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Labor Adjustment Costs and Risk Management

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Abstract

This paper studies the effects of labor adjustment costs on corporate risk management. Labor adjustment costs attenuate the correlation between the internal funds of a firm and its investment opportunity, and create more incentives for the firm to smooth internal funds. Using a state border discontinuity approach, I find that state-level labor protection laws significantly impact a firm's use of foreign currency derivative contracts. I further find that a firm holds more cash when labor adjustment costs are larger, and such an effect concentrates on firms that do not engage in derivative hedging.

I. Introduction

Are labor adjustment costs important for corporate risk management? Although recent asset pricing literature shows that labor adjustment costs have an impact on corporate risk (Ochoa (2013), Belo, Lin, and Bazdresch (2014)), little is known about whether and how firms' risk management policies are affected by costly labor force adjustments. In this paper, I first theoretically examine how labor adjustment costs affect corporate risk management policies and subsequently provide supporting empirical evidence.

For the theoretical model, I integrate labor adjustment costs into the risk management model of Froot, Scharfstein, and Stein (1993) and show that a firm increases the optimal hedging ratio when facing larger labor adjustment costs. The underlying economic mechanism is as follows. Labor adjustment costs reduce a firm's reaction to the aggregate economic condition and attenuate the correlation between the firm's internal funds and its investment opportunity, both of which are correlated with the state of the economy. As a result, the firm has more incentives to smooth internal funds. If the firm is also allowed to hold cash intertemporally, the model implies that the firm can increase both the derivative hedging activities and cash holding in order to achieve the optimal fraction of hedged internal funds.

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Measuring corporate risk management activities is central to my empirical tests. In this article, I focus on corporate foreign currency hedging and cash holding. For the measurement of foreign currency hedging, I follow the procedure of Hoberg and Moon (2017) and construct a text-based measure using corporate annual reports extracted from the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) database (https://www.sec.gov/edgar.shtml) maintained by the U.S. Securities and Exchange Commission (SEC). Following the prior literature such as Azar, Kagy, and Schmalz (2016), cash holding is measured as the ratio of cash and short-term investment to total assets. My sample spans from the fiscal year 1996 to 2013.

To capture labor adjustment costs, I focus on employers' firing costs and exploit the cross-state variation in the adoption of wrongful discharge laws (WDLs). Previous studies suggest that WDLs increase firing costs for employers (Jung (1997), Boxfold (2008)). Autor, Kerr, and Kugler (2007) also find supporting evidence that WDLs increase labor adjustment costs. Given that WDLs restrict employers' discretion to terminate employment relations with employees, the firing costs increase for firms headquartered in states that adopt WDLs.

WDLs have three common law exceptions to the at-will employment doctrine; the good-faith, the implied-contract, and the public-policy exception. I focus on the effects of the good-faith exception, as several studies argue that this is the most legally significant and suggest that it matters most for employment flows, capital investment, and financing decisions (Autor et al. (2007), Serfling (2016), Bai, Fairhurst, and Serfling (2017)). However, I also examine the effects of the implied-contract and the public-policy exceptions.

I employ a state border discontinuity method to estimate the effects of the good-faith exception on corporate derivative hedging and cash holding policies. Specifically, I focus on states with different recognition statuses of the good-faith exception on the opposite sides of a state border and restrict the sample to firms headquartered in counties within 50 miles of state borders. Conceptually, my estimations are equivalent to comparing the differences in the mean derivative hedging or cash holding measures of firms located on the opposite sides of state borders, and relating the differences to whether the good-faith exception is recognized in a state. I have two main findings.

First, I find that the good-faith exception has a significant impact on the use of foreign currency derivative contracts. For firms with high exposures to foreign currency risk, the estimation shows that firms headquartered in states that recognize the good-faith exception mention foreign currency hedging contracts 37.3% more in their annual reports compared to firms just located on the opposite side of state borders, in which the good-faith exception is not recognized. The effects of the good-faith exception are small and insignificant for firms with low exposures to foreign currency risk. I do not find any evidence showing that the implied-contract or the public-policy exception impact corporate foreign currency hedging activities.

Second, I find that the good-faith exception has a significant impact on corporate cash holding. The estimation results show that the cash holding of firms headquartered in states that adopt the good-faith exception is 3.4 percentage points higher compared to firms just located on the opposite side of state borders, but are

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not subject to the law. The estimation is not only statistically significant, but also economically significant. The estimation represents a 14.8% increase relative to the sample mean of 23 percentage points. I find that the implied-contract and the public-policy exceptions have a small and insignificant impact on cash holding.

I further examine the effect for firms that use (hedgers) and do not use (nonhedgers) foreign currency derivative contracts. I find that the effect of the good-faith exception on cash holding is heterogeneous. For nonhedgers, the effect is large and significant. The estimation represents an 18.3% increase relative to the sample mean. However, for hedgers, the estimation magnitude is smaller and is not statistically significant. The results suggest that firms use cash holding for risk management if they are restricted to use derivative contracts.

The effects of the good-faith exception are robust to alternative samples and specifications. First, my results are robust to using samples including firms headquartered in counties within 25 miles or 75 miles of state borders. Second, I estimate local linear models allowing for constant trends in the minimum distances of county centroids to state borders in the estimations. The results of these estimations are robust. Third, I further focus on firms located in contiguous counties on the opposite sides of state borders and further exploit the within county pair-year variation and I obtain similar results.

Finally, I implement a set of placebo tests for the effects of the good-faith exception. In the tests, I focus only on firms headquartered in states with the same recognition status of the good-faith exception and draw some pseudo policy-change borders among these firms to reestimate the effects. The results show that the estimations using the pseudo policy-change borders either have opposite signs, or the magnitudes are much smaller and less statistically significant compared to the estimations using the true state borders. The results suggest that the discontinuous changes in the recognition status of the good-faith exception across the state borders contribute to the documented effects.

This article contributes to the literature examining the determinants of corporate risk management policies (Nance, Smith, and Smithson (1993), Opler, Pinkowitz, Stulz, and Williamson (1999), Graham and Rogers (GR) (2002), Purnanandam (2008), Bates, Kahle, and Stulz (2009), Klasa, Maxwell, and Ortiz-Molina (2009), Harford, Klasa, and Maxwell (2014), Rampini, Sufi, and Viswanathan (2014), and Azar, Kagy, and Schmalz (2016)). Almeida, Campello, Cunha, and Weisbach (2014) also survey the recent literature on liquidity management. To the best of my knowledge, this article is the first to formally theorize the effect of labor adjustment costs on firms' risk management policies and to provide supporting empirical evidence. The labor adjustment costs are documented as an additional key determinant and suggests that labor market frictions have important implications for corporate risk management.

This article is also related to the rising literature on the interaction between labor market frictions and corporate finance. Simintzi, Vig, and Volpin (2014) and Serfling (2016) show that labor adjustment costs increase operating leverage and crowd out corporate financial leverage. Bai et al. (2017) argue that greater employment protection discourages investment ex ante by making projects more irreversible ex post, backing this up with consistent empirical evidence. This article differs from these studies by identifying a new economic channel through

which labor adjustment costs affect corporate policies. I theoretically show that labor adjustment costs attenuate the correlation between a firm's investment opportunity and its internal funds, and create incentives for managers to engage in risk management to smooth future internal funds. I further find consistent empirical evidence that supports this theoretical implication.

