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Unemployment insurance benefits and income smoothing

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ABSTRACT

Labor unemployment insurance reduces unemployment concerns. We argue that these benefits moderate incentives to smooth earnings to reduce employees' concerns about unemployment risk. Using exogenous variations in unemployment insurance benefits, we find evidence consistent with this argument. We also find that the link between unemployment insurance benefits and income smoothing is stronger when there is higher unemployment risk and when the firm is likely to employ more low-wage workers, who find unemployment insurance benefits especially useful. Our paper contributes to the literature by showing that public policy decisions such as unemployment insurance have significant, albeit probably unintended, externalities on corporate financial reporting.

1. Introduction

In this paper, we examine how the public policy decision to provide unemployment insurance benefits affects firms' income smoothing behavior. Unemployment imposes significant economic, physiological, and psychological costs on workers (e.g., Diamond, 1982; Harris and Holmstrom, 1982; Lazear, 2003; Mortensen, 1986; Wanberg, 2012). All states in the United States as well as many countries around the world have implemented unemployment benefits programs to lessen these burdens. Workers are likely to be less concerned about unemployment if they are provided with relief measures, such as unemployment insurance (UI) benefits, in the event that they are laid off.

As volatile earnings are perceived as a signal of risk, firms prefer to report smooth income so that they appear less risky (Graham et al., 2005). A large body of empirical literature finds evidence of income smoothing behavior, in which firms create precautionary reserves during periods of strong performance and then release them during poor performance periods (e.g., see Hall, 1993; Land and Lang, 2002; Lang et al., 2006; Leuz et al., 2003; Tucker and Zarowin, 2006). Most of the prior theories and empirical evidence that link labor conditions to financial reporting choices typically focus on how senior executives' employment considerations (e.g., bonus contracts and equity incentives) affect reporting choices (e.g., Healy, 1985; Fischer and Verrecchia, 2000; Kirschenheiter and Melumad, 2002; Goldman and Slezak, 2006). While changes in labor policies such as UI benefits have a direct impact on a broader swath of the labor population, the literature that investigates how these policies influence corporate financial reporting choices is still emerging (Dou et al., 2016; Ji and Tan, 2016).

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We argue that concerns about unemployment risk could induce income smoothing and that UI benefits therefore affect firms' income smoothing behavior. It is well-established in the labor economics literature that unemployment risk is costly to firms because employees who are concerned about the adverse effects of unemployment require firms to provide a wage premium (i.e., a compensating wage differential) for this risk exposure. The outcome is an increase in the firm's compensation expenses (Abowd and Ashenfelter, 1981; Li, 1986). This compensating wage differential is not trivial. For example, Agrawal and Matsa (2013) conservatively estimate that in the absence of UI benefits, the cost of compensating wage differentials can be over 150 basis points of firm value for a BBB-rated firm. We therefore contend that managers have incentives to engage in income smoothing to make their firms appear less risky to current and prospective employees. This appearance, in turn, reduces compensating wage differentials and other related costs (e.g., productivity losses due to employees' anxiety over the prospect of unemployment). If, as conjectured, unemployment concerns induce income smoothing behavior, then unemployment benefits, which diminish such concerns, should attenuate income smoothing. We empirically examine this issue by following Agrawal and Matsa (2013) and using exogenous inter-state cross-sectional and intra-state time-series variations in UI benefits in the United States. Following prior literature, we capture income smoothing in terms of the negative correlation between operating cash flows and accruals (e.g., see Land and Lang, 2002; Lang et al, 2006; Leuz et al., 2003; Tucker and Zarowin, 2006).

Using a sample period from 1987 to 2012 and controlling for the determinants of innate accruals, as prior literature suggests (Dechow and Dichev, 2002; Francis et al., 2004, 2005a, 2005b), we find evidence that higher UI benefits are indeed associated with reduced income smoothing.[1] Moreover, we fail to find similar results when accruals are re-estimated as "innate accruals," per Francis et al. (2005a, 2005b). In other words, our results suggest that the attenuation of income smoothing behavior due to UI benefits can indeed be attributed to the exercising of accounting discretion rather than to innate factors that affect accruals.

We also conduct several cross-sectional analyses to further our understanding of the effects of UI benefits on income smoothing. Recognizing that employees' concerns about unemployment are a function of both UI benefits' generosity and the risk of being unemployed, we first investigate whether the impact of the benefits on income smoothing is affected by the risk of unemployment. Because the value of UI benefits is especially salient when unemployment risk is high, we hypothesize that the role of UI benefits in curbing income smoothing is greater when the risk of unemployment is high. We test this idea by using the state-level prevalence of collective bargaining agreements, the industry-level fraction of workers who receive income from UI, and the industry-level mass layoff propensity to capture unemployment risk. Unemployment risk increases when a firm's workforce is less likely to be covered by union-negotiated collective bargaining agreements, when the industry-level propensity of having to access UI benefits is high, and when the likelihood of being laid off en masse is high. Our findings are as predicted. Across all three unemployment risk proxies, we find that UI benefits have a stronger effect in reducing income smoothing when the risk of unemployment is high.

UI benefits are especially appealing to low-wage workers because they have limited assets and savings that can provide a liquidity cushion in the event of a layoff (Browning and Crossley, 2001; Bloemen and Stancanelli, 2005). Hence, we expect any attenuation of income smoothing due to UI benefits to be especially pronounced for firms that employ a proportionately large number of low-wage workers. Following Agrawal and Matsa (2013), we capture the industry-level proportion of low-wage workers as the fraction of workers who earn less than $50,000 a year and find that our results are indeed stronger for firms that are likely to have more low-wage workers.

Firms may engage in income smoothing behavior with either garbling or signaling objectives (e.g., see Tucker and Zarowin, 2006). Garbling distorts and signaling improves a firm's information environment. To gain some insight into this issue, we carry out additional analyses to examine whether our findings vary systematically based on the level of corporate governance, as firms with strong governance should commit to a strong information environment (e.g., Dechow et al., 1996; Francis et al., 2005a, 2005b; Koh, 2007; Armstrong et al., 2012). Garbling (signaling) behavior suggests that the sensitivity of income smoothing to UI benefits would be stronger for firms with weak (strong) corporate governance. We capture corporate governance in terms of the governance index (Gompers et al., 2003) and the entrenchment index (Bebchuk et al., 2008). The results indicate that our results are stronger for firms with weak corporate governance, suggesting that unemployment concern-driven income smoothing behavior is more likely aimed at information garbling than signaling.

In robustness tests, we construct a geographic disclosure-weighted measure of UI benefits to capture the differential effects that UI benefits have on income smoothing in relation to a firm's exposure in a certain state. In applying this measure, we continue to find consistent results. We also identify periods with large increases in UI benefits and find that the results are stronger in state-years with larger increases in UI benefits. Furthermore, we obtain robust results when we use smaller samples in which additional state-level controls are applied or from which industries with dispersed inter-state workforces are removed. Additional tests also reveal that our findings cannot be attributed to the temporal decline in accruals-operating cash flow relationship reported by Bushman et al. (2016). Collectively, these findings enhance our confidence that UI benefits affect firms' income smoothing decisions.

Our paper contributes to the literature in several ways. First, even though the Financial Accounting Standards Board (FASB) recognizes employees as a primary group of financial statement users, few studies investigate whether financial reporting choices are influenced by broad labor considerations.[2] In contrast, a large body of literature documents how the

[1] Our empirical models also include firm and year fixed effects so that the results are not driven by time invariant firm-level factors and time trends.

[2] FASB Statement of Financial Accounting Concepts No. 8, OB2 and BC1.10.

remuneration of top executives (typically CEOs and CFOs) influences firms' financial reporting quality (e.g., see Healy and Wahlen, 1999; Kothari, 2001). Accordingly, our paper adds to the literature that explores how considerations of rank-and-file employees can also affect a firm's financial reporting outcomes (Hamm et al., 2018; Liberty and Zimmerman, 1986).

