Regulating in a Federal System:
Exploring federal and state implementation of OSHA regulation

Abstract

To accomplish the formidable task of enforcing federal health and safety standards in millions of workplaces across the country, OSHA must delegate and devolve inspection authority to lower-level federal and state bureaucrats. The agency not only enlists its regional offices to carry out inspections, but it also grants some states the authority to enforce federal health and safety standards on its behalf. I examine whether this delegation and devolution results in policy drift, where state inspection activity becomes unresponsive to the central preferences of Congress and the president. Using a rich dataset recording the results of each of the approximately four million inspections conducted by OSHA from 1972 to 2013, I examine federal and state influences on OSHA enforcement activity. I find that where states carry out their own inspections through federally approved state-plans, health and safety standards are less stringently enforced than in states where inspections are conducted by federal agents. Moreover, I support this finding by leveraging the geographic precision of the dataset to observe geographic discontinuities in OSHA enforcement across boundaries of state and federal jurisdictions.
1 Introduction

Institutional studies of policy-making at the federal level tend to focus on how various political actors - primarily those within Washington, D.C. - shape the outcome of national policy. These studies concentrate mostly on the political behavior of the highest-level policy makers within the three branches of government at the center of the federal political system. They are interested in how policy change is affected by the pivotal members of both chambers of Congress [Krehbiel, 1998; Binder, 1999; Tsebelis, 2002], by the committees that set the legislative agenda [Cox and McCubbins, 2005; Shepsle and Weingast, 1987], by the president and his appointed leaders within the executive branch [Lewis, 2008; Howell, 2003; Neustadt, 1960], and by the justices on the bench of the Supreme Court [Shipan, 2000; Segal, 1997]. When explaining federal policy creation and change, the predominant focus is on these centralized political actors.

However, such analyses of political institutions fail to capture the political system in its entirety. They ignore the full extent of the political process from policy construction to policy implementation and, as a result, are likely to miss some of major determinants of policy change. While it is important to understand how these centralized actors affect policy, it also important not to overlook the fact that many decisions and actions responsible for shaping policy occur outside of Washington’s political center. When having to implement federal policy at the local level, for example, those at the top must delegate or devolve authority to those at the extremities of the political system. Implementing federal policy across the extensive, diverse, and geographically disparate population of the United States is a substantial undertaking which requires political decision-makers at the center of the
system to employ others to execute the task on their behalf. They delegate authority to more decentralized agents who are able to ensure that all individuals in the United States are held equally accountable to federal standards - whether those individuals are from industrial cities in California or farming communities in Vermont.

With delegation, however, there is the potential for the loss of control. Any directive made by the center of the political system must filter through a series of delegations until it is applied at its most decentralized point. And as policy makes its way down the hierarchical ladder, its potential to deviate from the original policy increases at every rung. Since lower-level agents can make influential decisions and alter policy away from its original intent, it is important to question whether the political principals at the top of the hierarchy lose control to the various agents at the bottom.

Scholars have long studied this principal-agent problem with respect to bureaucratic delegation [McCubbins and Schwartz 1984; Epstein and O’Halloran 1994; Ferejohn and Shipan 1990; Krehbiel 1998; Wiseman 2009]. Both Congress and the president rely on delegating tasks to bureaucrats. However, the relationship between these central authorities and the bureaucracy is not the only principal-agent relationship that affects the execution of federal policy. Congress and the president also rely on the states to implement federal policy on their behalf.

Although this relationship receives less scholarly attention, it is not uncommon for the federal government to delegate authority to the states [McCann 2015]. We see this, for example, with the implementation of Medicaid. To administer the program, states receive incentives from the federal government through matching grants. This way, the federal governments provides aid to low income families by essentially compensating the states
to provide the services on their behalf. It is a form of delegation that allows the federal government to accomplish its goal of provide aid by outsourcing it to the states.

A similar type of delegation occurs with the implementation of federal health and safety standards. With the passage of the Occupational Safety and Health Act in 1970 under the Nixon administration, the federal government became responsible for maintaining and enforcing federal health and safety standards across all workplaces in the United States. However, to help the accomplish this goal, states were given the option to construct their own administration that would allow them to implement federal standards. The federal government would provide a matching grant as incentive, but the state would be required to maintain a program that is at least as effective as the federal government’s. As a result, just under half of the states implement federal OSHA standards in their territory on their own. The state agencies are fully administered by the states themselves. The inspections are governed by a state-level agency, executed by state-level inspection officers, and adjudicated through a state-level judicial system. The federal government has the responsibility to revoke a state plan’s status. However, it has yet to exercise this threat.

In this chapter, I attempt to explore the consequences of this devolution. In particular, I ask whether such devolution has forced the federal government to lose control over their responsibility to ensure workplace safety and health standards. To answer this question, I analyze inspection logs collected by the Occupational Safety and Health Administration going back to 1972. By observing individual inspections carried out on local establishments by federal OSHA and various state safety and health agencies, I show that the delegation has potentially led to less stringent inspections. By comparing the stringency with which safety and health standards are implemented across state and federal agencies, I am able to
observe how devolution leads to a lack of control.

2 Review of Bureaucratic Control

In order to implement the laws it creates, Congress must engage in delegation. It tasks agencies with the responsibility to carry out the rules and regulations that it designs. Because of this, political scientists have long questioned whether such delegation creates a loss of control to the agencies. With major informational asymmetries between Congress and the bureaucracy, it is easy to suspect that agencies are able to act independent of congressional preferences. Many have argued that in the delegation process, agencies have gained a striking level of autonomy (Carpenter 2001; Niskanen 1975). If this is the case, the disconnect between the elected legislators and the non-elected implementers has grave implications for our democracy.