My article is also related to studies that use labor unionization as the empirical setting to examine the effects of labor adjustment costs on corporate policies (Schmalz (2015)). However, there is one disadvantage of this setting, as there are always two forces associated with labor unionization: an increase in labor adjustment costs and an increase in employees' bargaining power. These two forces have opposite implications for firms' risk management policies.[1] Compared with the labor unionization setting, one advantage of my current empirical framework is that it allows to separate labor adjustment costs from employee bargaining power, and to isolate the effect of labor adjustment costs on risk management policies.

II. A Motivating Model

In this section, I present a theoretical model and derive a firm's optimal risk management strategy in the presence of labor adjustment costs. I integrate labor adjustment costs into the risk management model of Froot et al. (1993). In particular, I assume that labor is the only input for production and that it is costly for firms to hire or lay off employees. In Sections II.A and II.B, I assume that firms only use derivative hedging for risk management. In Section II.C, I discuss the implications for corporate cash holding. Section II.D summarizes the empirical implications.

A. Model Setup

The model has three dates, and the timeline and assumptions are as follows:

1) At date 0: The firm makes the hedging decision, h, to maximize the present value of the expected dividend in the future. I focus on a linear hedging strategy, for example, selling futures contracts in the model. The firm is assumed to be left with internal funds ω_0 at date 0 after paying all labor-related costs. The labor stock at date 0, l_0, is assumed to be exogenously given.

2) At date 1: The firm chooses the labor stock, l_1, to maximize profit. There is a continuum of states of the economy, and each state is characterized by the realization of a random variable ϵ, which is assumed to be normally distributed with a mean equal to 1 and a standard deviation equal to σ. Given the chosen hedging strategy at date 0, the internal funds in each state at date 1 are determined as $\omega = \omega_0(h + (1-h)\epsilon)$. I define the firm's date 1 profit as:

$$\theta f(l_1) - \bar{W} l_1 - C(e) - \frac{\eta}{2}(l_1 - l_0)^2,$$

and assume that $f_l(l) > 0$ and $f_{ll}(l) < 0$.

[1] Klasa et al. (2009) show that a firm's cash holding is negatively associated with the union coverage ratio at the industry-level, which is interpreted as a proxy for employee bargaining power.

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The term $\frac{\eta}{2}(l_1 - l_0)^2$ represents the labor adjustment costs and is the main friction in my model. The parameter η captures the difficulty in adjusting labor stock. If η is 0, the model is back to that of Froot et al. (1993). My main interest is to examine how η affects the optimal risk management policy.

The parameter θ captures the sensitivity of the revenue to the state of the economy, and can be interpreted as the firm's investment opportunity. I assume that $\theta = 1 + \alpha_0(\epsilon - 1)$ and $\alpha_0 > 0$, where α_0 measures the correlation between the firm's investment opportunity and its internal funds. It is reasonable to assume that such a correlation is positive. $\bar{W}$ is the wage for each unit of labor and is assumed to be rigid across the states of the economy. $C(e)$ represents the costs of raising external financing e and I assume that $C_e > 0$ and $C_{ee} > 0$. I follow Froot et al. (1993) and assume that the internal funds are not sufficient to finance labor costs.

3) At date 2: The output from production is realized and the outside investors are repaid. The discount rate is assumed to be 0.

The firm's optimization problems at dates 0 and 1 are characterized as follows. At date 1, given the internal fund, ω, the firm chooses labor stock, l_1, to maximize profit:

$$\begin{aligned} P(\omega) &= \max_{l_1} \theta f(l_1) - \bar{W} l_1 - C(e) - \frac{\eta}{2}(l_1 - l_0)^2 \\ \text{subject to} \quad e &= \bar{W} l_1 - \omega, \\ \theta &= 1 + \alpha_0(\epsilon - 1),\ \alpha_0 > 0. \end{aligned}$$

At date 0, the firm makes the hedging decision, h, to maximize the present value of the expected dividend and the expectation is taken with respect to ϵ:

$$\begin{aligned} \max_{h} \quad & \mathrm{E}[P(\omega)] \\ \text{subject to} \quad \omega &= \omega_0(h + (1-h)\epsilon). \end{aligned}$$

B. Model Solutions

The solutions for l_1 and h are characterized by the following two equations, details of which are available in Appendix A.

$$\theta f_l(l_1^*) - \eta l_1^* = \bar{W} + \bar{W} C_e - \eta l_0, \tag{1}$$

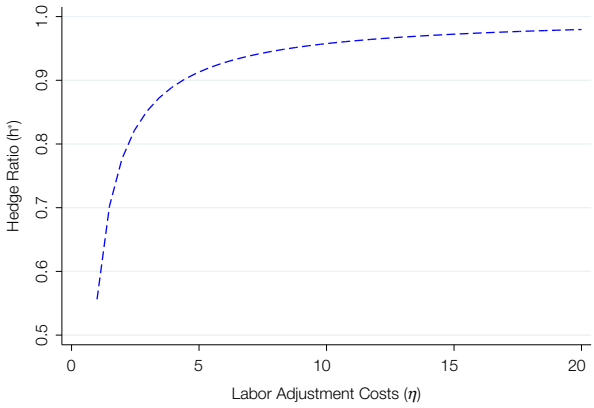
$$h^* = 1 + \frac{\alpha_0}{\omega_0} \frac{\mathrm{E}\left[\dfrac{P_{\omega\omega} f_l}{\theta f_{ll} - \eta}\right]}{\mathrm{E}[P_{\omega\omega}]}. \tag{2}$$

The model is solved numerically for a given set of parameters. I assume that the production function is given as $f(l) = l^\alpha$ and that the external financing cost function is quadratic, such that $C(e) = \frac{c}{2}e^2$. Figure 1 presents the relation between the optimal hedging ratio and the parameter η for a set of additional parameters: $\alpha = 0.67$, $c = 1$, $\bar{W} = 0.05$, $\omega_0 = 0.4$, and $\alpha_0 = 0.5$. The result shows that the optimal hedging ratio increases with the difficulty to adjust labor force for $\alpha_0 > 0$.

When labor adjustment costs are zero ($\eta = 0$), the model returns to that of Froot et al. (1993), with the solution for the optimal hedging strategy identical

FIGURE 1
Labor Adjustment Costs and Optimal Hedging Ratio

Figure 1 reports the relation between the optimal hedging ratio and labor adjustment costs. I solve the model numerically based on equations (1) and (2) for a given set of function forms and parameters. The production function is assumed to be $f(I)=I^{\alpha}$ and the function of the external financing cost is assumed to be quadratic such that $C(e)=\frac{c}{2}e^2$. I set parameters in the model as follows: $\alpha=0.67$, $c=1$, $\bar{W}=0.05$, $\omega_0=0.4$, and $\alpha_0=0.5$.



to equation (20) in their paper. For a model without labor adjustment costs, the positive correlation between a firm's investment opportunity and its internal funds ($\alpha > 0$) reduces the incentives for risk management as less is gained by transferring funds from high states to low states through hedging. The introduction of labor adjustment costs increases the optimal hedging ratio because it attenuates the correlation between a firm's investment opportunity and its internal funds and, therefore, increases the gains from hedging.

To see this, when ϵ is low, the firm's internal funds are also low, but it demands more external financing compared to the case in which there are no labor adjustment costs. This is because it cannot fire employees at will, and has to pay wages to the retained employees. When ϵ is high, the firm demands less external financing compared to the case in which labor adjustment costs are zero, as labor adjustment costs constraint the hiring of employees. As a result, transferring more funds from high states to low states when labor force adjustments are more costly can improve firm value.

