Firm Regulations and Employment:
Evidence from Administrative Data

Alexander Gelber

UC Berkeley, Goldman School of Public
Policy, and NBER

2607 Hearst Ave.
Berkeley, CA, 94720

agelber@berkeley.edu
510-642-0953

Adam Isen

U.S. Department of the Treasury, Office of
Tax Analysis

1500 Pennsylvania Ave.
Washington, DC 20220

adam.isen@gmail.com
202-622-1727

I. Introduction

The federal government and state governments apply a wide-ranging set of regulations to firms. One important set of questions is whether and how they affect firms' decisions. For example, the Patient Protection and Affordable Care Act of 2010 (ACA) mandates that firms with 50 or more full-time equivalent employees must pay a penalty if they do not offer sufficiently generous health insurance coverage. Many have speculated that this could cause firms to reduce employment. Other proposed policies, such as an expansion of mandated parental leave, could cause similar effects.

In this paper, we examine whether firms take actions to avoid being subject to existing regulations. Many business regulations exempt the smallest businesses from these laws. In particular, many of the laws apply only to firms whose number of employees exceeds a certain threshold number; firms whose number of employees is smaller than this threshold are exempted from the laws. Mandates with exemptions for the smallest businesses include rules regarding anti-discrimination, employee layoff notification, family leave, and health care insurance. The paper explores the effects of these mandates on small businesses by exploiting the firm size cutoffs.

To undertake the analysis, we construct a panel of federal mandates, including their specific employee size cutoffs. We then match these data to a matched employer-employee panel derived from two confidential Census datasets: the Longitudinal Business Database (LBD) and the Longitudinal Employer-Household Dynamics (LEHD). The LBD is a longitudinal dataset that contains annual data on the number of employees, payroll, capital, and revenues by firm for each firm in the U.S. since 1975. The LEHD is a quarterly longitudinal dataset derived from unemployment insurance (UI) records of all employees, which contains their wages as well as some demographic information (the years of coverage depend on the state).

In the analysis, we examine whether firms strategically "bunch" just below the minimum employee cutoffs to avoid the regulations. For example, with regards to anti-discrimination legislation, the cutoff at which the federal legislation is enforced is fifteen employees in most cases, but it is twenty employees in the case of age discrimination, and many individual states have their own laws that have a lower employee size cutoff for all types of discrimination. We produce histograms of the distribution of firms' number of employees and check whether a spike appears at a number of employees just below the size threshold at which the mandates are enforced. Interestingly, no significant differences are found in the density of firms below and above the size thresholds for federal laws regarding anti-discrimination, employee layoff notification, family leave, and health care insurance. This suggests that firms are not behaving strategically to avoid these cutoffs. The greater is the number of firms bunching just below the threshold, the greater must be the costs to firms of the legislation. Thus, our results suggest that these policies are not sufficiently costly to firms to force them below the thresholds.

Recently, Garicano, Lelarge, and van Reenen (2013) found large effects of regulations on firm size in France using administrative data; we view our results as consistent with theirs, as the French context differs from that in the U.S. The results specifically for family leave and health insurance mandated benefits relate to other work on the effects of mandated benefits on firms. Summers (1989) discusses mandated benefits and discusses a model in which mandated benefits are not costly to firms because under certain assumptions they simply pass along the cost of the benefit to the worker in the form of lower money wages. Gruber (1994) finds empirical support for this hypothesis, showing that the incidence of mandated maternity benefits falls primarily on workers' wages. Our findings are broadly consistent with these findings in the sense that we find evidence that these mandated benefits do not appear to be sufficiently costly to firms to influence

their decisions about their size. Some of the regulations we examine, such as the employee notification or anti-discrimination legislation, are not mandated benefits. We are not aware of work on the costs of these policies to firms. Some literature has examined the economics of anti-discrimination law (*e.g.* Donohue 2007).

The paper proceeds as follows. Section II describes the policies we investigate. Section III discusses the data and empirical strategy. Section IV presents the results. Section V concludes.

II. Policy Environment

In this section, we describe the relevant features of the four policies that the empirical work investigates: Federal mandates regarding employer discrimination, employee layoff notification, family leave, and a Massachusetts law regarding employer offers of health insurance.