However, many institutional studies of the bureaucracy have found evidence to the contrary. Although the agency is given discretion over the implementation of law, it is constrained by various political forces. And despite the need for delegation, Congress is capable of reducing bureaucratic drift by reducing informational asymmetries through active and passive monitoring (McCubbins and Schwartz 1984), by applying ex-post punishments to bureaucrats through public shaming in Congressional oversight hearings (Kiewiet 1991), by limiting the agency’s budget (Carpenter 1996), by legislating rules and procedures limiting bureaucratic discretion (McCubbins, Noll and Weingast 1987, Huber and Shipan 2002), and by checking the president’s appointment powers (Wood and Waterman 1991). Thus, Congress has a number of tools for keeping a leash on bureaucratic behavior.
These studies suggest that in order to determine policy outcomes in the United States, we must look across the branches and observe the system as a series of interactions between them. A comprehensive analysis must not just focus on the preferences of the principals, but also at the behavior of their various agents. This perspective has led scholars to try to incorporate the full set of players into their analysis on policy change, from the president and Congress to the committees and bureaucrats. To better predict policy movement, one must identify the ideological placement of the relevant committees in Congress, the pivotal voters in the House and Senate, the president, the Supreme Court, and the agency altogether (Ferejohn and Shipan 1990; Shipan 2004).

Still, these studies are limited to inter-branch relationships. They explain policy change by observing the behavior of those at the center of the federal government in Washington. To the extent that they examine delegation, their focus is on bureaucratic delegation. Yet delegation to the bureaucracy is not the only way in which Washington executes its laws. Some policy require more complex forms of delegation. This is particularly the case when implementing federal policy at the local level. The political center must delegate to multiple agents that are spread out across the country. They not only do this through bureaucratic delegation but they do this through federal-to-state delegation as well.

The federal government often leverages the states to do its bidding. For example, it uses intergovernmental grants to encourage states to regulate air pollution, manage Medicaid programs, and provide job training for the economically disadvantaged. Instead of executing federal policy using federal agencies, it essentially pay states to do it on their behalf.

Whether it is through bureaucratic delegation or through federal-to-state delegation, those who are at the center of the political system must delegate extensively in order to carry
out large-scale, local-level policy across the United States. Therefore, as the government attempts to apply its policy regionally, it must rely more heavily on others to do its bidding. Agents administer permits and carry out inspections, assess compliance, and issue penalties. And each of these tasks represents the end of a long chain of decisions that carry a directive from its origin in Washington to its ground-level execution. And as this distance increases, so too does the potential for bureaucratic drift. Therefore, to what extent are the street-level decisions responsive to central-level politics? Is the implementation of federal law uniformly carried out according to the wishes of central political actors in D.C., or does delegation make policy vulnerable to regional pressures?

In this chapter, I explore whether such regional enforcement of federal policy leads to a loss of control by the federal government. In particular, I explore whether the implementation of federal health and safety standards has drifted away from federal preferences as a result of delegating enforcement authority to the states.

3 Implementation of federal inspections: the case of OSHA

The Occupational Health and Safety Administration in the Department of Labor is responsible for ensuring safe working conditions by enforcing health and safety standards established under the OSH Act of 1970. They have a number of regional offices where they engage in about 100,000 regional inspections of business establishments each year. For a number of reasons OSHA is a good test case for exploring regional variation in the implementation of federal law.

First, the implementation of OSHA standards are local. Inspectors show up at the door
of local businesses across just about every county of every state. This includes nearly 100,000 private sector establishments that employ over 12 million employees nationwide. Having such strong local presence across the nation allows one to potentially compare OSHA activity in Fairbanks, Alaska to the activity in Portland, Maine.

Second, in order to implement these inspections regionally, OSHA divides itself into regional hubs and delegates authority to subordinates within these regions to carry out central directives. The agency’s delegation process, which is both vertical and horizontal, provides numerous instances where OSHA subordinates use their discretion to apply federal standards. For example, to inspect a fertilizer plant in Texas, OSHA calls upon its 6th regional office that covers four contiguous central-southern states. The regional office then calls upon the area office in Texas responsible for the jurisdiction that covers the fertilizer plant. And the area office sends a federal inspector to make an assessment of the plant’s compliance to federal laws.

Third, OSHA implementation is controversial. Pro-business Republicans and pro-labor Democrats contentiously disagree over its costs and benefits. Thus, there is reason to suspect both national and regional opposition to OSHA agency activity where either pro-business interests or pro-labor interests dominate.

Fourth, OSHA allows states to adopt their own plans for enforcing federal health and safety standards. In order to regulate workplace health and safety more efficiently and effectively, the federal government entrusts primary authority over the inspection process to some of the fifty states. Other than being monitored through an annual review, state OSH are given almost full discretion over the implementation of federal inspections. This is a unique feature of OSHA implementation and the major focus of this paper. Since the
federal government formally devolves inspection authority to some states and not others, we can compare the two programs to explore the effect of devolution on implementation. In this paper specifically, I assess the differences in inspection stringency between federal and state plans.

Lastly, OSHA inspections are recorded in detail. The dataset is large and can be cut and analyzed in a number of ways to identify variation in inspection behavior.

4 Exploring the Data

As part of President Obama’s Open Government Initiative, the Department of Labor (DOL) recently launched a webpage dedicated to making DOL enforcement data publicly available and easily searchable online[1]. Through this website, I was able to access OSHA’s inspection database, which contains records of every inspection conducted by the agency since the first inspection in 1972. As of January 1, 2014, OSHA had conducted 4,077,338 inspections across the country, issued a total of 11,119,827 citations, and collected 4,758,681 penalties for a total of $3,554,041,378 in fines paid (nominal dollars). Each of these inspections is documented in detail, down to the name and address of the establishment being inspected.

Figure [1] demonstrates the varied geographic distribution of these worksite inspections. It displays every inspection carried out by OSHA, geocoded down to the address of each establishment where the inspection took place. As expected, inspections are carried out in all regions - rural and urban - across the United States. They are densely clustered in populous areas where a large number of workplaces are located. And they are disproportionately

I geocoded the address of as many of the inspection sites going back to 1972 that could be matched in the ArcGIS database of US addresses. About 60% of all the inspection addresses matched total. This number was closer to 70% in the last decade. All of them are plotted on the map above, reflecting the geographic concentration of inspections.

located in high industrial areas where workplace hazards are more likely to be present, such as the rustbelt in the northwest and the major manufacturing areas in the South.