Second, the extant literature on how corporate behavior is affected by UI benefits investigates issues ranging from wage-setting (e.g., see Abowd and Ashenfelter, 1981; Hamermesh and Wolfe, 1990; Li, 1986; Topel, 1984) to layoffs (Topel, 1983) and corporate leverage decisions (Agrawal and Matsa, 2013). By showing that state UI benefits also affect income smoothing behavior, we contribute to the growing literature that finds evidence of the financial reporting externalities of UI (e.g., Dou et al., 2016; Ji and Tan, 2016). Our paper complements Dou et al. (2016), which reports evidence of firms engaging in upward earnings management in response to unemployment concerns. We believe that our finding of unemployment concern-driven income smoothing behavior is especially interesting because income smoothing directly relates to firm's incentive to project itself as less risky and therefore by extension to the notion of attempts to minimize compensating wage differentials. Additionally, income smoothing is likely to be a more sustainable form of earnings management in contexts where UI benefits may remain constant over several years and changes in UI benefits are less predictable.

Finally and more generally, our findings provide evidence of broad public policy decisions such as UI programs having a significant, yet likely unintended, influence on corporate financial reporting outcomes. Hence, we believe our paper contributes to the broader literature that investigates issues pertaining to the intersection of public policy and accounting.

The remainder of this paper is organized as follows. Section two develops the hypotheses. Section three describes the data and empirical design. Section four presents the results and robustness tests. Section five offers conclusions.

2. Hypotheses development

In the United States, the Federal–State UI Program is an important safety net that provides temporary income to eligible workers who are unemployed through no fault of their own.[3] Based on guidelines under federal law, each state administers a separate UI program. State laws determine the eligibility, amounts, and durations of UI benefits. Most states fund their programs through taxation on employers, with three states requiring minimal employee contributions. The taxes imposed on the firms vary based on past experience; firms that have had more worker unemployment claims in the past pay higher taxes.[4] Claims for UI benefits are paid by state governments, which are allowed to tap federal funds after they use up their resources or if they reach certain rates of aggregate unemployment. The benefits are typically based on a percentage of an individual's earnings over the most recent 52-week period and are limited to a maximum amount stipulated by each state. Most states allow for a maximum of 26 weeks of benefits.[5]

Many factors can lead to variation in UI benefits across states and times. Key factors include underlying economic conditions (e.g., higher average wages) and political forces (e.g., bolstering of political support). The direct effect of the UI program is on unemployed workers. Gruber (1997) argues that the primary advantage of UI benefits is to smooth consumption during periods of unemployment. In particular, he argues that pooling unemployment risk through insurance leads to greater efficiency and provides evidence that consumption would fall significantly in the absence of UI. Other studies have found that UI is associated with workers' search for new employment, duration of unemployment spells, labor productivity, savings, stock market participation, and mortgage defaults (e.g., Feldstein, 1978; Topel and Welch, 1980; Moffitt, 1985; Katz and Meyer, 1990; Meyer, 1995; Acemoglu and Shimer, 2000; Gormley et al., 2010; Engen and Gruber, 2001; Meyer and Mok, 2007; Hsu et al., 2018).

2.1. The relation between UI and income smoothing

In this paper, we argue that concerns over unemployment potentially affect managerial decisions on financial reporting, given that both existing and prospective employees are likely to use the firm's accounting information to assess their risk of unemployment. As a higher risk of unemployment leads to higher compensating wage differentials, firms have incentives to present their employment prospects in a more positive light. These compensating wage differentials can impose substantial costs on firms. For example, employing conservative assumptions, Agrawal and Matsa (2013) estimate that in the absence of UI benefits, the cost of compensating wage differentials is 154 basis points of firm value for a BBB-rated firm. Chemmanur et al. (2013) find that the incremental labor costs associated with higher unemployment risk (due to added leverage) are large enough to offset the tax-shield benefits of debt. Therefore, managers who are concerned about these costs have an incentive to project a less risky image of the firm to current and prospective employees.

Markets perceive volatile earnings as symptomatic of higher risk. Consequently, managers exhibit a proclivity to engage in income smoothing activities.[6] For example, 97% of the senior managers surveyed by Graham et al. (2005) indicate a preference for smooth income, and up to 78% of the participating managers indicate a willingness to sacrifice economic value to achieve it. Moreover, 89% of the respondents express the belief that the market perceives smoother earnings as less risky. More

[3] http://workforcesecurity.doleta.gov/unemploy/uifactsheet.asp.

[4] See, for example, the determination of UI tax rates in Washington State: http://www.esd.wa.gov/newsandinformation/faq/tax-rate-update-6–10.php.

[5] For a more detailed discussion of the institutional background of UI programs in the United States, see Agrawal and Matsa (2013).

[6] Merchant and Rockness (1994) report that managers find earnings management ethically more acceptable when they believe their action is in the organization's best interest.

than two-thirds of respondents indicate that smoother earnings signal business stability to customers and suppliers, potentially resulting in better terms of trade; this suggests that perceptions of lower risk conveyed via smoother earnings likely elicit benefits from a broad array of stakeholders. Consistent with this survey evidence, a large body of empirical literature reports cases in which accruals are used to achieve smoother income (e.g., see Hall, 1993; Wahlen, 1994; Collins et al., 1995; Land and Lang, 2002; Leuz et al., 2003; Kanagaretnam et al., 2004; Lang et al., 2006; Liu and Ryan, 2006; Kilic et al., 2013).

Therefore, given the compensating wage differential costs associated with the risk of unemployment and the perception of lower risk afforded by smoother income, we posit that managers have incentives to engage in income smoothing to mitigate current and potential employees' unemployment risk concerns.

Workers' concerns about future unemployment are partially alleviated by the presence of UI benefits programs, as these programs provide a source of income for workers in the event of a layoff. When the expected unemployment income is higher, there is less concern about future unemployment. If greater unemployment concerns do indeed induce more income smoothing from managers, then such behavior should be curtailed when high UI benefits are present because UI benefits diminish unemployment concerns and compensating wage differentials. Accordingly, we expect lower levels of income smoothing in the presence of high UI benefits. Hence, our main hypothesis is as follows (in alternative form):

Hypothesis H1. *Income smoothing is negatively associated with UI benefits.*

It is worth noting that H1 is a joint hypothesis of compensating wage differential concerns inducing income smoothing behavior and income smoothing being costly, all else constant. If income smoothing is costless, we would not expect the propensity to do it to decline, even if the compensating wage differential concerns were to diminish due to high UI benefits. We expect income smoothing activities to entail some costs, for several reasons. First, income smoothing could entail compliance/control costs because regulators typically view discretionary income smoothing as a departure from the spirit of GAAP. For example, banking sector regulators have expressed concern about the practice of creating cookie jar reserves of loan loss provisions with the objective of income smoothing, and, in 2001, the Securities and Exchange Commission (SEC) introduced the Staff Accounting Bulletin (SAB) 102 to curb this behavior and to ensure that banks consistently follow GAAP in provisioning for loan losses (Beck and Narayanamoorthy, 2013). Second, because income smoothing requires the building of precautionary reserves during periods of strong performance in order to release them in subsequent poor performance periods, engaging in the practice constrains managers' ability to report highly favorable results during periods of good performance. Third, borrowing from future earnings to smooth current-period income could expose the manager to disastrous consequences if the future performance also turns out to be unexpectedly poor (Ronen and Sadan, 1981). Given these potential costs of income smoothing, it is reasonable to posit that managers' propensity to engage in this behavior would diminish in line with their diminishing incentive to project a less risky image of the firm to employees.

2.2. The effect of unemployment risk

Our primary hypothesis posits firms' propensity to engage in income smoothing to be lower when UI benefits are high because UI benefits moderate compensating wage differentials. Clearly, there is a direct link between unemployment risk and the usefulness of UI benefits. No income is expected from UI benefits if the layoff probability is zero. However, as unemployment risk increases, so do the expected benefits of unemployment income.