C. Implications for Cash Holding

Although the model focuses on corporate derivative hedging, it has implications for cash holding since firms can hold cash and achieve the same goal of transferring funds between different states at date 1. The main conclusion from the model is that a firm would optimally hedge h^* fraction of its internal funds in the future and let the remaining $1-h^*$ fraction fluctuate with the state of the economy. If the firm is allowed to hold cash intertemporally and save c in the cash account at date 0, then the optimal solutions for the cash holding c^* and the hedging position h'^* can be summarized in the equation $\omega_0 h^* = c^* + \omega_0 h'^*$.

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However, c^* and h'^* cannot be separately identified in this simple model, since cash holding and corporate hedging are perfect substitutes.

If a firm is not significantly exposed to some hedgeable risk, or is restricted to use derivative contracts, then the firm can use cash holding for risk management, with the optimal cash holding c^* set to $\omega_0 h^*$ in the model.

D. Empirical Implications

The model has implications for firms with foreign operations. For multinational firms, ϵ represents the home currency (U.S. dollar) price of the foreign currency. The term θ captures the sensitivity of foreign revenue to the exchange rate. A firm can manage the exposures to foreign currency risk by selling foreign currency futures contracts. If the firm cannot use foreign currency derivative contracts, maybe because of large hedging costs, then it may use cash holding to achieve the goal of risk management. The empirical implications of this model are summarized as follows:

1) Firms with high exposures to foreign currency risk use more foreign currency derivative contracts for risk management when the domestic labor adjustment costs are larger.

2) Firms hold more cash when labor adjustment costs are larger. Furthermore, the effect should concentrate more on firms that choose not to use derivative contracts.

III. Data

A. Corporate Risk Management Data

In this article, I focus on corporate foreign currency hedging activities and cash holding. I do not use the data for commodity hedging activities as only a small fraction of firms uses commodity contracts in my sample, and it would be difficult to identify the effect of labor adjustment costs. I do not examine the effect of labor adjustment costs on interest rate derivative hedging, since an increase in labor adjustment costs would lead to a lower corporate leverage (Serfling (2016)), which in turn would mechanically reduce interest rate hedging activities and introduce confounding effects into the estimations.

To quantify corporate foreign currency hedging, I develop Perl scripts to parse firms' annual reports in the SEC's EDGAR database and search keywords related to derivative hedging. The SEC has required electronic filings since May 1996; therefore, the data on corporate derivative hedging consist of all nonfinancial, nonregulated utilities, and U.S.-headquartered firms covered in the EDGAR database between the fiscal years of 1996 and 2013.

The procedure of data extraction for foreign currency hedging closely follows Hoberg and Moon (2017). A firm is defined to use foreign currency hedging contracts in a year if it mentions one word from each of the following three lists

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within a 25-word window in a paragraph from its annual report. The three keyword lists are as follows:[2]

List 1: Currency, currencies, foreign exchange;

List 2: Forward, future, option, swap, spot, derivative, hedge, hedging, hedged;

List 3: Contract, position, instrument, agreement, obligation, transaction, strategy, strategies.

The measure for corporate foreign currency hedging activities is the natural logarithm of 1 plus the firm's total mentions of foreign currency hedging contracts in its annual report in a year (ln(1+FX_HEDGE_NUM)).

It is important to note that some firms do not use derivative contracts for hedging, simply because they are not exposed to foreign currency risk. Therefore, I focus on firms with significant exposures to foreign currency risk in the empirical tests in order to increase the power of the tests. I define a firm's exposures to foreign currency risk in two ways: i) First, a firm is defined to be exposed to foreign currency risk if its foreign sales account for a large fraction in total sales. Specifically, I sort firms into terciles based on the ratio of foreign sales to total sales each year, with firms in the top tercile are defined to have significant exposures to foreign currency risk; ii) Second, I follow the definition in GR (2002). Specifically, I define a firm to be exposed to foreign currency risk if the firm discloses foreign assets, sales, or income in the Compustat geographic segment file, or discloses positive values of foreign currency adjustment, exchange rate effect, foreign income taxes, or deferred foreign taxes in the Compustat annual file. The second definition is broader than the first based on foreign sales.

For the corporate cash holding measurement, I follow the prior literature and use the ratio of cash and short-term investment to total assets.

B. Geographic and State Law Data

The details for geographic and state law data are described as follows. A firm's headquarters state and county in a year are identified using the information in its annual report. For headquarters states, I extract the state of the reported business address in a year. For headquarters counties, I extract the 5-digit zip code in a year and match the zip code to a county using the crosswalk provided by the Missouri Census Data Center.[3] If a firm-year observation is matched to more than one county, I keep the county with the largest population in the year 2000.

In addition, the state border data is taken from Holmes (1998), available at Thomas Holmes's Web site (http://users.econ.umn.edu/∼holmes/data/BorderData.html). Several important variables are available within the data set; the Federal Information Processing Standard (FIPS) codes for counties and states, all state

[2]In order to exclude the false positive hits in the extractions, I further exclude the following terms: i) Not use currency/currencies/foreign exchange/derivative, ii) not hedge/hedging/hedged, and iii) forward-looking, forward looking, or in the future.

[3]The crosswalk between zip code and FIPS county code is available at http://mcdc2.missouri.edu/websas/geocorr2k.html.

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borders associated with one county, the minimum distance of a county's centroid to a state border, and the points on state borders used to obtain the minimum distances.

Data on the adoptions of the good-faith, the implied-contract, and the public-policy common law exceptions in WDLs is taken from Autor, Donohue, and Schwab (2003). For each common law exception, I create a dummy equal to 1 if a firm's headquarters state has adopted the exception in a year, and 0 otherwise. The majority of U.S. states adopted one or more exceptions during the 1970s, 1980s, and early 1990s. Louisiana, the last state that adopted WDLs, took on the good-faith exception in Jan. 1998. By the year 1999, 13 states had adopted the good-faith exception, 43 states had adopted the implied-contract exception, and 43 states had adopted the public-policy exception. Autor et al. (2003) provide details on the definition of each common law exception.

I also control the effect of right-to-work (RTW) laws in the estimations. Klasa et al. (2009) show that the effect of labor unionization on cash holding is more pronounced when firms are headquartered in non-RTW states. Their evidence suggests that RTW laws could have impacts on cash holding and risk management policies in general. I create a dummy variable for the adoption of RTW laws for each state using data from the National Conference of State Legislatures (http://www.ncsl.org/research/labor-and-employment/right-to-work-laws-and-bills.aspx).[4]

For county characteristics, I focus on the unemployment rate and the growth rate of the number of establishments. The data on the unemployment rate at the county-level is obtained from the Bureau of Labor Statistics.[5] The data on the number of establishments in a county is taken from County Business Pattern.[6] The definitions and sources of all data are available in Appendix B.

