Deregulation of Trading Hours in the German Retail Sector and Store Size

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DEREGULATION OF TRADING HOURS IN THE
GERMAN RETAIL SECTOR AND STORE SIZE

by

ANNE PREUSS

A thesis submitted in partial fulfillment of the requirements
for the Honors in the Major Program in Economics
in the College of Business Administration
and in The Burnett Honors College
at the University of Central Florida
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Abstract

In 2006, the German federal government relinquished its power to determine store opening hours to the 16 federal states. Since then, substantial deregulation of shopping hours has occurred in all states except Bavaria and Saarland. Such deregulation could support economic growth, but it has been argued to hurt small businesses.

Therefore, this thesis examines different store size categories to find possible effects of deregulation in Germany. Past studies have focused on the employment effects of deregulation, whereas this investigation employs a difference-in-difference approach with OLS regression on the number of stores in each size category. States that have extended store opening hours will be compared to those that have not. Theory predicts large stores to be more able to profit from efficiency gains and higher returns on investment due to extended hours.

The results did not support the theoretical framework. Instead, the data indicate no significant effects on the number of stores and suggest that the constraints are not binding. Small businesses do not appear to have been affected by the change. If deregulation can be found to increase consumer spending and welfare, then such a policy change can have positive economic impacts. Further research should be aimed in this direction.
Dedication

To everyone who motivated me to keep writing, and to start, I cannot thank you enough.
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Introduction

The retail sector is vital to the economy, employing approximately 10% of the workforce in industrialized economies (Schivardi and Viviano, 2011, p. 145). However, the retail experience of the average consumer is quite different depending on where the shopping occurs. It is common to see stores serving customers 24 hours a day in the U.S. In contrast, for some European consumers, retail shopping ends at 9pm on weekdays and is almost impossible on Sundays. Some governments restrict store opening hours and/or days, affecting consumers’ and retailers’ choices. Recently, however, others have removed or reduced regulations, as is the case with Germany.

Deregulation of shopping times could affect the retail sectors of these economies. When such restrictions are lifted, theory suggests that larger stores can better compete and possibly even benefit from longer hours; as a result, their share of the retail market should increase. One such impact could be the higher concentration of hypermarkets and large supermarkets in countries that have deregulated. Opening hour restrictions are often designed to specifically protect smaller, traditional stores, which cannot afford the additional labor and operating costs associated with longer hours. Protecting smaller, sometimes family-owned, businesses often becomes an important political objective for governments. Yet in the face of sluggish economic growth in Europe and international pressure to deregulate hours, it is worth reexamining whether these potential negative effects on small businesses can be substantiated.
If not, then countries could deregulate since this may increase economic activity with little or no downside.

I will examine the effects of deregulation on store concentration and entry/exit, for smaller and larger retail stores. Germany provides a kind of natural experiment, as deregulation occurred at different times in each state. Thus, German data from the period 2002-2011 will be studied to detect possible changes in the states’ retail sectors resulting from widespread deregulation in 2006 and 2007. The empirical evidence regarding the effect of retail store opening time regulation, described in detail in the Results section of this thesis, shows no significant effect, underscoring the need for additional research on this topic.
Literature Review

Regulation of Shopping Hours

**Overview of Shopping Regulation.** Shopping regulations, such as limited opening hours, can be imposed by local, regional, or national governments on retail businesses of varying sizes and thereby limit the commercial activities of businesses. Besides restricting hours, governments may also limit business location and store size, as is the case in Ireland, Norway, and some American cities, like San Francisco (Institute for Local Self-Reliance, 2012). In Germany, the *Baunutzungsverordnung* legislation effectively protects medium-sized retailers and discount stores by prescribing a maximum floor area of 1,200 square meters, allowing for retail space of 700 square meters (Kalhan and Franz, 2009, p. 63).

Governments can restrict the days (typically weekends) or hours (usually early morning or late evening) that stores can open for customers. When a store closes for one or more days, this often results in higher costs, such as spoiled food, than opening later or closing earlier. Note that a store opening regulation serves as a kind of upper bound on store behavior; stores may be open during the government-prescribed times, but they could still choose to remain closed during the additional hours for economic reasons or personal choice.

**Shopping Deregulation in Europe.** In Europe, store opening-hour regulation is still a widespread phenomenon. As of 2013, Austria, Belgium, Cyprus, Finland, France, Germany, Greece, Iceland, Luxembourg, Malta, the Netherlands, Norway, Portugal, Spain (regionally), and the United Kingdom continue to have legislation restricting retail opening hours. However, the following nations have completely unrestricted hours: Bulgaria, Croatia, the Czech Republic,
Denmark, Estonia, Hungary, Ireland, Italy, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia, Sweden, and Turkey (EuroCommerce). Beyond Europe, some Australian states and Canadian provinces and municipalities still restrict shopping hours, for instance (Australian Government Productivity Commission, 2011 and Skuterud, 2005), so this type of regulation is not only found in Europe.

Germany’s laws and other restrictive legislation should be viewed in the following context: Europeans are comparatively more concerned about producer interests and consumer (or rather, worker) protection, whereas Americans care more about consumer economic interests (namely, a wide variety of goods and longer store hours) and consumer sovereignty (Whitman, 2007, pp. 383-384). Nevertheless, such regulations are being progressively scaled back throughout Europe.

