# Do Employment Protections Reduce Productivity? Evidence from U.S. States*

David H. Autor
MIT and NBER

William R. Kerr
Harvard Business School

Adriana D. Kugler
University of Houston, NBER, CEPR and IZA

November 29, 2005

**Abstract**

Theory predicts that mandated employment protections may reduce productivity by distorting production choices. Firms facing (non-Coasean) worker dismissal costs will curtail hiring below efficient levels and retain unproductive workers, both of which should affect productivity. These theoretical predictions have not, to our knowledge, been tested. We use the adoption of wrongful-discharge protections by U.S. state courts over the last three decades to evaluate the link between dismissal costs and productivity. Drawing on establishment-level data from the Annual Survey of Manufacturers and the Longitudinal Business Database, we find that wrongful-discharge protections significantly reduce employment flows. Moreover, preliminary analysis of plant-level data provides evidence of capital deepening and a rise in labor productivity following the introduction of wrongful-discharge protections, but no significant effects on total factor productivity. This last result suggests that the introduction of employment protections came at little efficiency cost.

**Keywords**: Dismissal Costs, Employment Fluctuations, Entry and Exit, Labor Productivity, TFP, Entrepreneurship.
**JEL Classification**: J11, J21, J31, J61.

*E-mails: dautor@mit.edu, wkerr@hbs.edu and adkugler@uh.edu. The research in this paper was conducted while the authors were Special Sworn Status researchers of the U.S. Census Bureau at the Boston Census Research Data Center (BRDC). Support for this research from NSF grant (ITR-0427889) is gratefully acknowledged. Research results and conclusions expressed are those of the authors and do not necessarily reflect the views of the Census Bureau. This paper has been screened to insure that no confidential data are revealed. We are grateful to participants at the Census Bureau RDC Conference for their comments. Autor acknowledges generous support from the National Science Foundation (CAREER SES-0239538) and the Alfred P. Sloan Foundation. Kugler acknowledges support from a GEAR grant from the University of Houston.

# 1 Introduction

An extensive literature explores the impact of dismissal costs—also frequently called firing costs or employment protection—on the operation of labor markets. Beginning with the seminal work of Lazear (1991), a significant body of research has focused on assessing how dismissal costs affect employment levels. Theory suggests, however, that dismissal costs may have ambiguous effects on employment levels. Dismissal costs act as a tax on firing, which reduces dismissals but also reduces hiring. The net effect of these offsetting factors is ambiguous, at least in the short run. It is perhaps not surprising therefore that the empirical literature has found widely varying effects of dismissal costs on employment levels.

By contrast, theory makes a clear prediction about the impact of dismissal costs on the efficiency of hiring and firing. Provided that dismissal protections are not undone by Coasean bargaining, dismissal protections raise firms' adjustments costs. Consequently, firms will find it optimal not to hire workers whose short-term marginal product exceeds their market wage and will choose to retain unproductive workers whose wage exceeds their productivity (see, for example, the model of Blanchard and Portugal, 2001). These distortions in production choices unambiguously reduce worker flows. They are also likely to cause firms to substitute capital for labor and have the potential to reduce productivity by distorting production choices.

This paper evaluates whether, and to what extent, the introduction of dismissal costs affects firms' production choices and, ultimately, their productivity. The source of variation in dismissal costs that we exploit is the adoption of wrongful discharge protections by U.S. state courts from the late 1970s to the early 1990s. These common-law protections against wrongful discharge generated a flood of litigation in adopting states and increased the uncertainty and potential cost of discharging workers. As has been established in prior work using both household survey data and aggregate employment statistics, adoption of wrongful discharge laws had measurable effects on state employment levels, unemployment to employment flows, and the outsourcing of jobs to temporary help employers (cf. Miles 2000; Schanzenbach 2003; Autor 2003; Autor et al. 2004 and forthcoming; Kugler and Saint Paul, 2004). But these aggregate effects have never been explored using microdata on firms, nor have they their consequences for productivity been analyzed.

In this paper, we simultaneously analyze the consequences of employment protections for establishment-level employment flows and productivity. We first test whether dismissal costs reduce employment volatility—a necessary implication of any standard non-Coasean model—both at the extensive (entry/exit) margin and intensive (within-plant) margin. We next assess whether any reduction in employment volatility is accompanied by a reduction in productivity.

Our analysis exploits detailed, comprehensive establishment-level data from two Census Bureau surveys: the Longitudinal Business Database (LBD) and the Annual Survey of Manufacturers (ASM). Sourced from U.S. tax records and Census surveys, the LBD provides annual employment and payroll information on all US private establishments in most lines of business. The LBD is thus an exceptional resource for identifying the effects of dismissal costs on how firms adjust their labor inputs; it cannot, however, facilitate a further study of the concomitant adjustments of other factors of production and the consequences for productivity. We thus complement the LBD with a balanced panel of 'ongoing' manufacturing plants continuously surveyed by the ASM. We first demonstrate that the impact of dismissal costs on employment adjustment within this panel mirror the LBD universe, and then turn to the ASM's detailed operating data (e.g., output, capital investment, employment) to study extensively the important productivity outcomes.

We find robust evidence that one of the three dismissal protections adopted during this period, the Covenant of Good Faith and Fair Dealing, significantly reduced annual employment fluctuations and entry of manufacturing establishments in adopting states. Consistent with the apparent rise in adjustment costs, we find that firms in adopting states engaged in capital deepening, leading to a concurrent rise in labor productivity and an apparent fall in the return to capital. However, we observe little evidence of a change in total factor productivity. These results suggest that although adoption of dismissal protections significantly altered production choices, any productivity impacts are likely to have been small.

## 2 Wrongful Discharge Protections in the United States

The U.S. has long had a legal presumption that workers and employers may freely terminate their employment relationships 'at will,' that is without notification, financial penalty or requirement to demonstrate good (or any) cause. This legal doctrine, referred to as employment-at-will, was first articulated by the Tennessee Supreme Court in 1884 and was subsequently adopted into the common law by almost all U.S. state courts by the mid 1930s (Morriss 1994).[1]

Beginning in the 1970s, the legal consensus supporting employment-at-will eroded rapidly. In a series of precedent-setting cases between 1972 and 1992, the vast majority of U.S. state courts adopted one or more common-law exceptions to the employment-at-will doctrine. These exceptions, which are typically classified into three categories, constrained the ability of employers operating in adopting states to terminate workers at will. These common-law exceptions are: 1) the implied covenant to terminate only in good faith and fair dealing ('good faith' exception); 2) the tort of wrongful discharge in violation of public policy ('public policy' exception); and 3) the implied-in-fact contract not to terminate without good cause ('implied contract' exception).[2] We summarize these exceptions here and refer the reader to Autor et al. (forthcoming) for a fuller discussion.

Read broadly, the good faith exception prohibits employers from firing workers for 'bad cause.' The definition of 'bad cause,' however, varies greatly by state and over time. The California Supreme Court's famous 1980 good faith ruling in *Cleary v. American Airlines*[3]—likely the most influential of all good faith cases—was initially understood to bar California employers from terminating *any* worker without good cause. In 1988, however, the California court vastly reduced the scope of the *Cleary* decision with its ruling in *Foley v. Interactive Data Corp.*[4] At present, all eleven state courts that recognize the good faith exception (including California) primarily limit awards to 'timing' cases in which the employer intentionally terminates a worker to deprive her of a promised benefit (e.g., a sales commission or non-vested pension). Hence, 'bad cause' under the good faith exception is currently construed narrowly, though this was not always the case.

The public policy exception, recognized by 43 states as of 1999, provides workers with protections against discharges that would inhibit them from acting in accordance with public policy. In states recognizing the public policy exception, workers may, for example, litigate if they are fired for performing jury duty, filing a worker's compensation claim, reporting an employer's wrongdoing,

[1] Idaho, New Jersey and New Mexico adopted employment-at-will in 1948, 1953 and 1968, respectively. Prior to New Jersey, the most recent was Wyoming in 1937.

[2] For detailed discussion of the evolution of the employment-at-will doctrine, see Morriss (1994 and 1995), Autor (2003), Kugler and Saint Paul (2004) and Autor et al. (forthcoming). Our discussion draws particularly on the latter work, which contains the most current legal analysis.

[3] 168 Cal. Rptr. 722 (Cal. Ct. App. 1980 October).

[4] 765 P.2d 373 (Cal. 1988).

or refusing to commit perjury. Because courts typically limit public policy cases to clear violations of explicit legislative commands, rather than violations of a vaguer sense of public obligation, the public policy exception is not generally thought to impose substantial constraints on employer behavior.

The implied contract exception, also recognized by 43 states in 1999, comes into force when an employer implicitly promises not to terminate a worker without good cause. Such implicit promises may include, for example: personnel manuals stating that the employer's policy is to terminate employees only for just cause; expectations arising from a worker's longevity of service or history of promotions and salary increases; and usual company practices that preclude terminating workers without good cause. The expected economic impact of the implied contract exception is hard to gauge. On the one hand, employers can potentially 'contract around' this exception simply by rewording personnel manuals and adding explicit language to employment contracts to state that all employees remain 'at-will.'[5] On the other hand, firms without sophisticated personnel staff may be unaware of the implied contract exception or lack the expertise to fully insulate themselves from its reach. Additionally, the implied contract exception can potentially reclassify an employer's entire workforce as not 'at-will,' which may impose significant costs.

As emphasized by Autor et al. (forthcoming), it is likely that a substantial component of the economic cost of the employment-at-will exceptions emanates from the uncertainty they introduced into the employment relationship. When most exceptions were adopted in the late 1970s through late 1980s, the volume and cost of wrongful-discharge litigation that would eventually ensue was unknown to firms and potential litigants. Augmenting the uncertainty, personnel and professional law journals (i.e., the trade publications read by personnel managers and corporate attorneys) published numerous articles that appeared to substantially overstate the scope of the protections afforded to workers and the penalties that firms would incur for violating them (Edelman et al., 1992). Because employers were potentially led to anticipate greater constraints and costs than ultimately materialized, Autor et al. (forthcoming) argue that the short-term and medium-term

[5] And indeed, large employers took such steps. The Bureau of National Affairs (1985) found that 63 percent of large employers surveyed in the early 1980s had recently "removed or changed wording in company publications to avoid any suggestion of an employment contract," and 53 percent had "added wording to applications and handbooks specifying that employment may be terminated for any reason." Sutton and Dobbin (1996) report that the percentage of firms using "at-will" clauses in employment contracts increased from 0 to 29 percent between 1955 and 1985.

effects of these dismissal protections are likely to have exceeded their 'steady-state' effects and they present evidence consistent with this hypothesis.

Several prior studies have analyzed the effects of employment-at-will exceptions on labor market outcomes. The first study in this vein, Dertouzos and Karoly (1992), found using aggregate state-level data that adoption of common-law dismissal protections reduced state employment levels by as much as seven percent. Subsequent analyses by Miles (2000), Schanzenbach (2003) and Autor et al. (2004 and forthcoming) using industry and household level data do not confirm these results, however. These more recent studies find either modest negative effects (Autor et al., Schanzenbach) or undetectable effects of dismissal protections on employment levels (Miles). As noted above, however, theory does not make unambiguous predictions about the impact of dismissal costs on employment levels.

A number of studies produce evidence that states' adoption of dismissal protections raised hiring and firing costs. Miles (2000) and Autor (2003) show that employers in adopting states substituted temporary help agency workers for direct-hire employees, presumably in an effort to minimize litigation risks.[6] Kugler and Saint-Paul (2004) find using the National Longitudinal Survey of Youth that these protections (especially the good faith exception) reduced the re-employment probability of unemployed relative to employed workers, suggesting that dismissal protections exacerbated adverse selection into non-employment. Both sets of findings are significant for our work because they demonstrate that the adoption of dismissal protections raised firms' adjustment costs—a necessary condition for them to have had productivity impacts.

Our study builds on this prior work in two major respects. First, using data at the establishment level, we provide direct evidence on the effects of dismissal protections on firms' employment adjustments at both the extensive (plant opening/closing) and intensive (job flows) margins. Second, we directly evaluate the consequences of dismissal protections for establishment-level production choices and realized productivity.

[6] The implied contract exception in particular confers a comparative advantage on temporary help agencies since these firms are universally understood to offer only short-term employment. It is the implied contract exception that appears primarily responsible for the growth of temporary help agency employment (Autor 2003).

## 3 Theoretical Considerations

In a standard competitive model of the labor market, employment protections are economically equivalent to mandated employment benefits. Benefit mandates raise the cost of employing workers, leading to an inward shift in labor demand. If, however, workers value the mandated benefit at its marginal cost of provision—that is, the mandate is efficient—then the Coase theorem applies. Labor supply shifts outward to offset exactly the inward shift in labor demand, employment levels are unchanged and wages fall to cover exactly the cost of the benefit (Summers 1989; Lazear 1991). There are no productivity consequences.[7]

Mandatory dismissal protections can impose efficiency costs in the competitive model, however. If workers value dismissal protections at less than their marginal cost of provision—or, equivalently, if some share of the termination benefit accrues to a third-party, such as an attorney—the benefit mandate drives a wedge between the private and social cost of job separations, yielding a deadweight loss. Because dismissal costs are only paid when workers and firms separate, the deadweight loss component of the dismissal cost functions as a tax on separations—an adjustment cost. Consider, for example, a case where a worker's marginal product falls below his wage and the wage cannot drop sufficiently to compensate the firm (either due to a non-negativity constraint or due to downward wage rigidities). If the worker values the dismissal benefit at its marginal cost, both the worker and the firm will agree to terminate the job. If the dismissal payment incurs a deadweight loss, however, both the worker and the firm will find it optimal to continue the employment relationship so long as the present value of the productivity shortfall is less than the deadweight loss. Consequently, inefficient dismissal protections—that is, protections that workers value at less than cost—inhibit efficient job separations.

In the competitive model, these inefficient dismissal protections unambiguously reduce allocative efficiency—that is, they are welfare reducing. Their implications for the efficiency of production are less clear cut, however. If dismissal protections cause firms to retain (some) unproductive workers, this will cause a decline in labor productivity, *ceteris paribus.* Offsetting this factor, firms may

[7] Aghion and Hermalin (1990) and Levine (1991) present models in which dismissal protections are under-provided by the private market due to adverse selection. In these cases, dismissal protection mandates can be efficiency-enhancing since workers value these protections above their cost of provision. In the Coasean model, this would imply that imposing the mandate would raise employment levels.

screen new hires more stringently, leading to a favorable compositional shift in the productivity of the employed workforce. Moreover, because inefficient dismissal protections provide firms with an incentive to substitute from labor to other factors of production, capital deepening may also raise the marginal product of labor. Hence, the net impact on technical efficiency (as opposed to allocative efficiency) is ambiguous.