C. Samples and Summary Statistics

I use two samples in the empirical analysis: the "Foreign Currency Sample" and the "Cash Sample." The "Foreign Currency Sample" includes firm-year observations with the ratio of foreign sales to total sales in the top tercile, headquartered in counties within 50 miles of state borders, and where the recognition status of the good-faith exception is different across a state border. This sample includes 3,205 observations at the firm-state border-year level and 2,453 observations at the firm-year level, whereby all variables in the regressions are nonmissing. The "Cash Sample" includes all firm-year observations with identifiable geographic information, headquartered in counties within 50 miles of state borders, and where the recognition status of the good-faith exception is different across a state border. This sample includes 17,187 observations at the firm-state border-year level and

[4]The states that have passed RTW laws as of 2013 are: Alabama, Arizona, Arkansas, Florida, Georgia, Idaho, Indiana (after 2012), Iowa, Kansas, Louisiana, Mississippi, Michigan (after 2013), Nebraska, Nevada, North Carolina, North Dakota, Oklahoma (after 2001), South Carolina, South Dakota, Tennessee, Texas (after 1993), Utah, Virginia, and Wyoming. Wisconsin and West Virginia adopted RTW laws in 2015 and 2016, respectively. In 2017, Kentucky adopted RTW laws.

[5]The unemployment rate data at the county-level is available at https://www.bls.gov/lau/#data.

[6]The data on the number of establishments in a county is available at https://www.census.gov/programs-surveys/cbp/data/datasets.html.

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12,924 observations at the firm-year level, whereby all variables in the regressions are nonmissing.

Table 1 presents the summary statistics for the firm-level characteristics. Panel A reports the summary statistics for the measurements of foreign currency hedging activities and 1-year lagged other firm characteristics for firms in the "Foreign Currency Sample." The statistics show that 59.6% of firm-year observations mention foreign currency contracts at least once in the annual reports, and the average count of mentions in a firm-year observation is 2.16. This result is quite similar to that reported in Hoberg and Moon (2017). Panel B reports the statistics for corporate cash holding and 1-year lagged other firm characteristics of firms in the "Cash Sample." The statistics show that the average ratio of cash and short-term investment to total assets is 23.0 percentage points in the sample.

TABLE 1
Summary Statistics

Table 1 reports the summary statistics for the firm-level characteristics. Panel A includes firm-year observations with the ratio of foreign sales to total sales in the top tercile, headquartered in counties within 50 miles of state borders, with the recognition status of the good-faith exception differing across a state border. Panel B includes all firm-year observations where geographic information can be identified, headquartered in counties within 50 miles of state borders, with the recognition status of the good-faith exception differing across a state border. All statistics are reported at the firm-year level. All data sources and variable definitions are available in Appendix B.

	N	Mean	P25	Median	P75	Std. Dev.
Panel A. Foreign Currency Sample						
FX_HEDGE	2,453	0.596	0.000	1.000	1.000	0.491
ln(1 + FX_HEDGE_NUM)	2,453	1.152	0.000	0.693	2.197	1.153
FIRM_SIZE	2,453	5.123	3.575	5.122	6.586	2.042
FIRM_AGE	2,453	3.102	2.639	3.219	3.638	0.832
BOOK_LEVERAGE	2,453	0.254	0.012	0.211	0.428	0.241
MTB	2,453	2.237	1.226	1.679	2.558	1.667
CAPEX	2,453	0.047	0.018	0.035	0.060	0.043
ROA	2,453	−0.014	−0.024	0.040	0.082	0.206
RD	2,453	0.107	0.000	0.034	0.120	0.246
TANGIBILITY	2,453	0.193	0.075	0.146	0.259	0.162
DIVIDEND_PAYER	2,453	0.296	0.000	0.000	1.000	0.456
CASH_HOLDING	2,453	0.215	0.050	0.139	0.332	0.208
Panel B. Cash Sample						
CASH_HOLDING	12,924	0.230	0.039	0.137	0.354	0.242
FIRM_SIZE	12,924	4.294	2.753	4.167	5.701	2.134
FIRM_AGE	12,924	2.944	2.398	3.045	3.526	0.843
BOOK_LEVERAGE	12,924	0.253	0.006	0.187	0.428	0.257
MTB	12,924	2.297	1.088	1.519	2.462	2.305
CAPEX	12,924	0.046	0.014	0.030	0.058	0.052
ROA	12,924	−0.084	−0.108	0.020	0.069	0.317
RD	12,924	0.560	0.000	0.010	0.110	2.650
TANGIBILITY	12,924	0.198	0.061	0.133	0.271	0.189
DIVIDEND_PAYER	12,924	0.208	0.000	0.000	0.000	0.406

Table 2 reports the state borders used in the samples across which the recognition status of the good-faith exception is different. For each state border, I also report the number of firm-year observations in the state with and without the good-faith exception. The statistics suggest that the firms in the samples are concentrated in the east coast of the United States.

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TABLE 2
State Borders

Table 2 reports the state borders used in each sample for the empirical tests. Panel A includes firm-year observations with the ratio of foreign sales to total sales in the top tercile, headquartered in counties within 50 miles of state borders, and with the recognition status of the good-faith exception differing across a state border. Panel B includes all firm-year observations with identifiable geographic information, headquartered in counties within 50 miles of state borders, and with the recognition status of the good-faith exception differing across a state border. For each state border, column 1 represents the number of firm-year observations in the states that adopt the good faith exception and column 2 represents the number of firm-year observations in the states that do not adopt the good faith exception. Column 3 represents the total number of firm-year observations associated with each state border. All data sources and variable definitions are available in Appendix B.

State Borders	1	2	3
Panel A. Foreign Currency Sample			
CT_NY	312	846	1,158
MA_NH	759	76	835
MA_RI	630	55	685
DE_PA	15	195	210
DE_NJ	15	96	111
CT_RI	35	55	90
ID_WA	23	24	47
DE_MD	11	18	29
MA_NY	8	16	24
LA_MS	11	5	16
Panel B. Cash Sample			
CT_NY	1,231	4,670	5,901
MA_RI	3,328	204	3,532
MA_NH	3,241	267	3,508
DE_PA	156	1,525	1,681
DE_NJ	156	598	754
DE_MD	156	307	463
CT_RI	235	203	438
MA_NY	52	237	289
LA_MS	159	54	213
ID_WA	76	109	185
CO_WY	9	46	55
AR_LA	38	15	53
MA_VT	46	2	48
LA_TX	25	22	47
NE_WY	9	11	20

IV. Empirical Strategy

To test the empirical implications of the model, I focus on one type of labor adjustment costs, namely, employers' firing costs, and exploit the cross-state variation in the adoption of WDLs.[7] Following Serfling (2016) and Bai et al. (2017), I focus on the effects of the good-faith exception on corporate foreign currency hedging and cash holding, but I also examine the effects of the implied-contract and the public-policy exceptions.

Since employers in states that adopt the good-faith exception cannot fire employees without good cause, the WDLs restrict employers' abilities to terminate the employment relations at will, and also increase employers' firing costs. A firm is defined to be subject to the good-faith exception or the other two common law exceptions if its headquarters state adopted the exception in a year.[8]

To estimate the effects of the good-faith exception on corporate foreign currency hedging and cash holding, it would be ideal to use a differences-in-differences (DiD) method. However, my data on corporate hedging is only

[7]Previous studies that also exploit this empirical setting include Autor et al. (2003), Autor (2003), Autor et al. (2007), Bai et al. (2017), Serfling (2016), and Acharya, Baghai, and Subramanian (2014).

[8]I implicitly assume that a firm's main economic activities concentrate in its headquarters state.

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available from the fiscal year 1996, with only Louisiana changing its recognition status of the good-faith exception in Jan. 1998 during the sample period. This prevents me from employing a DiD method and I instead employ a state border discontinuity method.