A number of labor market characteristics can affect unemployment risk. For example, the propensity to lay off workers can vary across industries due to structural factors such as the nature of demand and production technology (Agrawal and Matsa, 2013). Further, the unemployment risk of workers in some firms and/or industries could be attenuated by contractual arrangements such as collective bargaining agreements. If compensating wage differentials are higher when employees face greater unemployment risk, then the impact of UI benefits in mitigating unemployment concerns should also be greater in contexts of high unemployment risk. Hence, to the extent that income smoothing behavior is induced by workers' unemployment concerns, the role of generous UI benefits in attenuating it should be stronger for firms with workers who are exposed to higher unemployment risk.

Therefore, we posit our second hypothesis as follows (in alternative form):

Hypothesis H2. *The negative association between income smoothing and UI benefits is stronger when the risk of unemployment is high.*

2.3. The effect of employee wage profile

UI benefits provide liquidity to workers during periods of unemployment and facilitate consumption smoothing (Gruber, 1997; Chetty, 2008). These benefits are especially useful for low-wage workers because they are more likely to have limited assets and savings that can provide a liquidity cushion during a layoff (Browning and Crossley, 2001; Bloemen and Stancanelli, 2005; Agrawal and Matsa, 2013). Hence, if a reduction in unemployment concerns due to UI benefits moderates firms' income smoothing behavior, we would expect the effect to be stronger for firms that employ a proportionately large number of low-wage workers.

Accordingly, our third hypothesis is as follows (in alternative form):

Hypothesis H3. *The negative association between income smoothing and UI benefits is stronger for firms that employ proportionately large numbers of low-wage workers.*

3. Data and empirical framework

Unlike in most other countries, the level of UI benefits in the United States is determined at the state rather than the national level. Moreover, there are time-series variations in UI benefits at the state level. We use these cross-sectional (across states) and time-series (within state) variations in UI benefits to test our conjecture of a link between income smoothing and unemployment concerns.

3.1. Data

We obtain data on UI benefits from the U.S. Department of Labor's annual issue of Significant Provisions of State Unemployment Insurance Laws; data on firm financials come from Compustat.[7] We combine data on firm-level financial information with state-level UI benefits, based on the state where the firm's headquarters is located.[8] We exclude firms in the financial services and utilities industries (SIC 6000-6999 and SIC 4900-4948). After ensuring data sufficiency to compute all of the control variables, our unemployment insurance data range is from 1987 to 2011, and the sample used in testing our primary hypothesis consists of 75,537 firm-year observations.[9]

3.2. Measurement of UI benefits

To analyze the effect of UI benefits on financial reporting, we use the maximum amount of unemployment benefits (*UI*) allowed by each state in a given year. This amount is defined as the maximum number of weeks that a state provides benefits to claimants (*Max Duration*), multiplied by the maximum weekly benefit amount (*Max Weekly Benefit*). This variable provides a proxy for the total UI benefits that a claimant can receive in a given year which has been shown to affect firms' financial policies (Agrawal and Matsa, 2013).

Panel A of Table 1 presents the means of the maximum weekly UI benefits, maximum durations, and the maximum total UI benefits by state over our sample period. Although there is little variation in the maximum number of weeks that a worker can claim unemployment benefits (with the average being 26 weeks across most states), the maximum amount of the mean weekly (total) benefits varies significantly, ranging from a low of $187 ($4,870) in Mississippi to a high of $642 ($19,260) in Massachusetts. Panel B shows the mean values of the maximum weekly benefits, the maximum durations, and the total benefits for each year in our sample period.

Table 2 presents summary statistics for the variables used in the paper. The mean maximum UI benefit over our sample period is $9,036, with the 25th and 75th percentiles being $8,759 and $9,267, respectively. We might consider these maximum benefits to be relatively small, at least in comparison with some workers' salaries prior to being laid off. From a utility (or economic importance) perspective, however, the utility for a dollar of employment income is likely to be lower than the utility for a dollar of unemployment income because of the diminishing marginal utility of income. A key reason for this difference in utility is that dollars received from a salary are likely to be spent on discretionary items, and dollars from UI are more likely to be spent on basic necessities. UI benefits provide an important economic lifeline to many who have lost their jobs. It is also important to note that involuntary unemployment tends to increase sharply during periods of economic crisis, when the wealth of many individuals falls significantly and there are fewer job opportunities in general. The marginal utility per dollar of income (and especially unemployment income) is likely to be greater during these periods. In fact, prior studies that document the links between UI benefits and corporate leverage (Agrawal and Matsa, 2013), or between UI and banks' consumer credit decisions (Hsu et al., 2018), suggest that the effect of these benefits on employees is nontrivial.

3.3. Regression specification

We follow the prior literature by seeking to capture firms' income smoothing behavior in terms of the negative correlation between operating cash flows and accruals (e.g., see Land and Lang, 2002; Lang et al., 2006; Leuz et al., 2003; Tucker and Zarowin, 2006). The intuition here is that income smoothing incentives tend to result in firms making negative accruals in periods of strong performance (thereby creating precautionary reserves) and positive accruals in periods of weak performance (by releasing reserves). The firm's fundamental performance is proxied by operating cash flows. Although a negative correlation between operating cash flows and accruals can be a natural result of accruals accounting (Dechow, 1994), the literature recognizes that the excess correlation that remains after relevant controls are employed (which varies in a system-

[7] http://workforcesecurity.doleta.gov/unemploy/statelaws.asp#sigprouilaws.

[8] This matching criterion creates some measurement error with respect to the variable of interest if some of the firm's workers are located outside of the headquarters state, as employees are covered by the UI laws of the state in which they are employed. We address this issue in additional analyses by employing a geographic–disclosure-weighted measure of UI and excluding industries with a dispersed workforce. We find similar results. See Section 4.4.3.

[9] The sample size is larger in some specifications where the requirements for the control variables are less restrictive.

Table 1
Panel A: Average unemployment insurance benefits by state.

State	Max weekly benefit	Max duration	Unemployment insurance	State	Max weekly benefit	Max duration	Unemployment insurance
Alabama	194	26	5,032	Montana	276	27	7,408
Alaska	319	27	8,288	Nebraska	223	26	5,794
Arizona	199	26	5,184	Nevada	281	26	7,295
Arkansas	310	26	8,068	New Hampshire	286	26	7,443
California	304	26	7,900	New Jersey	420	26	10,925
Colorado	338	26	8,786	New Mexico	283	26	7,365
Connecticut	443	26	11,518	New York	339	26	8,808
Delaware	292	26	7,583	North Carolina	353	26	9,169
District of Columbia	328	26	8,520	North Dakota	284	26	7,373
Florida	256	26	6,663	Ohio	385	26	10,002
Georgia	249	26	6,462	Oklahoma	280	26	7,275
Hawaii	384	26	9,988	Oregon	355	26	9,226
Idaho	277	26	7,196	Pennsylvania	413	26	10,749
Illinois	385	26	10,015	Rhode Island	479	26	12,449
Indiana	273	26	7,095	South Carolina	243	26	6,318
Iowa	322	26	8,370	South Dakota	214	26	5,565
Kansas	308	26	8,006	Tennessee	231	26	6,018
Kentucky	292	26	7,592	Texas	296	26	7,694
Louisiana	222	26	5,762	Utah	318	26	8,263
Maine	376	26	9,783	Vermont	286	26	7,431
Maryland	281	26	7,293	Virginia	264	26	6,861
Massachusetts	642	26	19,260	Washington	403	29	11,468
Michigan	315	26	8,186	West Virginia	323	26	8,396
Minnesota	395	26	10,271	Wisconsin	293	26	7,606
Mississippi	187	26	4,870	Wyoming	279	26	7,246
Missouri	224	26	5,828				

Table 1
Panel B: Unemployment insurance benefits by year, 1987–2011.