While many labor economists use this competitive model as a benchmark, much of the macroeconomic literature views employment protection through the lens of Diamond-Mortensen-Pissarides equilibrium unemployment (e.g., Mortensen and Pissarides, 1994; Kugler et al., 2003). As in the competitive model, dismissal costs in the equilibrium unemployment model curtail efficient separations by reducing the threshold productivity at which firms are willing to dismiss workers. In contrast to the competitive model, however, worker-firm matches in the equilibrium unemployment setting generate quasi-rents, and the allocation of rents between firms and workers is typically determined through Nash bargaining. Nash bargaining exacerbates the deadweight loss from inefficient employment protections.[8] In the Nash bargain, the dismissal cost reduces the firm's outside option ('threat point'), causing workers' wage demands to rise even as profits fall. Facing lower profits and higher wage demands, firms curtail job creation and increase the threshold productivity at which they are willing to hire. This rise in reservation productivity potentially leads to an *increase* in firm-level productivity since less productive matches are not realized.[9] Hence, the net productivity effect is again ambiguous.

Although the competitive and equilibrium unemployment models differ in their details, both imply that dismissal protections reduce employment adjustments but have ambiguous effects on firms' productivity. On the other hand, both models indicate that if dismissal protections do *not* reduce job flows (perhaps because they satisfy Coasean equivalence), these protections should not affect productivity. These theoretical observations motivate our empirical approach. We begin by assessing whether states' adoptions of exceptions to the employment-at-will doctrine reduced job flows. We next turn to an analysis of their consequences for firm productivity. Because of

[8] Nash bargaining amplifies inefficiencies because it is non-Coasean; the initial allocation of property rights affects both the distribution of resources *and* the efficiency of bargained outcomes (cf. Grout 1984).

[9] Although productivity impacts are ambiguous, welfare consequences are generally negative, as in the competitive case above. If the search equilibrium is not initially constrained efficient, however, it is possible for policy interventions to improve aggregate efficiency (cf. Pissarides 2000, chapter 8).

the many possible avenues of adjustment noted above, our empirical work examines the impacts of dismissal protections on multiple firm-level production outcomes including capital investment, capital intensity, labor productivity and total factor productivity.

# 4 Data Description

Establishment-level data are essential for characterizing how firms and their associated establishments respond to the passage of dismissal protections. This project draws such data from two confidential surveys collected by the Census Bureau—the Longitudinal Business Database (LBD) and the Annual Survey of Manufacturers (ASM). Each survey is described below, and Table 1 provides descriptive statistics.

## 4.1 Longitudinal Business Database

The LBD is a unique source for studying employment dynamics across manufacturing and non-manufacturing sectors. Sourced from IRS tax data and Census surveys, the LBD annually covers approximately 3.5 million establishments with positive employment, representing over 60 million employees, in most US private industries. Panel A of Table 1 highlights that most of the LBD's surveyed employees are in the manufacturing, retail trade, and services sectors. These percentages are fairly similar for states passing dismissal protections and those not doing so.[10]

The microdata first facilitate the development of complete state-industry-year panels of employment by summing employment counts across individual establishments. Publicly available series normally do not provide employment counts by state-industry; even when they do so, the Census Bureau is required to suppress values that compromise the confidentiality of individual establishments. Building from the microdata overcomes these limitations and a full employment panel is developed for the 1979 to 1995 sample frame.

From this state-industry-year panel, we can estimate absolute year-over-year employment changes. The mean absolute employment change over the sample is approximately 11 percent. This absolute job turnover metric aggregates over employment adjustments on the intensive margin (i.e., the

[10] The LBD's sample frame during the 1979 to 1995 period includes Mining; Construction; Manufacturing; Wholesale Trade; Retail Trade; and Services (except hospitals, education services, social services, and private households). Sectors not included are Agriculture, Forestry, and Fishing; Transportation and Public Utilities; Finance, Insurance, and Real Estate; and Public Administration. Jarmin and Miranda (2002) describe the construction of the LBD.

hiring and firing of workers by continuing establishments) and the entry/exit margin. In the LBD, establishments are assigned unique and time-invariant identifiers that further afford longitudinal estimations of these two dimensions of adjustment. The entry and exit rates for establishments are approximately 13 percent and 11 percent, respectively. As many entering and exiting establishments are very small in size, only 7 percent and 6 percent of employees are working in entering or exiting establishments, respectively. Finally, the survey's reporting structure affords the linkage of establishments to their parent firms. Approximately 22 percent of establishments and 55 percent of employees are part of multi-unit firms.

## 4.2 Annual Survey of Manufacturers

While the LBD provides a comprehensive view of employment dynamics across manufacturing and non-manufacturing sectors, reported data are limited to total employment and payroll only. To evaluate the impact of reduced job turnover for capital and productivity outcomes, we turn to two detailed surveys of manufacturers undertaken by the Census Bureau. The Census of Manufacturers (CM) collects operating data on all US manufacturing plants at five-year intervals (i.e., 1972, 1977, and so on). In between the CMs, the Census Bureau conducts the Annual Survey of Manufacturers (ASM). The ASM is a probability sampled subset of the CM, with the panel redrawn two years after each CM. Plants with more than 250 employees in the previous CM are sampled with certainty.

We extract from the ASM a balanced panel of all plants continuously monitored from 1972 to 2000. This restriction focuses on intensive adjustments in large plants operating in stable business climates; by conditioning on survival, the extensive margin is suppressed. While the approximately 5600 plants represent less than 2 percent of all US manufacturing establishments, they account for over a quarter of total manufacturing activity. Almost all of these plants are part of multi-unit firms, although not all of the plants have sister establishments within this balanced panel.

Year-over-year employment changes are again studied. While the average annual employment change is again 11 percent, a larger fraction of these changes are negative, reflecting the trend decline in manufacturing employment from 1979 to 1995. In addition, the more detailed employment data for manufacturers allow us to examine production and non-production workers separately; the mean non-production worker employment share is 28 percent. The mean hourly wage paid to production workers is $15 in 1996 dollars.[11]

The continuous monitoring of this ASM panel affords the calculation of detailed capital stocks and productivity metrics. Capital stocks are calculated with the perpetual inventory method, as explained below. The mean plant-level capital stock for the 1979 to 1995 sample is $29m in 1996 dollars. Return on capital is defined as nominal total value of shipments (TVS) net of labor and materials/fuels costs divided by total capital expenditure. Labor productivity is defined as deflated TVS divided by total plant employment. Finally, we estimate total factor productivity (TFP) as the residual from a production function of value-added on four factors: production workers, non-production workers, machinery capital, and structure capital.

# 5 Consequences of Employment Protections

In this section we discuss the impact of wrongful discharge protections on firm behavior. We begin by examining the first-order effect of employment protections on employment fluctuations, both at the intensive (within-establishment) and extensive (entry/exit) margins. If wrongful discharge protections indeed increase adjustment costs, this should lead to a reduction in hiring and dismissals, resulting in an overall dampening of employment fluctuations. We next test the impact of employment protections on employment levels, a margin along which prior research has obtained mixed results. Finally, we turn to the important question of whether the possibly restricted ability of businesses to adjust employment due to the introduction of employment protections has productivity consequences.

## 5.1 Effects on Employment Fluctuations

We estimate the effects of the wrongful discharge exceptions (i.e., good faith, public policy and implied contract) described in Section (2) on employment fluctuations using both the LBD and ASM. We begin by estimating the following equation using the LBD:

$$ABS_{sjt} = \lambda_s + \kappa_j + \tau_t + \beta_{GF} GF_{st-1} + \beta_{PP} PP_{st-1} + \beta_{IC} IC_{st-1} + \varepsilon_{sjt}, \quad (1)$$

where $ABS_{sjt}$ is the absolute year-to-year employment change of a two-digit SIC sector $j$, in state $s$, at time $t$,

[11] The ASM does not support the calculation of non-production worker wages.

$$ABS_{sjt} = \frac{|E_{sjt} - E_{sjt-1}|}{\left[\frac{(E_{sjt}+E_{sjt-1})}{2}\right]}.$$

$\lambda_s$, $\kappa_j$, and $\tau_t$ are vectors of state, industry and time effects, respectively. $GF_{st-1}$, $PP_{st-1}$, and $IC_{st-1}$ are indicators of whether the good faith, public policy and implied contract exceptions were in place in state $s$ at time $t-1$.[12] Thus, the coefficients $\beta_{GF}$, $\beta_{PP}$, and $\beta_{IC}$ capture the effects of employment protections on annual net employment flows.

Our core battery of specifications also includes two estimations of greater stringency. First, we consider models with state-specific time trends. These require that identification come from the discontinuity surrounding the passage of the wrongful discharge exception. These specifications can provide reassurance that our coefficients are not reflecting omitted variables potentially correlated with the adoption of the exceptions. A benefit of the state-industry panel is that we can also control for industry-specific trends using the non-parametric form of two-digit SIC industry and year interactions. These latter estimations allow us to control for employment shifts due to national trends in a state's industries, again providing confidence in the identification strategy.

Panels A and B of Table 2 report estimates of the effects of the wrongful-discharge exceptions on employment fluctuations for the Full Sample and for Manufacturing only. Panel A includes all LBD sectors: Manufacturing, Mining, Construction, Wholesale Trade, Retail Trade and Services. The reported standard errors account for possible error correlations across firms within a state and within states over time. We weight the samples using the mean employment level in the state-industry-year cells during the early 1979 to 1985 period. The results for the Full Sample show a decline in employment fluctuations following the introduction of the good faith exception, though the results are not significant. By contrast, the results for the public policy and implied contract exceptions are mixed but insignificant.

When we estimate these models for Manufacturing alone in Panel B, we find a negative and significant effect of the good faith exception on employment fluctuations. The results are robust to the inclusion of state-specific and industry-specific trends. They suggest a reduction in employment fluctuations of about 15 percent after the introduction of the good faith exception. The results for

[12] The one-year lag from the survey date is due to employment counts in the LBD and ASM usually being measured as of March 1st.

the public policy and implied contract exceptions remain insignificant.

The initial LBD results suggest significant effects of the good faith exception on employment fluctuations in manufacturing. To test whether this finding appears consistent with a causal relationship, we evaluate the relationship between adoption of the good faith exception and employment fluctuations using a dynamic specification:

$$\begin{aligned} ABS_{sjt} \quad = \quad & \lambda_s + \kappa_j + \tau_t + \sum_{q=-3}^{2} \beta_{GFt+q} \Delta GF_{st+q} + \sum_{q=-3}^{2} \beta_{PPt+q} \Delta PP_{st+q} + \sum_{q=-3}^{2} \beta_{ICt+q} \Delta IC_{st+q} \\ & + \beta_{GFt-4} GF_{st-4} + \beta_{PPt-4} PP_{st-4} + \beta_{ICt-4} IC_{st-4} + \varepsilon_{sjt}, \end{aligned} \tag{2}$$

where $\Delta GF_{st+q}$, $\Delta PP_{st+q}$, and $\Delta IC_{st+q}$ indicate whether adoption occurred at year $t+q$, and where $GF_{st-4}$, $PP_{st-4}$, and $IC_{st-4}$ indicate whether adoption occurred at year $t-4$ or before.[13] Appendix Table 1 presents results from this dynamic specification estimated for the manufacturing sector, as well as additional specifications including state-specific and industry-specific trends.

The basic specification shows negative coefficients for the good faith lags, but positive coefficients for the leads, thus supporting a causal interpretation of our results—that is, the introduction of the exception precedes employment changes and not vice versa. By contrast, the public policy and implied contract leads and lags have uniformly positive (though typically insignificant) coefficients. The results are robust to the inclusion of state-specific and industry-specific trends, but suggest a greater effect after three years of adoption. On the other hand, results using the LBD suggest a smaller long-term effect after four or more years of adoption.[14]

The results from the LBD suggest that manufacturing was particularly affected by the introduction of wrongful discharge exceptions, perhaps because manufacturing employment is highly seasonal and cyclical, making dismissal protections particularly costly.[15] We use plant-level data

[13] The dynamic estimations also include a second set of lead and lag variables to account for the four cases in which legal exceptions were formally abandoned. The inclusion or exclusion of these additional regressors does not materially influence the reported results.

[14] Only 13 states introduced good faith exceptions during the period studied. The first introduction of the good faith exception happened in California, where the court ruling was highly visible. Not surprisingly, though our LBD results on employment changes (both for the basic as well as the dynamic specifications) are strongest for our full sample of states, the results are qualitatively similar but less precise when we exclude California. Similarly, we check the robustness of our results to the exclusion of Arizona (which introduced the good faith exception in 1985), since Arizona experienced atypically high employment creation throughout the 1980s and 1990s. In Column (7) of Tables 2 and 3, we report the results without Arizona, which show similar effects on employment changes.

[15] During the 1979 to 1995 period, the mean year-to-year turnover in manufacturing was 11.5%, compared to 10.0%

from the ASM to further examine the effects of employment protections in manufacturing. Panel A of Table 3 presents analogous results to those using the LBD in Table 2. Because our ASM sample uses a balanced panel of ongoing plants, we can now add plant fixed-effects to the prior specification, leading to the following estimating equation:

$$ABS_{pt} = \mu_p + \tau_t + \beta_{GF} GF_{st-1} + \beta_{PP} PP_{st-1} + \beta_{IC} IC_{st-1} + \varepsilon_{pt}. \quad (3)$$

Here, the dependent variable is the absolute year-to-year employment change in plant $p$ from $t-1$ to $t$, and where $\mu_p$ is a plant effect. As before, we include state-specific and industry-specific trends. The estimated standard errors again allow for error correlations across plants within states and within states over time.