Specifically, I focus on firms headquartered in contiguous states with different recognition statuses of the good-faith exception. In the main results, I restrict the sample to firms headquartered in counties within 50 miles of state borders. In robustness tests, I use alternative samples including firms headquartered in counties within 25 or 75 miles of state borders. The distance is defined as the minimum distance of a firm's headquarters county centroid to an associated state border. I compare the corporate foreign currency hedging and cash holding policies of firms that are subject to the good-faith exception with those just located on the opposite side of state borders but are not subject to the law. The specification is as follows:

$$Y_{ijcsbt} = \alpha + \beta \text{GOOD_FAITH}_{ct} + \gamma' X_{icsbt} + \eta_{bt} + \delta_{jt} + \epsilon_{ijcsbt}.$$

The dependent variable Y_{ijcsbt} is the measure of foreign currency hedging or cash holding for firm i in industry j, headquartered in county c of state s, associated with state border b in year t. GOOD_FAITH_{ct} is a dummy variable equal to 1 if the state of county c has adopted the good-faith exception in year t, and 0 otherwise. In empirical tests, I also examine the effects of the implied-contract exception ($\text{IMPLIED_CONTRACT}_{ct}$) and the public-policy exception ($\text{PUBLIC_POLICY}_{ct}$). When estimating the effects of any common law exception, I focus only on state borders in which the recognition statuses differ on the two sides.

X_{icsbt} is a vector of firm, county, and state controls. In terms of the firm-level controls for foreign currency hedging, I follow Hoberg and Moon (2017) and control for 1-year lagged firm size (FIRM_SIZE), firm age (FIRM_AGE), book leverage (BOOK_LEVERAGE), market-to-book ratio (MTB), capital investment (CAPEX), return on asset (ROA), R&D to sales ratio (RD), a dummy variable indicating missing R&D expenses (RD_MISS), tangibility (TANGIBILITY), a dividend payer dummy (DIVIDEND_PAYER), and cash holding (CASH_HOLDING). For the cash holding tests, I do not control the 1-year lagged cash holding. All financial variables are winsorized at the 1st and 99th percentiles. For county characteristics, I control for the unemployment rate and the growth rate of the number of establishments. For state-level controls, I include dummies for the recognition of the two additional common law exceptions in WDLs and the RTW laws. η_{bt} is a set of state border-year fixed effects, whereby any common shocks in a year shared by firms located on the opposite sides of the state borders can be absorbed by this set of fixed effects. δ_{jt} is a set of 2-digit SIC (SIC2) year fixed effects.

By estimating this specification, I conceptually compare the differences in the mean risk management measures of firms located on the opposite sides of state borders, and relate the differences to whether a common law exception is recognized in a state. The identification assumption is

$$\text{E}(\text{GOOD_FAITH}_{ct}, \epsilon_{ijcsbt} | X_{icsbt}, \eta_{bt}, \delta_{jt}) = 0.$$

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This assumption says that, conditional on control variables, the difference in the recognition status of the good-faith exception (or any of the other two common law exceptions) within a state pair is uncorrelated with the difference in the error terms of any two firms headquartered in counties within 50 miles and located on the opposite sides of the state border.

In all estimations, I report the robust standard errors clustered at the firm level. In theory, the standard errors should be clustered at the state and state border levels separately, in order to account for the potential correlations in the residuals within states and along the state borders. However, by doing so, the number of clusters will be lower than the threshold proposed by Cameron, Gelbach, and Miller (2011), possibly resulting in unreliable standard errors. Empirically, standard errors clustered at the firm level are most conservative for my estimations.

V. Main Results

A. Foreign Currency Hedging

Table 3 reports the effects of the individual common law exception on corporate foreign currency hedging. The dependent variable in all estimations is the natural logarithm of 1 plus a firm's total mentions of foreign currency hedging contracts in its annual report in a year. Panels A, B, and C of Table 3 report the effects of the good-faith exception, the implied-contract exception, and the public-policy exception, respectively. Columns 1–2 of each panel report the results for firms with high exposures to foreign currency risk, while columns 3–4 report the results for firms with low exposures to foreign currency risk. In columns 1 and 3, a firm is defined to be with high (low) exposures to foreign currency risk if its ratio of foreign sales to total sales in a year is in the top (bottom) tercile in the sample. In columns 2 and 4, I use the definition in GR (2002) to define a firm's exposures to foreign currency risk. The sample is restricted to firms headquartered in counties within 50 miles of state borders.

Panel A of Table 3 reports the effects of the good-faith exception. Estimations suggest that the good-faith exception has a positive and significant impact on corporate foreign currency hedging for firms with high exposures to foreign currency risk. Specifically, the estimation in column 1 suggests that firms headquartered in states recognizing the good-faith exception mention foreign currency hedging contracts 37.3% more times in the annual reports in a year, compared to firms just located on the opposite side of state borders in which the good-faith exception is not recognized. This result is robust to the alternative definition of foreign currency risk exposure, as shown in column 2. The estimation magnitude in column 2 is smaller than that in column 1, which is consistent with the broader and cruder definition in GR (2002) compared to that based on foreign sales.

In columns 3 and 4 of Table 3, I further present results for firms with low exposures to foreign currency risk. I do not expect to observe large and significant effects of the good-faith exception for these firms. Consistent with the expectation, the estimations are much smaller than those in columns 1 and 2 and are statistically insignificant.

The effects of the implied-contract and public-policy exceptions are reported in Panels B and C, respectively. All estimations are statistically insignificant and

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TABLE 3
Wrongful Discharge Laws and Foreign Currency Hedging

Table 3 reports the effects of Wrongful Discharge Laws on corporate foreign currency hedging. The sample includes firms headquartered in counties within 50 miles of state borders. The dependent variable in all estimations is the natural logarithm of 1 plus a firm's total mentions of foreign currency hedging contracts in its annual report in a year. Panels A, B, and C report the effects of the good-faith exception, the implied-contract exception, and the public-policy exception, respectively. Columns 1–2 of each panel report the results for firms with high exposures to foreign currency risk, and columns 3–4 report the results for firms with low exposures to foreign currency risk. In columns 1 and 3, a firm is defined to be exposed to foreign currency risk if its ratio of foreign sales to total sales in a year is in the top tercile in the sample. In columns 2 and 4, a firm is defined to be exposed to foreign currency risk according to the definition in Graham and Rogers (GR) (2002). All regressions encompass 1-year lagged firm characteristics, including firm size (FIRM_SIZE), firm age (FIRM_AGE), book leverage (BOOK_LEVERAGE), market-to-book ratio (MTB), capital investment (CAPEX), return on asset (ROA), R&D to sales ratio (RD), a dummy variable indicating missing R&D expenses (RD_MISS), tangibility (TANGIBILITY), a dividend payer dummy (DIVIDEND_PAYER), and cash holding (CASH_HOLDING), as well as state border-year fixed effects and SIC2-year fixed effects. Standard errors in square brackets are robust and are clustered at the firm level. All data sources and variable definitions are available in Appendix B. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	High Exposure		Low Exposure	
	Foreign Sales	GR	Foreign Sales	GR
	1	2	3	4
Panel A. Good Faith Exception				
GOOD_FAITH	0.373**	0.235**	−0.059	0.030
	[0.147]	[0.116]	[0.079]	[0.051]
Firm and county controls	Yes	Yes	Yes	Yes
Border-year FE	Yes	Yes	Yes	Yes
SIC2-year FE	Yes	Yes	Yes	Yes
Adj. R^2	0.350	0.319	0.248	0.094
N	3,205	9,703	3,404	7,250
Panel B. Implied Contract Exception				
IMPLIED_CONTRACT	0.053	0.014	0.069	0.012
	[0.105]	[0.076]	[0.055]	[0.020]
Firm and county controls	Yes	Yes	Yes	Yes
Border-year FE	Yes	Yes	Yes	Yes
SIC2-year FE	Yes	Yes	Yes	Yes
Adj. R^2	0.393	0.302	0.311	0.100
N	2,550	8,952	3,452	7,367
Panel C. Public Policy Exception				
PUBLIC_POLICY	−0.014	−0.025	0.067	−0.021
	[0.111]	[0.075]	[0.054]	[0.026]
Firm and county controls	Yes	Yes	Yes	Yes
Border-year FE	Yes	Yes	Yes	Yes
SIC2-year FE	Yes	Yes	Yes	Yes
Adj. R^2	0.405	0.334	0.352	0.169
N	3,408	10,134	3,999	8,560