Year	N	Max weekly benefit	Max duration	Max UI benefits
1987	654	187.62	26.04	4,907.21
1988	3586	194.64	26.04	5,090.42
1989	3793	203.62	26.04	5,326.34
1990	3806	214.19	26.04	5,605.13
1991	3861	222.17	26.04	5,813.32
1992	4111	233.32	26.15	6,119.32
1993	4400	242.15	26.15	6,351.85
1994	4593	251.4	26.15	6,598.72
1995	4800	257.32	26.15	6,754.26
1996	5082	264.17	26.15	6,934.15
1997	4974	272.66	26.15	7,157.70
1998	4604	280.23	26.15	7,358.11
1999	4426	291.26	26.15	7,647.06
2000	4279	299.47	26.15	7,863.55
2001	3992	322.77	26.15	8,479.36
2002	3697	336.23	26.15	8,837.28
2003	3554	347.85	26.15	9,138.87
2004	3493	357.62	26.15	9,393.13
2005	3379	365.64	26.11	9,578.04
2006	3271	376.02	26.11	9,848.26
2007	3201	388	26.11	10,166.72
2008	3064	404.81	26.11	10,607.58
2009	2902	420.17	26.11	11,010.87
2010	2825	427.55	26.11	11,203.32
2011	2722	428.58	26.11	11,229.81

Panel A (B) shows the distribution of unemployment insurance allowed by state (year). UI is the average of the maximum unemployment benefit allowed, defined as the product of the maximum weekly benefit times the maximum number of weeks allowed.

Table 2
Summary statistics.

	Mean	Standard deviation	25th percentile	Median	75 percentile
$Accruals_t$	−0.044	0.105	−0.086	−0.040	0.002
CFO_t	−0.003	0.243	−0.036	0.059	0.120
UI_{t-1}	9.036	0.362	8.759	8.991	9.267
CFO_{t-1}	0.009	0.224	−0.025	0.062	0.123
CFO_{t+1}	0.006	0.232	−0.024	0.063	0.122
$\Delta Revenue_t$	0.094	0.311	−0.020	0.067	0.207
$PP\&E_t$	0.551	0.406	0.230	0.451	0.792
Log_Assets_t	5.167	2.177	3.603	5.063	6.642
$\partial(CFO)_t$	0.190	0.417	0.042	0.077	0.151
$\partial(Sales)_t$	0.506	0.622	0.161	0.306	0.583
$OperCycle_t$	4.642	0.760	4.234	4.707	5.124
$NegEarn_t$	0.335	0.348	0.000	0.200	0.600
$Int\_Intensity_t$	0.192	0.715	0.000	0.015	0.086
$Cap\_Intensity_t$	0.288	0.238	0.096	0.214	0.423
GDP_Growth_t	5.120	2.704	3.660	5.220	6.980

This table presents the summary statistics for the variables used in the paper. *Accruals* is total accruals divided by total assets. *CFO* is cash flow from operations divided by total assets. *UI* is the maximum unemployment benefit allowed, defined as the product of the maximum weekly benefits times the maximum number of weeks allowed expressed in thousands of dollars. Regression models employ the natural log of *UI*. *ΔRevenue* is the change in sales divided by total assets. *PP&E* is property, plant, and equipment divided by total assets. *Log_Assets* is the natural log of total assets. *σ(CFO)* is the standard deviation of the rolling ten-year cash flows from operations scaled by total assets. *σ(Sales)* is the standard deviation of sales revenue scaled by total assets. *OperCycle* is the log of the sum of days accounts receivable and days inventory. *NegEarn* is the proportion of losses over the prior ten years. *Int_Intensity* is the sum of R&D and advertising expense as a fraction of sales revenue. *Cap_Intensity* is the ratio of net book value of property, plant, and equipment to total assets. *GDP_Growth* is state-level growth in GDP.

atic manner, as predicted by earnings management incentives) reflects income smoothing behavior.[10] This approach allows us to capture income smoothing propensities in an intuitive manner, without having to use multiple years of observations to capture income and cash flow volatility.[11] Using a multiple-year approach to capture income smoothing is problematic in our setting because UI benefits could undergo several changes within a given multi-year time frame.

Following the prior literature (e.g., Dechow, Sloan, and Sweeney, 1995; Sloan, 1996), we measure accruals as follows: Accruals = (ΔCA − ΔCash) − (ΔCL − ΔSTD − ΔTP) − Dep, where ΔCA = the change in current assets, ΔCash = the change in cash/cash equivalents, ΔCL = the change in current liabilities, ΔSTD = the change in debt included in current liabilities, ΔTP = the change in income taxes payable, and Dep = depreciation and amortization expense. Having computed accruals, we then define the following variables:

$$Accruals = \text{accruals/average total assets.} \tag{1}$$

$$CFO = (\text{income from continuing operations - accruals})/\text{average total assets.} \tag{2}$$

CFO is cash flow from operations, and average total assets is the average of the beginning and ending book value of total assets. Following the prior literature, a basic model of income smoothing can be depicted as

$$Accruals = \beta_0 + \beta_1 CFO_t + \beta_n Controls_t + e. \tag{3}$$

Controls represents the vector of variables that attempt to capture the determinants of innate (i.e., nondiscretionary) accruals. In controlling for innate factors that determine accruals, following Jones (1991) and many subsequent papers (e.g., Dechow et al., 1995), we control for the change in revenue ($\Delta Revenue_t$) and gross plant, property, and equipment ($PP\&E_t$) scaled by average total assets. As the next set of determinants of innate accruals, we follow Dechow and Dichev (2002) and Francis et al. (2004, 2005a) and control for firm size, cash flow variability, sales variability, length of operating cycle, incidence of negative earnings realizations, intangibles intensity, and capital intensity. Firm size is proxied by the log of total assets (Log_Assets_t). Cash flow variability ($\sigma(CFO)_t$) and sales variability ($\sigma(Sales)_t$) are measured as the standard deviation of the firm's rolling 10-year cash flows from operations and sales revenue respectively, with both scaled by total assets. Operating cycle ($OperCycle_t$) is the log of the sum of days accounts receivable and days inventory. The incidence of negative earnings ($NegEarn_t$) is the proportion of losses over the prior 10 years. Intangibles intensity ($Int\_Intensity_t$) is the sum of R&D and advertising expenses as a fraction of sales revenue. Capital intensity ($Cap\_Intensity_t$) is captured as the ratio of the net book value of property, plant, and equipment to total assets. We also control for state-level GDP growth (GDP_Growth_t) to control for the possibility of macroeconomic growth affecting the firm's accruals.

[10] This approach of capturing income smoothing is also prevalent in the banking literature, where the propensity for smoothing is measured in terms of the correlation between income before provisions (equivalent to operating cash flow for banks) and loan loss provisions (which are the largest form of accrual for banks) (e.g., see Wahlen, 1994; Collins et al., 1995; Kanagaretnam et al., 2004; Liu and Ryan, 2006; Kilic et al., 2013).

[11] For example, studies such as those by Leuz et al. (2003), Francis et al. (2004), and Lang et al. (2012) capture income smoothing as the ratio of the standard deviation of income to the standard deviation of operating cash flows.

In addition to the aforementioned innate factors, we also control for CFO_{t-1} and CFO_{t+1} as a means of accounting for the mapping of current accruals into last-period and next-period cash flows. Controlling for these cash flows (which are correlated to contemporaneous cash flows) is potentially important because our paper focuses on how the accruals are conditional on contemporaneous cash flows. All of our regression models also include firm and year fixed effects to control for time-invariant firm-level effects and general time trends in the accruals process, if any.[12] Finally, we cluster standard errors by state to correct for potential correlations among firms within the same state.[13]

In Eq. (3), the coefficient on CFO_t, β_1, represents the extent to which accruals are discretionally used to smooth earnings, conditional on cash flows from operations in the absence of any UI benefits. Note that by construction, *CFO* is income from continuing operations before accruals, and thus this variable can be considered a proxy of the earnings signal prior to the use of accruals to smooth income.