Consistent with the LBD, the results using the ASM suggest that the good faith exception reduces employment fluctuations. In particular, we estimate in Table 3 that the good faith exception reduced employment fluctuations by 7.5 percent, which is slightly smaller than the estimate using the LBD data. The difference between the results using the LBD and ASM are explained in part by the fact that we can control in the ASM for additional unobservable factors affecting a plant's employment fluctuations. Contrasting columns (4) and (6), with and without plant effects, we can see that excluding plant effects using our ASM sample implies a reduction of 10 percent in employment fluctuations as opposed to 7.5 percent with plant effects. As is shown in the next sections, the remaining differences between the estimates in the LBD and the ASM samples are likely due to the fact that the LBD includes entering and exiting business while the ASM sample is composed of a balanced sample of ongoing plants. Hence, the ASM analysis excludes any effect of wrongful discharge protections on employment fluctuations occurring through entry and exit.

As with the LBD, we also estimate a dynamic specification using ASM data. The lower panel of Table 3 presents these estimates. Similar to the patterns found with the LBD, leads of the good faith exception are found to have positive but insignificant effects on employment fluctuations while lags of the good faith exception have negative effects on employment changes. In contrast to the LBD, ASM results show effects of the good faith exception on employment changes immediately

in construction, 5.6% in wholesale trade, 6.7% in retail trade, and 8.0% in services. Only mining (26.5%) had a higher annual turnover. Regressions examining the mining sector also find a substantial dampening of annual employment volatility following the adoption of the good faith exception.

following adoption. In addition, the results on the fourth lag with the ASM show evidence of a larger long-term effect of the good faith exception on manufacturing employment fluctuations than the one found using the LBD.[16,17]

### 5.2 Effects on Entry and Exit

The divergence in the estimated effects of wrongful-discharge exceptions on employment fluctuations in the LBD and the ASM samples suggests that part of the reduction in employment fluctuations observed following adoption of the good faith exception is explained by changes in firm entry and exit (i.e., the extensive employment margin). To evaluate the importance of external adjustment, we use the LBD to estimate regressions similar to equation (1), where the dependent variable is the log of the average count of plants over five-year intervals among continuing, entering and exiting businesses. We use five-year averages as opposed to yearly counts to minimize the possibility of capturing spurious entry and exit due to 'ghosting' and reporting bumps observed surrounding Census years. The wrongful discharge indicators take the value of 1 if the exceptions had been adopted as of the midpoint of the five-year intervals.[18]

Panels A through D of Table 4 report results of these regressions for all, continuing, entering and exiting plants, respectively. Panel A shows little change in the total count of plants in response to the introduction of any of the exceptions. However, Panels B through D show that in the case of the good faith exception, this reflects counteracting forces among continuing and other plants. Panel B shows that an increase in plant survival after the introduction of good faith exceptions, though this effect is marginally significant. Panel C shows that entry is substantially reduced in manufacturing after the introduction of good faith exceptions, though exit is unaffected. These results, controlling for state-specific and industry-specific trends, suggest a reduction of 0.077 log

[16] As for the LBD results, the ASM results are qualitatively similar but somewhat less precise when we exclude Arizona or California from our sample.

[17] As a complement to the panel estimations, similar results are found with lagged dependent variable specifications.

[18] Annual regressions of entry and exit yield quantitatively similar results, though the coefficient magnitudes are smaller. Entry and exit are better studied in LBD with five-year intervals than annually due to spurious peaks of entry and exit rates surrounding Census years, when additional manpower is devoted to updating the business registry. This updating has a noticeable effect on establishment counts, but not on summed employment levels used for year-to-year employment changes. Entry and exit are defined as the first and last year an establishment is observed in the LBD, respectively, with the end years of the sample excluded. This procedure ignores potential exit and re-entry by establishments, but more importantly avoids spurious entry and exit from 'ghosting' establishments with poor longitudinal linkages.

points in the number of entering plants or a reduction of about 9,000 establishments.[19] By contrast, the public policy and implied contract exceptions do no appear to affect entry and exit.

In combination with the findings in Tables 2 and 3, these results suggest that the dampening effect of the good faith exception on employment fluctuations operates through two channels: a reduction in net employment flows in ongoing plants and a reduction in the entry of new plants.

### 5.3 Effects on Employment Levels

Here we explore the effects of wrongful-discharge exceptions on employment levels. As discussed, the effect of these dismissal protections on net employment is theoretically ambiguous (at least in the short run) since both dismissals and hiring are affected.

We start by estimating similar regressions to equation (3) using the ASM data, but where the dependent variable is the log of employment in plant $p$ at time $t$. Table 5 presents results of these regressions for total employment as well as for production and non-production employment separately. Panel A shows that total employment increases with the introduction of the good faith and public policy exceptions, though the public policy results are insignificant. By contrast, the implied contract exception has a negative though insignificant effect on employment, which is consistent in sign and magnitude (though not significance) with the findings in Autor et al. (2004 and forthcoming).

When employment is disaggregated into production and non-production workers, we find that the increase in total employment following the introduction of the good faith exception is driven by the increase in employment of non-production workers. Panel B shows that production employment does not react to the introduction of the good faith exception, while Panel C shows that non-production employment in the typical plant increased by 0.054 log points following the introduction of this exception.[20] This differential rise in non-production demand may be explained by capital-skill complementarity (cf. Griliches, 1967; Berman, Bound and Griliches, 1994); as we show in section (5.4), adoption of the good faith exception spurred firms to engage in capital-deepening.

As before we also estimate dynamic specifications to check whether our findings are consistent

[19] This result is consistent with results in Kugler and Pica (2005), who find that increased dismissal costs in Italy after the 1990 Labor Market Reform reduced entry of small firms.

[20] These results are robust to various specifications and to the exclusion of California and Arizona (the latter reported in Column (7)), even though Arizona had unusually high employment growth during the 1980s and 1990s.

with a causal interpretation. Appendix Table 2 shows positive effects of the lags but mostly negative effects of the leads on employment levels. When Arizona is excluded in Column (7), both leads become negative while the lags are always positive.[21] By contrast, the results for the implied contract exception show consistently negative effects of both leads and lags, though the lead effects are smaller.[22]

Table 6 shows results from regressions similar to equation (1) using LBD data, but where the dependent variable is the log of average manufacturing employment in state $s$ and industry $j$ over five-year intervals and where the wrongful discharge indicators take the value of 1 if the exceptions had been adopted as of the midpoint of the five-year intervals. Panel A presents results for all plants, while Panels B through D present results for continuing, entering and exiting plants, respectively.[23]

Consistent with the results from the ASM that only includes continuing plants, we find that total employment increased by about 0.078 log points following the adoption the good faith exception when considering the sample of all states. Examining employment separately for continuing, entering and exiting plants in Panels B through D shows that this growth is driven by continuing plants. Panel B shows a significant increase in employment of 0.083 log points in continuing plants, while Panels C and D show a decline in employment created by plant entry and an increase in employment lost due to plant exit, although these two effects are not statistically significant. Note also the close comparability of the estimated effects of the good faith exception on employment levels in the ASM sample (Table 5, Panel A) and on employment levels in ongoing plants in the LBD (Table 6, Panel B). This pattern is expected since the ASM sample is composed exclusively of ongoing plants. In summary, the net growth of employment that we observe after adoption of the good faith exception is accounted for by reduced job creation in entering plants and increased job destruction in exiting plans—both of which led to reduced employment—accompanied by more than offsetting employment growth in ongoing plants.

[21] Given the unusual employment growth in Arizona even prior to the introduction of the good faith doctrine, it is not surprising that the dynamic effects become clearer after we exclude Arizona. On the other hand, the effects on employment changes and the rest of the results presented below are not sensitive to dropping Arizona.

[22] The estimated effect of the implied contract exception on employment is in line with results in Autor et al. (2004 and forthcoming). It is a puzzle, however, that we find that the implied contract exception had a negative effect on employment levels but no effect on employment fluctuations.

[23] Annual employment regressions yield quantitatively similar results, though the coefficient magnitudes are smaller. We use employment at 5-year intervals here to keep consistency with the results on the counts of entering and exiting plants presented in the previous section.

As with the ASM, the dynamic specifications in Appendix Table 3 show negative coefficients on the good faith exception's leads and positive coefficients on the lags, especially when Arizona is dropped from the sample. Also, similarly to the ASM, we find negative lead and lag coefficients on the implied contract exception, though the coefficients on the leads are always smaller.

### 5.4 Productivity Effects

The finding that the good faith exception reduces job flows implies that this discharge protection raises firms' adjustments costs. Here we explore the consequences of this rise in adjustment costs on other margins of non-labor adjustment. One such margin is capital substitution; if discharge protections raise the effective price of labor by making it more expensive to hire and fire, firms may substitute towards other inputs. Second, given the restrictions on firms' ability to adjust, we also may expect total factor productivity to be affected—though as noted in Section (3), compositional shifts in worker hiring following adoption of dismissal protections may generate countervailing effects on labor productivity.

We begin by examining whether productivity was affected by employment protections due to changes in input composition. In particular, we ask whether the introduction of employment protections affected capital investment and, subsequently, capital-labor ratios. Panels A and B of Table 7 report results of specifications similar to equations (1) and (3) without and with state-specific and industry-specific trends, but where the dependent variables are the log of total capital investment and the log of the capital-labor ratio.[24]

Capital stocks are measured beginning-of-year and constructed using the perpetual inventory method. Capital stocks are separately calculated for machinery and structures and then aggregated for total capital metrics. The capital stock of plant $p$ in industry $j$ at time $t$ is:

$$K_{pt} = (1 - \delta_{jt-1}) K_{pt-1} + \frac{I^N_{pt-1}}{P^N_{Ijt-1}} + \frac{I^U_{pt-1}}{P^N_{Ijt-3}},$$

where initial capital stocks in 1972 are obtained by deflating book values of capital by BEA two-digit SIC deflators for installed capital. New equipment investments, $I^N_{pt-1}$, are deflated with NBER

[24] To maintain a full panel using the log specification, we construct the dependent investment variable as the log of one plus investment. The results are very similar if observations with zeros are excluded. Zero values are not present for capital stocks.

four-digit SIC new-capital deflators, $P^N_{Ijt-1}$. Used equipment purchases, $I^U_{pt-1}$, employ the NBER four-digit SIC deflators lagged three periods. The annual depreciation rates, $\delta_{jt-1}$, are obtained from the BEA by two-digit SIC industries.

Panel A of Table 7 shows a positive and significant effect of the introduction of the good faith exception on total investment (machinery and structures) of close to 0.07 log points, but no effects from the introduction of the public policy and implied contract exceptions. Dynamic specifications in Appendix Table 4 indicate that capital investment remains high several years after adoption of the good faith exception. However, leads of the good faith adoption variable in the dynamic specifications are strongly negative, suggesting that part of the post-adoption rise in capital investment may reflect an investment rebound from an earlier downturn.

Not surprisingly given the increase in employment levels, Panel B shows mixed effects on capital-labor ratios. For example, effects are negative when controlling for state-specific trends and positive when controlling for plant effects. Moreover, dynamic specifications in Appendix Table 5 find positive coefficients on the leads and negative effects on the lags, raising the question of whether the introduction of the good faith exception followed rather than preceded increases in the capital-labor ratio.

Table 8 explores whether the increase in capital investment following the introduction of the good faith exception found in Table 7 had the expected effects for the returns on capital and labor. Panels A through C report effects on the return on capital, labor productivity, and the production worker hourly wage, respectively. As expected following an increase in investment and the capital stock, the return on capital falls after the introduction of the good faith exception, though this effect is generally not significant. However, Panel B presents more persuasive evidence that labor productivity rose substantially (by 1 to 4 log points), while non-production wages rose modestly (by 1 to 1.5 log points) following adoption of the good faith exception. This measured rise in labor productivity follows from the fact that both capital investment and non-production worker employment (Table 5) rose following adoption of the good faith exception. Since our labor productivity measure does not adjust for labor quality input, the rise in raw labor productivity is potentially consistent with a rise in total factor productivity (TFP), a fall in TFP or no change at all.

To make a more direct attack on the productivity question, Table 9 presents results of specifications like equations (1) and (3), but where the dependent variables is a TFP measure estimated using a production function residual methodology. For the residuals methodology, we first estimate the following production function in logs for each two-digit SIC industry and year using ordinary least squares:

$$\log(Y_{pt}) = \alpha_{jt}\log(L_{pt}) + \gamma_{jt}\log(H_{pt}) + \theta_{jt}^{M}\log(K_{pt}^{M}) + \theta_{jt}^{S}\log(K_{pt}^{S}) + \xi_{pt},$$

where $Y_{pt}$ is value added (i.e., total value of shipments net of materials/fuels costs and inventory) in plant $p$ at time $t$ deflated using a PPI for each two-digit SIC industry, $L_{pt}$ is the count of production or unskilled workers, and $H_{pt}$ is the count of non-production or skilled workers. $K_{pt}^{M}$ and $K_{pt}^{S}$ are the separated machinery and structures capital stocks, respectively. The residuals from the regression above provide our first TFP measure:

$$TFP_{pt} = \log(Y_{pt}) - \widehat{\alpha}_{jt}\log(L_{pt}) - \widehat{\gamma}_{jt}\log(H_{pt}) - \widehat{\theta}_{jt}^{M}\log(K_{pt}^{M}) - \widehat{\theta}_{jt}^{S}\log(K_{pt}^{S}).$$

The results in Table 9 show a uniformly negative and significant effect of the introduction of the good faith exception on productivity, though the effects become less precise when we control for plant effects. By contrast, the public policy exception appears to have positive effects and the implied contract exception appears to have negative effects, though the effects are insignificant across all specifications.[25] However, results from dynamic specifications reported in Appendix Table 7 show mostly negative coefficients for both leads and lags of the good faith exception, but the coefficients on the lags are larger. Only when plant effects as well as state-specific and industry-specific trends are included do the coefficients on the leads turn positive while the coefficients on the lags remain negative. The dynamic specification thus raises questions about a causal interpretation of the good faith effects on productivity. Given these mixed findings, we read these results to

[25] We also employ a cost-shares methodology to analyze TFP. Cost shares are estimated for three-digit SIC industries from the NBER productivity database (Bartelsman and Gray 1996). Production worker, non-production worker, and materials and fuels cost shares are calculated relative to TVS; the cost share of capital is a residual such that the cost shares sum to one. The results of the TFP measure obtained using a cost-shares methodology are more mixed. However, the cost-shares methodology presents several disadvantages: (1) the coefficients on the shares are out-of-sample estimates obtained using NBER data; (2) we cannot disaggregate between equipment and structures since the capital share is obtained as a residual; and (3) the cost-shares methodology assumes constant returns-to-scale in the production function and perfectly competitive input markets.

suggest that the good faith exception did not have noticeable efficiency consequences despite its impact on job flows and input mix.