4.1 Enforcement Effort

Moreover, we can observe trends in OSHA’s inspection activity over time. Figure 2 shows the number of inspections recorded by OSHA since its first recorded inspection in 1972. These include all inspections of all types conducted by the agency. Immediately, we can see that there is a major jump in recorded inspections at the beginning of the Reagan Administration. Unfortunately, this is an artifact of the database and the way OSHA keeps records. Prior to 1984, record keeping had not yet been standardized and states that were conducting inspections under an approved state-plan had their own system for recording inspection activity. Until 1982 did these states begin transitioning to OSHA’s Integrated
Figure 2: The above figure shows the number of inspections recorded in the database by year. The vertical dashed lines in gray indicate president turnover. Notice that there is an alarming jump in recorded inspections from 1982 to 1984. This jump reflects the migration of states with initially approved state-plans to the federal Integrated Management Information System (IMIS), such that after 1984 all inspections are recorded in the database. For this reason, when observing inspection trends across all states, it is important to limit the analysis to the period after 1984. Thus, pre-1984 represents only federal, while 1984 on represents state and federal plans.

Since 1984, the total number of inspections has been in a decline. And the trends in this change appear to be consistent with administrative effects. As one might expect from a Republican administration, both Reagan and Bush administrations saw declines in inspection number. During their tenure inspections fell from approximately 130,000 in 1984...
to approximately 110,000 inspections by the end of the Bush Administration in 1993 for a 15% reduction. This is consistent with what we might expect from a pro-business, Republican agenda, where efforts are taken to reduce the regulatory burden on businesses.

However, the decline continues on into the Clinton administration where we see even greater reductions in the annual inspection total. Indicating the decline in regulatory efforts, this reduction by the Clinton Administration is often criticized by pro-labor Democrats as being lax on enforcing workplace health and safety (Lurie, Long, and Wolfe 1999). This decline coincides with Vice President Gore’s “Reinventing Government” campaign, which focused efforts on making the federal government more effective and efficient. The campaign directed agency heads to reinvent their agency so that it would not only work better but also cost less (Gore 1993). In response, Labor Secretary, Robert Reich hired Joseph Dear to administer OSHA’s reinvention. Under Dear, the OSHA offices were directed to measure themselves on the quality of inspections rather than quantity. And as a result, OSHA’s inspection numbers were reduced by approximately 10,000 annual inspections and remained at a steady 100,000 annual inspections for the next couple decades - with some variation.

It is easy to see presidential effects on inspection totals here. But perhaps this measure is noisy. Not all inspections are conducted under the same protocol. In fact, OSHA conducts six types of inspections. The most common are programmed or planned inspections. These are proactive inspections that are predetermined by the agency to target potential violators and are used as way a to actively audit high-hazard business establishments. Some of these inspections are predetermined by lottery while others are predetermined by formula. In order to deter business establishments from violating federal OSHA standards, they are all executed without advanced notice so as to maintain the threat of a potential inspection.
The other five types of inspections are conducted in response to 1) imminent danger situations, 2) fatalities and catastrophes, 3) complaints, 4) referrals, and 5) previous violations. These inspections are very different from programmed inspections in that they are reactionary in nature. They are triggered by an external event rather than conducted through the regular auditing procedures.\footnote{See U.S. Department of Labor Program Highlights, Fact Sheet No. OSHA 2098, “OSHA Inspections.”}

In order to reduce the noise in the data, I focus on the subset inspections that are planned or programmed. I choose to focus on these inspections rather than unplanned inspections for two reasons. First, they are substantively different from the other types of inspections because they are performed as a standard audit rather than a reaction to a potential violation. The unplanned inspections are likely to ebb and flow by chance, whereas the planned inspections are potentially more political. Second, planned or programmed inspections are the standard inspection conducted by the agency. They represent the bulk of inspections carried out by OSHA. For example, in 2010, planned or programmed inspections made up more than 60% of the total number of inspections. The next most common type of inspection was in response to a complaint. These inspections made up only about 17% of the total number inspections in 2010. The third most common type of inspection was a result of referrals from other agencies (around 10%). Accidents, fatalities and catastrophes, imminent danger situations, and follow-up inspections were each no more than about 3% of the total number of inspections.\footnote{Since I have decided to focus on planned or programmed inspections, the analysis does not necessarily generate expectations about unplanned inspections. It is possible that an analysis of unplanned inspections might generate different results. However, there is a strong correlation between the median planned and unplanned inspections at both the state and federal level. Although, as one might expect, the unplanned inspections tend to result in slightly larger median non-zero penalty than the planned inspections.}

Figure 3 displays the counts for only those inspections that are programmed or planned.
Figure 3: The above figure shows the number of planned or programmed inspections recorded in the database by year. The vertical dashed lines in gray indicate president turnover. Any reactionary inspections (inspections that are responding to a complaint) are excluded.

I have also limited the observations to include only those inspections from 1984 to 2013 so that each observed total is an aggregate sum of inspections conducted by both federal and state officials. This seems to reduce a great deal of the noise associated with unplanned, reactionary inspections. Still the same trend seems to emerge. There is a steady decline with Reagan and Bush and an immediate decline under Joseph Dear’s leadership. The inspection trend then basically flat-lines by the end of the Clinton Administration at just over 30,000 programmed inspections a year.

4.2 State Plans

As I mentioned above, this is the aggregate sum of inspections made by federal and state officials. It is a measure of total levels of OSHA enforcement across all states. However,
it is important to note that OSHA enforcement authority in some states has devolved to state agencies. Though federal safety and health standards are determined by Congress, the responsibility for implementing those standards falls in the hands of the state-level occupational safety and health administrations for 21 of the 50 states. Since its inception in 1970, federal OSHA has approved these 21 states to administer federal occupational safety and health regulations on their own, acting as virtually independent state agencies. However, these states are never fully immune to federal supremacy because Section 18 of the OSH Act - the section that conceives these state plans - gives the general requirement that these states maintain an enforcement of occupational safety and health standards at least as effective as the federal government’s enforcement.