To examine the relation between UI benefits and income smoothing, we extend Eq. (3) as follows:

$$Accruals = \beta_0 + \beta_1 CFO_t \times UI_{t-1} + \beta_2 CFO_t + \beta_3 UI_{t-1} + \beta_n Controls_t + e. \quad (4)$$

Following Agrawal and Matsa (2013), the model introduces *UI* as the *natural* log of the maximum unemployment benefits allowed by a state in a given year. *UI* is included in the specification as a lagged variable because we argue that changes in *UI* lead to changes in income smoothing behavior. Our coefficient of interest is the coefficient on the interaction term $CFO_t \times UI_{t-1}$ (β_1). If, as hypothesized in H1, UI benefits indeed alleviate firms' income smoothing behavior, then we expect this interaction coefficient to be significantly positive. We examine H2 and H3 through subsample analyses by re-estimating regression model (4) after splitting the sample based on the appropriate partitioning variables.

4. Results

4.1. Test of H1: relationship between UI benefits and income smoothing

Table 3 presents the results for the tests of our main hypothesis that income smoothing is negatively associated with the level of state-level UI benefits. In Panel A of Table 3, Columns (1) and (2) report the results with and without controls for innate accruals, respectively. Following Francis et al. (2004), Column (1) can be interpreted as the relationship between UI benefits and income smoothing behavior exhibited by total (i.e., both innate and discretionary) accruals, while Column (2) represents the relationship between UI benefits and income smoothing via discretionary accruals. In both columns of Table 3, Panel A, the coefficient on CFO_t is reliably negative, which is suggestive of income smoothing behavior as reported in the prior literature. More importantly, the coefficient on the interaction term $CFO_t \times UI_{t-1}$, which is our coefficient of interest, is positive and significant. This finding suggests that, as hypothesized in H1, UI benefits reduce firms' propensity to engage in income smoothing activities. The impact is also economically significant. Given the magnitude of the main income smoothing coefficient in Column 2 of Table 3 (CFO_t), our results suggest a one standard deviation increase in the log of UI benefits attenuates the income smoothing propensity by about 2.9%.[14]

In H1, we argue that the discretionary use of accruals for income smoothing attenuates when UI benefits are high. While the results reported in Column (2) of Table 3, Panel A provide support for this idea, to gain further confidence in our findings, we also examine whether similar findings can be obtained with respect to innate accruals where we do not conjecture such a systematic relationship. If similar results are found with respect to innate accruals as well, there would be a concern that our findings may be attributed to a factor other than the conjectured mechanism. We investigate this issue by following Francis et al. (2005a, 2005b). Specifically, we first define innate accruals as the fitted value of annual estimations obtained by regressing total accruals on the aforementioned determinants of innate accruals. We then regress these innate components of accruals on CFO_t, UI_{t-1}, and $CFO_t \times UI_{t-1}$ along with prior-year and following-year cash flows from operations. These findings are reported in Panel B of Table 3. Unlike in Panel A, the coefficient on the interaction term $CFO_t \times UI_{t-1}$ is not statistically significant in Panel B of Table 3. In other words, we do not observe UI benefits affecting the relationship between operating cash flows and innate accruals in a predictable manner.

Together, the results reported in Panels A and B of Table 3 provide strong support for H1 by indicating not only that the use of accruals for income smoothing declines when UI benefits are high but also that this effect is attributable to discretionary, and not innate, accruals.

4.2. Test of H2: the effect of unemployment risk

Hypothesis H2 predicts that the effect of UI benefits on reducing income smoothing should be stronger when employees face a greater risk of unemployment. In investigating H2, we focus on labor market characteristics and use three proxies of unemployment risk.

[12] Note that year fixed effects effectively capture country-level macroeconomic factors, which are the same for all firms within a year.

[13] Agrawal and Matsa (2013) argue that it is more appropriate to cluster at the state level, because that is where the variation in UI benefits occurs, and clustering in this way controls for potential time-varying correlations in unobserved factors that affect different firms within the same state. These authors also argue that this kind of clustering corrects for within-firm error term correlations over time, making it more generalizable than firm-level clustering.

[14] $(0.082 \times 0.362) / -1.020 = -0.029$.

Table 3
Panel A: Impact of unemployment insurance on income smoothing via discretionary accruals.

	(1) $Accruals_t$	(2) $Accruals_t$
$\boldsymbol{CFO_t \times UI_{t-1}}$	**0.249*****	**0.082*****
	(0.029)	**(0.027)**
CFO_t	−2.551***	−1.020***
	(0.270)	(0.266)
UI_{t-1}	−0.018**	0.003
	(0.007)	(0.004)
CFO_{t-1}	0.121***	0.130***
	(0.005)	(0.007)
CFO_{t+1}	0.114***	0.091***
	(0.003)	(0.004)
$\Delta Revenue_t$		0.113***
		(0.006)
$PP\&E_t$		−0.012**
		(0.006)
Log_Assets_t		0.011***
		(0.001)
$\partial(CFO)_t$		−0.006*
		(0.003)
$\partial(Sales)_t$		0.002
		(0.002)
$OperCycle_t$		0.010***
		(0.002)
$NegEarn_t$		0.014***
		(0.003)
$Int\_Intensity_t$		−0.018***
		(0.002)
$Cap\_Intensity_t$		−0.113***
		(0.014)
GDP_Growth_t		0.000
		(0.000)
	Firm and year fixed effects included	
Observations	128,704	75,537
R-squared	0.447	0.487

Certain institutional arrangements between firms and employees, such as collective bargaining agreements, are designed to reduce employees' unemployment risk exposure. Collective bargaining agreements are prevalent in highly unionized settings and cover a wide range of employment-related issues, such as life and health insurance, pay, hours, holidays, employee dismissal, and severance pay (e.g., see Booth, 1995). It is widely understood that it is more difficult and/or costly to lay off employees who are covered by collective bargaining agreements. Abraham and Medoff (1984) find that written rules to deal with permanent layoffs are present in 92% of unionized firms but only 24% of nonunionized firms.[15] These written rules are typically incorporated into collective bargaining agreements. Moreover, Budd and McCall (1997, 2004) find that unionization significantly increases the likelihood of a low-level worker receiving UI benefits because unions act as an important information conduit regarding the UI benefit system. Hence, both the risk and the cost of unemployment should be lower for unionized employees who are covered by collective bargaining agreements. Therefore, we use the percentage of employees covered by collective bargaining power agreements as our first empirical proxy of unemployment risk. Although this construct should ideally be measured at the firm level, data limitations prevent us from doing so. Therefore, we measure this construct at the state-year level using data from the Unionstats database maintained by Barry T. Hirsch and David A. Macpherson.[16]

Our second measure of unemployment risk is the industry-level fraction of workers who receive income from UI (UI payment rate), according to the Current Population Survey of the U.S. Bureau of Labor Statistics (BLS). The third measure of unemployment risk is the industry-level average annual fraction of workers separated from work during a mass layoff (layoff propensity) based on data from the BLS Mass Layoff Statistics and the U.S. Bureau of Economic Analysis.[17] High UI payment rates and layoff propensity indicate a high risk of unemployment.

[15] In a related point, Gibbons and Katz (1991) argue that it is easier for employees of unionized firms to find re-employment in the event of a layoff. The rationale is that in nonunionized settings, where firms have more discretion about whom to lay off, the market infers that laid-off workers are people of lower ability. However, such inferences cannot be made in unionized settings, as most jobs covered by collective bargaining agreements are governed by layoff-by-seniority rules.

[16] http://unionstats.gsu.edu/.

[17] We thank Professor David Matsa for providing us with data on UI payment rates and layoff propensity.

Table 3
Panel B: Impact of unemployment insurance on income smoothing via innate accruals.

