***	0.007	-0.007	0.030***	0.028***	-0.015	-0.307***	1.000		
UITAX	0.202***	-0.007	-0.024**	0.008	-0.037***	0.028***	-0.018*	-0.002	-0.005	-0.033***	-0.085***	1.000	
ETS	0.074***	0.034***	0.050***	-0.080***	0.131***	-0.156***	-0.053***	0.047***	-0.011	0.016	0.034***	-0.043***	1.000

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Note:

This table presents pairwise correlations for the regression variables. *UI* is the log of maximum number of weeks that a state provides benefits to claimants (max duration), multiplied by the maximum weekly benefit amount (max weekly benefit). $\Delta ln(SGA)_{i,t}$ is the log change in selling, general and administrative expense from year $t-1$ to year t. $\Delta ln(Sales)_{i,t}$ is the log change in sales from year $t-1$ to year t. *LEV* is the total liabilities scaled by total assets. *ASINT* is the log-ratio of total assets to sales. *EMPINT* is the log-ratio of number of employees to sales. *SucDec* is an indicator variable which equals 1 if sales decrease in year $t-1$ (i.e., sales in year $t-1$ < sales in year $t-2$), and 0 otherwise. *FCF* is calculated as the cash flow from operating activities minus common and preferred dividends scaled by total assets. *SmallProfit* is an indicator variable which equals 1 in year t for which the net income scaled by the year-beginning total assets is greater than or equal to zero but less than one percent, and 0 otherwise. *SGDP* is the growth rates of state-level GDP. *UNEMP* is the state-level unemployment rates. *UITAX* is the ratio of taxable to total wages. *ETS* is the MSCI employee treatment score.

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Table 3 UI benefits and cost stickiness

	(1) $\Delta ln(SGA)_{i,t}$	(2) $\Delta ln(SGA)_{i,t}$	(3) $\Delta ln(OC)_{i,t}$	(4) $\Delta ln(OC)_{i,t}$
Intercept	0.148	0.172	-0.004	0.027
	(3.63)***	(4.14)***	(-0.14)	(0.83)
$\Delta ln(Sales)_{i,t}$	-0.327	-0.347	1.323	1.302
	(-1.43)	(-1.51)	(7.24)***	(7.19)***
$Dec*\Delta ln(Sales)_{i,t}$	2.646	2.620	0.530	0.534
	(6.47)***	(6.43)***	(1.63)	(1.66)
UI	-0.015	-0.016	0.001	0.000
	(-3.37)***	(-3.64)***	(0.20)	(0.12)
$UI*\Delta ln(Sales)_{i,t}$	0.109	0.110	-0.046	-0.044
	(4.48)***	(4.54)***	(-2.39)*	(-2.31)*
$UI*Dec*\Delta ln(Sales)_{i,t}$	**-0.307**	**-0.304**	**-0.070**	**-0.069**
	(-7.06)***	**(-7.00)*****	**(-2.02)***	**(-2.00)***
LEV		-0.019		-0.012
		(-3.53)***		(-2.77)**
ASINT		0.004		0.003
		(3.36)***		(3.67)***
EMPINT		0.606		0.513
		(3.16)**		(3.38)***
SucDec		-0.032		-0.026
		(-10.06)***		(-10.51)***
FCF		-0.028		-0.114
		(-1.53)		(-7.76)***
SmallProfit		0.006		-0.005
		(0.79)		(-0.78)
SGDP		0.021		-0.103
		(0.44)		(-2.78)**
UNEMP		-0.000		-0.001
		(-0.44)		(-2.57)*
UITAX		0.018		0.006
		(1.43)		(0.66)
n	9643	9588	9643	9588
Adjusted-R^2	0.495	0.502	0.741	0.747

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note:

UI is the log of maximum number of weeks that a state provides benefits to claimants (max duration), multiplied by the maximum weekly benefit amount (max weekly benefit). $\Delta ln(SGA)_{i,t}$ is the log change in selling, general and administrative expense from year $t-1$ to year t. $\Delta ln(OC)_{i,t}$ is the log change in operating expense from year $t-1$ to year t.$\Delta ln(Sales)_{i,t}$ is the log change in sales from year $t-1$ to year t. *Dec* is an indicator variable which equals 1 if sales decrease in year t relative to year $t-1$, and 0 otherwise. *LEV* is the total liabilities scaled by total assets. *ASINT* is the log-ratio of total assets to sales. *EMPINT* is the log-ratio of number of employees to sales. *SucDec* is an indicator variable which equals 1 if sales decrease in year $t-1$ (i.e., sales in year $t-1$ < sales in year $t-2$), and 0 otherwise. *FCF* is calculated as the cash flow from operating activities minus common and preferred dividends scaled by total assets. *SmallProfit* is an indicator variable which equals 1 in year t for which the net income scaled by the year-beginning total assets is greater than or equal to zero but less than one percent, and 0 otherwise. *SGDP* is the growth rates of state-level GDP. *UNEMP* is the state-level unemployment rates. *UITAX* is the ratio of taxable to total wages.

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Table 4 UI benefits, employee treatment and cost stickiness

	(1) $\Delta ln(SGA)_{i,t}$	(2) $\Delta ln(SGA)_{i,t}$	(3) $\Delta ln(OC)_{i,t}$	(4) $\Delta ln(OC)_{i,t}$
Intercept	-0.060	-0.029	-0.163	-0.107
	(-0.62)	(-0.30)	(-2.11)*	(-1.39)
$\Delta ln(Sales)_{i,t}$	-0.330	-0.350	1.334	1.313
	(-1,43)	(-1.53)	(7.30)***	(7.25)***
$Dec*\Delta ln(Sales)_{i,t}$	-0.213	0.033	-5.097	-4.842
	(-0.21)	(0.03)	(-6.45)***	(-6.18)***
UI	0.006	0.005	0.016	0.013
	(0.62)	(0.43)	(1.94)	(1.60)
$UI*\Delta ln(Sales)_{i,t}$	0.127	0.128	-0.030	-0.030
	(5.20)***	(5.25)***	(-1.55)	(-1.54)
$UI*Dec*\Delta ln(Sales)_{i,t}$	-0.012	-0.039	-0.520	-0.494
	(-0.12)	(-0.37)	(-6.12)***	(-5.86)***
ETS	0.045	0.042	0.035	0.029
	(2.41)*	(2.30)*	(2.36)*	(1.99)*
$ETS*\Delta ln(Sales)_{i,t}$	-0.034	-0.033	-0.032	-0.030
	(-6.48)***	(-6.33)***	(-7.85)***	(-7.35)***
$ETS*Dec*\Delta ln(Sales)_{i,t}$	0.621	0.566	1.194	1.141
	(3.28)**	(2.99)**	(7.94)***	(7.63)***
*ETS*UI*	-0.005	-0.004	-0.003	-0.003
	(-2.29)*	(-2.20)*	(-2.14)*	(-1.78)
$\boldsymbol{ETS*UI*Dec*\Delta ln(Sales)_{i,t}}$	**-0.064**	**-0.058**	**-0.125**	**-0.119**
	(-3.15)**	**(-2.85)****	**(-7.75)*****	**(-7.44)*****
LEV		-0.019		-0.012
		(-3.61)***		(-2.79)**
ASINT		0.004		0.003
		(3.64)***		(3.52)***
EMPINT		0.518		0.451
		(2.67)**		(2.95)**
SucDec		-0.031		-0.026
		(-9.91)***		(-10.29)***
FCF		-0.023		-0.113
		(-1.24)		(-7.71)***
SmallProfit		0.006		-0.005
		(0.69)		(-0.80)
SGDP		0.044		-0.077
		(0.94)		(-2.09)*
UNEMP		-0.000		-0.001
		(-0.16)		(-2.28)*
UITAX		0.014		0.004
		(1.14)		(0.39)
n	9643	9588	9643	9588
Adjusted-R^2	0.498	0.505	0.744	0.750