Therefore, in many ways this is an instance of where the federal government delegates enforcement authority not just to its lower-level agencies but also to the state agencies themselves. The federal government benefits from this for a couple reasons: not only does it share the cost of these inspections with the states, but the states are also more attuned to the industries of their regions and are in a better position to regulate more efficiently and effectively. The states, on the other hand, might gain in the independence from federal regulators and the ability to tailor enforcement efforts to be more appropriate for the industries unique to their regions. Nonetheless, the legal independence is only partial since they must meet the condition of Section 18. Moreover, these states are subject to federal oversight through annual reviews.

Table 1 gives a list of the states that have been granted operational status as of 2013.

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4information for this table was taken from the OSHA website in February 2014. [https://www.osha.gov/dcsp/osp/faq.html#oshaprogram](https://www.osha.gov/dcsp/osp/faq.html#oshaprogram)
<table>
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<th>Final Approval</th>
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<td>18 Vermont</td>
<td>1973</td>
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They are a smattering of both Republican and Democratic states, high and low industrial states, and states from all regions of the US. Although all of these states applied for the approval of a state plan just after the OSHA Act was passed in the early 1970’s, most were not given full operational status until the early 1980’s, a full decade later. Not until a state gains full operational status does federal OSHA suspend its authority to conduct inspections in that state. Once operational status is approved, the state-level office of occupational health and safety operates the enforcement of health and safety standards in that state. This means that these states determine not only which establishments to target and to inspect, but this also means that the states are in full control of a large portion of the adjudication process. Thus, these states own a portion of the appellate procedure for contestation. Therefore, in these states, contested penalties go through a state-level appeals process in which penalties can be thrown out or abated. However, eventually an appeal can make its way to a federal
review commission or administrative law judge or even the Supreme Court. So again, the states are not fully independent.

Given that inspection authority is decentralized to the state governments it makes sense to disaggregate the inspection numbers in Figure 3 to compare the number of inspections between state and federal entities. We can then ask if there are differences in the enforcement level between these two groups. Specifically, we can observe whether the state plans are responsive to federal preferences in the same way that federal inspections are.
Figure 4: The first plot displays the total number of programmed inspections per year that are carried out by federal (solid line) and by state (dashed line) offices. The second plot does the same except that the total number of inspections are divided by the total number of establishments that are covered under each jurisdiction, as indicated from Census data of business patterns from 1988 to 2012. State plans not only conduct more inspections, but they also conduct more inspections per establishment in their state. Moreover, we can see the Joseph Dear’s reforms during Clinton’s administration in 1994 has significantly reduced the number of inspections for federal OSHA but not for the state plan states. This suggests that the state plans were unresponsive to the federal reinvention strategy.
Figure 4 contains the same inspections as Figure 3 except the totals are disaggregated to display the sum of inspections conducted by state plans and the sum of inspections conducted by federal OSHA. In the first plot of Figure 4, the total number of inspections are displayed while in the second plot of Figure 4 I have divided total number inspections by the total number of establishments in each jurisdiction (the establishments from the Census and spans the years from 1988 to 2012). Therefore the second plot controls for size of the jurisdiction.

There are a couple main points that can be drawn from these plots. First we can see that most occupational health and safety inspections are conducted by state OSHA offices. In fact, in most years state-level offices conduct more than twice as many inspections as federal offices despite the fact that they are being conducted in a minority of the states. Second, the change in inspection levels differs between federal and state-level plans. We can see that the gap between federal and state inspections has increased since 1984 and that the trend line for federal inspections seems to be more responsive to the presidential administrative agendas discussed above. For example, federal inspection numbers experience a steep decline from the Reagan administration through the Clinton administration, whereas the state inspection numbers experience a more gradual decline.

Moreover, we can see that Joseph Dear’s reinvention strategy had a significant effect on federal OSHA inspections. There is a sharp decline in the number of inspections that the federal offices conducted after he arrives in 1994. The strategy was to reduce the regulatory burden set out by the federal government. The same effect is not present among state-level inspections.

The differences in the inspection trends suggest that states with state plans are less responsive to central administrative initiatives. These states seem to have successfully achieved
a level of autonomy that protects them from federal-level partisan tides or federal-level agendas. Although this figure fails to shed light on whether state-plans are upholding safety and health standards at least as effectively as federal OSHA (something we cannot tell from the sheer number of inspections across jurisdictions that might contain very different numbers of hazardous industries), it does tell us that there is a disconnect between federal agendas and state level agendas. These trends suggest that the federal government has lost control of policy administration in those states with state plans.

4.3 Enforcement Stringency

To further explore whether state plans are responsive to federal standards or whether they act fully independent of them, we can look at how stringently they enforce those standards compared to their federal counterpart. One way to measure enforcement stringency is to use the size of the penalty awarded by the inspection officer after an inspection is conducted. There is a degree of discretion that is given to inspectors in identifying violations and assessing the penalty size for that violation. So an inspector that enforces health and safety standards more stringently would be one who observes more violations in an inspection, classifies more violations as being serious violations, and then assesses a larger penalty for those violations. Therefore, in states where health and safety standards are more stringently assessed, violators would be required to pay more for their transgressions than in states where the same standards were less stringently assessed.

An inspector conducting an inspection makes a number of decisions in observing a potential violation. She can decide to issue no penalties whatsoever, or she can decide to simply issue a citation without a penalty, or she can issue citation with a penalty. Therefore, there
are number of variables we can observe indicating the stringency of an inspection. For example, we can observe whether or not an establishment has been cited. And given that it has been cited, we can observe how many citations have been issued. And given that citations have been issued, we can observe whether or not the establishment has been penalized. And given that it has been penalized, we can also observe the size of the total penalty.