In the last fifty years, the federal government has enacted several pieces of legislation to protect vulnerable groups of workers. Beginning in 1964, the Civil Rights Act made it illegal to discriminate on the basis of race, religion, sex, or national origin in employment decisions. Older workers were added as a protected group in 1967 through the Age Discrimination Act. The proposed project will explore how these and other Equal Employment Opportunity Commission laws influence the employment outcomes of protected groups by exploiting the fact that the laws generally only apply to businesses that have at least fifteen or more employees. One exception is that the cutoff at which the legislation is enforced is twenty employees in the case of age discrimination. The second exception is that individual states have their own laws that have a lower employee size cutoff; our results are robust to excluding these states.

The Family and Medical Leave Act of 1993 (FMLA) requires covered employers to provide employees job-protected and unpaid leave for qualified medical and family reasons. Qualified medical and family reasons include personal or family illness, military service, family military leave, pregnancy, adoption, or the foster care placement of a child. To qualify for the FMLA mandate, a worker must be employed by a business with 50 or more employees. He or she must also have worked for that employer for at least 12 months (not necessarily consecutive) and 1,250 hours within the last 12 months.

The Worker Adjustment and Retraining Notification Act (WARN) was enacted on August 4, 1988 and became effective on February 4, 1989. This worker notification law provides protections to workers by requiring employers to provide at least 60 days notice in advance of plant closing and mass layoffs (defined as 33 percent or more reduction of the workforce for most layoffs). The law only applies to firms that have one hundred or more employees, and we therefore examine whether there is bunching around the level of 99 employees.

Finally, following the 2006 enactment of the Massachusetts health care insurance reform law, employers with more than ten full-time equivalent employees (FTEs) must provide a "fair and reasonable contribution" to the premium of health insurance for employees (Kaiser Family Foundation 2007). Employers who do not are assessed an annual fair share contribution of $295 per employee per year. We investigate whether there is "bunching" in the histogram of firm size just to the left of this threshold in Massachusetts, *i.e.* at 10 employees.

III. Data and Estimation Strategy

We rely upon the most detailed and comprehensive data currently available on firm size: the Longitudinal Employer Household Dynamics Files (LEHD) and the Longitudinal Business Database (LBD). These administrative data sets crucially contain data on the universe of firms.[1]

The primary source of data used in this project comes from the Census Bureau's LEHD file, which provides administrative quarterly earnings records for a large percentage of the United States workforce. The data are based on unemployment insurance earnings records and longitudinally follow workers over time. They are estimated to cover over 95 percent of private sector employment. Although coverage laws vary slightly from state to state, UI programs do not cover federal employees, the self-employed, and many agricultural workers, domestic workers, churches, nonprofits, and state and local government employees. Despite these omissions from the data, if firms covered by UI bunch under the employer size thresholds, we should still observe significant bunching under the thresholds as the vast majority of firms are covered. As of the date of our work, the full LEHD file contained over 2.8 billion quarterly earnings records from 40 states, with most states containing records as far back as the early 1990s.[2]

Since the administrative earnings records are based on firms' reports that are used to calculate tax liabilities, they are presumably free of or contain very little measurement error, compared to existing survey data. Further, because the data are constructed from the individual level up to the firm level, they appear not to be susceptible to rounding of the reported number of workers employed by the firm (a specific measurement error issue we find in other administrative data – see below). This is important when the analysis involves investigating any potential discontinuities in the density of firms according to number of employees.

In the Employer Characteristics File (ECF) of the LEHD, there are records that contain both the total number of workers ever employed by the firm in each quarter as well as the number of workers employed at the end of the quarter or beginning of the following quarter. Since the regulations apply to the minimum number of employees a firm must possesses over a specific amount of time, we take the end-of-quarter employment numbers – a quarterly snapshot

of the size of each firm – as the measure of firm size for the purposes of this analysis. Some rules apply to employees who have worked some minimum amount of time or due to other specific requirements, but this is not precisely observed in the data, implying that the analysis is a "fuzzy" rather than a "sharp" research design. For example, the WARN act cutoff of 100 workers excludes workers who have worked less than six months in the last year and employees who work less than 20 hours a week, thus creating a fuzzy research design. The results are robust to classifying firms coverage as having had 100 or more employees that have worked at the firm for at least three quarters and excluding employees who, if earning the minimum wage, could not have worked more than 20 hours per week.