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note:

UI is the log of maximum number of weeks that a state provides benefits to claimants (max duration), multiplied by the maximum weekly benefit amount (max weekly benefit). $\Delta ln(SGA)_{i,t}$ is the log change in selling, general and administrative expense from year $t-1$ to year t. $\Delta ln(OC)_{i,t}$ is the log change in operating expense from year $t-1$ to year t.$\Delta ln(Sales)_{i,t}$ is the log change in sales from year $t-1$ to year t. *Dec* is an indicator variable which equals 1 if sales decrease in year t relative to year $t-1$, and 0 otherwise. *LEV* is the total liabilities scaled by total assets. *ASINT* is the log-ratio of total assets to sales. *EMPINT* is the log-ratio of number of employees to sales. *SucDec* is an indicator variable which equals 1 if sales decrease in

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year $t-1$ (i.e., sales in year $t-1$ < sales in year $t-2$), and 0 otherwise. *FCF* is calculated as the cash flow from operating activities minus common and preferred dividends scaled by total assets. *SmallProfit* is an indicator variable which equals 1 in year t for which the net income scaled by the year-beginning total assets is greater than or equal to zero but less than one percent, and 0 otherwise. *SGDP* is the growth rates of state-level GDP. *UNEMP* is the state-level unemployment rates. *UITAX* is the ratio of taxable to total wages. *ETS* is the MSCI employee treatment score.

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Table 5 Event-years with a large increase in unemployment insurance benefits

States	Event Years			States	Event Years			
Alabama	2003			Minnesota	2000			
Arizona	2005			Missouri	1998	2001	2008	2017
Arkansas	2006			Montana	2004	2009		
California	2002			North Carolina	2001	2021		
Connecticut	2001			North Dakota	2001	2014		
Delaware	2020			Nebraska	1999	2001		
D.C.	2006	2017		New Hampshire	1999	2003	2008	
Florida	1998	2014	2021	New Mexico	2004	2008	2010	
Georgia	2020			New York	1999	2001	2020	
Idaho	2021			Oklahoma	2008	2014		
Illinois	2001	2019		Pennsylvania	2001			
Indiana	2001			South Carolina	2014			
Kansas	2017	2021		Tennessee	1999	2011		
Kentucky	2001	2004	2019	Utah	2001			
Louisiana	1998	2001	2009	Virginia	2001	2003		
Maryland	2001	2003	2008	Vermont	1999	2003		
Massachusetts	2001	2007		Washington	2002	2012		
Michigan	2003	2021		Wyoming	2008			

The table presents 67 state-year events that meet three criteria: (i) a significant rise (>10%) in maximum total benefits; (ii) the presence of at least one neighboring state without a substantial increase in maximum total benefits; and (iii) the state should not experience a significant increase in maximum total benefits in the preceding year, and at least one adjacent state should not have a substantial increase in maximum total benefits in the preceding year.

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Table 6 UI benefits and cost stickiness: DID design