Some European nations, like Sweden, lifted their regulations many years ago, providing a comparison to those that still regulate or have only recently deregulated. Sweden, after expanding retail hours in 1948 and 1967, fully removed all store opening hour restrictions in 1972. Denmark only recently deregulated, but it did so gradually but uniformly from 1995 to 2012. As in Sweden, the deregulation process ended in store hours being completely deregulated.

**Shopping Deregulation in Germany.** This thesis focuses on the deregulation experience in Germany, which has been a gradual process. In Germany shopping days were determined by the *Ladenschlussgesetz* (“Store closing law”) from 1956 to 2006. Although it was
revised several times, the last major changes came in 1996, when stores were allowed to open from 6 am to 8 pm Monday-Friday and Saturday until 4 pm, and in 2003, when Saturday opening hours were changed to 8 pm as well. Since 2006, however, federal states now have the power to determine shop opening hours. The *Ladenschlussgesetz* is only still in place in Bavaria. All other federal states deregulated opening hours in 2006 and 2007. When one state deregulated shopping hours, this probably induced its neighbors to deregulate as well to avoid losing customers to cross-border shopping.

Unlike in many countries, shopping deregulation in Germany occurred at different times, when legislation was passed in each state, as can be seen in Appendix Table A1, which summarizes Tables 5 and 6 in Reddy (2012, p.53-54). The exact dates that deregulation laws went in force are noted. For simplicity, those that occurred after June 30 were rounded up to the next year; the change happened so late in the year that its effect on businesses would not likely be seen until the following year.

The yearly opening hours by state are also listed. Bavaria and Saarland made no (or minimal) changes to their opening hours; thus, their total opening hours are the lowest. While all other states have at least 7000 legal yearly opening hours, Rhineland-Palatinate and Saxony have significantly less, 4856 and 5865 hours respectively. Most states allow stores to open 24 hours a day Mondays-Saturdays; in addition, they allow for opening on select Sundays each year for a certain number of hours. There is some year-to-year variation in the number of
opening hours based on the different holidays celebrated in each state, which may fall on workdays, but the values in Table A1 reflect this possibility.

As mentioned earlier, extending possible shopping hours in no way requires a business to stay open longer. In fact, Kosfeld (2002) observed that many stores that initially extended shopping hours in Germany following the 1996 deregulation have since reverted back to their preregulation hours (p. 52). More recent research has found the old store opening hour restrictions to be binding constraints. By the beginning of 2012, 3,000 of 5,700 Rewe stores, Germany’s second largest food retailer, were open until 10 pm, with 260 stores operating even until midnight (Seidel 2012). Bossler and Oberfichtner (2014) found average opening hours per week of 76.7 in deregulating states, compared to 73.1 hours in Bavaria (where no deregulation occurred) by examining the store hours of Edeka, Germany’s largest food retailer (p. 21).

To test the effect on large stores, I analyzed the opening hours of IKEAs in Germany. Only in Bavaria and Saarland do closing times push against the limits; in all other states, the constraint does not appear binding because store hours could be further extended. ¹All IKEA stores open past 8 pm are taking advantage of deregulated store hours; under the Ladenschlussgesetz, stores had to close by 8 pm nationwide. I examined a hand-selected anecdotal sample of small stores in Bautzen, a town in Saxony. Here, none of the stores appear

¹ The reasons for not extending hours up to the constraint are probably economic and sociocultural in nature. It may not be profitable to extend hours for stores in relatively smaller cities. Most likely, customers would not expect stores to remain open later, so traffic might be low, especially if surrounding stores have long closed.
to have been bound by the opening hour restrictions. Extended opening hours seem to have been adopted by a significant number of medium and large stores, but few small stores.

**Concentration of Larger Stores**

Whether deregulation of store opening hours has any effect on the concentration of larger stores and hypermarkets is an open question. Clemenz (1990) builds a theoretical model in which deregulation “either has no effects or it reduces prices, increases consumer welfare, and leads to an increase of the relative market shares of efficient firms” (p.1324). Smaller stores, which face higher costs, will benefit most from trading hour regulations (p. 1336).

If smaller stores benefit from regulation, as Clemenz showed and lobbyists contend, then we should expect to see a weakening of the economic position of smaller, traditional stores when opening hour regulations are lifted. Larger retail stores should strengthen their market shares, and this increase could occur through a number of different channels.

**Possible Sources of Advantage for Larger Stores.** Research by Baker (2002), cited by the Australian Government Productivity Commission (2011), points to a shift toward larger shopping centers by ‘time-poor’ but well-off consumers, who face relatively low transportation costs (p. 281). These consumers are likely to be two-income households who can now take advantage of extended hours. Here it is important to consider a spatial perspective. Larger shopping centers are generally located further from city centers than small, traditional supermarkets, often due to their size. Therefore, it may be difficult for consumers, especially
those with limited time, to access them during normal opening hours. As hours are extended, the locational disadvantage of larger centers dissipates.

There is also a greater return to capital investment because of longer operating hours. When a large supermarket or hypermarket stays closed, there is underutilization of the property, of equipment, etc. (Australian Government Productivity Commission, 2011, p.278). As those fixed costs are spread out over longer hours and more business, larger stores can compete better with smaller stores.