	(1) $InnateAccruals_t$
$CFO_t \times UI_{t-1}$	**0.013**
	(0.009)
CFO_t	−0.111
	(0.081)
UI_{t-1}	−0.006**
	(0.003)
CFO_{t-1}	−0.010***
	(0.001)
CFO_{t+1}	0.017***
	(0.001)
	Firm and year fixed effects included
Observations	75,537
R-squared	0.504

Bold coefficients are the coefficients of interest.
This table presents regression results on income smoothing. Panel A (B) reports results using total (innate) accruals. *Accruals* is total accruals in *t*. *InnateAccruals* is the fitted value from regressing *Accruals* on innate firm characteristics. UI_{t-1} is maximum total benefits in *t*-1. CFO_t is cash flow from operations in *t*. CFO_{t-1} is cash flow from operations in $t-1$. CFO_{t+1} is cash flow from operations in $t+1$. See Table 2 for all other variable definitions. We include firm and year fixed effects. We report coefficient estimates and standard errors (in parentheses) based on robust standard errors clustered by state. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

We test H2 by running regression model (4) after separating our observations into subsamples based on high and low propensity to hold collective bargaining agreements, UI payment rates, and layoff propensity, respectively. The high versus low subsamples are based on cross-sectional medians of the respective measures. H2 predicts that the coefficient on the interaction term $CFO_t \times UI_{t-1}$ is more strongly positive (i.e., a greater propensity that UI benefits attenuate income smoothing behavior) when the likelihood of having collective bargaining agreements is low, UI payment rates are high, and the layoff propensity is high.

The results of H2 are presented in Table 4. Columns 1–2 report results based on the likelihood of having collective bargaining agreements, while Columns 3–4 and 5–6 report results based on UI payment rates and layoff propensity, respectively. As can be seen in Columns 1 and 2 of Table 4, the coefficient of interest—that on the two-way interaction term $CFO_t \times Risk_t$—is significantly positive when the likelihood of having collective bargaining agreements is low but not when it is high. In Columns 3 and 4 of Table 4, we observe the coefficient on $CFO_t \times Risk_t$ to be positive and significant both when UI payment rates are high and low. Casual observation indicates the statistical significance and the magnitude of this coefficient to be smaller when UI payment rates are low (Column 4) than when they are high (Column 3). However, a chi-squared test reveals that the coefficients on $CFO_t \times Risk_t$ reported in the two columns are not statistically distinguishable from one another.[18] Finally, in Column 5 of Table 4, we find the coefficient on $CFO_t \times Risk_t$ to be reliably positive when the layoff propensity is high, but, as can be seen in Column 6 of Table 4, this coefficient remains insignificant when the layoff propensity is low.

In summary, the results reported in Table 4 are broadly supportive of H2, that the negative association between income smoothing and UI benefits is stronger (weaker) when the risk of unemployment is high (low).

4.3. Test of H3: The effect of employee wage profile

Our final hypothesis (H3) argues that the negative association between income smoothing and UI benefits should be stronger for firms employing proportionately large numbers of low-wage workers. Because these workers find UI benefits most useful, the total compensation wage differentials associated with unemployment risk would be higher for firms that employ them.

We follow Agrawal and Matsa (2013) and capture the firm's likelihood of having a proportionately large number of low-wage workers in terms of the industry-level percentage of workers who earn less than $50,000 in annual income based on the 2000 U.S. population census.[19] We then re-run regression model (4) after partitioning our sample into firms employing high and low fractions of low-wage workers based on the cross-sectional median. H3 predicts a more strongly positive coefficient on the interaction term $CFO_t \times UI_{t-1}$ for firms likely to employ a larger fraction of low-wage workers.

The results for H3 are reported in Table 5. As expected, we find the coefficient of interest—that on $CFO_t \times UI_{t-1}$—to be reliably positive for the subsample of firms with more low-wage workers (Column 1 of Table 5). In contrast, this coefficient is

[18] p-value = 0.347.
[19] We thank Professor David Matsa for providing us with this data.

Table 4
The role of unemployment risk.

	Low likelihood of collective bargaining agreements	High likelihood of collective bargaining agreements	High UI payment rates	Low UI payment rates	High layoff propensity	Low layoff propensity
	(1)	(2)	(3)	(4)	(5)	(6)
	$Accruals_t$	$Accruals_t$	$Accruals_t$	$Accruals_t$	$Accruals_t$	$Accruals_t$
$CFO_t \times UI_{t-1}$	**0.173*****	**0.069**	**0.096*****	**0.075***	**0.126*****	**0.044**
	(0.038)	**(0.041)**	**(0.026)**	**(0.040)**	**(0.026)**	**(0.037)**
CFO_t	−1.830***	−0.908**	−1.172***	−0.942**	−1.458***	−0.635*
	(0.333)	(0.408)	(0.236)	(0.385)	(0.242)	(0.348)
UI_{t-1}	−0.010	0.008*	−0.002	0.008	−0.006	0.013
	(0.009)	(0.004)	(0.005)	(0.006)	(0.004)	(0.008)
CFO_{t-1}	0.118***	0.135***	0.138***	0.121***	0.147***	0.109***
	(0.010)	(0.010)	(0.007)	(0.009)	(0.007)	(0.007)
CFO_{t+1}	0.086***	0.093***	0.096***	0.084***	0.095***	0.083***
	(0.004)	(0.006)	(0.005)	(0.005)	(0.004)	(0.005)
$\Delta Revenue_t$	0.098***	0.122***	0.108***	0.115***	0.117***	0.105***
	(0.006)	(0.005)	(0.007)	(0.006)	(0.006)	(0.007)
$PP\&E_t$	−0.012	−0.011**	−0.010	−0.012*	−0.009	−0.013*
	(0.011)	(0.004)	(0.007)	(0.007)	(0.006)	(0.007)
Log_Assets_t	0.013***	0.010***	0.011***	0.012***	0.011***	0.011***
	(0.003)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
$\partial(CFO)_t$	−0.006	−0.005	−0.003	−0.009**	−0.006	−0.008
	(0.007)	(0.003)	(0.006)	(0.004)	(0.004)	(0.005)
$\partial(Sales)_t$	0.004	0.001	0.002	0.003	0.001	0.005*
	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
$OperCycle_t$	0.011***	0.010***	0.014***	0.006***	0.017***	0.004**
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
$NegEarn_t$	0.016***	0.012***	0.016***	0.012**	0.010***	0.021***
	(0.004)	(0.004)	(0.005)	(0.006)	(0.003)	(0.006)
$Int\_Intensity_t$	−0.030***	−0.016***	−0.024***	−0.016***	−0.027***	−0.014***
	(0.002)	(0.002)	(0.005)	(0.003)	(0.004)	(0.003)
$Cap\_Intensity_t$	−0.095***	−0.129***	−0.092***	−0.157***	−0.101***	−0.149***
	(0.022)	(0.012)	(0.016)	(0.012)	(0.015)	(0.016)
GDP_Growth_t	−0.000	0.000	0.000	0.001	0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
	Firm and Year Fixed Effects Included					
Observations	26,347	49,190	41,915	33,622	50,373	25,164
R-squared	0.521	0.474	0.530	0.469	0.542	0.446

Bold coefficients are the coefficients of interest.
This table presents regression results on income smoothing and unemployment risk. Unemployment risk is captured in terms of the likelihood of employees being covered by collective bargaining agreements, industry-level UI payment rates and the industry-level layoff probability. CFO_t is cash flow from operations in *t*. CFO_{t-1} is cash flow from operations in $t-1$. CFO_{t+1} is cash flow from operations in $t+1$. We include firm and year fixed effects. See Table 2 for all other variable definitions. We report coefficient estimates and standard errors (in parentheses) based on robust standard errors clustered by state. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

statistically insignificant for firms with fewer low-wage workers (Column 2 of Table 5). Hence, the results reported in Table 5 support H3 in that the role of UI benefits in attenuating income smoothing behavior is stronger for firms that employ proportionately large numbers of low-wage workers.

4.4. Additional analyses

4.4.1. The effect of corporate governance

The literature posits that managers may engage in income smoothing behavior either to garble information and depict a false sense of stability or to signal their private information to external stakeholders (e.g., Tucker and Zarowin, 2006). While garbling adversely affects a firm's information environment, one could argue that signaling has the opposite effect.