## 6 Conclusions

There are two main contributions of this paper. The first is to exploit microdata to examine the effect of dismissal protections on establishment-level outcomes in a representative sample of employers. The second is to consider simultaneously the effects of these protections on job flows—where there are unambiguous theoretical implications—and on several other important margins of firm behavior, including capital investment, labor productivity, and total factor productivity, where the predictions of theory are less clear cut. We believe that the power of the analysis derives from the relatively strong evidence that adoption of one particular dismissal protection, the good faith exception to employment-at-will, significantly reduced employment fluctuations in adopting states. This finding indicates that adjustments costs rose—a necessary condition for there to be an impact on economic efficiency.

The finding on employment fluctuations motivates us to analyze how the rise in adjustment costs impacted firms' choices of capital and labor inputs, and ultimately, their productivity. The most surprising result of our analysis is that the increase in adjustment costs appears to have spurred capital *and* skill deepening—that is, firms raised capital investment and increased non-production worker employment. These changes in input choices led to a sharp rise in labor productivity, though their effect on total factor productivity are not clear cut.

Our findings also present two unresolved puzzles. A first is that the adoption of the good faith exception appears to follow (likely by coincidence) a major investment downturn. This pattern reduces our confidence in the causal interpretation of the rise in capital investment following adoption of the good faith exception. We plan to investigate this issue further. The second, less significant, puzzle is that the estimated effect of the good faith exception on employment levels is generally larger than appears plausible (albeit imprecisely estimated). This finding is partly, but not entirely, explained by the experience of Arizona, which had unusually strong and persistent employment growth for reasons that are unlikely to be related to the good faith exception. In addition, this result is driven largely by an increase in non-production employment, demand for which could plausibly have increased as firms undertook new capital investment. In light of these puzzles, we view the findings on the effects of the good faith exception on internal and external employment adjustments as compelling, while our conclusions on the consequences of the adoption of dismissal protections for establishment-level productivity remain more tentative.

Our findings have interesting parallels with those of a recent study by Acemoglu and Finkelstein (2005) of firm-level responses to changes in labor costs in the U.S. hospital. Responding to a change in Medicare reimbursement policy in the 1980s that effectively increased the cost of labor relative to capital, Acemoglu-Finkelstein document that hospitals raised both their capital-labor ratios and the skill composition of their workforces. Acemoglu-Finkelstein suggest that this result may be explained by either capital-skill complementarity or technology-skill complementarity (assuming that new capital investments embed recent technologies), as in our discussion above. While the Acemoglu-Finkelstein findings are drawn from a distinctly different economic context than our study (a heavily regulated sector versus a relatively competitive sector) and exploit a different source of policy variation (employment subsidies rather than dismissal costs), the parallels with our findings for the effect of dismissal protections on the U.S. manufacturing sector are nonetheless striking and deserving of further consideration.

# 7 References


Acemoglu, Daron and Amy Finkelstein. 2005. "Input and Technology Choices in Regulated Industries: Evidence from the Health Care Sector." MIT Mimeograph, November.

Aghion, Phillipe and Benjamin Hermalin. 1990. "Legal Restrictions on Private Contracts can Enhance Efficiency." *Journal of Law, Economics, and Organizations*. 6(2), Fall, 381–409.

Autor, David H. 2003. "Outsourcing at Will: The Contribution of Unjust Dismissal Doctrine to the Growth of Employment Outsourcing." *Journal of Labor Economics*. 21(1), January, 1–42.

Autor, David H., John J. Donohue and Stewart J. Schwab. 2004. "The Employment Consequences of Wrongful-Discharge Laws: Large, Small, or None at All?" *American Economic Review Papers and Proceedings*. 93(2), May, 440–446.

Autor, David H., John J. Donohue and Stewart J. Schwab. Forthcoming. "The Costs of Wrongful-Discharge Laws." *Review of Economics and Statistics.*

Bartelsman, Eric and Wayne Gray. 1996. "The NBER Manufacturing Productivity Database." NBER Technical Working Paper 205.

Berman, Eli, John Bound and Zvi Griliches. 1994. "Changes in the Demand for Skilled Labor within U.S. Manufacturing Industries: Evidence from the Annual Survey of Manufactures." *Quarterly Journal of Economics.* 109, 367–397.

Blanchard, Olivier Jean and Pedro Portugal. 2001. "What Hides Behind an Unemployment Rate: Comparing Portuguese and U.S. Labor Markets." *American Economic Review.* 91(1), 187–207.

Bureau of National Affairs. 1985. *Employee Discipline and Discharge* (Washington, DC: Bureau of National Affairs).

Dertouzos, James N. and Lynn A. Karoly. 1992. *Labor-Market Responses to Employer Liability* (Santa Monica, CA: Rand).

Edelman, Lauren B., Steven E. Abraham and Howard S. Erlanger. 1992. "Professional Construction of Law: The Inflated Threat of Wrongful-Discharge." *Law & Society Review.* 26, 47–83.

Griliches, Zvi. 1969. "Capital-Skill Complementarity." *Review of Economics and Statistics.* 51, 465–68.

Grout, Paul. 1984. "Investment and Wages in the Absence of Binding Contracts: A Nash Bargaining Approach." *Econometrica.* 52, 449–460.

Jarmin, Ron and Javier Miranda. 2002. "The Longitudinal Business Database." CES Working Paper.

Kugler, Adriana and Giovanni Pica. 2005. "Effects of Employment Protection on Job and Workers Flows: Evidence from the 1990 Italian Reform." NBER Working Paper No. 5256.

Kugler, Adriana and Gilles Saint-Paul. 2004. "How Do Firing Costs Affect Worker Flows in a World with Adverse Selection?" *Journal of Labor Economics.* 22(3), 553–584.

Kugler, Adriana, Juan F. Jimeno and Virginia Hernanz. 2003. "Employment Consequences of Restrictive Permanent Contracts: Evidence from Spanish Labor Market Reforms." CEPR Discussion Paper No. 3724.

Lazear, Edward P. 1990. "Job Security Provisions and Employment." *Quarterly Journal of Economics.* 105(3), 699–726.

Levine, David I. 1991. "Just-Cause Employment Policies in the Presence of Worker Adverse Selection." *Journal of Labor Economics.* 9, 294–305.

Miles, Thomas J. 2000. "Common Law Exceptions to Employment at Will and U.S. Labor Markets." *Journal of Law, Economics, and Organizations.* 16(1), 74–101.

Morriss, Andrew P. 1994. "Exploding Myths: An Empirical and Economic Reassessment of the Rise of Employment-At-Will." *Missouri Law Review.* 59, 679–771.

Morriss, Andrew P. 1995. "Developing a Framework for Empirical Research on the Common Law: General Principles and Case Studies of the Decline of Employment-At-Will." *Case Western Reserve Law Review.* 45(4), Spring, 999–1148.

Mortensen, Dale T. and Christopher A. Pissarides. 1994. "Job Creation and Job Destruction in the Theory of Unemployment." *Review of Economic Studies.* 61(3), 397–415.

Pissarides, Christopher A. 2000. *Equilibrium Unemployment Theory* (Cambridge, MA: MIT Press).

Schanzenbach, Max. 2003. "Exceptions to Employment at Will: Raising Firing Costs or Enforcing Life-Cycle Contracts?" *American Law and Economics Review.* 5(2), August, 470–504.

Summers, Lawrence H. 1989. "Some Simple Economics of Mandated Benefits." *American Economic Review.* 79(2), May, 177–183.

Sutton, John R. and Frank Dobbin. 1996. "The Two Faces of Governance: Response to Legal Uncertainty in American Firms, 1955–1985." *American Journal of Sociology.* 61(5), 794–811.

## Table 1: Descriptive Statistics for LBD and ASM, 1979-1995

| Means of Variable | Covered by Exceptions | | | |
|---|---|---|---|---|
| | Good Faith | Public Policy | Implied Contract | Never Covered |
| | (1) | (2) | (3) | (4) |
| | A. LBD State-SIC2 Panel | | | |
| Employment Change | 13% | 11% | 11% | 10% |
| % Positive Change | 57% | 57% | 57% | 57% |
| Surveyed Employment | 14,067,564 | 54,688,955 | 55,364,021 | 6,327,212 |
| % Manufacturing | 26% | 29% | 28% | 21% |
| % Mining | 1% | 1% | 1% | 1% |
| % Construction | 7% | 7% | 7% | 9% |
| % Wholesale Trade | 9% | 8% | 9% | 9% |
| % Retail Trade | 26% | 26% | 26% | 29% |
| % Services | 32% | 29% | 30% | 32% |
| % in Entering Establishments | 8% | 7% | 7% | 8% |
| % in Exiting Establishements | 7% | 6% | 6% | 7% |
| % Part of Multi-Unit Firms | 53% | 56% | 55% | 53% |
| Surveyed Establishments | 813,888 | 3,077,873 | 3,163,578 | 391,296 |
| Establishment Entry Rate | 14% | 13% | 13% | 15% |
| Establishment Exit Rate | 12% | 11% | 11% | 12% |
| % Part of Multi-Unit Firms | 21% | 23% | 22% | 23% |
| Maximum States | 12 | 43 | 43 | 3 |
| | B. ASM Mfg. Plant Panel | | | |
| Plant Employment Change | 12% | 11% | 11% | 10% |
| % Positive Change | 47% | 48% | 48% | 48% |
| Plant Employment | 854 | 756 | 778 | 663 |
| % Non-Production Workers | 32% | 27% | 27% | 26% |
| % Part of Multi-Unit Firm | 98% | 98% | 98% | 97% |
| Production Worker Wage | $15.96 | $15.18 | $15.49 | $13.74 |
| Total Installed Capital (m) | $28 | $29 | $29 | $33 |
| Total Investment (m) | $1.6 | $1.6 | $1.6 | $1.8 |
| Labor Productivity (k) | $74 | $80 | $81 | $88 |
| Maximum Plants | 709 | 4,847 | 4,601 | 408 |

Table 2: Effects of Employment-at-Will Doctrines on LBD Empl. Changes, 1979-1995

| Legal Exception | State FE, SIC2 FE, YR FE | Col. 1 plus State Trends | Col. 1 plus SIC2-YR FE | Col. 1 plus State Trends, SIC2-YR FE | Col 4. Dropping AZ |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| | A. LBD Absolute Percentage Empl. Change, Full Sample | | | | |
| Good | -0.006 | -0.007 | -0.005 | -0.006 | -0.002 |
| Faith | (0.004) | (0.006) | (0.004) | (0.007) | (0.006) |
| Public | 0.001 | -0.002 | 0.002 | -0.001 | 0.000 |
| Policy | (0.002) | (0.003) | (0.002) | (0.003) | (0.002) |
| Implied | 0.000 | -0.001 | 0.001 | -0.001 | -0.001 |
| Contract | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| Obs. | 37,721 | 37,721 | 37,721 | 37,721 | 36,969 |
| | B. LBD Absolute Percentage Empl. Change, Mfg. Only | | | | |
| Good | -0.015 | -0.024 | -0.012 | -0.020 | -0.021 |
| Faith | (0.004) | (0.009) | (0.005) | (0.009) | (0.008) |
| Public | 0.007 | 0.009 | 0.007 | 0.010 | 0.010 |
| Policy | (0.004) | (0.004) | (0.003) | (0.003) | (0.003) |
| Implied | 0.002 | 0.001 | 0.003 | 0.003 | 0.003 |
| Contract | (0.004) | (0.005) | (0.003) | (0.005) | (0.005) |
| Obs. | 15,817 | 15,817 | 15,817 | 15,817 | 15,497 |

Notes: Huber-White robust standard errors clustered on state reported in parentheses.