However, every store that chooses to open longer must face some additional costs, most significantly employee wages, and larger stores are in a better position to manage labor costs. The demand for labor increases both through a “sales effect” of higher revenue and through a “threshold effect” of necessary minimum staffing during all hours; meanwhile, a “smoothing” of sales during peak hours can be expected, reducing labor productivity (Gradus, 1996, cited in Skuterud, 2005, p. 1967). Small retailers are more susceptible to a threshold labor constraint (Boylaud and Nicoletti, 2001, cited in Australian Government Productivity Commission, 2011, p. 307). A large retailer can close different departments (bakery, deli, etc.) during off-hours, bringing down its labor demand to what would be similar to a smaller supermarket. For a smaller supermarket, though, those labor costs constitute a larger share of revenue. Thus, it is difficult for a small supermarket to compete with respect to labor costs.

Evidently, compared to smaller stores, larger stores can better adjust to changes in labor costs, and deregulation can additionally help them overcome locational disadvantages. It
appears as if they benefit from deregulation through greater returns to capital investment and possibly, an increase in efficiency, although there are mixed opinions on this issue.

**The Effect of Efficiency.** For all stores, longer hours allow for certain efficiency gains. Inventory, especially in regard to perishable goods, can be managed at a lower cost when stores can receive (just-in-time) deliveries and sell products during those extended hours. The larger the store, and its inventory, the more significant those gains should be. Overall, though, researchers disagree whether or not there is a net increase in the efficiency of firms, especially large stores, due to deregulation.

Some scholars argue that deregulation actually leads to a reduction in efficiency. Tullock (1984) believes that the increase in operating costs due to deregulation outweighs the increase in sales, as consumers only reschedule their purchases and do not actually consume more (as cited in Lanoie, Tanguay, and Vallee, 1994, p. 179). In this case, consumer welfare would probably increase, but not efficiency for firms; consumers benefit from the flexibility offered by additional opening hours, but firms may not. Some companies, such as the fast food chain Chick-fil-A, have been able to compete very well in their markets despite having more limited opening hours. More recently, a German study finds an increase in “hedonistic” shopping, especially on weekends, that should “lead to an increase in overall retail sales” (Grünhagen, 2

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2 However, Clemenz (1990) discounts these possible cost increases as “not well founded” (p. 1335).
Grove, and Gentry, 2003, p.1812). If sales have increased considerably, then operating cost increases can be overcome, and Tullock’s argument for decreased efficiency may not hold.

Ferris (1990) also argues that deregulation reduces efficiency: owners cannot price discriminate based on the day or time, but they will open longer to compete for the marginal consumer, even when it would not be efficient to do so (as cited in Lanoie, Tanguay, and Vallee, 1994, p. 179-180). The result is an oversupply of hours, and many stores, unable to cover their costs, will exit the industry. Whether or not the rational shop owner would actually extend hours, knowing the associated additional costs, is an open question.

Efficiency differences seem to play a large role in determining how deregulation will affect retailers, and usually, larger stores benefit from more efficient structures, increased buying power, and economies of scale. Wenzel (2011, p.146) concludes that under asymmetric opening hours, larger retailers benefit as long as their cost efficiency difference is large. Otherwise, under a small cost efficiency difference, deregulation may actually favor small retailers.

It is important to note that efficiency differences can have a continuing, dynamic effect. Deregulation contributed to comparatively high productivity growth in the Swedish retail sector, in contrast to Denmark, Germany, and the Netherlands (Kjøller-Hansen, Thelle, & Lindén, 2013, p.18). This continuing productivity growth can reinforce the initial effects deregulation had on the Swedish retail sector, which is extremely concentrated.
Prior Studies on Store Concentration. Wenzel (2010, p.518) captures the effects of all additional operating costs: longer opening hours work as higher entry costs would, so the number of stores decreases. “Following a deregulation, the model predicts concentration in the retail sector to rise,” raising prices (pgs. 524-525). However, there is not yet empirical evidence for such a deregulation-retail sector concentration relationship. This thesis aims to investigate this connection through data from German states.

Previous attempts to provide evidence have ended with contradictory results. A study by Ferris (1991) shows that Ontario municipalities with limited hours have a larger number of stores, whereas Moorehouse (1984) finds that American states with restricted Sunday shopping have fewer stores (Lanoie et al., 1994, p.180). Morrison and Newman (1983) empirically show a redistribution of sales from small to large stores following deregulation, and data from British Columbia by Lanoie et al. (1994, p. 181) support such a shift in market share. However, three years of data does not provide strong empirical support. Cross-sectional data from Australia from 2008-2009 finds “no relationship between the proportion of small retail businesses and the stringency of trading-hours regulation in each state and territory” (Australian Government Productivity Commission, 2011, p.308). However, the smallest proportions of small retail businesses are in the deregulated states (p.309). The empirical evidence available internationally on this topic is still inconclusive and is based on short time frames.

Small Firm Entry/Exit

A decision about entry or exit in an industry underlies the change in the proportion of small businesses. Therefore, it may be helpful to investigate the factors a small business must
consider in an entry or exit decision. Ingene and Lusch (1981) argue that retailers’ entry or exit is due only to long-term changes, not any short-run factors (as cited in Kong-Wing, 1996, p.45). However, Kong-Wing finds that retailers do in fact respond to short-term and medium-term changes in the economy, such as a recession; in fact, “individual enterprises do not have any long-term planning.” (p.55) Deregulation, though, is a long-term change.