For ease of analysis, I have decided to focus only on the last variable. Therefore, I am limiting the observations only to those inspections that resulted in an initial penalty. By excluding all inspections where no action was taken or where an establishment was cited without penalty, I am able to compare penalties across all inspections where penalties were issued. Hence my variable of interest is penalty size, which is a non-zero value.

Figure 5 displays the median non-zero penalty for every inspection conducted in each year since 1984. The median non-zero penalty measures the stringency with which inspectors punish violators given that the inspector has decided to issue a penalty in the first place. I have chosen to ignore prior decisions - like the decision to inspect the establishment and the decision give a citation - so as to focus solely on the decision about the size of the penalty to give.5

5One could choose to expand the scope of the analysis to include inspections that resulted in zero penalties. In the current analysis, such an inspection is taken out of the sample and disregarded when estimating inspector stringency. A major reason for doing this is that there are a large number of inspections that result in no penalty whatsoever. Under George W. Bush’s administration, for example, about 30% of federal inspections resulted in no initial penalty. The large number of zeros in the data has the tendency to bias the median penalty size toward zero, reducing valuable variation in the variable of interest. Since I am primarily concerned with how the median penalty varies across jurisdictions, I choose to drop the zeros from the analysis. In doing so, I limit the analysis to variation in penalties among inspections where penalties are issued.

However, one might argue that an inspector’s decision to avoid issuing a penalty is an indicator of leniency and there may be systematic differences in the number of zero-penalties across state and federal jurisdictions that are responsible for the results in the paper. It would be especially troubling for the current analysis if federal OSHA averaged more zero-sized penalties than state-run OSHA. In which case, the paper’s finding that state-run OSHA was less stringent than federal OSHA may be attributed to the difference in zero-sized penalties dropped from the analysis.

Yet, this is not the case. While federal OSHA issues zero penalties in about 30% of its inspections, state-
Figure 5: The plot attempts the gauge the stringency with which OSHA punishes health and safety violators over time by measuring the non-zero penalty in which the average inspection results. While the increase in the average penalty is partly attributable to inflation, there are a few major changes in the average penalty that have occurred. The first occurs under the Bush administration, where Congress passes a bill in 1990 that raises the maximum penalty per violation. This gets reduced in 1994 under Clinton as Al Gore spearheads an attempt to reduce the regulatory burden on small businesses - an attempt that is well supported by the Republican majority in Congress. Then in 2010, through unilateral executive action, Obama drastically increases the fine for safety and health violations.

We can see here that the while total inspection numbers have been on the decline since 1984, the median penalty per inspection has been trending upwards. Most notably this trend begins in 1990 when Congress passes a bill that raises the maximum penalty allowed for a number of particular infractions. Because of this we see steep increases in the median penalty assessed from 1990 until Joseph Dear’s leadership during the Clinton Administration beginning in 1993. The agency’s reinvention during that time not only saw steep declines in run OSHA issues them about 50% of their inspections. Therefore, while there is a systematic difference between them, the difference suggests that state OSHA is even less stringent than the current analysis suggests. Hence, the results of the paper should hold.
Figure 6: The figure shows that inspections carried out by federal OSHA result in larger penalties than inspections carried out by state-run OSHA. Moreover, this figure shows that state-level OSHA penalties are almost non-responsive to federal preferences. For example, Obama’s push to levy greater penalties in 2010 only has impact among states where federal officers carry out inspections. There is almost no response among inspections carried out in states that deliver their own inspections

the number of inspections but it also saw steep decreases in the size of the penalty assessed. This effect was part of Dear’s strategy to reduce the regulatory burden on employers by working with employers to reduce hazards rather than threaten them with fines.

Additionally, this figure shows the enormous penalty hikes that coincide with the Obama Administration’s effort to incentivize workplace compliance to OSHA standards. By drastically increasing the penalties handed out per inspections the Administration intended to take a hard stance against violators. Spearheaded by OSHA’s director, David Michaels, the Obama Administration has made a point to use steep penalties to severely punish transgressions.
Figure 6 disaggregates the median non-zero penalties per inspection displayed in Figure 5 into those performed in states covered by federal OSHA and those performed in states covered by state-plans. This allows us to compare enforcement stringency across the two groups over time. This leads to a couple main observations. First, there is a noticeable difference in the median penalty levied by the two groups. Today, a fine levied by Federal OSHA will likely cost an establishment $5,000, whereas a fine levied by a state plan will likely cost an establishment $500. And second, this difference has generally increased over time. While those penalties assessed by federal OSHA have responded to federal initiatives (i.e. Congress enacting legislation in 1990 to increase penalty sizes, Dear in 1994 to decrease penalty sizes, and Obama in 2010 to drastically increase penalty sizes) those penalties assessed by the state plans have not responded in kind. Rather the penalties have remained fairly low and the changes have remained fairly flat.

Disaggregating these trends by states can emphasize this point further. I have displayed the state-level trends in the size of the median penalty in Figures 7 and 8. Figure 7 displays those states that are covered by federal OSHA while Figure 8 displays those states covered by state-plans. Although there are differences in the penalty size across the states, the trends are pretty consistent within each group. Each of the states covered by federal OSHA respond similarly to presidential initiatives. For example, it is clear that each state can be seen to drastically increase penalty sizes in 2010. However, such a trend is not present across most states with state plans. Those states experience fairly flat trend-lines. Moreover, all but a few of these states seem to be unresponsive to to the Obama’s hike in penalties.
Figure 7

Median Non–Zero Penalty Per Year
(Federal OSHA)
Figure 8

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### 5 Does devolution lead to a loss of political control?