Table 3: Effects of Employment-at-Will Doctrines on ASM Empl. Changes, 1979-1995

| Legal Exception | State FE, SIC2 FE, YR FE | | Col. 1 plus State Trends | | Col. 1 plus SIC2-YR FE | | Col. 1 plus State Trends, SIC2-YR FE | | Plant FE, YR FE | | Col. 5 plus State Trends, SIC2-YR FE | | Col 6. Dropping AZ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | | (5) | | (6) | | (7) | |
| | A. ASM Absolute Percentage Empl. Change | | | | | | | | | | | | | |
| Good Faith | -0.007 | (0.005) | -0.014 | (0.006) | -0.006 | (0.005) | -0.012 | (0.005) | -0.009 | (0.005) | -0.009 | (0.004) | -0.010 | (0.004) |
| Public Policy | 0.001 | (0.003) | -0.002 | (0.003) | -0.001 | (0.003) | -0.003 | (0.002) | 0.000 | (0.003) | -0.002 | (0.003) | -0.002 | (0.003) |
| Imp. Contract | 0.000 | (0.003) | 0.001 | (0.002) | 0.000 | (0.002) | 0.001 | (0.002) | 0.000 | (0.003) | 0.000 | (0.003) | 0.000 | (0.003) |
| | B. ASM Absolute Percentage Empl. Change: Dynamic Specification | | | | | | | | | | | | | |
| Δ GF t+2 | 0.006 | (0.015) | -0.004 | (0.020) | 0.003 | (0.014) | -0.005 | (0.020) | 0.003 | (0.016) | 0.002 | (0.014) | -0.005 | (0.014) |
| Δ GF t+1 | 0.005 | (0.010) | -0.010 | (0.022) | 0.005 | (0.010) | -0.009 | (0.024) | -0.001 | (0.008) | 0.000 | (0.015) | -0.011 | (0.012) |
| Δ GF | -0.005 | (0.008) | -0.021 | (0.023) | -0.008 | (0.009) | -0.023 | (0.024) | -0.010 | (0.008) | -0.014 | (0.015) | -0.024 | (0.014) |
| Δ GF t-1 | -0.004 | (0.009) | -0.023 | (0.022) | -0.004 | (0.010) | -0.022 | (0.024) | -0.009 | (0.009) | -0.012 | (0.014) | -0.023 | (0.012) |
| Δ GF t-2 | -0.009 | (0.009) | -0.030 | (0.024) | -0.009 | (0.010) | -0.029 | (0.026) | -0.015 | (0.009) | -0.017 | (0.016) | -0.029 | (0.012) |
| Δ GF t-3 | -0.026 | (0.008) | -0.048 | (0.023) | -0.023 | (0.009) | -0.044 | (0.024) | -0.032 | (0.008) | -0.031 | (0.014) | -0.041 | (0.011) |
| GF Lag t-4 | -0.007 | (0.010) | -0.037 | (0.023) | -0.006 | (0.011) | -0.033 | (0.025) | -0.013 | (0.010) | -0.020 | (0.015) | -0.030 | (0.012) |
| Δ PP t+2 | -0.003 | (0.005) | -0.005 | (0.006) | -0.003 | (0.004) | -0.004 | (0.005) | -0.004 | (0.005) | -0.003 | (0.005) | -0.003 | (0.005) |
| Δ PP t+1 | 0.004 | (0.003) | 0.001 | (0.004) | 0.003 | (0.003) | -0.001 | (0.004) | 0.004 | (0.003) | 0.002 | (0.003) | 0.002 | (0.003) |
| Δ PP | 0.009 | (0.003) | 0.006 | (0.005) | 0.008 | (0.003) | 0.003 | (0.005) | 0.009 | (0.003) | 0.007 | (0.003) | 0.007 | (0.003) |
| Δ PP t-1 | 0.008 | (0.004) | 0.005 | (0.005) | 0.006 | (0.004) | 0.001 | (0.005) | 0.008 | (0.004) | 0.006 | (0.004) | 0.006 | (0.004) |
| Δ PP t-2 | 0.006 | (0.005) | 0.002 | (0.005) | 0.003 | (0.004) | -0.002 | (0.005) | 0.005 | (0.005) | 0.002 | (0.004) | 0.002 | (0.004) |
| Δ PP t-3 | 0.005 | (0.004) | 0.001 | (0.005) | 0.003 | (0.004) | -0.002 | (0.005) | 0.005 | (0.004) | 0.003 | (0.004) | 0.003 | (0.004) |
| PP Lag t-4 | 0.006 | (0.005) | 0.001 | (0.006) | 0.003 | (0.004) | -0.004 | (0.005) | 0.005 | (0.005) | 0.002 | (0.004) | 0.002 | (0.004) |
| Δ IC t+2 | 0.004 | (0.004) | 0.005 | (0.004) | 0.004 | (0.003) | 0.004 | (0.004) | 0.004 | (0.003) | 0.003 | (0.004) | 0.003 | (0.004) |
| Δ IC t+1 | 0.000 | (0.003) | -0.001 | (0.004) | 0.000 | (0.003) | 0.000 | (0.003) | 0.000 | (0.003) | 0.000 | (0.003) | 0.000 | (0.003) |
| Δ IC | 0.005 | (0.005) | 0.004 | (0.005) | 0.005 | (0.004) | 0.005 | (0.005) | 0.005 | (0.005) | 0.004 | (0.005) | 0.004 | (0.005) |
| Δ IC t-1 | 0.004 | (0.005) | 0.002 | (0.006) | 0.003 | (0.004) | 0.002 | (0.005) | 0.004 | (0.005) | 0.001 | (0.005) | 0.001 | (0.005) |
| Δ IC t-2 | 0.008 | (0.005) | 0.005 | (0.006) | 0.009 | (0.004) | 0.008 | (0.005) | 0.008 | (0.005) | 0.007 | (0.004) | 0.007 | (0.004) |
| Δ IC t-3 | 0.004 | (0.004) | 0.001 | (0.006) | 0.004 | (0.004) | 0.002 | (0.005) | 0.004 | (0.004) | 0.001 | (0.004) | 0.001 | (0.004) |
| IC Lag t-4 | -0.003 | (0.005) | -0.006 | (0.006) | -0.001 | (0.004) | -0.004 | (0.006) | -0.003 | (0.005) | -0.004 | (0.004) | -0.004 | (0.004) |
| Obs. | 96,287 | | 96,287 | | 96,287 | | 96,287 | | 96,287 | | 96,287 | | 95,964 | |

Notes: Huber-White robust standard errors clustered on state reported in parentheses.

Table 4: Effects of Employment-at-Will Doctrines on LBD Plant Counts, 1978-1997

| Legal Exception | State FE, SIC2 FE, YR FE | Col. 1 plus State Trends | Col. 1 plus SIC2-YR FE | Col. 1 plus State Trends, SIC2-YR FE | Col. 4 Dropping AZ |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| | | | A. LBD Mfg. Log Count of All Plants | | |
| Good Faith | 0.027 | 0.026 | 0.003 | 0.020 | 0.022 |
| | (0.023) | (0.013) | (0.032) | (0.026) | (0.028) |
| Public Policy | 0.061 | 0.008 | 0.068 | 0.006 | 0.006 |
| | (0.021) | (0.006) | (0.026) | (0.023) | (0.024) |
| Implied Contract | -0.012 | -0.017 | -0.019 | -0.017 | -0.018 |
| | (0.019) | (0.007) | (0.025) | (0.016) | (0.016) |
| Obs. | 3,911 | 3,911 | 3,911 | 3,911 | 3,832 |
| | | | B. LBD Mfg. Log Count of Continuing Plants | | |
| Good Faith | 0.047 | 0.040 | 0.021 | 0.035 | 0.037 |
| | (0.027) | (0.015) | (0.036) | (0.027) | (0.029) |
| Public Policy | 0.068 | 0.008 | 0.076 | 0.007 | 0.007 |
| | (0.024) | (0.007) | (0.029) | (0.024) | (0.024) |
| Implied Contract | -0.013 | -0.015 | -0.021 | -0.015 | -0.016 |
| | (0.022) | (0.008) | (0.027) | (0.017) | (0.017) |
| Obs. | 3,891 | 3,891 | 3,891 | 3,891 | 3,813 |
| | | | C. LBD Mfg. Log Count of Entering Plants | | |
| Good Faith | -0.117 | -0.068 | -0.131 | -0.077 | -0.078 |
| | (0.031) | (0.028) | (0.032) | (0.034) | (0.035) |
| Public Policy | 0.016 | -0.011 | 0.015 | -0.019 | -0.019 |
| | (0.028) | (0.028) | (0.030) | (0.033) | (0.033) |
| Implied Contract | -0.021 | -0.030 | -0.016 | -0.030 | -0.028 |
| | (0.024) | (0.031) | (0.028) | (0.034) | (0.034) |
| Obs. | 3,846 | 3,846 | 3,846 | 3,846 | 3,767 |
| | | | D. LBD Mfg. Log Count of Exiting Plants | | |
| Good Faith | 0.011 | 0.005 | -0.012 | -0.002 | 0.004 |
| | (0.026) | (0.034) | (0.029) | (0.043) | (0.046) |
| Public Policy | 0.063 | 0.048 | 0.068 | 0.042 | 0.044 |
| | (0.018) | (0.022) | (0.023) | (0.032) | (0.032) |
| Implied Contract | -0.006 | -0.022 | -0.009 | -0.021 | -0.021 |
| | (0.020) | (0.022) | (0.023) | (0.025) | (0.025) |
| Obs. | 3,862 | 3,862 | 3,862 | 3,862 | 3,783 |

Notes: Five-year blocks. Huber-White robust standard errors clustered on state-year reported in parentheses.

Table 5: Effects of Employment-at-Will Doctrines on
ASM Empl. Levels, 1979-1995

| Legal Exception | State FE, SIC2 FE, YR FE | Col. 1 plus State Trends | Col. 1 plus SIC2-YR FE | Col. 1 plus State Trends, SIC2-YR FE | Plant FE, YR FE | Col. 5 plus State Trends, SIC2-YR FE | Col. 6. Dropping AZ |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| | | | A. ASM Log Total Empl. | | | | |
| Good | 0.023 | 0.049 | 0.013 | 0.042 | 0.030 | 0.028 | 0.029 |
| Faith | (0.026) | (0.031) | (0.022) | (0.028) | (0.025) | (0.019) | (0.020) |
| Public | 0.014 | -0.002 | 0.013 | 0.001 | 0.013 | 0.009 | 0.009 |
| Policy | (0.014) | (0.011) | (0.012) | (0.010) | (0.015) | (0.011) | (0.011) |
| Implied | -0.012 | -0.006 | -0.004 | -0.002 | -0.013 | -0.007 | -0.006 |
| Contract | (0.014) | (0.010) | (0.012) | (0.009) | (0.014) | (0.010) | (0.010) |
| Obs. | 96,310 | 96,310 | 96,310 | 96,310 | 96,310 | 96,310 | 95,987 |
| | | | B. ASM Log Production Worker Empl. | | | | |
| Good | 0.001 | 0.060 | -0.008 | 0.051 | 0.003 | 0.019 | 0.022 |
| Faith | (0.027) | (0.034) | (0.022) | (0.030) | (0.026) | (0.018) | (0.018) |
| Public | 0.018 | -0.002 | 0.015 | 0.002 | 0.018 | 0.013 | 0.014 |
| Policy | (0.015) | (0.010) | (0.013) | (0.009) | (0.015) | (0.012) | (0.012) |
| Implied | -0.010 | -0.007 | 0.001 | -0.001 | -0.010 | -0.004 | -0.004 |
| Contract | (0.016) | (0.010) | (0.013) | (0.009) | (0.016) | (0.010) | (0.010) |
| Obs. | 96,276 | 96,276 | 96,276 | 96,276 | 96,276 | 96,276 | 95,953 |
| | | | C. ASM Log Non-Production Worker Empl. | | | | |
| Good | 0.047 | 0.054 | 0.036 | 0.052 | 0.060 | 0.054 | 0.055 |
| Faith | (0.029) | (0.020) | (0.028) | (0.018) | (0.032) | (0.024) | (0.024) |
| Public | 0.008 | -0.007 | 0.012 | -0.001 | 0.004 | 0.002 | 0.002 |
| Policy | (0.015) | (0.012) | (0.013) | (0.011) | (0.015) | (0.011) | (0.011) |
| Implied | -0.015 | -0.001 | -0.010 | 0.001 | -0.018 | -0.006 | -0.006 |
| Contract | (0.013) | (0.011) | (0.012) | (0.011) | (0.014) | (0.011) | (0.011) |
| Obs. | 95,850 | 95,850 | 95,850 | 95,850 | 95,850 | 95,850 | 95,528 |

Notes: Huber-White robust standard errors clustered on state reported in parentheses.

Table 6: Effects of Employment-at-Will Doctrines on
LBD Empl. Levels, 1978-1997

| Legal Exception | State FE, SIC2 FE, YR FE | Col. 1 plus State Trends | Col. 1 plus SIC2-YR FE | Col. 1 plus State Trends, SIC2-YR FE | Col. 4 Dropping AZ |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| | A. LBD Mfg. Log Empl. in All Plants | | | | |
| Good Faith | 0.061<br>(0.044) | 0.092<br>(0.028) | 0.045<br>(0.053) | 0.078<br>(0.044) | 0.085<br>(0.047) |
| Public Policy | 0.066<br>(0.025) | 0.015<br>(0.016) | 0.064<br>(0.031) | 0.011<br>(0.032) | 0.013<br>(0.033) |
| Implied Contract | -0.027<br>(0.028) | -0.009<br>(0.018) | -0.032<br>(0.033) | -0.012<br>(0.027) | -0.014<br>(0.027) |
| Obs. | 3,911 | 3,911 | 3,911 | 3,911 | 3,832 |
| | B. LBD Mfg. Log Empl. in Continuing Plants | | | | |
| Good Faith | 0.067<br>(0.045) | 0.096<br>(0.029) | 0.051<br>(0.054) | 0.083<br>(0.044) | 0.087<br>(0.046) |
| Public Policy | 0.067<br>(0.026) | 0.008<br>(0.016) | 0.065<br>(0.032) | 0.005<br>(0.032) | 0.007<br>(0.033) |
| Implied Contract | -0.030<br>(0.028) | -0.015<br>(0.018) | -0.034<br>(0.033) | -0.017<br>(0.028) | -0.019<br>(0.027) |
| Obs. | 3,891 | 3,891 | 3,891 | 3,891 | 3,813 |
| | C. LBD Mfg. Log Empl. in Entering Plants | | | | |
| Good Faith | -0.004<br>(0.048) | 0.014<br>(0.056) | -0.023<br>(0.053) | -0.001<br>(0.068) | 0.024<br>(0.071) |
| Public Policy | 0.035<br>(0.046) | 0.127<br>(0.047) | 0.029<br>(0.047) | 0.106<br>(0.052) | 0.113<br>(0.052) |
| Implied Contract | 0.021<br>(0.045) | 0.123<br>(0.058) | 0.020<br>(0.046) | 0.113<br>(0.056) | 0.109<br>(0.057) |
| Obs. | 3,846 | 3,846 | 3,846 | 3,846 | 3,767 |
| | D. LBD Mfg. Log Empl. in Exiting Plants | | | | |
| Good Faith | 0.073<br>(0.048) | 0.075<br>(0.093) | 0.048<br>(0.056) | 0.066<br>(0.112) | 0.107<br>(0.118) |
| Public Policy | 0.080<br>(0.038) | 0.140<br>(0.050) | 0.070<br>(0.040) | 0.111<br>(0.056) | 0.124<br>(0.056) |
| Implied Contract | 0.019<br>(0.040) | 0.133<br>(0.044) | 0.016<br>(0.044) | 0.124<br>(0.045) | 0.121<br>(0.045) |
| Obs. | 3,862 | 3,862 | 3,862 | 3,862 | 3,783 |

Notes: Five-year blocks. Huber-White robust standard errors clustered on state-year reported in parentheses.