Politicians and trade groups may argue for shopping hour regulations on the basis that they protect small businesses from closing due to intense competition from larger competitors. Cabral (2007, p.84) argues that this is not worth protecting against, as smaller firms face smaller experimentation costs, so it should be expected that we see higher entry and exit rates for smaller firms. And smaller firms do enter and exit an industry more frequently: “survival rates tend to be increasing in firm size and age.” (p. 68). His competitive selection model attributes this to the higher efficiency of larger firms: more efficient firms have lower marginal costs, and firms are pricing at their expected marginal costs, so through lower prices, more efficient firms can sell more output and capture higher market share (p.78). Thus, exiting firms are smaller than average.

When it comes to entry and exit, the entry process is slower than the exit process due to low sunk costs (Kong-Wing, 1996, p. 45). As a result, we should expect a relatively immediate exit reaction to negative shocks, but only a lagged entry reaction to positive shocks. This intuitively makes sense, as economic recoveries also usually take much longer.
Kong-Wing’s research into exit/entry by Chinese firms finds that economic changes are more important than competition in exit/entry decisions (p.43). However, Borraz et al. (2013, p.88) describe a different situation in Uruguay, where the entry of supermarkets creates a significant, although relatively modest, competitive threat to the survival of small stores. Data from Tokyo from the 1990s shows that large supermarkets’ entry (sometimes referred to as the “Walmart effect”) induces the exit of existing large and medium-size competitors, but actually improves the survival rates of small supermarkets (Igami, 2011, p.1). Igami cites as key factors small stores’ product differentiation and the positive externality of additional shoppers generated by a new large supermarket. Other mixed evidence as to the effects of entry and exit on other retail stores is also available.

Intensive and Extensive Margin

For small stores, the intensive margin appears to be the more viable method of adjusting to longer store hours, while this may not necessarily be true for large stores. Managers and owners may be forced to work because they cannot pay higher wages, but, as noted earlier, smaller stores are more susceptible to a threshold labor constraint (Australian Government Productivity Commission, p.33). Therefore, an intensive strategy may not be sufficient to compete for customers. In Germany, both intensive and extensive margin adjustment costs are a significant barrier due to union-negotiated overtime wages and employment protection legislation. Merkl and Wesselbaum (2011, p.806) find that although the extensive margin is the dominant force in the United States and Germany, the extensive margin is somewhat more important in the United States. This study, though, does not differentiate
between small and large businesses, which may rely on extensive margin adjustment to different degrees.

**Summary of Theoretically Expected Changes in Germany**

As shopping hours are deregulated, some stores, but most likely not all, will choose to stay open longer. Those that decide to remain open longer should do so because they believe they have sufficient additional demand for those hours/days and have the staffing to fill those opening hour shifts. Thus, larger stores will tend to make more use of the extended hours. This is due to higher efficiency gains, according to Clemenz (1990) and Wenzel (2011), and greater returns to capital investments. Smaller stores are hesitant to open longer due to their higher costs and threshold labor constraints, as Gradus (1996) explains. With extended opening hours, stores can capture higher market share and earn higher profits by diverting shopping to those additional hours. The competitive position of stores that retain regular hours (mostly small stores) is thus worsened.

As a result, small stores may no longer be able to compete and will choose to leave the market through bankruptcy. As Wenzel (2010) notes, new small-store entry may effectively be restricted through the “entry barrier” that longer shopping hours present. Stores that do extend opening hours will tend to add employees, so we should expect to see fewer small retail stores (0-9 employees and 10-49 employees) and more large stores (50-249 and 250+ employees) in states after they have deregulated. Ceteris paribus, the distribution of store sizes should remain relatively constant in the states that have not significantly deregulated.
Conceptual Framework

This section will provide insight into an individual firm’s decision to extend opening hours. On a national level, these decisions lead to the data that will be used in the difference-in-difference model. Owners can hire more workers and move to a larger size category, or if they miscalculate or misjudge the market, they may be forced to close their business.

Each firm has its own production function, which shows the relationship between the quantities of inputs used and the quantity of output that can be produced. The factors of production can be simplified to only labor and capital. For a firm to extend opening hours, it must increase labor, but not necessarily capital, unless it has self-checkout registers, which are uncommon in Germany.

In economics, the short-run is differentiated from the long-run in that in the long-run, the quantity of all inputs can be adjusted. For most retail stores, labor can be increased in the short-run because highly skilled workers are not really needed. Therefore stores should be able to increase labor to meet longer opening hours, if they choose to do so.

Focusing on the firm’s opening hour decision, the owner could consider marginal costs and sunk costs. Marginal costs would include hourly wages, utilities, etc. As for marginal costs, these will be key to the owner’s decision. The marginal revenue product of labor (MRP_L) is compared to the marginal cost of labor, the wage. The profit-maximizing firm would choose L so that the wage equals the additional revenue received through the employee. In the short
run, this is given by $pMP_L = w$ for competitive firms and $p \left( 1 + \frac{1}{\epsilon_i} \right) MP_L = w$ for noncompetitive firms (Perloff, 2014, pgs. 530-533).

Since we are considering off-peak hours, diminishing marginal returns probably occur: staying open one more hour, e.g. from 10 to 11 pm, does not increase sales as much as deciding to close at 6 pm instead of 5 pm. Thus, the $MRP_L$ tends to decrease with hours worked.

Sunk costs describe those costs that must be paid regardless of the opening hours chosen. For a retailer, the monthly rent or advertising would be classified as sunk costs, so these expenses are irrelevant for marginal analysis. Higher returns on investment can be achieved because longer hours could create additional revenue.