there is no clear pattern of the signs of the estimations. The results suggest that, in my sample, the recognition of the implied-contract or the public-policy exception has little impact on corporate foreign currency hedging. Overall, the estimations in Table 3 suggest that, among all three common law exceptions in WDLs, only the good-faith exception has a positive and significant impact on corporate foreign currency hedging. This conclusion is consistent with the evidence in Serfling (2016) and Bai et al. (2017), whereby only the adoption of the good-faith exception affects corporate leverage and investment decisions.

B. Cash Holding

Table 4 reports the effects of WDLs on corporate cash holding, with the sample restricted to firms headquartered in counties within 50 miles of state borders.

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Panels A, B, and C of Table 4 report the effects of the good-faith exception, the implied-contract exception, and the public-policy exception, respectively. In column 1 of each panel, I report the results using the full sample. In columns 2 and 3 of each panel, I estimate the effects for both nonhedgers and hedgers, respectively. Nonhedgers are defined to be firms that do not mention foreign currency hedging contracts in the annual reports in a year. Hedgers are defined to be firms that mention foreign currency hedging contracts at least once in the annual reports in a year.

The model in Section II predicts that, if a firm is allowed to hold cash intertemporally, then its cash holding will be larger if the adjustment of labor force is more costly. Therefore, I expect firms to hold more cash if their headquarters' states recognize WDLs, particularly the good-faith exception. The estimation in column 1 of Panel A suggests that the good-faith exception has a positive and significant impact, consistent with the model prediction. Specifically, the cash holding of firms headquartered in states that recognize the good-faith exception is

TABLE 4

Wrongful Discharge Laws and Cash Holding

Table 4 reports the effects of Wrongful Discharge Laws on corporate cash holding. The dependent variable in all estimations is the ratio of cash and short-term investments to total assets in a year. The sample is restricted to firms headquartered in counties within 50 miles of state borders. Panels A, B, and C report the effects of the good-faith exception, the implied-contract exception, and the public-policy exception, respectively. Columns 1–3 of each panel report the results for the full sample, the nonhedgers sample, and the hedgers sample, respectively. Nonhedgers are defined to be firms that do not mention foreign currency hedging contracts in the annual reports in a year. Hedgers are defined to be firms that mention foreign currency hedging contracts at least once in the annual reports in a year. All regressions encompass, 1-year lagged firm characteristics, including firm size (FIRM_SIZE), firm age (FIRM_AGE), book leverage (BOOK_LEVERAGE), market-to-book ratio (MTB), capital investment (CAPEX), return on asset (ROA), R&D to sales ratio (RD), a dummy variable indicating missing R&D expenses (RD_MISS), tangibility (TANGIBILITY), and a dividend payer dummy (DIVIDEND_PAYER), as well as state border-year fixed effects and SIC2-year fixed effects. Standard errors in square brackets are robust and are clustered at the firm level. All data sources and variable definitions are available in Appendix B. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	Full Sample	Nonhedgers	Hedgers
	1	2	3
Panel A. Good Faith Exception			
GOOD_FAITH	0.034**	0.042**	0.030
	[0.016]	[0.021]	[0.026]
Firm and county controls	Yes	Yes	Yes
Border-year FE	Yes	Yes	Yes
SIC2-year FE	Yes	Yes	Yes
Adj. R^2	0.458	0.462	0.504
N	17,187	11,366	5,567
Panel B. Implied Contract Exception			
IMPLIED_CONTRACT	−0.003	−0.007	0.007
	[0.010]	[0.012]	[0.011]
Firm and county controls	Yes	Yes	Yes
Border-year FE	Yes	Yes	Yes
SIC2-year FE	Yes	Yes	Yes
Adj. R^2	0.475	0.474	0.515
N	16,925	11,206	5,003
Panel C. Public Policy Exception			
PUBLIC_POLICY	0.009	0.011	0.003
	[0.010]	[0.012]	[0.013]
Firm and county controls	Yes	Yes	Yes
Border-year FE	Yes	Yes	Yes
SIC2-year FE	Yes	Yes	Yes
Adj. R^2	0.422	0.424	0.479
N	19,103	12,963	5,866

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3.4 percentage points higher compared to firms just located on the opposite side of state borders in which the good-faith exception is not recognized. Such an estimation is not only statistically significant, but is also economically significant. The sample average of cash holding is 23.0 percentage points, and the estimation represents a 14.8% increase relative to the sample mean. However, the estimations in column 1 of Panels B and C are small and insignificant, suggesting that the implied-contract or the public-policy exception has little impact on corporate cash holding.

I further examine the heterogeneous effects for nonhedgers and hedgers. In the model, cash holding and corporate derivative hedging are perfect substitutes and firms can choose these two policies simultaneously to manage risk. Therefore, firms are expected to hold less (more) cash when they choose (not) to use any derivative contracts. Columns 2 and 3 of Table 4 of each panel present the results. In Panel A, the estimations suggest that both nonhedgers and hedgers hold more cash if their headquarters' states recognize the good-faith exception, yet the effect concentrates more on nonhedgers, and is consistent with the model prediction. Specifically, for nonhedgers, the estimation represents an 18.3% increase relative to the sample mean. For hedgers, the estimation magnitude represents a 13.0% increase relative to the sample mean but is not statistically significant. In Panels B and C, the estimations again suggest that the implied-contract or the public-policy exception does not matter for cash holding.

Overall, the estimations in Tables 3 and 4 show that the good-faith exception has a positive and significant effect on corporate foreign currency hedging and cash holding. The empirical evidence supports the theoretical predictions in Section II. The results suggest that labor adjustment costs affect firms' ex ante incentives to smooth internal funds in the future and that this has real impacts on corporate investment and employment decisions ex post (Schoefer (2016)).

C. Robustness Tests

I present several robustness tests for the effects of the good-faith exception, with the results reported in Table 5. For foreign currency hedging tests, I use the first definition of foreign currency risk exposures based on foreign sales. For cash holding tests, I restrict the sample to nonhedgers. With the exception of the estimations in Panel A, the samples are restricted to firms headquartered in counties within 50 miles of state borders.

In Panel A, I report the results using alternative samples. In particular, columns 1 and 3 report the results using samples including firms headquartered in counties within 25 miles of state borders. In columns 2 and 4, I expand the samples to include firms headquartered in counties within 75 miles of state borders. The estimations are robust and still suggest that the good-faith exception has a significant impact on corporate foreign currency hedging and cash holding.