Table 7: Effects of Employment-at-Will Doctrines on ASM Capital Investment, 1979-1995

| Legal Exception | State FE, SIC2 FE, YR FE | Col. 1 plus State Trends | Col. 1 plus SIC2-YR FE | Col. 1 plus State Trends, SIC2-YR FE | Plant FE, YR FE | Col. 5 plus State Trends, SIC2-YR FE | Col. 6. Dropping AZ |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| | | | | A. ASM Log Total Capital Investment | | | |
| Good Faith | 0.066<br>(0.045) | 0.090<br>(0.044) | 0.066<br>(0.042) | 0.078<br>(0.040) | 0.075<br>(0.048) | 0.068<br>(0.036) | 0.078<br>(0.034) |
| Public Policy | 0.017<br>(0.029) | 0.012<br>(0.032) | 0.016<br>(0.029) | 0.023<br>(0.027) | 0.027<br>(0.029) | 0.039<br>(0.030) | 0.041<br>(0.031) |
| Implied Contract | 0.016<br>(0.026) | 0.030<br>(0.030) | 0.021<br>(0.026) | 0.029<br>(0.028) | 0.013<br>(0.027) | 0.007<br>(0.028) | 0.008<br>(0.028) |
| Obs. | 96,310 | 96,310 | 96,310 | 96,310 | 96,310 | 96,310 | 95,987 |
| | | | | B. ASM Log Total Capital-Labor Ratio | | | |
| Good Faith | 0.058<br>(0.029) | -0.002<br>(0.018) | 0.042<br>(0.023) | -0.001<br>(0.020) | 0.043<br>(0.030) | 0.031<br>(0.025) | 0.030<br>(0.026) |
| Public Policy | -0.028<br>(0.017) | -0.001<br>(0.010) | -0.023<br>(0.013) | -0.004<br>(0.009) | -0.027<br>(0.017) | -0.010<br>(0.009) | -0.010<br>(0.010) |
| Implied Contract | 0.020<br>(0.018) | 0.007<br>(0.009) | 0.009<br>(0.014) | 0.003<br>(0.010) | 0.017<br>(0.018) | 0.008<br>(0.008) | 0.007<br>(0.008) |
| Obs. | 84,414 | 84,414 | 84,414 | 84,414 | 84,414 | 84,414 | 84,176 |

Notes: Huber-White robust standard errors clustered on state reported in parentheses.

Table 8: Effects of Employment-at-Will Doctrines on
ASM Capital Returns, Labor Productivity, and Production Worker Wages, 1979-1995

| Legal Exception | State FE, SIC2 FE, YR FE | Col. 1 plus State Trends | Col. 1 plus SIC2-YR FE | Col. 1 plus State Trends, SIC2-YR FE | Plant FE, YR FE | Col. 5 plus State Trends, SIC2-YR FE | Col. 6. Dropping AZ |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| | A. ASM Return on Capital using Value-Added (with trimmed tails) | | | | | | |
| Good Faith | -0.051 | -0.007 | -0.041 | -0.013 | -0.046 | -0.037 | -0.038 |
| | (0.025) | (0.049) | (0.023) | (0.042) | (0.022) | (0.029) | (0.030) |
| Public Policy | 0.022 | 0.001 | 0.021 | 0.007 | 0.021 | 0.014 | 0.014 |
| | (0.014) | (0.013) | (0.014) | (0.012) | (0.015) | (0.015) | (0.015) |
| Implied Contract | -0.011 | -0.001 | -0.006 | -0.004 | -0.017 | -0.010 | -0.010 |
| | (0.015) | (0.013) | (0.014) | (0.014) | (0.015) | (0.014) | (0.014) |
| Obs. | 78,823 | 78,823 | 78,823 | 78,823 | 78,823 | 78,823 | 78,609 |
| | B. ASM Log Labor Productivity | | | | | | |
| Good Faith | 0.039 | 0.006 | 0.040 | 0.009 | 0.027 | 0.035 | 0.038 |
| | (0.015) | (0.007) | (0.015) | (0.007) | (0.016) | (0.010) | (0.009) |
| Public Policy | 0.003 | 0.006 | 0.002 | 0.007 | 0.004 | 0.003 | 0.004 |
| | (0.008) | (0.005) | (0.007) | (0.005) | (0.009) | (0.008) | (0.008) |
| Implied Contract | 0.000 | 0.007 | 0.000 | 0.008 | -0.001 | -0.002 | -0.001 |
| | (0.008) | (0.007) | (0.008) | (0.006) | (0.008) | (0.007) | (0.007) |
| Obs. | 96,308 | 96,308 | 96,308 | 96,308 | 96,308 | 96,308 | 95,985 |
| | B. ASM Log Production Worker Wages | | | | | | |
| Good Faith | 0.013 | 0.017 | 0.009 | 0.015 | 0.014 | 0.015 | 0.016 |
| | (0.016) | (0.006) | (0.014) | (0.006) | (0.016) | (0.006) | (0.005) |
| Public Policy | -0.002 | 0.001 | -0.003 | -0.001 | -0.001 | 0.002 | 0.002 |
| | (0.007) | (0.004) | (0.007) | (0.004) | (0.007) | (0.006) | (0.006) |
| Implied Contract | 0.005 | 0.005 | 0.004 | 0.005 | 0.005 | 0.000 | 0.001 |
| | (0.007) | (0.003) | (0.007) | (0.004) | (0.008) | (0.006) | (0.006) |
| Obs. | 96,310 | 96,310 | 96,310 | 96,310 | 96,310 | 96,310 | 95,987 |

Notes: Huber-White robust standard errors clustered on state reported in parentheses.

Table 9: Effects of Employment-at-Will Doctrines on ASM Establishment Productivity, 1979-1995

| Legal Exception | State FE, SIC2 FE, YR FE | Col. 1 plus State Trends | Col. 1 plus SIC2-YR FE | Col. 1 plus State Trends, SIC2-YR FE | Plant FE, YR FE | Col. 5 plus State Trends, SIC2-YR FE | Col. 6. Dropping AZ |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Good Faith | -0.029<br>(0.013) | -0.023<br>(0.008) | -0.030<br>(0.014) | -0.023<br>(0.009) | -0.021<br>(0.014) | -0.014<br>(0.009) | -0.016<br>(0.009) |
| Public Policy | 0.009<br>(0.009) | 0.005<br>(0.006) | 0.008<br>(0.010) | 0.004<br>(0.006) | 0.006<br>(0.010) | 0.002<br>(0.010) | 0.002<br>(0.010) |
| Implied Contract | -0.005<br>(0.009) | -0.002<br>(0.009) | -0.004<br>(0.009) | -0.002<br>(0.009) | -0.004<br>(0.009) | -0.009<br>(0.010) | -0.008<br>(0.010) |
| Obs. | 78,662 | 78,662 | 78,662 | 78,662 | 78,662 | 78,662 | 78,477 |

Notes: Huber-White robust standard errors clustered on state reported in parentheses. TFP is the establishment-level residual from a regression of value-added on four factors of production (production employment, non-production employment, equipment and structures).

## App. Table 1: Dynamic Effects of Employment-at-Will Doctrines on LBD Mfg. Empl. Changes, 1979-1995

| Legal Exception | State FE, SIC2 FE, YR FE | | Col. 1 plus State Trends | | Col. 1 plus SIC2-YR FE | | Col. 1 plus State Trends, SIC2-YR FE | | Col. 4 Dropping AZ | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | | (5) | |
| Δ GF t+2 | 0.024 | (0.030) | 0.024 | (0.032) | 0.019 | (0.029) | 0.022 | (0.030) | 0.025 | (0.044) |
| Δ GF t+1 | 0.019 | (0.038) | 0.018 | (0.039) | 0.015 | (0.031) | 0.017 | (0.032) | 0.029 | (0.045) |
| Δ GF | 0.006 | (0.015) | 0.018 | (0.020) | 0.001 | (0.015) | 0.017 | (0.018) | 0.023 | (0.030) |
| Δ GF t-1 | -0.010 | (0.015) | 0.000 | (0.020) | -0.009 | (0.015) | 0.004 | (0.020) | 0.010 | (0.032) |
| Δ GF t-2 | 0.003 | (0.015) | 0.012 | (0.020) | 0.002 | (0.015) | 0.015 | (0.019) | 0.019 | (0.031) |
| Δ GF t-3 | -0.029 | (0.016) | -0.023 | (0.023) | -0.028 | (0.015) | -0.017 | (0.021) | -0.017 | (0.032) |
| GF Lag t-4 | -0.004 | (0.015) | -0.009 | (0.022) | -0.005 | (0.015) | -0.006 | (0.021) | -0.001 | (0.032) |
| Δ PP t+2 | 0.002 | (0.009) | 0.004 | (0.010) | 0.001 | (0.009) | 0.003 | (0.010) | 0.002 | (0.010) |
| Δ PP t+1 | 0.018 | (0.013) | 0.023 | (0.013) | 0.018 | (0.012) | 0.023 | (0.013) | 0.023 | (0.013) |
| Δ PP | 0.004 | (0.006) | 0.012 | (0.008) | 0.002 | (0.006) | 0.009 | (0.009) | 0.010 | (0.009) |
| Δ PP t-1 | 0.008 | (0.006) | 0.017 | (0.009) | 0.009 | (0.006) | 0.016 | (0.009) | 0.017 | (0.009) |
| Δ PP t-2 | 0.007 | (0.007) | 0.015 | (0.010) | 0.006 | (0.008) | 0.014 | (0.011) | 0.014 | (0.010) |
| Δ PP t-3 | 0.007 | (0.008) | 0.014 | (0.011) | 0.006 | (0.008) | 0.013 | (0.011) | 0.012 | (0.011) |
| PP Lag t-4 | 0.012 | (0.006) | 0.022 | (0.010) | 0.010 | (0.006) | 0.019 | (0.011) | 0.020 | (0.011) |
| Δ IC t+2 | 0.010 | (0.006) | 0.012 | (0.006) | 0.009 | (0.005) | 0.011 | (0.005) | 0.013 | (0.005) |
| Δ IC t+1 | 0.008 | (0.006) | 0.009 | (0.007) | 0.009 | (0.006) | 0.009 | (0.007) | 0.009 | (0.007) |
| Δ IC | 0.009 | (0.009) | 0.009 | (0.007) | 0.008 | (0.007) | 0.007 | (0.006) | 0.008 | (0.006) |
| Δ IC t-1 | 0.004 | (0.006) | 0.002 | (0.006) | 0.006 | (0.006) | 0.004 | (0.006) | 0.005 | (0.006) |
| Δ IC t-2 | 0.013 | (0.007) | 0.012 | (0.008) | 0.016 | (0.007) | 0.015 | (0.008) | 0.016 | (0.008) |
| Δ IC t-3 | 0.012 | (0.007) | 0.012 | (0.009) | 0.011 | (0.007) | 0.011 | (0.009) | 0.012 | (0.009) |
| IC Lag t-4 | 0.005 | (0.005) | 0.005 | (0.010) | 0.005 | (0.005) | 0.006 | (0.009) | 0.006 | (0.009) |
| Obs. | 15,044 | | 15,044 | | 15,044 | | 15,044 | | 14,724 | |

Notes: Huber-White robust standard errors clustered on state reported in parentheses.

App. Table 2: Dynamic Effects of Employment-at-Will Doctrines on ASM Log Empl. Levels, 1979-1995

| Legal Exception | State FE, SIC2 FE, YR FE | | Col. 1 plus State Trends | | Col. 1 plus SIC2-YR FE | | Col. 1 plus State Trends, SIC2-YR FE | | Plant FE, YR FE | | Col. 5 plus State Trends, SIC2-YR FE | | Col. 6 Dropping AZ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | | (5) | | (6) | | (7) | |
| Δ GF t+2 | -0.005 | (0.019) | 0.000 | (0.012) | -0.010 | (0.014) | 0.008 | (0.011) | 0.023 | (0.022) | 0.004 | (0.017) | -0.008 | (0.012) |
| Δ GF t+1 | 0.009 | (0.029) | -0.023 | (0.021) | -0.006 | (0.025) | -0.012 | (0.024) | 0.029 | (0.027) | -0.025 | (0.017) | -0.024 | (0.019) |
| Δ GF | 0.046 | (0.030) | 0.026 | (0.022) | 0.033 | (0.025) | 0.038 | (0.026) | 0.066 | (0.029) | 0.015 | (0.017) | 0.017 | (0.018) |
| Δ GF t-1 | 0.050 | (0.031) | 0.043 | (0.024) | 0.034 | (0.026) | 0.051 | (0.027) | 0.072 | (0.031) | 0.021 | (0.018) | 0.024 | (0.021) |
| Δ GF t-2 | 0.065 | (0.033) | 0.062 | (0.027) | 0.047 | (0.030) | 0.069 | (0.030) | 0.086 | (0.030) | 0.024 | (0.022) | 0.027 | (0.024) |
| Δ GF t-3 | 0.092 | (0.035) | 0.097 | (0.026) | 0.071 | (0.029) | 0.101 | (0.032) | 0.115 | (0.033) | 0.053 | (0.025) | 0.058 | (0.026) |
| GF Lag t-4 | 0.058 | (0.042) | 0.145 | (0.032) | 0.037 | (0.038) | 0.140 | (0.035) | 0.079 | (0.040) | 0.049 | (0.028) | 0.052 | (0.029) |
| Δ PP t+2 | 0.012 | (0.015) | -0.006 | (0.013) | 0.008 | (0.011) | -0.008 | (0.011) | 0.016 | (0.015) | 0.011 | (0.011) | 0.010 | (0.011) |
| Δ PP t+1 | 0.011 | (0.015) | -0.019 | (0.015) | 0.000 | (0.011) | -0.025 | (0.011) | 0.015 | (0.015) | 0.001 | (0.012) | 0.001 | (0.012) |
| Δ PP | 0.017 | (0.019) | -0.026 | (0.015) | 0.007 | (0.016) | -0.026 | (0.012) | 0.019 | (0.018) | 0.006 | (0.015) | 0.006 | (0.015) |
| Δ PP t-1 | 0.020 | (0.019) | -0.029 | (0.014) | 0.011 | (0.015) | -0.027 | (0.011) | 0.022 | (0.018) | 0.010 | (0.015) | 0.010 | (0.015) |
| Δ PP t-2 | 0.026 | (0.019) | -0.025 | (0.016) | 0.016 | (0.016) | -0.024 | (0.012) | 0.028 | (0.019) | 0.014 | (0.016) | 0.014 | (0.016) |
| Δ PP t-3 | 0.028 | (0.021) | -0.029 | (0.019) | 0.018 | (0.018) | -0.024 | (0.016) | 0.030 | (0.022) | 0.018 | (0.019) | 0.018 | (0.019) |
| PP Lag t-4 | 0.032 | (0.026) | -0.040 | (0.022) | 0.023 | (0.023) | -0.028 | (0.019) | 0.034 | (0.026) | 0.028 | (0.021) | 0.028 | (0.022) |
| Δ IC t+2 | -0.008 | (0.011) | -0.004 | (0.009) | -0.003 | (0.010) | -0.001 | (0.009) | -0.008 | (0.011) | -0.009 | (0.008) | -0.009 | (0.008) |
| Δ IC t+1 | -0.013 | (0.014) | -0.007 | (0.013) | -0.006 | (0.012) | -0.003 | (0.012) | -0.010 | (0.014) | -0.012 | (0.011) | -0.013 | (0.011) |
| Δ IC | -0.019 | (0.017) | -0.010 | (0.018) | -0.011 | (0.016) | -0.006 | (0.016) | -0.017 | (0.017) | -0.019 | (0.013) | -0.020 | (0.013) |
| Δ IC t-1 | -0.027 | (0.021) | -0.010 | (0.022) | -0.013 | (0.019) | -0.001 | (0.019) | -0.026 | (0.021) | -0.020 | (0.017) | -0.020 | (0.017) |
| Δ IC t-2 | -0.027 | (0.022) | -0.009 | (0.025) | -0.014 | (0.020) | -0.003 | (0.022) | -0.025 | (0.022) | -0.021 | (0.019) | -0.022 | (0.019) |
| Δ IC t-3 | -0.023 | (0.025) | -0.002 | (0.027) | -0.007 | (0.022) | 0.006 | (0.024) | -0.021 | (0.025) | -0.016 | (0.021) | -0.016 | (0.021) |
| IC Lag t-4 | -0.021 | (0.028) | 0.001 | (0.030) | -0.007 | (0.025) | 0.009 | (0.027) | -0.020 | (0.028) | -0.015 | (0.023) | -0.015 | (0.023) |
| Obs. | 96,310 | | 96,310 | | 96,310 | | 96,310 | | 96,310 | | 96,310 | | 95,987 | |

Notes: Huber-White robust standard errors clustered on state reported in parentheses.