Longer store hours can also serve as a differentiating factor to improve a store’s competitive position. Compared to perfectly competitive firms, monopolistically competitive and oligopolistic firms achieve a position of higher profits (at least in the short-run) due to their differentiated products. If a store remains open longer than all of its competitors, then it does offer a unique service. Were all stores to increase their opening hours, store hours could act as a barrier to entry into the market because new entrants would require more capital to establish themselves and compete directly with their rivals (Wenzel, 2010).

Thus far, we have focused on the firm’s perspective. From a societal viewpoint, longer store hours can increase consumer welfare, which is a measure of “the benefit a consumer gets from consuming that good in excess of its cost” (Perloff, 2014, p.139). If we consider cost to
include opportunity cost, then the cost of goods can decline with longer hours. Shoppers place a value on their time, so extended hours permit them to reschedule their purchases to more convenient times, when there is a lower opportunity cost to do so. Thus, cost decreases, and their benefit from consumption increases. At an aggregate level, consumer welfare increases.
Data

The values for the variables described below are compiled in the Appendix, Table A2.

Retail Business Sizes (By Number of Employees)

German regional data, at the state level, can be found through the website of the Statistisches Bundesamt (Federal Statistical Office). The Unternehmensregister-95 system contains statistics about registered businesses in Germany. Information for variable WZ-G in the category “Handel, Instandh. u. Rep. v. Kfz u.Gebrauchsgütern” (Trade, Maintenance and Repair of Automobiles and Consumer Goods) is available for years 2002-2011. The registry categorizes “Trade, Maintenance, and Repair” businesses by the number of employees (0-9, 10-49, 50-249, 250+).

The differences between the states are evident in absolute terms: in 2011 Northrhine-Westphalia had 146,755 small stores (0-9 employees), while Bremen only 4,957. Therefore, examining percentage changes, as displayed in Table A3, in the store size categories may allow for more relevant comparison. There is a general downward trend, starting in 2005 but intensifying in 2008/2009, for the number of businesses with 0-9 employees. Most states experienced an increase in larger businesses, beginning in 2009 and 2010. However, when graphing the states against each other, most states appear to have very smooth curves with little total fluctuation in the number of stores (see Appendix Figure A1).

The data on Trade, Maintenance and Repair of Automobiles and Consumer Goods had to be manipulated slightly before proceeding further. Starting with the year 2006, minor adjustments were made by the Statistisches Bundesamt to the calculation method; therefore,
the variable was renamed WZ08-G. For the year 2006, both WZ-G and WZ08-G are available, so I replaced those values with a mean measure for 2006 to use in calculations (Table A2).

**German Retail Sector Employment**

The Statistisches Bundesamt also offers data about employment in the retail sector (variable WZ-G) for the years 2002-2011. The table *Sozialversicherungspflichtig Beschäftigte am Arbeitsort: Bundesländer, Stichtag, Geschlecht, Wirtschaftszweige* presents the number of employees subject to Social Security contributions by the federal state of their workplace and their sector. Females and males are counted separately. The employment numbers are as of December 31 of each year. Years 2002-2007 were calculated using standard WZ2003, whereas years 2008-2011 utilized standard WZ2008, which differed slightly in the types of business counted in order to comply with international standards. The effects of the recession can be clearly seen here: in every state but Hamburg, there is a decline in retail sector employment in 2009. Employment then increases in 2010 and 2011. The overall change between 2002 and 2011 is positive for eight states.

**Business Bankruptcies in Germany**

Bankruptcy statistics by federal states for the years 2002-2011 are available through Table 325-31-4-B in the Statistisches Bundesamt database. This table includes all bankruptcies filed in that year, without categorizing the firms into different business sectors. Despite this limitation, these statistics can help evaluate the economic conditions in each federal state in the time period being considered. The number of bankruptcies filed is generally increasing in all states until 2009 or 2010, after which bankruptcies start to decrease. Nevertheless, the number
of bankruptcies in 2011 is still much higher than 2002; in several states (Northrhine-Westphalia and Lower Saxony), the bankruptcies in 2011 values are more than twice as large as those in 2002.

Retail Sector Value-Added Tax Revenue
Value-added tax revenue reflects economic conditions in each year and the profitability of businesses in each state. Unfortunately, the Statistisches Bundesamt data only includes the years 2007-2011, and repeated attempts to attain older data were unsuccessful. Therefore, this variable was excluded from the estimated models.

State Populations
State population data from the period 2002-2012 can be found on the Statistisches Bundesamt website. The German states differ significantly in area and population, affecting their potential economic strength. For example, the population of Northrhine-Westphalia (17,841,956) many times exceeds that of Bremen (661,301 inhabitants). Two trends are interesting to note in the state population data. Five states, after years of decreases, show population increases in 2010 and 2011. Unlike many other states, Hamburg and Berlin had sustained population increases from at least 2005 until 2011. In total, though, from 2002 to 2012, only Bavaria and Hamburg did not suffer from an overall decrease in the population. Percentage changes in the state population can be found in Figures A2.
Empirical Model

Description of Difference-in-Difference Model

To find the effects of shopping hour deregulation in German states, a difference-in-difference econometric model will be utilized. This model compares states that have deregulated with those that have not before and after the deregulation period. Even though a true experiment is difficult to conduct, the different state deregulation policies provide an exploitable source of natural variation in a quasi-experimental setting. A difference-in-difference model is a version of fixed effects estimation using aggregate data (Angrist and Pischke, 2009, p. 228), in our case, aggregate retail business data from Germany. Such a model allows for combining time series and cross-section analyses to solve the problems associated with each, namely the time series factors that would bias time series analysis and the omitted factors that would bias cross-section analysis (Gruber, 2007, p. 78). Bavaria and Saarland serve as the main controls as there has been no significant increase in store opening hours in these states. All of the other states (the “treatment group”) have greatly increased hours since 2006 or 2007. However, deregulation in Rhineland-Palatinate and Saxony has been less than in other states, so they may be counted as part of the “control group,” depending on the definition of the treatment.