More generally, our design should show bunching in the firm size distribution in a wide range of circumstances. As long as there are *some* firms with the same number of employees throughout the year, bunching should arise just under the threshold if there is a strategic reaction to the policy. Even if firms strategically react to the policy but change their number of employees throughout the year, bunching should still arise in the firm size distribution, but this bunching should be attenuated. In general, reasonable assumptions about the evolution of firm size over time lead to the conclusion that if firms react strategically to the policy we should still observe bunching in the firm size distribution in our data, particularly given our administrative data with large sample sizes, but that this bunching could be attenuated.

While the LEHD data are very detailed in some regards, they have several important limitations that bear mentioning. First, some important states are missing from LEHD coverage. For example, Massachusetts, which underwent health insurance reform that differentially affected businesses by number of employees, is not one of the covered states in the data. Second, with the exception of one state, the earliest data go back to 1990, but some of the policies went

into effect prior to 1990. While examining the long run degree of bunching is valuable, there is also some advantage to leveraging data from both pre and post the policy changes; histograms that allow us to construct the first-differenced firm size densities over time may increase the power of the analysis.

Therefore, we turn to the Longitudinal Business Database (LBD) for its extensive state and year coverage. The LBD is a plant-level database that covers the universe of establishments in the United States from 1975 to 2005. Included in the database is detailed industry information and annual information on employment on March 15th in each year. While covering all U.S. states and going back substantially further in time, the main limitation of the dataset is that the reports of employment appear to contain a rounding bias around "round" numbers that is not apparent in the LEHD, presumably because LBD data are self-reported by firms but are not directly used to calculate tax liabilities. Therefore, we mainly use the LBD only when the LEHD does not contain relevant states or pre/post data for any specific policy change. However, is it worth nothing that similar results are observed when using the LBD for the entirety of the analysis.

To investigate whether firms are bunching just below the minimum employee cutoffs to avoid the regulations, we create histograms of the distribution of employee size, by individual number of employee bins. We then examine whether there is a spike in firm size just to the right of each regulation's cutoff. As a general rule, the range we investigate for each regulation is five individual bins above and below the pertinent cutoff for the small cutoffs (less than 50 employees), and ten individual bins for the relatively larger firm cutoffs (50 or more employees). For each regulation, the distribution is plotted using the most recent year of data available. Then, if the regulation went into effect during the period for which data are available, we plot the

difference in the distribution of firm size from two years after the law was enacted versus two years before.

Specifically, we use the 2007 LEHD (most recent full year for that data set) to investigate the Civil Rights Act and Age Discrimination Act, the Family Leave Act, and the WARN act. Because the Family Leave Act was enacted in 1993, we also use the LEHD from 1991 to 1995, restricting the sample to states for which data are available beginning in 1991 or before, to examine how the firm size distribution changed around the policy change. We then turn to the LBD for the remainder of the analysis. The WARN act was enacted in 1988, so differences in firm size using data from 1986 through 1990 are examined. Finally, the Massachusetts Health Mandate went into effect in 2006, and so the firm size distribution in 2009 (most recent full year for the LBD) as well as the difference in the distribution between 2004 and 2008 is examined.

We can estimate a regression corresponding to the visual patterns shown. Building on Saez (2010), Kleven and Waseem (2013) develop methods for estimating "bunching" below a notch in the budget set, such as the notches created by the costs of the regulations we are investigating, as these costs discontinuously apply to firms above but not below employer size thresholds. Following Kleven and Waseem, for each employment size bin z_i, we calculate p_i, the proportion of the sample with the number of employees in the range $[z_i\text{-}k, z_i)$. The employment bins are normalized by distance to the employment threshold at which the regulation binds, so that for $z_i=0$, p_i is the fraction of people with earnings in the range $[-k,0)$. To estimate bunching, we assume that p_i can be written as:

$$p_i = \sum_{d=0}^{D} \beta_d (z_i)^d + \sum_{j=-k}^{-1} \gamma_b 1\{z_i = j\} + \varepsilon_i \qquad (1)$$

(where 1 denotes the indicator function and j denotes the bin). This equation expresses the earnings distribution as a degree D polynomial, plus a set of indicators for bins within k under

the kink. The range of bins between –*k* and -1 are those where bunching occurs. γ_b is the coefficient reflecting the average amount of mass in these bins. In our empirical application, we choose *D*=5 and *k*=1 as our baseline, so that we investigate bins of size one. Our results are robust to alternative choices of *D* and *k*.[3] We typically use a range of firm sizes of 30 (from 15 below to 15 above the threshold) for performing these estimates, though the results are also robust to this choice.