App. Table 3: Dynamic Effects of Employment-at-Will Doctrines on LBD Mfg. Empl. Levels, 1979-1995

| Legal Exception | State FE, SIC2 FE, YR FE | | Col. 1 plus State Trends | | Col. 1 plus SIC2-YR FE | | Col. 1 plus State Trends, SIC2-YR FE | | Col. 4 Dropping AZ | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | | (5) | |
| Δ GF t+2 | 0.039 | (0.037) | 0.076 | (0.039) | 0.006 | (0.040) | 0.047 | (0.038) | 0.005 | (0.027) |
| Δ GF t+1 | -0.011 | (0.068) | 0.022 | (0.073) | -0.023 | (0.072) | 0.012 | (0.066) | -0.073 | (0.037) |
| Δ GF | 0.052 | (0.069) | 0.097 | (0.074) | 0.036 | (0.071) | 0.081 | (0.066) | -0.001 | (0.043) |
| Δ GF t-1 | 0.042 | (0.071) | 0.103 | (0.078) | 0.024 | (0.074) | 0.085 | (0.071) | 0.000 | (0.048) |
| Δ GF t-2 | 0.115 | (0.069) | 0.149 | (0.079) | 0.097 | (0.076) | 0.128 | (0.074) | 0.041 | (0.049) |
| Δ GF t-3 | 0.137 | (0.067) | 0.175 | (0.076) | 0.102 | (0.075) | 0.137 | (0.074) | 0.056 | (0.056) |
| GF Lag t-4 | 0.124 | (0.079) | 0.237 | (0.080) | 0.089 | (0.084) | 0.194 | (0.078) | 0.116 | (0.062) |
| Δ PP t+2 | 0.047 | (0.032) | -0.006 | (0.029) | 0.053 | (0.032) | -0.003 | (0.026) | -0.003 | (0.026) |
| Δ PP t+1 | 0.100 | (0.026) | -0.014 | (0.028) | 0.101 | (0.028) | -0.018 | (0.022) | -0.019 | (0.023) |
| Δ PP | 0.116 | (0.034) | -0.020 | (0.028) | 0.124 | (0.036) | -0.019 | (0.023) | -0.018 | (0.024) |
| Δ PP t-1 | 0.118 | (0.035) | -0.031 | (0.028) | 0.124 | (0.036) | -0.031 | (0.022) | -0.031 | (0.023) |
| Δ PP t-2 | 0.119 | (0.037) | -0.036 | (0.031) | 0.122 | (0.038) | -0.038 | (0.025) | -0.039 | (0.025) |
| Δ PP t-3 | 0.140 | (0.037) | -0.023 | (0.034) | 0.140 | (0.039) | -0.029 | (0.030) | -0.028 | (0.030) |
| PP Lag t-4 | 0.153 | (0.049) | -0.052 | (0.047) | 0.158 | (0.053) | -0.050 | (0.041) | -0.048 | (0.041) |
| Δ IC t+2 | -0.013 | (0.021) | -0.002 | (0.015) | -0.011 | (0.023) | -0.004 | (0.016) | -0.006 | (0.016) |
| Δ IC t+1 | -0.030 | (0.029) | -0.009 | (0.024) | -0.027 | (0.031) | -0.009 | (0.023) | -0.011 | (0.023) |
| Δ IC | -0.043 | (0.033) | -0.016 | (0.030) | -0.041 | (0.036) | -0.019 | (0.029) | -0.021 | (0.029) |
| Δ IC t-1 | -0.049 | (0.041) | -0.009 | (0.040) | -0.049 | (0.044) | -0.013 | (0.036) | -0.018 | (0.036) |
| Δ IC t-2 | -0.068 | (0.049) | -0.021 | (0.048) | -0.067 | (0.051) | -0.024 | (0.044) | -0.027 | (0.044) |
| Δ IC t-3 | -0.077 | (0.054) | -0.029 | (0.052) | -0.076 | (0.056) | -0.032 | (0.048) | -0.037 | (0.049) |
| IC Lag t-4 | -0.062 | (0.063) | -0.014 | (0.061) | -0.068 | (0.065) | -0.019 | (0.056) | -0.025 | (0.057) |
| Obs. | 16,180 | | 16,180 | | 16,180 | | 16,180 | | 15,849 | |

Notes: Huber-White robust standard errors clustered on state reported in parentheses.

## App. Table 4: Dynamic Effects of Employment-at-Will Doctrines on ASM Log Capital Investment, 1979-1995

| Legal Exception | State FE, SIC2 FE, YR FE | | Col. 1 plus State Trends | | Col. 1 plus SIC2-YR FE | | Col. 1 plus State Trends, SIC2-YR FE | | Plant FE, YR FE | | Col. 5 plus State Trends, SIC2-YR FE | | Col. 6 Dropping AZ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | | (5) | | (6) | | (7) | |
| Δ GF t+2 | -0.243 | (0.118) | -0.248 | (0.149) | -0.252 | (0.113) | -0.267 | (0.142) | -0.207 | (0.120) | -0.269 | (0.119) | -0.307 | (0.123) |
| Δ GF t+1 | -0.046 | (0.143) | -0.055 | (0.181) | -0.053 | (0.129) | -0.078 | (0.172) | -0.006 | (0.137) | -0.068 | (0.127) | -0.046 | (0.137) |
| Δ GF | -0.027 | (0.144) | -0.023 | (0.183) | -0.034 | (0.129) | -0.052 | (0.175) | 0.011 | (0.136) | -0.049 | (0.127) | -0.021 | (0.135) |
| Δ GF t-1 | -0.062 | (0.152) | -0.042 | (0.188) | -0.061 | (0.135) | -0.069 | (0.179) | -0.022 | (0.142) | -0.073 | (0.129) | -0.046 | (0.136) |
| Δ GF t-2 | 0.042 | (0.168) | 0.091 | (0.186) | 0.048 | (0.150) | 0.060 | (0.179) | 0.084 | (0.157) | 0.034 | (0.125) | 0.076 | (0.127) |
| Δ GF t-3 | 0.064 | (0.167) | 0.127 | (0.194) | 0.070 | (0.151) | 0.091 | (0.188) | 0.109 | (0.165) | 0.063 | (0.137) | 0.115 | (0.137) |
| GF Lag t-4 | 0.048 | (0.158) | 0.191 | (0.192) | 0.043 | (0.141) | 0.114 | (0.181) | 0.091 | (0.155) | 0.054 | (0.125) | 0.086 | (0.131) |
| Δ PP t+2 | 0.011 | (0.038) | 0.006 | (0.035) | -0.019 | (0.034) | -0.016 | (0.031) | 0.021 | (0.039) | -0.001 | (0.034) | -0.002 | (0.034) |
| Δ PP t+1 | 0.027 | (0.033) | 0.029 | (0.041) | 0.008 | (0.034) | 0.033 | (0.037) | 0.040 | (0.032) | 0.040 | (0.035) | 0.039 | (0.035) |
| Δ PP | 0.000 | (0.033) | 0.001 | (0.049) | -0.017 | (0.036) | 0.018 | (0.046) | 0.013 | (0.034) | 0.019 | (0.036) | 0.019 | (0.036) |
| Δ PP t-1 | 0.010 | (0.041) | 0.003 | (0.059) | -0.004 | (0.042) | 0.028 | (0.053) | 0.022 | (0.041) | 0.034 | (0.046) | 0.034 | (0.046) |
| Δ PP t-2 | -0.008 | (0.052) | -0.016 | (0.068) | -0.028 | (0.051) | 0.004 | (0.064) | 0.006 | (0.052) | 0.022 | (0.053) | 0.023 | (0.053) |
| Δ PP t-3 | 0.047 | (0.042) | 0.033 | (0.060) | 0.026 | (0.047) | 0.056 | (0.056) | 0.066 | (0.044) | 0.086 | (0.053) | 0.088 | (0.053) |
| PP Lag t-4 | 0.050 | (0.046) | 0.024 | (0.071) | 0.027 | (0.055) | 0.059 | (0.067) | 0.072 | (0.046) | 0.103 | (0.057) | 0.102 | (0.057) |
| Δ IC t+2 | -0.030 | (0.028) | -0.032 | (0.035) | -0.017 | (0.025) | -0.019 | (0.032) | -0.029 | (0.028) | -0.027 | (0.028) | -0.028 | (0.027) |
| Δ IC t+1 | -0.021 | (0.036) | -0.025 | (0.048) | -0.005 | (0.032) | -0.011 | (0.043) | -0.018 | (0.037) | -0.019 | (0.035) | -0.021 | (0.035) |
| Δ IC | -0.039 | (0.041) | -0.040 | (0.058) | -0.028 | (0.038) | -0.034 | (0.054) | -0.037 | (0.041) | -0.044 | (0.042) | -0.045 | (0.042) |
| Δ IC t-1 | 0.006 | (0.048) | 0.009 | (0.065) | 0.028 | (0.042) | 0.022 | (0.060) | 0.005 | (0.048) | 0.006 | (0.049) | 0.005 | (0.050) |
| Δ IC t-2 | -0.028 | (0.048) | -0.022 | (0.071) | -0.013 | (0.043) | -0.018 | (0.065) | -0.029 | (0.050) | -0.042 | (0.047) | -0.042 | (0.047) |
| Δ IC t-3 | -0.020 | (0.049) | -0.015 | (0.078) | -0.007 | (0.046) | -0.013 | (0.073) | -0.022 | (0.050) | -0.041 | (0.051) | -0.041 | (0.052) |
| IC Lag t-4 | -0.018 | (0.047) | -0.013 | (0.090) | 0.001 | (0.047) | -0.011 | (0.085) | -0.020 | (0.048) | -0.047 | (0.059) | -0.045 | (0.059) |
| Obs. | 96,310 | | 96,310 | | 96,310 | | 96,310 | | 96,310 | | 96,310 | | 95,987 | |

Notes: Huber-White robust standard errors clustered on state reported in parentheses.