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3 This is consistent with the control groups of other researchers. In Senftleben-König’s (2014) study of the effects of deregulation on employment in Germany, her control group is composed of Saarland and Bavaria. In a similar study (2014), Bossler and Oberfichtner’s control group only includes Bavaria. Saarland was completely excluded from the sample because the shops were “slightly treated” because they could now open for 24 hours once a year (p. 5). I judged this exception to be insignificant enough to include Saarland in the control group.
The following logic will be tested: if deregulation has no effect on store size, controlling for some effects, then the changes in store sizes in each state between 2002 and 2011 should follow the same trend. If the political and trade union argument holds true, though, deregulation would have a significant effect in the treatment group, reducing the number of smaller retail shops in states where opening hours have been extended. Here is a simplified example of the comparison a difference-in-difference model makes, as adapted from Gruber (2007, p.77):

(1) Businesses (Berlin, 2007) – Businesses (Berlin, 2006) = Treatment effect + Bias from economic conditions

(2) Businesses (Bavaria, 2007) – Businesses (Bavaria, 2006) = Bias from economic conditions

Therefore, upon subtracting Eq. (2) from Eq. (1), one arrives at

(3) [Bus. (Berlin, 07) – Bus. (Berlin, 06)] – [Bus. (Bavaria, 07) – Bus. (Bavaria, 06)] = Treatment effect

When I subtract the change in the number of businesses in Bavaria (a control group) from the change in the number of businesses in Berlin (a treatment group), I can control for bias due to any changes in economic conditions in Germany to arrive at a difference-in-difference estimator, an estimate of the effect of deregulation (the treatment) on the number of stores. The key identifying assumption is that trends in the areas would have evolved in the same way in absence of the treatment. The graphs in the Appendix Figures A1 show a comparison of the trends. The trends for the control and treatment groups appear to remain similar for small, small/medium, and medium/large stores during the entire period studied.
Only with large stores do we see a departure from this similarity, starting in 2010. This could possibly indicate effects of deregulation.

Regression Model

The following equation will be used to model the effects of deregulation in a state on the number of retail stores in a state:

\[ y_{st} = \beta_1 D_{st}^{after} S_{st}^{treatment} + \beta_2 employment_{st} + \beta_3 bankruptcies_{st} + \beta_4 population_{st} + \tau_t + \delta_s + \epsilon_{st} \]

In this equation, the response variable, \( y_{st} \), represents the number of small stores (0-9 employees and 10-49 employees) or the number of large stores (50-249 employees and 250+ employees) for a specific state, \( s \), in a given year, \( t \). I run separate regressions for both small stores and large stores as the dependent variable. The dummy variable \( D_{st}^{after} \) takes the value of 1 if the given year is after deregulation has occurred in that state and the value of 0 if the year is before deregulation occurred. If the deregulation was passed after June 30, the next year is counted as the year of the policy change.

The value of the scale variable \( S_{st}^{treatment} \) depends on the strength of the deregulation policy in that state and lies between 0 and 1, as used in Senftleben-König (2014). Such a treatment definition seemed preferable to the two extremes of strict treatment (excluding Bavaria, Rhineland-Palatinate, Saarland, and Saxony) and less strict treatment (fully including Bavaria, Rhineland-Palatinate, Saarland, and Saxony).

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4 Senftleben-König incorporates the differing deregulation intensity of German states through a variable that is based on the “percentage change in hours that shops are allowed to open” through the new legislation (p.14). This variable would take the value of 1 if store hours doubled.
Rhineland-Palatinate and Saxony in the treatment group). The values for the scale variable can be found in Appendix Table A4.

The coefficient of interest is $\beta_1$, which shows the effect on the number of stores, ceteris paribus, of significant deregulation in a state. If the scale and the dummy variable were both 1, this coefficient would have its full impact on the number of stores of each type.

The model contains several other explanatory variables. The employment in the retail industry in each state in the given year is measured by $\text{Employment}$. During a weaker economy or a recession, staff levels might be reduced and the company might move to a lower size category. The number of bankruptcies in each state in the given year is shown through $\text{Bankruptcies}$. The previous two variables are all measures of the general economic conditions. These are especially important since the global recession greatly affected Germany in 2008, so through these variables and the year fixed effects, the impact of the recession can be accounted for.

To control for significant population differences between the states, the population of the states will also be considered through the variable $\text{population}$. I also include constants, $\delta_s$, in the equation, one for each of the states; these are the state fixed effects, which represent the effects on $y_{st}$ by unobservable factors specific to each state. The standard errors in the regressions are clustered at the state level to allow for correlation within states (the clusters) because we cannot assume that the values for one state over time are independent of each other. Year fixed effects are captured through the term $\tau_t$. The error term, $\epsilon_{st}$, captures
anything omitted from the regression that varies across the states and years. If these unobservable variables are uncorrelated with $y_{st}$, then they are not problematic to our analysis.