	(1) $\Delta ln(SGA)_{i,t}$	(2) $\Delta ln(SGA)_{i,t}$	(3) $\Delta ln(OC)_{i,t}$	(4) $\Delta ln(OC)_{i,t}$
Intercept	0.005	0.002	-0.008	0.012
	(0.88)	(0.16)	(-1.79)	(0.97)
$\Delta ln(Sales)_{i,t}$	0.801	0.776	1.026	1.003
	(20.16)***	(19.38)***	(30.65)***	(30.22)***
$Dec*\Delta ln(Sales)_{i,t}$	-0.404	-0.362	-0.244	-0.188
	(-7.83)***	(-6.87)***	(-5.60)***	(-4.29)***
Treat	0.012	0.015	-0.001	-0.000
	(1.47)	(1.82)	(-0.19)	(-0.03)
$Treat*\Delta ln(Sales)_{i,t}$	-0.039	-0.048	0.008	0.006
	(-0.51)	(-0.61)	(0.12)	(0.09)
$Treat*Dec*\Delta ln(Sales)_{i,t}$	0.147	0.154	-0.077	-0.067
	(1.49)	(1.56)	(-0.93)	(-0.82)
Post	-0.000	0.000	0.018	0.019
	(-0.05)	(0.02)	(3.18)**	(3.27)**
$Post*\Delta ln(Sales)_{i,t}$	-0.143	-0.127	-0.231	-0.206
	(-3.17)**	(-2.81)**	(-6.08)***	(-5.50)***
$Post*Dec*\Delta ln(Sales)_{i,t}$	0.375	0.333	0.265	0.212
	(4.86)***	(4.29)***	(4.07)***	(3.30)***
$Treat*Post*\Delta ln(Sales)_{i,t}$	0.057	0.057	0.007	0.003
	(0.68)	(0.68)	(0.10)	(0.05)
$\boldsymbol{Treat*Post*Dec*\Delta ln(Sales)_{i,t}}$	**-0.250**	**-0.235**	**-0.164**	**-0.178**
	(-2.04)**	**(-3.41)****	**(-1.95)***	**(-2.36)****
LEV		-0.010		-0.006
		(-0.98)		(-0.72)
ASINT		0.007		0.006
		(3.40)***		(3.91)***
EMPINT		0.342		1.129
		(0.87)		(3.45)***
SucDec		-0.022		-0.022
		(-3.55)***		(-4.37)***
FCF		0.024		-0.123
		(0.68)		(-4.17)***
SmallProfit		0.018		0.000
		(1.14)		(0.01)
SGDP		-0.038		-0.078
		(-0.43)		(-1.08)
UNEMP		-0.003		-0.002
		(-1.56)		(-1.78)
UITAX		0.066		0.017
		(2.48)*		(0.79)
n	2835	2835	2835	2835
Adjusted-R^2	0.473	0.478	0.704	0.716

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note:

Treat is an indicator variable which equals to 1 if a firm year is in the state with significant unemployment insurance increase (> 10%), and 0 otherwise. *Post* is an indicator variable which equals to 1 if a firm year is after the unemployment insurance increase, and 0 otherwise. $\Delta ln(SGA)_{i,t}$ is the log change in selling, general and administrative expense from year $t-1$ to year t. $\Delta ln(OC)_{i,t}$ is the log change in operating expense from year $t-1$ to year t.$\Delta ln(Sales)_{i,t}$ is the log change in sales from year $t-1$ to year t. *Dec* is an indicator variable which equals 1 if sales decrease in year t relative to year $t-1$, and 0 otherwise. *LEV* is the total liabilities scaled by total assets. *ASINT* is the log-ratio of total assets to sales. *EMPINT* is the log-

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ratio of number of employees to sales. *SucDec* is an indicator variable which equals 1 if sales decrease in year $t-1$ (i.e., sales in year $t-1$ < sales in year $t-2$), and 0 otherwise. *FCF* is calculated as the cash flow from operating activities minus common and preferred dividends scaled by total assets. *SmallProfit* is an indicator variable which equals 1 in year t for which the net income scaled by the year-beginning total assets is greater than or equal to zero but less than one percent, and 0 otherwise. *SGDP* is the growth rates of state-level GDP. *UNEMP* is the state-level unemployment rates. *UITAX* is the ratio of taxable to total wages.