In the absence of frictions preventing bunching, the "excess mass" of firms below a notch in a budget constraint created by a regulation should be directly proportional to the elasticity of firm size with respect to the magnitude of the cost imposed by the regulation, as well as to the cost of the regulation. Thus, if we estimate no "excess mass," *i.e.* a lack of bunching, this could either indicate that the regulations are not very costly to firms, or that firms are not very responsive to the regulations.

IV. Results

The figures show the results plainly: there are no visible discontinuities in firm counts around the size thresholds. Figure 1 shows a histogram relevant to anti-discrimination legislation. Firms with 15 or more employees are subject to laws against racial discrimination, and there is clearly no bunching of firms at firm sizes below 15. Firms with 20 or more employees are subject to laws against age discrimination, and there is clearly no bunching of firms at firm sizes below 20. Estimating equation (1) again confirms that γ_b is insignificant ($p > 0.10$), with standard errors that rule out more than a small coefficient. This suggests no reaction of firm employment to the policy.

Figure 2 shows a histogram relevant to the Family and Medical Leave Act. Firms with 50 or more employees are subject to laws against racial discrimination, and there is clearly no

bunching of firms at firm sizes below 50. Figure 3 shows the difference in firm counts in each size bin between 1991 and 1995. Specifically, it shows the number of firms at each firm size in 1995 (after FMLA was passed), minus the number of firms at each firm size in 1991 (before FMLA was passed). It is clear that there is no systematic difference just below the threshold as opposed to just above the threshold. Estimating equation (1) again confirms that γ_b is insignificant ($p>0.10$) and precise, again suggesting no reaction of firm employment to the policy.

Figure 4 shows a histogram relevant to WARN. Firms with 100 or more employees are subject to laws against racial discrimination, and there is clearly no bunching of firms at firm sizes below 100. Figure 5 shows the difference in firm counts in each size bin between 1986 and 1990. Specifically, it shows the number of firms at each firm size in 1990 (after WARN was passed), minus the number of firms at each firm size in 1986 (before WARN was passed). It is clear that there is no systematic difference just below the threshold as opposed to just above the threshold. Estimating equation (1) again confirms that γ_b is insignificant ($p>0.10$), with standard errors that rule out more than a small coefficient, again suggesting no reaction of firm employment to the policy.

Figure 6 shows a histogram relevant to the Massachusetts health reform employer mandate. Firms with 11 or more employees are subject to the mandate requiring employers to offer insurance. We examine the years 2003 (before the law was passed or implemented) and 2009 (after the law was passed and implemented). We examine the difference in those years between Massachusetts and all other states—a double difference. It is clear that there is no systematic difference just below the threshold as opposed to just above the threshold. When we examine the single difference from 2003 to 2009 in Massachusetts, it also shows no systematic

difference just below and above the threshold. Finally, when we examine a single cross section from years after the policy was implemented, we also find no discontinuities at the threshold. Again, estimating equation (1) confirms that γ_b is insignificant ($p>0.10$) with standard errors that rule out more than a small coefficient. Again, this suggests no reaction of firm employment to the policy.

V. Conclusion

This paper investigates whether small businesses behave strategically to avoid the costs of regulation. Specifically, several important regulations—including rules regarding anti-discrimination, employee layoff notification, family leave, and health care insurance—apply only to businesses whose number of employees exceeds a threshold. We find no evidence that firms strategically "bunch" below these thresholds in order to avoid being subject to these regulations. Specifically, the probability distribution function of firms is smooth around the thresholds corresponding to all of these laws.