When I conduct the analysis, I plan to perform various robustness checks to see how sensitive my results are to changes in the variables. I would change the opening hour threshold when determining which states to include in the treatment group. A “strict” definition of “significant deregulation” is an increase in opening hours to at least 6000; this therefore leaves Bavaria, Rhineland-Palatinate, Saarland, Saxony with a value of 0 for $S^{treatment}$. A “less strict” definition would leave only Bavaria and Saarland in the control group. The classification of “small” and “large” stores would also be modified to include “small and medium” stores and “medium and large” stores.

An additional robustness check would transform the level $y_{st}$ variable to a logarithmic form. All of the coefficients ($\beta_1, \beta_2...$) then represent the change in log (number of stores) when the explanatory variable increases by one, and when the coefficients are multiplied by 100, they show the approximate percentage change in the number of stores (Wooldridge, 2006, p.197). The percentage change interpretation can make sense for this data because a difference of 10 stores is more important when there is a change from, for example, 10 large stores to 20 large stores, compared to a change from 210 to 220 large stores.
Evaluating the Strength of the Study Design

According to Meyer (p. 153), the three “goals of a research design should be: (1) find variation in the key explanatory variables that is exogenous, (2) find comparison groups that are comparable and, (3) probe the implications of the hypotheses under test.”

The major problem with “natural experiment” studies is that the assumption of randomness is not credible (Rosenzweig and Wolpin, 2000, p. 828). Meyer likewise warns that policy changes may be driven by political factors associated with outcomes (p.159). Senftleben-König (2014), though, does make a convincing case for exogeneity in the deregulation law change (p.5). For example, Bavaria had first announced a “pioneering role” in store closing hour deregulation, but the vote resulted in a tie after the Prime Minister had to leave early. Thus, Bavaria did not deregulate.

It is the second goal that warrants the most scrutiny. As the number of retail businesses, employment, bankruptcy, taxable revenue, and population data all indicate, there are significant differences between the states being compared. As Meyer suggests, it is desirable to have multiple comparison groups with greater differences (p.157); such is the case with the two states (Bavaria and Saarland) with no deregulation. To improve comparability, he also recommends extending research to multiple pre-intervention and post-intervention time periods (p.157), and fortunately we have data from 2002 to 2011, several years before and after deregulation in 2006 and 2007. We have “multiple comparison groups” and “multiple time periods” also in the sense that states are receiving the “treatment” (deregulation) at different times; a state may even be part of the control group in 2006, and then belong to the treatment
group in 2007 upon extending its permitted retail opening hours. To avoid omitted variable bias, it is worth asking whether groups with different mean values of a possibly unmeasured variable respond to other factors similarly (p.157). Through the available data, states seem to be similarly affected by factors such as the recent recession and the subsequent recovery.

As Meyer notes, a “recession may have a disproportionate effect” (p.155) on one group, such as smaller shop owners. Although the recession appears to impact retail store owners similarly across the states, it is a source of variation that unfortunately cannot be completely eliminated, a downside of a natural experiment such as this. Therefore, as far as probing the implications of the hypotheses, one must be very careful in applying the results to different cases, where the time period, institutions, and characteristics of states can be different.
Results

This section reports the results obtained from the difference-in-difference ordinary least squares regressions.

First, the OLS model without modifications was tested. The term “intx” represents the multiplication of term $D_{after}$ and $S_{treatment}$, so this becomes the variable of interest. For my main results, I used the scale treatment definition. These results are presented in Table 3. With the scale value treatment, most of the p-values for the interaction term were lower, indicating that this could be the best treatment definition to apply.

However, none of the intx terms prove significant. The signs on the intx coefficients also do not fit the model’s predictions: according to the regression output, the number of small or small/medium stores increases with deregulation, but the number of large or medium/large stores decreases. Because the coefficients are not significantly different from zero, though, this is not a great area of concern.

The model appears to be supported by a very high $R^2$ value (99%), but this is due to little variation in the number of stores over time and the presence of state fixed effects. Once state fixed effects are introduced to the model, $R^2$ increases to 99%, regardless of the presence of other dependent variables (Table 6). The little variation there is in the number of stores appears

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5 I also tested alternative types of treatments, including the “strict” definition of treatment and “less strict” definitions of treatment in place of the scale values. These results are displayed in Appendix Tables A6 and A8.
to be almost completely absorbed by the state fixed effects. Although the $R^2$ value stayed relatively constant, the root mean squared error changed considerably between the different regressions run. The MSE was much higher for small-store models; thus, those models have much more variability, also due to the higher number of small stores than large stores. The fitted regression line is further from the data points.

Some adjustments were made to this model, and the results of these tests can be found in the Appendix. Table A5 shows results excluding the recession years 2007 and 2008. Tables A6-8 display the results obtained with the original time period but different definitions of treatment; Table A7 uses the strict treatment definition, but considers only West German states.6

Next, modifications to test robustness were applied to the regression for large stores. The first column of Table 4 is identical to the large store column of Table 3. In the next columns, explanatory variables were omitted to test their impacts on the model. The fifth column’s only explanatory variable is the strength of deregulation. The R-Squared value remains nearly as high as in the other tests, and the intx coefficient is still not significant, but in absolute terms, not much changed, compared with the previous tests with more explanatory variables. This suggests a low explanatory power on the part of the other variables. Finally, the dependent

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6 In their study of the effect of German shopping hour deregulation on food retailing employment, Bossler and Oberfichtner (2014) excluded all former East German states because they are “still affected by lower economic development, high unemployment rates…and a differing industrial structure” (p.8).
variable was changed to logarithmic form, which also did not result in a significant intx coefficient. Similar modifications to the regressions can be seen in the Appendix, Tables A9-19, for the tests using different store sizes and different treatment definitions.