## App. Table 5: Dynamic Effects of Employment-at-Will Doctrines on ASM Log Capital-Labor Ratio, 1979-1995

| Legal Exception | State FE, SIC2 FE, YR FE | | Col. 1 plus State Trends | | Col. 1 plus SIC2-YR FE | | Col. 1 plus State Trends, SIC2-YR FE | | Plant FE, YR FE | | Col. 5 plus State Trends, SIC2-YR FE | | Col. 6 Dropping AZ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | | (5) | | (6) | | (7) | |
| Δ GF t+2 | 0.061 | (0.019) | 0.057 | (0.028) | 0.045 | (0.014) | 0.037 | (0.026) | 0.029 | (0.022) | 0.021 | (0.034) | 0.012 | (0.030) |
| Δ GF t+1 | 0.001 | (0.044) | 0.065 | (0.058) | -0.005 | (0.031) | 0.036 | (0.059) | -0.037 | (0.054) | 0.007 | (0.060) | -0.034 | (0.043) |
| Δ GF | -0.035 | (0.048) | 0.016 | (0.062) | -0.047 | (0.035) | -0.015 | (0.063) | -0.073 | (0.059) | -0.038 | (0.063) | -0.083 | (0.044) |
| Δ GF t-1 | 0.002 | (0.048) | 0.037 | (0.064) | -0.013 | (0.032) | 0.006 | (0.064) | -0.039 | (0.056) | -0.010 | (0.061) | -0.054 | (0.040) |
| Δ GF t-2 | -0.005 | (0.050) | 0.032 | (0.063) | -0.020 | (0.033) | 0.001 | (0.064) | -0.049 | (0.058) | 0.001 | (0.062) | -0.039 | (0.045) |
| Δ GF t-3 | 0.026 | (0.056) | 0.044 | (0.067) | 0.010 | (0.038) | 0.015 | (0.069) | -0.019 | (0.064) | 0.022 | (0.063) | -0.022 | (0.044) |
| GF Lag t-4 | 0.099 | (0.055) | 0.008 | (0.073) | 0.063 | (0.035) | -0.020 | (0.072) | 0.048 | (0.064) | 0.036 | (0.066) | -0.005 | (0.049) |
| Δ PP t+2 | -0.019 | (0.016) | 0.005 | (0.013) | -0.007 | (0.009) | 0.010 | (0.009) | -0.019 | (0.015) | -0.004 | (0.008) | -0.003 | (0.008) |
| Δ PP t+1 | -0.014 | (0.020) | 0.028 | (0.016) | 0.001 | (0.014) | 0.031 | (0.012) | -0.016 | (0.020) | 0.006 | (0.015) | 0.006 | (0.015) |
| Δ PP | -0.018 | (0.024) | 0.031 | (0.017) | -0.003 | (0.017) | 0.028 | (0.015) | -0.020 | (0.024) | 0.003 | (0.013) | 0.003 | (0.013) |
| Δ PP t-1 | -0.029 | (0.024) | 0.028 | (0.018) | -0.012 | (0.017) | 0.024 | (0.016) | -0.031 | (0.025) | -0.003 | (0.012) | -0.003 | (0.012) |
| Δ PP t-2 | -0.034 | (0.026) | 0.027 | (0.019) | -0.015 | (0.019) | 0.024 | (0.017) | -0.035 | (0.027) | -0.005 | (0.015) | -0.004 | (0.015) |
| Δ PP t-3 | -0.030 | (0.028) | 0.038 | (0.021) | -0.013 | (0.022) | 0.030 | (0.020) | -0.030 | (0.028) | -0.002 | (0.017) | -0.002 | (0.017) |
| PP Lag t-4 | -0.047 | (0.033) | 0.042 | (0.023) | -0.030 | (0.024) | 0.026 | (0.021) | -0.046 | (0.033) | -0.019 | (0.019) | -0.017 | (0.019) |
| Δ IC t+2 | 0.010 | (0.016) | 0.013 | (0.010) | 0.004 | (0.013) | 0.006 | (0.009) | 0.013 | (0.016) | 0.013 | (0.009) | 0.013 | (0.009) |
| Δ IC t+1 | 0.007 | (0.020) | 0.007 | (0.015) | 0.003 | (0.016) | 0.003 | (0.013) | 0.009 | (0.021) | 0.011 | (0.011) | 0.011 | (0.011) |
| Δ IC | 0.020 | (0.024) | 0.016 | (0.019) | 0.013 | (0.020) | 0.011 | (0.016) | 0.021 | (0.025) | 0.020 | (0.014) | 0.020 | (0.014) |
| Δ IC t-1 | 0.034 | (0.028) | 0.018 | (0.023) | 0.017 | (0.022) | 0.007 | (0.021) | 0.034 | (0.029) | 0.021 | (0.015) | 0.020 | (0.015) |
| Δ IC t-2 | 0.042 | (0.030) | 0.021 | (0.026) | 0.024 | (0.024) | 0.012 | (0.024) | 0.041 | (0.030) | 0.029 | (0.016) | 0.028 | (0.016) |
| Δ IC t-3 | 0.034 | (0.032) | 0.012 | (0.028) | 0.014 | (0.025) | 0.002 | (0.027) | 0.033 | (0.032) | 0.021 | (0.017) | 0.019 | (0.018) |
| IC Lag t-4 | 0.046 | (0.033) | 0.011 | (0.031) | 0.027 | (0.024) | 0.003 | (0.029) | 0.044 | (0.034) | 0.031 | (0.015) | 0.030 | (0.015) |
| Obs. | 84,414 | | 84,414 | | 84,414 | | 84,414 | | 84,414 | | 84,414 | | 84,176 | |

Notes: Huber-White robust standard errors clustered on state reported in parentheses.

App. Table 6: Dynamic Effects of Employment-at-Will Doctrines on ASM Log Labor Productivity Levels, 1979-1995

| Legal Exception | State FE, SIC2 FE, YR FE | | Col. 1 plus State Trends | | Col. 1 plus SIC2-YR FE | | Col. 1 plus State Trends, SIC2-YR FE | | Plant FE, YR FE | | Col. 5 plus State Trends, SIC2-YR FE | | Col. 6 Dropping AZ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | | (5) | | (6) | | (7) | |
| Δ GF t+2 | 0.049 | (0.038) | 0.023 | (0.031) | 0.045 | (0.037) | 0.026 | (0.029) | 0.019 | (0.035) | 0.023 | (0.030) | 0.001 | (0.020) |
| Δ GF t+1 | 0.037 | (0.031) | -0.003 | (0.025) | 0.040 | (0.028) | 0.007 | (0.025) | -0.009 | (0.037) | -0.006 | (0.020) | -0.003 | (0.022) |
| Δ GF | 0.056 | (0.030) | 0.011 | (0.027) | 0.059 | (0.028) | 0.022 | (0.027) | 0.009 | (0.037) | 0.011 | (0.022) | 0.016 | (0.024) |
| Δ GF t-1 | 0.061 | (0.033) | 0.010 | (0.028) | 0.065 | (0.031) | 0.024 | (0.028) | 0.013 | (0.039) | 0.016 | (0.021) | 0.019 | (0.023) |
| Δ GF t-2 | 0.072 | (0.035) | 0.019 | (0.032) | 0.076 | (0.032) | 0.031 | (0.032) | 0.021 | (0.041) | 0.031 | (0.025) | 0.038 | (0.027) |
| Δ GF t-3 | 0.070 | (0.036) | 0.008 | (0.034) | 0.075 | (0.031) | 0.023 | (0.033) | 0.019 | (0.043) | 0.027 | (0.025) | 0.036 | (0.026) |
| GF Lag t-4 | 0.100 | (0.039) | -0.001 | (0.033) | 0.103 | (0.035) | 0.020 | (0.033) | 0.046 | (0.045) | 0.057 | (0.026) | 0.065 | (0.027) |
| Δ PP t+2 | 0.007 | (0.008) | 0.006 | (0.007) | 0.005 | (0.006) | 0.008 | (0.006) | 0.007 | (0.008) | 0.006 | (0.007) | 0.006 | (0.007) |
| Δ PP t+1 | 0.010 | (0.011) | 0.002 | (0.010) | 0.008 | (0.010) | 0.006 | (0.009) | 0.008 | (0.012) | 0.007 | (0.011) | 0.007 | (0.011) |
| Δ PP | 0.015 | (0.012) | 0.006 | (0.012) | 0.011 | (0.010) | 0.011 | (0.011) | 0.014 | (0.012) | 0.011 | (0.012) | 0.011 | (0.011) |
| Δ PP t-1 | 0.017 | (0.014) | 0.009 | (0.014) | 0.013 | (0.012) | 0.014 | (0.013) | 0.015 | (0.014) | 0.011 | (0.013) | 0.012 | (0.013) |
| Δ PP t-2 | 0.013 | (0.014) | 0.007 | (0.014) | 0.010 | (0.013) | 0.013 | (0.013) | 0.013 | (0.015) | 0.011 | (0.014) | 0.011 | (0.014) |
| Δ PP t-3 | 0.019 | (0.012) | 0.011 | (0.012) | 0.015 | (0.011) | 0.018 | (0.011) | 0.020 | (0.013) | 0.016 | (0.013) | 0.017 | (0.013) |
| PP Lag t-4 | 0.005 | (0.017) | 0.008 | (0.015) | 0.001 | (0.015) | 0.015 | (0.013) | 0.006 | (0.019) | 0.006 | (0.017) | 0.008 | (0.017) |
| Δ IC t+2 | -0.008 | (0.009) | -0.001 | (0.005) | -0.010 | (0.007) | -0.002 | (0.005) | -0.007 | (0.010) | -0.007 | (0.008) | -0.008 | (0.008) |
| Δ IC t+1 | -0.006 | (0.011) | 0.001 | (0.007) | -0.009 | (0.009) | -0.001 | (0.006) | -0.006 | (0.012) | -0.010 | (0.009) | -0.012 | (0.009) |
| Δ IC | -0.004 | (0.014) | 0.003 | (0.008) | -0.005 | (0.012) | 0.003 | (0.009) | -0.004 | (0.014) | -0.007 | (0.012) | -0.008 | (0.012) |
| Δ IC t-1 | -0.004 | (0.012) | 0.004 | (0.009) | -0.005 | (0.011) | 0.004 | (0.009) | -0.005 | (0.013) | -0.009 | (0.011) | -0.009 | (0.011) |
| Δ IC t-2 | 0.000 | (0.014) | 0.010 | (0.013) | -0.003 | (0.012) | 0.009 | (0.012) | -0.003 | (0.015) | -0.006 | (0.012) | -0.007 | (0.012) |
| Δ IC t-3 | -0.001 | (0.015) | 0.009 | (0.014) | -0.003 | (0.013) | 0.009 | (0.013) | -0.003 | (0.016) | -0.007 | (0.012) | -0.008 | (0.012) |
| IC Lag t-4 | -0.001 | (0.016) | 0.015 | (0.014) | -0.001 | (0.014) | 0.016 | (0.012) | -0.001 | (0.017) | -0.005 | (0.014) | -0.005 | (0.014) |
| Obs. | 96,308 | | 96,308 | | 96,308 | | 96,308 | | 96,308 | | 96,308 | | 95,985 | |

Notes: Huber-White robust standard errors clustered on state reported in parentheses.

App. Table 7: Dynamic Effects of Employment-at-Will Doctrines on ASM Establishment Productivity, 1979-1995

| Legal Exception | State FE, SIC2 FE, YR FE | | Col. 1 plus State Trends | | Col. 1 plus SIC2-YR FE | | Col. 1 plus State Trends, SIC2-YR FE | | Plant FE, YR FE | | Col. 5 plus State Trends, SIC2-YR FE | | Col. 6 Dropping AZ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | | (5) | | (6) | | (7) | |
| Δ GF t+2 | -0.017 | (0.044) | -0.016 | (0.050) | -0.016 | (0.044) | -0.012 | (0.051) | -0.008 | (0.050) | 0.004 | (0.049) | 0.005 | (0.050) |
| Δ GF t+1 | -0.042 | (0.032) | -0.044 | (0.063) | -0.043 | (0.035) | -0.039 | (0.066) | -0.012 | (0.037) | -0.010 | (0.056) | 0.022 | (0.048) |
| Δ GF | -0.022 | (0.033) | -0.024 | (0.066) | -0.028 | (0.036) | -0.025 | (0.069) | 0.002 | (0.038) | 0.000 | (0.058) | 0.033 | (0.050) |
| Δ GF t-1 | -0.045 | (0.040) | -0.046 | (0.059) | -0.046 | (0.043) | -0.042 | (0.063) | -0.019 | (0.045) | -0.016 | (0.054) | 0.008 | (0.048) |
| Δ GF t-2 | -0.045 | (0.034) | -0.043 | (0.067) | -0.046 | (0.038) | -0.038 | (0.070) | -0.018 | (0.040) | -0.007 | (0.057) | 0.023 | (0.050) |
| Δ GF t-3 | -0.069 | (0.034) | -0.065 | (0.067) | -0.072 | (0.038) | -0.064 | (0.071) | -0.047 | (0.040) | -0.037 | (0.059) | -0.006 | (0.051) |
| GF Lag t-4 | -0.063 | (0.039) | -0.059 | (0.066) | -0.065 | (0.043) | -0.059 | (0.069) | -0.027 | (0.046) | -0.019 | (0.058) | 0.010 | (0.051) |
| Δ PP t+2 | -0.011 | (0.011) | -0.017 | (0.010) | -0.011 | (0.010) | -0.017 | (0.009) | -0.007 | (0.011) | -0.008 | (0.009) | -0.008 | (0.009) |
| Δ PP t+1 | -0.013 | (0.015) | -0.023 | (0.012) | -0.015 | (0.016) | -0.025 | (0.014) | -0.013 | (0.015) | -0.013 | (0.015) | -0.012 | (0.015) |
| Δ PP | 0.005 | (0.013) | -0.005 | (0.011) | 0.004 | (0.014) | -0.004 | (0.011) | 0.004 | (0.015) | 0.004 | (0.011) | 0.005 | (0.011) |
| Δ PP t-1 | 0.008 | (0.015) | -0.004 | (0.013) | 0.008 | (0.016) | -0.003 | (0.014) | 0.010 | (0.017) | 0.009 | (0.015) | 0.008 | (0.015) |
| Δ PP t-2 | 0.007 | (0.015) | -0.006 | (0.013) | 0.004 | (0.015) | -0.008 | (0.014) | -0.001 | (0.016) | -0.005 | (0.015) | -0.005 | (0.015) |
| Δ PP t-3 | -0.004 | (0.017) | -0.018 | (0.015) | -0.007 | (0.018) | -0.019 | (0.016) | -0.007 | (0.019) | -0.008 | (0.016) | -0.008 | (0.017) |
| PP Lag t-4 | 0.000 | (0.021) | -0.012 | (0.019) | -0.004 | (0.022) | -0.014 | (0.020) | -0.002 | (0.022) | 0.002 | (0.017) | 0.002 | (0.018) |
| Δ IC t+2 | -0.007 | (0.012) | -0.009 | (0.009) | -0.006 | (0.012) | -0.009 | (0.010) | -0.006 | (0.013) | -0.018 | (0.011) | -0.018 | (0.011) |
| Δ IC t+1 | -0.006 | (0.012) | -0.008 | (0.011) | -0.005 | (0.012) | -0.008 | (0.011) | -0.009 | (0.012) | -0.023 | (0.010) | -0.024 | (0.010) |
| Δ IC | -0.015 | (0.016) | -0.017 | (0.013) | -0.014 | (0.016) | -0.018 | (0.013) | -0.016 | (0.017) | -0.033 | (0.015) | -0.033 | (0.015) |
| Δ IC t-1 | -0.009 | (0.015) | -0.011 | (0.015) | -0.007 | (0.015) | -0.012 | (0.016) | -0.008 | (0.015) | -0.027 | (0.013) | -0.026 | (0.013) |
| Δ IC t-2 | -0.013 | (0.016) | -0.014 | (0.019) | -0.009 | (0.016) | -0.014 | (0.019) | -0.010 | (0.016) | -0.031 | (0.016) | -0.031 | (0.016) |
| Δ IC t-3 | -0.008 | (0.017) | -0.010 | (0.020) | -0.005 | (0.017) | -0.011 | (0.021) | -0.002 | (0.017) | -0.026 | (0.017) | -0.026 | (0.017) |
| IC Lag t-4 | -0.064 | (0.017) | -0.007 | (0.022) | -0.010 | (0.017) | -0.007 | (0.022) | -0.009 | (0.018) | -0.028 | (0.017) | -0.028 | (0.017) |
| Obs. | 78,662 | | 78,662 | | 78,662 | | 78,662 | | 78,662 | | 78,662 | | 78,477 | |

Notes: Huber-White robust standard errors clustered on state reported in parentheses. TFP is the establishment-level residual from a regression of value-added on four factors of production (production employment, non-production employment, equipment and structures).