We investigate whether the association between income smoothing and UI benefits is affected by the firm's corporate governance environment to gain some insight into whether unemployment concern-driven income smoothing behavior can be primarily attributed to garbling or signaling. Prior literature suggests that stronger governance mechanisms are associated with more transparent information environments in general and more informative earnings in particular (e.g., Dechow et al., 1996; Francis et al., 2005a, 2005b; Koh, 2007; Armstrong et al., 2012). Hence, if unemployment concern-driven income smoothing behavior is primarily aimed at garbling, we would expect this behavior's sensitivity to UI benefits to be greater for firms with weak corporate governance. In contrast, the opposite would be expected if the main objective of unemployment risk-driven income smoothing behavior is to improve the information environment.

We investigate this issue by re-estimating model (4) after partitioning our sample based on two commonly used proxies of corporate governance. Our first governance proxy is the governance index (*G-index*) introduced by Gompers et al. (2003).

Table 5
The role of the employee wage profile.

	More low-wage workers (1) $Accruals_t$	Fewer low-wage workers (2) $Accruals_t$
$CFO_t \times UI_{t-1}$	**0.092*****	**0.070**
	(0.024)	**(0.043)**
CFO_t	−1.130***	−0.880**
	(0.233)	(0.411)
UI_{t-1}	0.005	−0.001
	(0.004)	(0.006)
CFO_{t-1}	0.137***	0.114***
	(0.007)	(0.012)
CFO_{t+1}	0.089***	0.091***
	(0.005)	(0.006)
$\Delta Revenue_t$	0.115***	0.105***
	(0.007)	(0.007)
$PP\&E_t$	−0.011	−0.017**
	(0.007)	(0.006)
Log_Assets_t	0.015***	0.006***
	(0.002)	(0.001)
$\partial(CFO)_t$	−0.002	−0.017***
	(0.005)	(0.005)
$\partial(Sales)_t$	0.002	0.003
	(0.002)	(0.002)
$OperCycle_t$	0.009***	0.013***
	(0.001)	(0.004)
$NegEarn_t$	0.019***	0.004
	(0.002)	(0.008)
$Int\_Intensity_t$	−0.020***	−0.018***
	(0.003)	(0.005)
$Cap\_Intensity_t$	−0.107***	−0.129***
	(0.013)	(0.020)
GDP_Growth_t	−0.000	0.001*
	(0.000)	(0.000)
	Firm and year fixed effects included	
Observations	50,496	25,041
R-squared	0.513	0.465

Bold coefficients are the coefficients of interest.
This table presents regression results on income smoothing and the industry-level proportion of low-wage workers in the workforce. CFO_t is cash flow from operations in *t*. CFO_{t-1} is cash flow from operations in $t-1$. CFO_{t+1} is cash flow from operations in $t+1$. We include firm and year fixed effects. See Table 2 for all other variable definitions. We report coefficient estimates and standard errors (in parentheses) based on robust standard errors clustered by state. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

G-index is a measure of shareholder rights based on 24 corporate governance-related provisions, with higher values indicating weaker shareholder rights. The second measure of governance is the entrenchment index (*E-index*), based on a subset of six provisions included in the G-Index, which Bebchuk et al. (2008) find to be particularly useful in explaining firm value. As with the *G-index*, higher *E-index* values indicate weaker corporate governance.

These results are reported in Table 6, with Columns 1 and 2 reporting the results for high and low *G-index* firms and Columns 3 and 4 reporting the results for high and low *E-index* firms. We find that the coefficient on the interaction term CFO_t - $\times$ UI_{t-1} is positive and significant for firms with a high *G-index* (Column 1) but insignificant for low *G-index* firms (Column 2). While this coefficient is statistically significant for both high and low *E-index* firms, we find it to be larger in magnitude for the former (Column 3) when compared with low *E-index* firms (Column 4). In other words, the results reported in Table 6 suggest that firms with weaker governance are more sensitive to UI benefits in terms of their income smoothing behavior. To the extent that weaker governance is associated with a higher likelihood of information garbling, these results indicate that unemployment concern-driven income smoothing behavior is primarily aimed at garbling rather than signaling. Nonetheless, these results must be viewed with caution because firms might resort to either type of income smoothing depending on the specific temporal circumstances and because corporate governance and financial reporting attributes are likely endogenously determined (Armstrong et al., 2010; Beyer et al., 2010).

4.4.2. The effect of the Sarbanes-Oxley act

As an additional test, we also examine whether regulatory attempts to improve governance affect our findings in the context of the Sarbanes-Oxley Act of 2002 (SOX). SOX sought to improve firms' governance environment and financial reporting quality through a number of provisions aimed at holding the CEO and CFO personally responsible for the accuracy and completeness of financial statements and improving internal controls and auditor independence. To examine whether

Table 6
The role of corporate governance.

	High G-Index (1) $Accruals_t$	Low G-Index (2) $Accruals_t$	High E-Index (3) $Accruals_t$	Low E-Index (4) $Accruals_t$
$CFO_t \times UI_{t-1}$	**0.247*****	**0.094**	**0.197*****	**0.108****
	(0.049)	**(0.057)**	**(0.042)**	**(0.052)**
CFO_t	−2.632***	−1.146**	−2.134***	−1.281**
	(0.476)	(0.559)	(0.412)	(0.513)
UI_{t-1}	−0.024***	−0.010	−0.016**	−0.015*
	(0.006)	(0.008)	(0.006)	(0.008)
CFO_{t-1}	0.119***	0.128***	0.121***	0.127***
	(0.021)	(0.011)	(0.013)	(0.015)
CFO_{t+1}	0.069***	0.084***	0.060***	0.098***
	(0.012)	(0.020)	(0.009)	(0.025)
$\Delta Revenue_t$	0.087***	0.096***	0.085***	0.098***
	(0.006)	(0.009)	(0.005)	(0.009)
$PP\&E_t$	−0.008	−0.007	−0.009	−0.016**
	(0.008)	(0.008)	(0.008)	(0.006)
Log_Assets_t	0.005**	0.004	0.008***	0.003
	(0.002)	(0.003)	(0.001)	(0.002)
$\partial(CFO)$	−0.006	−0.004	−0.014	0.005
	(0.023)	(0.010)	(0.009)	(0.010)
$\partial(Sales)$	−0.001	−0.003	0.000	−0.004
	(0.005)	(0.005)	(0.003)	(0.004)
OperCycle	0.006	0.012***	0.008***	0.008***
	(0.004)	(0.003)	(0.003)	(0.003)
NegEarn	0.021***	0.025**	0.020**	0.023***
	(0.006)	(0.011)	(0.007)	(0.009)
Int_Intensity	−0.021***	−0.025***	−0.026***	−0.026***
	(0.007)	(0.005)	(0.005)	(0.005)
Cap_Intensity	−0.049***	−0.099***	−0.060***	−0.081***
	(0.015)	(0.015)	(0.016)	(0.016)
GDP_Growth_t	0.000	0.001***	0.000	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
	Firm and Year Fixed Effects Included			
Observations	9,795	13,658	14,612	13,370
R-squared	0.553	0.520	0.562	0.534

Bold coefficients are the coefficients of interest.
This table presents regression results on income smoothing and corporate governance. Corporate governance is captured in terms of the Governance index (*G-index*) and the Entrenchment index (*E-index*). *Accruals* is total accruals in *t*. UI_{t-1} is maximum total benefits in $t-1$. CFO_t is cash flow from operations in *t*. CFO_{t-1} is cash flow from operations in $t-1$. CFO_{t+1} is cash flow from operations in $t+1$. We include firm and year fixed effects. See Table 2 for all other variable definitions. We report coefficient estimates and standard errors (in parentheses) based on robust standard errors clustered by state. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

unemployment concern-driven income smoothing behavior dissipates post-SOX, we re-examine regression model (4) by partitioning the sample into pre- and post-SOX periods. In untabulated results, we fail to find consistent evidence that the passage of SOX has a significant impact on the relationship between UI benefits and income smoothing behavior.