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Table 7 UI benefits, employee treatment and cost stickiness with respect to COGS

	(1) $\Delta ln(COGS)_{i,t}$	(2) $\Delta ln(COGS)_{i,t}$	(3) $\Delta ln(COGS)_{i,t}$	(4) $\Delta ln(COGS)_{i,t}$
Intercept	-0.080	-0.045	-0.218	-0.157
	(-1.85)	(-1.01)	(-2.13)*	(-1.53)
$\Delta ln(Sales)_{i,t}$	1.812	1.815	1.803	1.806
	(7.46)***	(7.51)***	(7.41)***	(7.44)***
$Dec*\Delta ln(Sales)_{i,t}$	-0.550	-0.564	-8.294	-7.974
	(-1.27)	(-1.31)	(-7.88)***	(-7.59)***
UI	0.008	0.008	0.022	0.019
	(1.82)	(1.79)	(2.01)*	(1.77)
$UI*\Delta ln(Sales)_{i,t}$	0.046	0.050	-0.082	-0.084
	(1.00)	(1.08)	(-3.17)**	(-3.25)**
$\mathbf{UI*Dec*\Delta ln(Sales)_{i,t}}$	**-0.091**	**-0.091**	-0.875	-0.842
	(-3.53)***	**(-3.56)*****	(-7.73)***	(-7.46)***
ETS			0.030	0.024
			(1.52)	(1.23)
$ETS*\Delta ln(Sales)_{i,t}$			-0.015	-0.013
			(-2.71)**	(-2.34)*
$ETS*Dec*\Delta ln(Sales)_{i,t}$			1.615	1.547
			(8.08)***	(7.73)***
*ETS*UI*			-0.003	-0.002
			(-1.41)	(-1.13)
$\mathbf{ETS*UI*Dec*\Delta ln(Sales)_{i,t}}$			**-0.173**	**-0.165**
			(-8.04)***	**(-7.69)*****
LEV		-0.017		-0.016
		(-2.97)**		(-2.92)**
ASINT		0.004		0.004
		(3.88)***		(3.39)***
EMPINT		0.505		0.441
		(2.49)*		(2.15)*
SucDec		-0.021		-0.021
		(-6.30)***		(-6.18)***
FCF		-0.101		-0.105
		(-5.16)***		(-5.33)***
SmallProfit		-0.008		-0.007
		(-1.00)		(-0.88)
SGDP		-0.164		-0.142
		(-3.31)***		(-2.88)**
UNEMP		-0.002		-0.002
		(-2.63)**		(-2.51)*
UITAX		0.001		-0.001
		(0.06)		(-0.04)
n	9639	9584	9639	9584
Adjusted-R^2	0.656	0.661	0.659	0.663

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note:

UI is the log of maximum number of weeks that a state provides benefits to claimants (max duration), multiplied by the maximum weekly benefit amount (max weekly benefit). $\Delta ln(COGS)_{i,t}$ is the log change in cost of goods sold from year $t-1$ to year t. $\Delta ln(Sales)_{i,t}$ is the log change in sales from year $t-1$ to year t. *Dec* is an indicator variable which equals 1 if sales decrease in year t relative to year $t-1$, and 0 otherwise. *LEV* is the total liabilities scaled by total assets. *ASINT* is the log-ratio of total assets to sales. *EMPINT* is the log-ratio of number of employees to sales. *SucDec* is an indicator variable which equals 1 if sales decrease in year $t-1$ (i.e., sales in year $t-1$ < sales in year $t-2$), and 0 otherwise. *FCF* is calculated as

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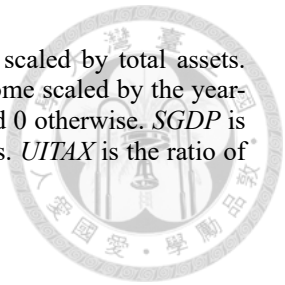
the cash flow from operating activities minus common and preferred dividends scaled by total assets. *SmallProfit* is an indicator variable which equals 1 in year *t* for which the net income scaled by the year-beginning total assets is greater than or equal to zero but less than one percent, and 0 otherwise. *SGDP* is the growth rates of state-level GDP. *UNEMP* is the state-level unemployment rates. *UITAX* is the ratio of taxable to total wages. *ETS* is the MSCI employee treatment score.



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