A number of factors could explain this finding. The number of firms bunching at the employment thresholds should be directly proportional to the elasticity of firms' behavior with respect to the cost of the regulation, as well as to the cost of the regulation. In this light, two possibilities arise. First, it is possible that the regulations are not very costly to firms. One possible explanation for this would be that many of the regulations are in the form of mandated benefits. If the cost of these benefits is passed one-for-one to workers—consistent with the empirical findings of Gruber (1994)—then the regulations should not be very costly to firms. However, it is worth noting that firms also do not appear to respond to other regulations, in particular anti-discrimination laws.[4]

Second, it is possible that firms are not very elastic with respect to these regulations. It could be that these regulations are costly to firms, but not sufficiently so to motivate them to hire a different number of workers than they would otherwise. In this light, it is worth noting that even larger firms (*e.g.* 50-person firms in the case of family leave) do not seem to respond to the incentive, despite the fact that a one-person change in their number of employees might make a smaller difference to the firm's profit. Another possible reason firms may not respond is that their number of employees changes frequently. Even if they are slightly above the threshold this year, they might be below the threshold next year. However, this is inconsistent with examination of the data. In particular, we find that firms in the bin immediately below the threshold in any given quarterly snapshot are still in two subsequent years 20 percent more likely (and when less time has passed, even more likely) to be below the threshold than firms in the bin immediately above the threshold in the initial period. Finally, it is possible that firms face frictions in adjusting to the policy, such as adjustment costs arising from hiring costs or lack of awareness of the relevant policies. Future research could attempt to distinguish the possible explanations for the lack of observed bunching.

Our results suggest that policies such as the ACA may cause only small changes in firm size. Of course, the ACA is a different context and our results may not generalize in this way. As the ACA regulations bind in 2016, it will soon be possible to confirm whether this is the case.

References

Abowd, John, Bryce E. Stephens, Lars Vilhuber, Fredrik Andersson, Kevin L. McKinney, Marc Roemer, and Simon Woodcock. 2009. 'The LEHD Infrastructure Files and the Creation of the Quarterly Workforce Indicators.' In Producer Dynamics: New Evidence from Micro Data, edited by Timothy Dunne, J. Bradford Jensen, and Mark J. Roberts, pp. 149-230. National Bureau of Economic Research.

Donohue, John. 2007. 'The Law and Economics of Antidiscrimination Law.' In Handbook of Law and Economics, edited by A. M. Polinsky and Steven Shavell. Elsevier. Available at: http://works.bepress.com/john_donohue/13.

Garicano, Luis, Claire Lelarge, and John van Reenen. 2013. 'Firm Size Distortions and the Productivity Distribution: Evidence from France.' Working Paper No. 18841. Cambridge, MA: National Bureau of Economic Research.

Gruber, Jonathan. 1994. 'The incidence of mandated maternity benefits.' American Economic Review 84(3): 622-641.

Kaiser Family Foundation. 2007. 'Massachusetts Health Care Reform Plan: An Update.' Available at: http://www.kff.org/uninsured/upload/7494-02.pdf.

Kleven, Henrik, and Mazhar Waseem. 2013. 'Using Notches to Discover Optimization Frictions and Structural Elasticities: Evidence from Pakistan.' Quarterly Journal of Economics 128(2): 669-723.

Saez, Emmanuel. 2010. 'Do Taxpayers Bunch at Kink Points?' American Economic Journal: Economic Policy 2(3): 180-212.

Summers, Lawrence. 1989. 'Some simple economics of mandated benefits.' American Economic Review 79(2): 177-184.

Endnotes

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[1] That is, within their coverage restrictions.

[2] See Abowd, Stephens, Vilhuber, Andersson, McKinney, Roemer, and Woodcock (2009) for a comprehensive discussion of both the construction and contents of the LEHD files.

[3] Kleven and Waseem (2013) also develop a method for estimating the amount of "missing mass" above the notch, *i.e.* the fraction of those induced by the notch to locate under the notch. They also develop methods to investigate the fraction of agents that locate in a dominated region and therefore do not respond because of frictions such as lack of awareness. In our context, this is not relevant because we do not find evidence either for bunching or, therefore, missing mass.

[4] Of course, it is also possible that these regulations are not costly to firms (or employees), or for firms near the employee cutoffs.