In Panel B, I estimate the effects using a different specification, whereby I allow firms' hedging and cash holding policies to vary with the distances of headquartered counties to state borders. In columns 1 and 3, I allow for the same constant trend in the distances for firms located on both sides of state borders. In columns 2 and 4, I allow for different constant trends in the distances for firms located on both sides of state borders. The results of the tests are robust. For foreign currency hedging, the estimation magnitudes are similar to those in column 1 of

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TABLE 5
Robustness Tests

Table 5 reports the robustness tests for the effects of the good-faith exception on corporate foreign currency hedging and cash holding. For foreign currency hedging tests, I use the first definition of a firm's exposures to foreign currency risk, with the specification the same as that in Table 3. For cash holding tests, I restrict to nonhedgers, with the specification the same as that in Table 4. The dependent variable in columns 1 and 2 of each panel is the natural logarithm of 1 plus a firm's total mentions of foreign currency hedging contracts in its annual report in a year. The dependent variable in columns 3 and 4 of each panel is the ratio of cash and short-term investment to total assets in a year. Panel A reports the results using samples including firms headquartered in counties within 25 or 75 miles of state borders. Panel B reports the results using alternative specifications. In columns 1 and 3 of Panel B, I allow for the same constant trend in the minimum distances of counties to state borders for firms located on both sides of state borders. In columns 2 and 4, I allow for different constant trends in the minimum distances of counties to state borders for firms located on both sides of state borders. Panel C reports the results using firms located in contiguous counties within 50 miles of state borders. Standard errors in square brackets are robust and are clustered at the firm level. All data sources and variable definitions are available in Appendix B. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Alternative Samples

	Dependent Variable			
	ln(1 + FX_HEDGE_NUM)		CASH_HOLDING	
	Sample Within			
	25 Miles of Borders	75 Miles of Borders	25 Miles of Borders	75 Miles of Borders
Variable	1	2	3	4
GOOD_FAITH	0.289*	0.346**	0.090***	0.032*
	[0.152]	[0.154]	[0.026]	[0.019]
Firm and county controls	Yes	Yes	Yes	Yes
Border-year FE	Yes	Yes	Yes	Yes
SIC2-year FE	Yes	Yes	Yes	Yes
Adj. R^2	0.357	0.346	0.433	0.485
N	1,975	3,496	6,433	14,647

Panel B. Alternative Specifications

	Dependent Variable			
	ln(1 + FX_HEDGE_NUM)		CASH_HOLDING	
Variable	1	2	3	4
GOOD_FAITH	0.405**	0.349*	0.091***	0.089***
	[0.195]	[0.203]	[0.027]	[0.027]
Firm and county controls	Yes	Yes	Yes	Yes
Border-year FE	Yes	Yes	Yes	Yes
SIC2-year FE	Yes	Yes	Yes	Yes
Adj. R^2	0.350	0.352	0.463	0.464
N	3,205	3,205	11,366	11,366

Panel C. Contiguous Counties Estimations

	Dependent Variable	
	ln(1 + FX_HEDGE_NUM)	CASH_HOLDING
Variable	1	2
GOOD_FAITH	0.401**	0.095***
	[0.198]	[0.031]
Firm and county controls	Yes	Yes
Border-year FE	Yes	Yes
SIC2-year FE	Yes	Yes
Adj. R^2	0.413	0.475
N	2,237	8,703

Panel A in Table 3. For cash holding, the estimation magnitudes are larger than those reported in column 2 of Panel A in Table 4.

In Panel C, I focus on firms headquartered in contiguous counties along state borders and further exploit the within county pair-year variation. The estimations

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still suggest that the good-faith exception has a significant impact on the use of foreign currency derivative contracts and corporate cash holding.

D. Placebo Tests

I further conduct a set of placebo tests. In the tests, I only focus on firms headquartered in states with the same recognition status of the good-faith exception and draw pseudo policy-change borders among these firms to reestimate the effects on corporate hedging and cash holding. The null hypothesis is that all the estimations are 0.

Table 6 reports the results of these tests. For all estimations, I restrict samples to firms headquartered in counties within 50 miles of the pseudo or the true state borders. For foreign currency hedging tests, I use the first definition of a firm's exposures to foreign currency risk based on foreign sales. The specification is the same as that in Table 3. Cash holding tests are restricted to nonhedgers, with the specification the same as that in Table 4.

The middle row reports the estimations using the true state borders. The placebo estimations are reported in the remaining rows. In the first three rows, the sample is restricted to firms headquartered in states that recognize the good-faith exception. In each row, a pseudo policy-change border is defined as the line

TABLE 6
Placebo Tests

Table 6 reports the placebo tests for the effects of the good-faith exception on corporate foreign currency hedging and cash holding. The sample is restricted to firms headquartered in counties within 50 miles of pseudo or true state borders. For foreign currency hedging tests, I use the first definition of a firm's exposures to foreign currency risk, with the specification equal to that in Table 3. For cash holding tests, I restrict to nonhedgers, and the specification is equal to that in Table 4. The dependent variable in column 1 is the natural logarithm of 1 plus a firm's total mentions of foreign currency hedging contracts in its annual report in a year. The dependent variable in column 2 is the ratio of cash and short-term investment to total assets in a year. The middle row reports the estimations using the true state borders. In the first three rows, the sample is restricted to firms headquartered in states that recognize the good-faith exception. In each row, a pseudo policy-change border is defined as the line such that the minimum distance of each point on the line to the true state border is X miles. This line is labeled as "PSEUDO_BORDER_X." Firms headquartered in counties between $X-50$ and X miles of state borders are relabeled as firms not subject to the good-faith exception. In the last three rows, the sample is restricted to firms headquartered in states that do not recognize the good-faith exception. In each row, a pseudo policy-change border is defined as the line such that the minimum distance of each point on the line to the true state border is X miles. This line as labeled "PSEUDO_BORDER_−X." Firms headquartered in counties between X and $X+50$ miles of state borders are relabeled as firms subject to the good-faith exception. Standard errors in square brackets are robust and are clustered at the firm level. All data sources and variable definitions are available in Appendix B. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable	
Variable	ln(1 + FX_HEDGE_NUM)	CASH_HOLDING
	1	2
PSEUDO_BORDER_100	−0.293	0.023
	[0.195]	[0.022]
PSEUDO_BORDER_75	0.051	0.001
	[0.104]	[0.013]
PSEUDO_BORDER_50	−0.104	0.002
	[0.113]	[0.012]
GOOD_FAITH	0.373**	0.042**
	[0.147]	[0.021]
PSEUDO_BORDER_−50	−0.033	0.005
	[0.060]	[0.005]
PSEUDO_BORDER_−75	−0.001	0.009**
	[0.047]	[0.005]
PSEUDO_BORDER_−100	0.075	−0.006
	[0.059]	[0.005]

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such that the minimum distance of each point on the line to the true state border is X miles. I label this line as "PSEUDO_BORDER_X." Firms headquartered in counties between $X-50$ and X miles of state borders are relabeled as firms not subject to the good-faith exception. In the last three rows, the sample is restricted to firms headquartered in states that do not recognize the good-faith exception. In each row, a pseudo policy-change border is defined as the line such that the minimum distance of each point on the line to the true state border is X miles. I label this line as "PSEUDO_BORDER_−X." Firms headquartered in counties between X and $X+50$ miles of state borders are relabeled as firms subject to the good-faith exception.