4.4.3. Weighted UI based on geographic disclosure

As described in Section 3.1, we assign firms to states based on the location of their headquarters. This criterion creates measurement error if many of a firm's workers are located outside the headquarters state. To mitigate this concern, we examine whether our results are robust to a geographic disclosure-weighted UI measure, which takes into account the firm's geographic segments by state and (presumably) the proportion of employees located in the state. Following Garcia and Norli (2012), we define the state-level geographic dispersion of a firm's operations as the number of different operating states mentioned in its 10-K filings. Garcia and Norli (2012) argue that "the 10-K statement also gives information on the firm's properties, such as factories, warehouses and sales offices. For example, firms may include sales at stores in different states, and/or list the manufacturing facilities they operate together with the city and state where they are located."[20] We obtain our relative state counts for each state (counts of one state/counts of total states) for each firm from Garcia and Norli (2012) and use it to compute a geographic disclosure-weighted average UI measure ($GDW\text{-}UI_{t-1}$). In this measure, state-level UI benefits are weighted by the relative state counts obtained from the 10-K disclosures. While the availability of the $GDW\text{-}UI_{t-1}$ measure results in a sample attrition of nearly 60%, in untabulated analyses we continue to find that higher UI benefits lead to less income smoothing when we re-run model (4) after replacing UI_{t-1} with $GDW\text{-}UI_{t-1}$ (i.e., we find the coefficient on the interaction term $CFO_t \times GDW\text{-}UI_{t-1}$ to be positive and significant).

[20] As Garcia and Norli (2012) explain, the counted number of states is comprised of the occurrence of different state names in the following 10-K sections: Item 1: Business, Item 2: Properties, Item 6: Consolidated Financial Data, and Item 7: Management's Discussion and Analysis.

Although our findings on the relationship between UI and income smoothing continue to hold with the $GDW\text{-}UI_{t-1}$ measure, it is worth noting that we cannot identify the context in which each state is mentioned in the 10-K filings. The filings are most likely to mention states where the firm's operations have a substantial presence, where new operations have begun, or where firms have recently ceased operations. As such, we choose to follow prior studies and use the headquarters-based measure as our primary measure of UI. To further alleviate concerns about the measurement error regarding UI, we follow Agrawal and Matsa (2013) by carrying out an additional robustness test in which we exclude industries characterized as having dispersed workforces. Agrawal and Matsa (2013) identify retail, wholesale, and transportation as industries with more dispersed workforces. Untabulated results show that our results are not sensitive to this exclusion.

4.4.4. Effects of large increases in UI

Although our cross-sectional tests enhance our confidence that our main results are driven by changes in UI benefits, we adopt another identification strategy by focusing on periods in which states experience large shocks to their UI benefits. Following Dou et al. (2016), we identify state-years in which UI benefits increase by more than 10% and examine whether our results are stronger for these periods. We separate our main sample into subsamples of firm-years with and without large UI increases and then re-estimate model (4) separately for these two subsamples. Untabulated results indicate that although we continue to find a positive coefficient on the interaction term $CFO_t \times UI_{t-1}$ in both subsamples, the magnitude of this coefficient is over 70% larger for the subsample of firm-years in which there are large increases in UI benefits. This finding provides further evidence of a causal relation between UI benefits and income smoothing behavior.

4.4.5. Controls for other state-level factors

Our primary analyses control for state-level GDP growth. In untabulated analyses, we apply additional state-level controls: the state unemployment rate and the percentage of the state population claiming unemployment benefits. While the use of these controls leads to smaller sample sizes, we continue to find results that support all of our hypotheses.

4.4.6. Controlling for temporal decline in accruals-operating cash flow relationship

In a recent paper, Bushman et al. (2016) report a temporal decline in the negative correlation between accruals and operating cash flows and find that this attenuation can largely be attributed to the increased incidences of one-time and nonoperating items and frequency of loss firm-years. This is relevant to our paper because, given the upward trend exhibited by unemployment benefits notwithstanding the use of year fixed effects, it is possible that the interaction coefficient $CFO_t \times UI_{t-1}$ is simply picking up the time trend uncovered by Bushman et al. (2016). To rule out this alternative explanation, in untabulated tests, we re-run our regression model (4) after including additional controls for special items (Compustat item SPI) and nonoperating items (Compustat item NOPI), both scaled by average net assets. Note that our model already controls for the incidence of loss making. We find that the inclusion of these additional control variables does not alter our inferences, as we continue to find positive and significant coefficients on the interaction term $CFO_t \times UI_{t-1}$ (p-value < 0.01). As a further test, we re-run our analyses after removing firms with special items, firms with above-median nonoperating items, and loss firms. If the positive coefficient on $CFO_t \times UI_{t-1}$ can largely be attributed to factors that contribute to temporal attenuation of the accruals-operating cash flow relationship, then these exclusions should bias against our results. However, untabulated results reveal that our inferences are not sensitive to these exclusions.

5. Conclusion

Labor theory on compensating wage differentials suggests that managers have incentives to smooth income to project a less risky image of the firm to employees because lower unemployment risk has the ex-ante effect of lowering the cost of compensating workers. If so, state UI benefits, which mitigate unemployment concerns, should curtail managerial incentives to engage in income smoothing. Using exogenous inter-state cross-sectional and intra-state time-series variations in U.S. UI benefits, we show that more generous state UI benefits result in less income smoothing by firms. This effect of UI benefits is interesting because it is likely an unintended outcome of state-level labor policies. It is difficult to imagine policy makers, in deliberating UI policies, explicitly considering the firm-level financial reporting implications of their decisions (which could have additional consequences, such as a lower cost of capital or higher financial reporting quality).

To deepen our insight into the effect of UI benefits on income smoothing, we show that the effect is stronger when workers face higher unemployment risk and when the firm is likely to employ proportionately more low-wage workers, who find UI benefits especially useful. In additional tests, we find this effect to be stronger for firms with weak corporate governance, but we do not find the passage of SOX to have had a significant impact on this behavior.

Reverse causality and endogeneity are important concerns that preclude the researcher from making strong causal inferences in empirical studies of financial economics. Although our paper is not completely devoid of these concerns, we believe that our institutional setting and research design choices allay them to a great extent.

First, as we capture UI benefits at the state level, it is unlikely that reverse causality explains our results because it is difficult to imagine a situation where state-level UI benefits are affected by firm-level income smoothing.

Second, while it is conceptually plausible to conceive of broader economic factors that affect both UI benefits and firms' income smoothing behavior, thereby raising concerns about omitted correlated variables, from a practical standpoint, it

appears that changes in UI benefits are driven by political considerations more than the underlying economics. For example, in the state of Florida, the maximum UI benefits remained constant over the 1998–2011 period, despite notable fluctuations in the economy. Meanwhile, Connecticut and Massachusetts increased their UI benefits almost annually during the same period. Lending support to this emphasis on political considerations, Agrawal and Matsa (2013) report that unlike the patterns of broader economic indicators, there are no regional trends in UI benefits. Moreover, in all of our analyses, we control for GDP growth rates to capture statewide economic conditions, and we include year fixed effects to control for broad time-series trends. As we employ firm fixed effects in all of our tests, results are also unlikely to be driven by time-invariant, omitted firm-level factors.

Third, we obtain the expected results from all of our cross-sectional tests that examine the conditions under which the relation between income smoothing and UI benefits are likely to be more/less pronounced. These results lend further support to a causal relation.

How a firm's financial reporting is shaped by broader public policy decisions is an important issue because accounting decisions are invariably influenced by the broader environment in which the firm operates. Even so, empirical evidence regarding this issue is rarely examined in the corporate disclosure literature. Seen in this light, we believe this paper to be of interest to a wide array of audiences. Although our paper indicates a link between UI benefits and accruals-based financial reporting decisions, it is plausible that UI benefits also influence earnings management decisions through real actions (i.e., real earnings management). We leave the exploration of this issue to future research.

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