I have shown that state plans enforce health and safety standards differently than federal OSHA. And I have shown that they are less responsive to federal partisan tides. But has
Figure 9: This plot disaggregates the median non-zero penalty per year by governor partisanship. The purpose is to observe if there are systematic differences between Democratic and Republican states that emerge as a result of devolving regulatory authority. However, the similarities between states with Democratic governors and states with Republican governors implies that the devolution of authority does not result in a loss of political control.

Figure 9 attempts to answer this question. This figure takes Figure 6 and disaggregates it further into two more groups representing partisanship. The solid lines reflect median penalties among inspections conducted by federal OSHA and the dashed lines represent the median penalties among inspections conducted by state plans. I have then further
grouped these into states with Republican governors (in red) and states with Democratic governors (in blue). This allows us to observe whether the stringency with which inspections are conducted differs based on the partisanship of the state’s governor. While we might not expect a difference in inspection stringency between Republican states and Democratic states where federal OSHA conducts its inspections, we might expect differences in state-plan states. This would suggest that devolution has resulted in a loss of control, and that states curb its stringency according to regional partisanship.

However, as we can see from Figure 9 this does not appear to be the case. Instead, there appears to be little difference in the stringency with which inspectors punish violators. The evidence suggests that a governor’s partisanship, regardless of jurisdiction, has no effect on penalties. Even despite the devolution of authority, partisan governors do not seem to systematically manipulate the penalty size according to their expected partisan preferences. State-plans run by Democrats levy fines similarly to state-plans run by Republicans.

Here I provide a more detailed test of whether the implementation of federal health and safety standards are influenced more by centralized political actors (such as the president and Congress) or by decentralized political actors (such as state leaders) and I test whether this influence is conditioned on devolution (whether the inspection is conducted by federal OSHA or by states with state plans). To do this, I set up the following two simple linear models where a state’s median penalty size in each year from 1984 to 2013 is the dependent variable and federal and state political actors that might influence the penalties as the independent variable. The basic idea of this setup is to test whether OSHA inspections are responsive to central or regional political forces and to test whether this responsiveness is different depending on whether states control the inspection process or whether federal
OSHA controls the inspection process. Not only can we observe the differences in coefficients between federal and state-level influence, but we can also observe if those differences change depending on whether the inspection is devolved or not.

To set up the test, I conduct two simple OLS regressions: one on federal inspections and one on state inspections. Each regression contains potential federal-level influences and potential state-level influences on the size of the median penalty for each state-year observation. Therefore, if devolution leads to a loss of control, then the state-level predictors should significantly predict the penalty size in state-plans rather than federal plans, whereas the federal-level predictors should not. On the other hand, if the federal government successfully maintains control despite devolution, then state level predictors should be insignificant for both models. Only the federal-level predictors should significantly predict penalty size.

Among FEDERAL OSHA Inspections:

\[
\text{Median Nonzero Penalty}_{\text{fed}} = \beta_{0,\text{fed}} + \beta_{1,\text{fed}} \text{Federal Level Influences} + \beta_{2,\text{fed}} \text{State Level Influences} + e_{\text{fed}} \quad (1)
\]

Among STATE OSHA Inspections:

\[
\text{Median Nonzero Penalty}_{\text{state}} = \beta_{0,\text{state}} + \beta_{1,\text{state}} \text{Federal Level Influences} + \beta_{2,\text{state}} \text{State Level Influences} + e_{\text{state}} \quad (2)
\]

INDEPENDENT VARIABLES OF INTEREST
The independent variables are used to measure two levels of possible influence on OSHA inspection activity. At one level, there are indicators of federal influence. These are basic variables that intend to measure the effects of president and congressional preferences.

**Federal-level Influences**

**President Dummies** - A dummy for each president from 1984 to 2013. This attempts to capture the influence of presidential administrations. It is expected that under Democratic presidents, OSHA will increase the stringency of its enforcement, while under Republican presidents the stringency should be reduced.

**Democratic Congress** - A dummy indicating years when Democrats control a majority of the House. It is expected that under Democratic Congresses, OSHA will increase its enforcement activity.

**State-level Influences**

**Democrat Governor** - A dummy variable indicating years where there is a Democratic governor. If state partisanship influences inspection behavior in that state we should expect that in those states where there is a Democratic governor there would be more stringent enforcement (Klarner, 2003).\(^6\)

**Divided Government** - A dummy variable indicating years when one party fails to control all three branches in the state legislature. It is interacted with Democratic governor as way to indicate when governors are less influential as a result of an opposing legislature. Therefore, divided government should reduce the effect of the governor.\(^7\)

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\(^6\) Data from Klarner website at [http://www.indstate.edu/polisci/klarnerpolitics.htm](http://www.indstate.edu/polisci/klarnerpolitics.htm)

\(^7\) Data from Klarner website at [http://www.indstate.edu/polisci/klarnerpolitics.htm](http://www.indstate.edu/polisci/klarnerpolitics.htm)
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| Observations     | 756     | 565    | 756     | 565    |
| R²               | 0.808   | 0.576  | 0.844   | 0.727  |

*p<0.1; **p<0.05; ***p<0.01

Table 2: An OLS regression estimating the median non-zero penalty. Model uses state-year observations from 1984 to 2013. The dependent variable is the median non-zero penalty for each state in a particular year. The results in the first and third column are constrained to inspections under federal OSHA, whereas the results in the second and fourth column are constrained to inspections in states where there is a state plan.
6 Results

The results of the OLS regressions can be found in the Table 2. The first and second column are the result of the models run on federal and state OSHA respectively. The third and fourth column are the same as the first and second, but with state-level fixed effects. Generally the tests verify the conclusions drawn by the preceding figures. There is evidence of significant presidential effects on both federal and state inspections. However, these presidential effects are much more limited in the states with state plans than in states with federal plans.

Moreover, the state-level variables are not significant in states where federal OSHA conducts inspections. However, for state OSHA, a Democratic governor is expected to significantly reduces the size of a penalty in the state. While the significance of the variable corresponds with the hypothesis that state plans allow states to ideologically affect inspections, the direction of the sign is unexpected. Assuming that Democrats prefer stricter inspections than Republicans, we would not expect Democratic governors to decrease the size of the penalty. Moreover, in the next set of models using state fixed-effects to capture within-state variation, the Democratic governor variable falls out of significance. Therefore, the significance in the first model was likely spurious.