The placebo estimations suggest that corporate foreign currency hedging and cash holding do not significantly change discontinuously across the pseudo state borders, while the effects are large and significant using the true state borders. In the row "PSEUDO_BORDER_50," the estimation for foreign currency hedging, −0.104, is statistically insignificant. The estimation for cash holding is 0.2 percentage points and is also statistically insignificant. When using other pseudo borders, the estimations either have the opposite signs or they are much lower, both economically and statistically, compared to the results in the middle row. Overall, the estimations in Table 6 suggest that the results of the good-faith exception in Tables 3 and 4 are not entirely driven by other factors other than the discontinuous changes in the good-faith recognition status across state borders.

VI. Conclusion

In this paper, I study the effects of labor adjustment costs on corporate derivative hedging and cash holding. I integrate labor adjustment costs with the risk management model in Froot et al. (1993), and show that the positive correlation between a firm's investment opportunity and its internal funds is attenuated when the labor force adjustment is more costly. As a result, firms have more incentives to engage in risk management activities and smooth the future internal funds.

To test the implications of the model, I focus on employers' firing costs and exploit the cross-state variation in Wrongful Discharge Laws (WDLs). I use a state border discontinuity approach and estimate the effects of WDLs on corporate foreign currency derivative hedging and cash holding policies. I find that only the good-faith exception in WDLs is important for risk management policies. For firms with high exposures to foreign currency risk, the good-faith exception has a positive and significant impact on the use of foreign currency derivative contracts. I further find that the good-faith exception has a positive and significant impact on corporate cash holding, and such an effect concentrates more on firms that do not use derivative contracts.

The results suggest that labor adjustment cost is a key determinant of corporate risk management policies. This article sheds light on how labor market frictions interact with corporate risk management.

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Appendix A. Model Solutions Details

I solve the firm's optimization problems via backward induction. First, the firm's labor investment decision is solved for each state at date 1, taking the firm's internal funds as given. Second, the optimal hedging strategy at date 0 is solved.

Date 1 Problem. The first-order condition for the labor investment decision in state ϵ at date 1 is as follows:

$$\theta f_I(I_1) - \eta I_1 = \bar{W} + \bar{W} C_e - \eta I_0. \tag{A-1}$$

Taking the derivative with respect to ϵ on both sides of equation (A-1) results in:

$$\frac{dI_1}{d\epsilon} = \frac{\bar{W} C_{e\epsilon} \omega_0 (1-h) + \alpha f_I}{\bar{W}^2 C_{ee} - \theta f_{II} + \eta}. \tag{A-2}$$

Next, taking the derivative with respect to ω on both sides of equation (A-1) leads to:

$$\theta f_{II} \frac{\partial I_1}{\partial \omega} - \eta \frac{\partial I_1}{\partial \omega} = \bar{W} C_{ee} \left(\bar{W} \frac{\partial I_1}{\partial \omega} - 1 \right). \tag{A-3}$$

Applying the envelope theorem results in:

$$P_\omega(\omega) = C_e. \tag{A-4}$$

Taking the derivative with respect to ω on both sides of equation (A-4) gives:

$$P_{\omega\omega} = C_{ee} \left(\bar{W} \frac{\partial I_1}{\partial \omega} - 1 \right). \tag{A-5}$$

Lastly, substituting equation (A-3) into equation (A-5), results in the following:

$$P_{\omega\omega} = \frac{C_{ee}(\theta f_{II} - \eta)}{\bar{W}^2 C_{ee} - (\theta f_{II} - \eta)}. \tag{A-6}$$

Date 0 Problem. The first-order condition for the optimal hedging ratio at date 0 is

$$\mathrm{E}\left[P_\omega \frac{d\omega}{dh} \right] = \mathrm{E}[P_\omega (1-\epsilon)] = \mathrm{cov}(P_\omega, \epsilon) = 0. \tag{A-7}$$

Since ϵ is assumed to be normally distributed and from equation (A-4), the following can be expressed:

$$\mathrm{cov}(P_\omega, \epsilon) = \mathrm{E}\left[\frac{dP_\omega}{d\epsilon} \right] = \mathrm{E}\left[C_{ee} \left(\bar{W} \frac{dI_1}{d\epsilon} - \omega_0 (1-h) \right) \right] = 0. \tag{A-8}$$

Substituting equation (A-2) into equation (A-8) and using equation (A-6) thus leads to:

$$h^* = 1 + \frac{\alpha_0}{\omega_0} \frac{\mathrm{E}\left[\frac{P_{\omega\omega} f_I}{\theta f_{II} - \eta} \right]}{\mathrm{E}[P_{\omega\omega}]}. \tag{A-9}$$

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Appendix B. Variable Definitions

FX_HEDGE: A dummy variable equal to 1 if a firm mentions foreign currency hedging contracts at least once in a year, and 0 otherwise. *Source*: Corporate 10-K filings in the EDGAR database.

ln(1+FX_HEDGE_NUM): The natural logarithm of 1 plus the firm's total mentions of foreign currency hedging contracts in a year. *Source*: Corporate 10-K filings in the EDGAR database.

GOOD_FAITH: A dummy variable equal to 1 if a state has adopted the good-faith exception in a year, and 0 otherwise.

IMPLIED_CONTRACT: A dummy variable equal to 1 if a state has adopted the implied-contract exception in a year, and 0 otherwise.

PUBLIC_POLICY: A dummy variable equal to 1 if a state has adopted the public-policy exception in a year, and 0 otherwise.

FIRM_SIZE: The natural logarithm of total assets: ln(AT). *Source*: Compustat.

FIRM_AGE: The natural logarithm of 1 plus the number of years since the firm's starting year. The starting year is defined in the following order: i) The founding year; ii) the IPO year if the founding year is missing; iii) the year of first trading with nonmissing price from CRSP if the IPO year is missing; iv) the first year in Compustat if there is no trading information in CRSP. *Sources*: Jay Ritter's IPO Database, CRSP, and Compustat.

BOOK_LEVERAGE: Total debt/Total assets: (DLC+DLTT)/AT. *Source*: Compustat.

MTB: Market to book ratio. (Equity value+total assets-book equity)/total assets: (PRCCF_F $\times$ CSHO + AT $-$ CEQ)/AT. If the item CEQ $<$ 0, I set it as missing. *Source*: Compustat.

CAPEX: Capital expenditures/total assets: Capex/AT. *Source*: Compustat.

ROA: Net income/total assets: NI/AT. *Source*: Compustat.

RD: Research and development expense/sales: XRD/SALE. If the item XRD is missing, I set it as 0. *Source*: Compustat.

RD_MISS: A dummy variable equal to 1 if the item XRD is missing in Compustat, and 0 otherwise. *Source*: Compustat.

TANGIBILITY: Property, plant, and equipment/total assets: PPENT/AT. *Source*: Compustat.

DIVIDEND_PAYER: A dummy variable equal to 1 if the item DVC is positive, and 0 otherwise. *Source*: Compustat.

CASH_HOLDING: Cash and short-term investment/total assets: (CHE/AT). *Source*: Compustat.

UNEMP_RATE: The unemployment rate at the county-year level. *Source*: the Bureau of Labor Statistics, available at https://www.bls.gov/lau/#data.

ESTABNUM_GR: The growth rate of the number of establishments at the county-year level. *Source*: County Business Pattern, available at https://www.census.gov/programs-surveys/cbp/data/datasets.html.

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