The model does validate a couple results observed above. First, across all presidential administrations state OSHA penalizes violators less than federal OSHA. State OSHA is simply less stringent than Federal OSHA when doling out fines. Despite their legal mandate to be “at least as effective” as Federal OSHA, states are nowhere near as stringent when it comes to fines.
And second, when the Obama administration sought to discourage health and safety violations by increasing the penalties levied on violators, state OSHAs were nearly unaffected. Figure 10 shows the predictions from the fixed-effects models for the size of the penalties in the Bush administration versus the Obama administration (assuming a Republican Governor, a Republican Congress, and a unified state legislature). In both administrations, the size of the penalties for state OSHA is smaller than the size of the penalties for federal OSHA. However, when moving from the Bush administration to the Obama administration, there is a major increase in the penalty size for federal OSHA but not state OSHA. Therefore, as mentioned above, state OSHA was nearly unresponsive to Obama’s push to increase enforcement.

7 Controlling for Geography: Matching Neighbors

Despite enforcing the exact same health and safety standards, it appears that federal OSHA fines violators more than state OSHA does. Although this might suggest that devolution allows for states to engage in less stringent inspections, it is also possible that those establishments that are subject to OSHA standards are different in federal jurisdictions than those in state jurisdictions. Because industries vary geographically, it is plausible that it is simply the geographic location of state-plan states that determine their difference in levied penalties. For example, violations in state-plan states like California, Oregon, and Washington are different from federal states like Maine and New Hampshire because they deal with different types of establishments and industries that tend to correlate with their difference in geographic location. The deep south, for example, is almost fully covered by federal OSHA,
and may not be comparable to the state-plan states that cover most of the west.

To infer that the difference in inspection jurisdiction (state or federal) is what is causing the difference in levied penalties, we would hypothetically observe the outcome of two inspections, identical in every way other than the jurisdiction of the officer that carries it out. Therefore, the difference in outcome can be attributed to the difference in jurisdiction.

Unfortunately, such a hypothetical cannot be observed. A difference in the jurisdiction of the officer already implies that the inspections take place in different states and, therefore, in distinct geographic locations. And since the geographic location of the inspection correlates with a host of variables that might have a systematic effect on the outcome, it is difficult
to conclude that the difference in outcome is the result of a difference in jurisdiction rather than a difference in location.

However, we can attempt to minimize this bias caused by geography by finding inspections that are geographically similar to each other, but differ in the jurisdiction of the inspection officer. In other words, we can try to control for the effect of geography (and the variables that are associated with it) by comparing inspections that share in location but differ in jurisdiction. The next part of the analysis attempts to do just this. By matching similar inspections on the borders of state-plan states to neighboring inspection on the border of federal OSHA states, we can assume that the marginal difference in geography (and, thus, the marginal difference in the variables that are associated with geography) is not the cause of any difference in outcome. Instead, we can begin to attribute the difference in penalty to the difference in OSHA inspection jurisdiction.

The following is an attempt to test whether the implementation of federal health and safety standards are influenced by its partial devolution to state authority by controlling for the geographic location of the inspection. So far, there is evidence that state inspections result in smaller penalties than those conducted by federal inspectors. However, since state and federal inspections occur in geographically distinct locations, the variables associated geography may be responsible for this difference. To control for geography, I set up a test that finds inspections that occur on borders between state and federal jurisdictions. This allows me to match a single state inspection with its closest neighboring federal inspection. The basic idea of this setup is to compare two similar inspections that occur in the same basic location, but differ in the jurisdiction of the inspector. Ideally, this will isolate the
effect on levied penalties that is attributable to federal-state differences and nothing else.\textsuperscript{8}

The test takes the following steps:

**Step 1: Isolate the border between state and federal jurisdictions**

Since OSHA records the address of every establishment that it inspects, we can identify the exact location of the inspection. Having geocoded these records, I am able to precisely locate any inspected establishment relative to any other inspected establishment. Moreover, I can locate these establishments relative to its state border. For the purpose of this analysis, I want identify all establishments that are marginally close to a border between state and federal OSHA jurisdictions. These are the establishments that we can compare to their neighbors on the other side.

To do this, I first specify the location of the border between state and federal jurisdictions. The first map in Figure 11 is a map of the United States that identifies states that have established a state-OSHA program. They are marked in green. Inspections in these states are conducted by state officers, whereas those in the other states are conducted by federal officers. The boundary between these federal and state inspections is created using a GIS techniques that eliminate all the state borders between identical jurisdictions. What remains are only the borders between different jurisdictions. The result is displayed in the second map of Figure 11 where a set of borders divide state and federal jurisdictions.

The next step is to create a buffer zone that circumscribes any point that is marginally close to that border. This will be used to isolate the set of inspections that are within a specific maximum distance from the border. Every inspection that will match with a neighboring

\textsuperscript{8}I follow the approach to analyzing geographic discontinuities used by Keele and Titiunik (2014).
inspection across the border with be contained in this set. Specifically, the buffer zone indicated in Figure 11 includes every point that is within 10 miles of the border.
Step 2: Only keep similar inspections within the buffer zone

I then remove any inspection that is outside of this buffer zone, leaving only those inspections that are within 10 miles of this border. These are the inspections that will be candidates for matching. However, because I will only match inspections that are within 5 miles of each other, the 10 mile buffer zone is an overestimate of the sample I am interested in. Nonetheless, it effectively subsets the data to contain all potential matches.

In sum, the subsetting process works as follows. First, I begin with the universe of inspections that have been recorded by OSHA since its inception. There are over four million in total. Then I whittle those inspections down to a relevant subset of generally similar inspections. These are planned or programmed inspections (non-complaints) conducted only on the construction industry during the eight years of the George W. Bush administration. This allows for the inspection type, industry type, and president to be held constant. Further, this set of inspections is cut down to only include those that have been successfully geocoded to their street address. The downside of this geocoding process is that it removes about 40% of the inspections. However, I assume that the removal process is random with respect to location and, therefore, inconsequential. The last step is to remove all inspections outside of the buffer zone. What remains are 8,776 geocoded inspections on the construction industry conducted between 2001 and 2008 that are within 10 miles of a boundary between state and federal jurisdictions.

Take, for example, the border between New Hampshire and Vermont in Figure 12. The first map locates every inspection in our sample across the two states. The second map removes those inspections that are conducted outside of the 10 mile buffer. The remaining
All Inspections in 10 miles from the border. I remove that pair from the sample. The matching algorithm is to keep those matches that are within 5 miles of each other. In other words, if the nearest neighbor across the border is within 5 miles of itself, this allows us to compare the outcomes of those inspections that are marginally close to each other, but are divided by a state boundary.

**Step 3: Geographic Matching Algorithm**

For the third step, I match inspections within the buffer zone that are conducted under state jurisdiction to the nearest inspection conducted in federal jurisdictions. I then only keep those matches that are within 5 miles of each other. In other words, if the nearest match is over 5 miles away I remove that pair from the sample. The matching algorithm is defined as follows:

1. Begin with all the inspections within the buffer zone
Figure 13: Matched Establishments: Federal-state difference in penalty amount between federal and state inspections of geographically similar construction sites between 2001 and 2008. The negative difference suggests that even when comparing geographically similar inspections, an establishment located in the state jurisdiction can expect a smaller non-zero penalty than if it were located in federal jurisdiction.

2. Divide these into two groups according to their state and federal jurisdictions

3. For each inspection within the state jurisdiction measure its distance in miles from every inspection conducted under federal jurisdiction and record the inspection that minimizes that distance.

4. Once every inspection has a match, drop those pairs where the minimum distance between them is more than 5 miles

This procedure creates a set of state-level inspections that are paired with its nearest federal-level inspection up to 5 miles. Of the original 8,776 inspections within the buffer zone, there are 2,424 matched pairs. Ninety percent of these pairs are within 1.75 miles of each other and fifty percent are less than a mile apart.\footnote{I did not match on exact year, so it is possible that an inspection in 2001 is compared to an inspection in 2008. However, the average difference in year between the pair is less than a year. Therefore, there is no significant systematic difference between the years of the penalties.}
For each inspection, I have recorded the dollar amount of the initial penalty that was levied. Then I took the difference in penalties between the pairs by subtracting the penalty of the state inspection from the penalty of the federal inspection. The result is a set of 2,424 differences. If the stringency of state inspections are no different from the stringency of federal inspections, there should be no difference between federal and state penalties on average.

Figure 13 summarizes the differences. I have plotted the average dollar difference along with its 95% confidence interval. The average difference in penalty is about $1000. This means that even given similar inspections located marginally close to each other, we can expect that federal OSHA will fine about $1000 more than its state-level counterpart.

While the matching analysis has been used up to this point to test whether there is a systematic difference in regulatory behavior between federal and state jurisdictions, it can also be used to test whether political variables also affect this behavior. For example, as hypothesized above, it is possible that the devolution of regulatory authority to the states allows those states to inject political influence into the regulatory process. While the regression tests failed to reveal such political influence, it is possible that the null effect was the result of comparing establishments that are dissimilar. Instead, by comparing establishments that are alike - both in kind and in location - the matching approach may be able to uncover political influence produced by devolving regulatory authority to the states.

In which case, the state-federal difference in penalties (displayed in Figure 13) would differ depending on which party controls the inspection carried out under state jurisdiction. Therefore, while state inspectors may be less stringent than their federal counterparts, perhaps this difference in stringency changes as the partisan ship of the state changes. We
might expect for inspections carried out in Democratic states to be more stringent than those carried out in Republican states. In which case, the negative state-federal difference in penalties, which we observe in Figure 13, would be greater if Republicans controlled the state than if Democrats controlled the state.

In Figure 14, I have separated the matched state-federal pairs into two groups based on the partisanship of the governor in the state jurisdiction. Of the 2,424 matched pairs, 1,468 had state-run plans where a Democratic governor was in power, while the rest had a state-run plan where a Republican was in power. An average of the difference in each group is plotted along with its 95% confidence interval.

The interval in red represents the state-federal difference when the state jurisdiction is represented by a Republican. The interval in blue represents the difference when the state
jurisdiction is represented by a Democrat. The difference between the two samples suggests, contrary to expectations, that Republican states are more stringent than Democratic states. Yet this is likely a spurious difference, since a two-sample t-test reveals that the difference is not quite significant at the .05 level. Therefore, as we observed in the regression results above, there does not appear to be much of a difference in regulatory behavior between Democratic and Republican states.

8 Conclusion

There are two primary sources for a political analysis of OSHA inspections. Scholz, Twombly and Headrick (1991) argue that OSHA enforcement is determined by both central and regional political pressures, while Huber (2007) has countered that claim arguing that the enforcement is primarily determined by central, but not regional actors. Huber claims that OSHA enforces its health and safety standards by engaging in what he terms strategic neutrality. He argues that OSHA standards are enforced uniformly and neutrally across the various geographic arms of the agency. Thus, the decentralized field-level bureaucrats are insulated from the political environment at the ground level and are tightly tethered to the commands of central leadership. As a result, he argues that we are not likely to observe regional variation of OSHA enforcement.

In this paper, I find evidence that both theories might have empirical truth. On one hand, I find that inspections are not responsive to regional political pressures as Huber contends. On the other hand, with an analysis of state plans, I find that some states are not in lock-step with federal pressures as Scholz might contend. Thus, it appears that the
federal government loses some control over the implementation of occupational health and safety standards by devolving its authority to the states. However, it does not appear that there is significant ideological drifting occurring within those states.
References