To conclude, I tested the original OLS model with different dependent variables, bankruptcies and retail employment, and regressed these only on the interaction term and the state and year fixed effects. Given the strong correlation between bankruptcies and the number of stores in Tables 3 and 4, I specifically wanted to ensure that the effect on stores of deregulation was not only due to bankruptcies. The test in Table 5 shows no significant effect of deregulation on bankruptcies, which supports the original formulation of the model. The tests for strict and less strict treatment definitions can be found in the Appendix, Tables A20 and A21. I did not test state population as a possible dependent variable because as seen in Table 4, removing it from the original equation does not increase the p-values of the interaction term nearly as much as removing bankruptcies does.
Discussion

The results displayed in the previous section will be discussed in this section, and other possible models will be considered. In addition, shortcomings of this research and possible future research extensions will be examined.

Discussion of Results

The models above found no significant change in the number of stores due to deregulation, regardless of size category. Considering the research in the Literature Review section, this could be due to a number of factors. Although customers may now be growing accustomed to grocery stores opening longer, most customers tend to still shop during “normal“ hours, especially for specialty items, which small stores often sell. Another possibility could be that at least some of these small stores have used deregulation to find unique “niches“ for themselves, for instance, by only opening in the later evening hours and offering alcohol and other products. Either way, small stores do not seem to have been significantly negatively affected by deregulation.

With respect to the other store size categories, the effects of deregulation may simply be contained within the categories. The additional workers that might be hired to extend opening hours might not translate into a change in size category, so there would be no movement between categories in the data. Further research would be needed to support any of these possible explanations.

Even if no certain conclusion can be reached from firms’ perspectives, deregulation in other countries has had a positive effect on consumers. Longer opening hours are known to
reduce the opportunity cost of shopping for consumers and increase consumer welfare due to
time savings. Estimates from the effects of the revision of the Danish Shops Act in 1995 place
the aggregate consumer welfare gains at between 5 and 6 billion DKK, about $1 billion at
current exchange rates. (Ministry of Trade and Industry, 2000, p. 8). This is consistent with
Wenzel (2010), who predicted an increase in consumer welfare due to deregulation. The same
welfare benefits can theoretically be expected in Germany.

Other Models Considered

Although state fixed effects logically fit my model, they lead to extremely high $R^2$ values.
Removing them might allow me to better understand which variables have higher explanatory
power. However, when state fixed effects were omitted from the model, the regression still
produced a $R^2$ value of 92%. The other independent variables (state population, retail
employment, and business bankruptcies) seem to act almost like state fixed effects because
they change relatively little over the years.

Besides the ordinary least squares regression, there are other possible models to explain
a relationship between deregulation and store sizes. A two-stage least squares regression
model uses an instrumental variable approach. A 2SLS model requires two assumptions: that
the instrument has no partial effect on $y$ and is not correlated with unobserved factors that
affect $y$; in addition, the instrument must be related to the endogenous explanatory variable
(such as bankruptcies) (Wooldridge, 2006, p.512). These assumptions probably cannot be
satisfied because the OLS regression equation does not show a significant effect when
bankruptcies (a possible instrumented variable) is regressed on only the interaction term (a
possible instrument) and fixed effects (Table 5). This is the drawback of 2SLS: it can be difficult to find an appropriate instrument.

Therefore, other estimator methods using an instrumental variable approach are also not feasible. Furthermore, there are additional reasons to avoid such models. According to Wansbeek and Knaap (1999), the Limited Information Maximum Likelihood (LIML) estimator has seldom been used for panel data contexts (p. 338). The Generalized Methods of Moments (GMM) Estimator suffers from finite-sample problems (Wooldridge, 2001, p.91). While OLS will be unbiased and consistent, GMM is only guaranteed to be consistent (p.90-91). Consequently, OLS remains the model of choice, given the data available.

Research Shortcomings

Generally, my research suffered because of the great difficulty of finding consistent data for my variables of interest, over longer time periods. As a result, the models became very saturated, with many independent variables (twenty-eight) and a relatively small number of observations (generally, n=160). Germany’s 16 total states were, unfortunately, a natural limitation. The assumptions required for fixed effects estimators can be found in Wooldridge (2006, pgs. 507-508). In order for the estimator to be normally distributed, the idiosyncratic errors ($u_t$) must be normally distributed (p.508). However, my regressions use standard errors clustered at the state level because my standard errors should be robust to heteroskedasticity and intra-group correlation. More clusters (states) would be preferable from an econometric perspective. Examining district level data within Germany would increase the number of clusters. Unfortunately, I did not have access to complete district level data for this project.
Several other data limitations are also worth mentioning here. Store sizes in terms of square meters or smaller categories (i.e. 10-25 employees instead of 10-49, etc.) perhaps would have produced more accurate results. For my measures of employment and the number of stores by number of employees, I had to work with two different standards, probably leading to a small amount of distortion. A measure of retail revenues, ideally on a store size level, would have greatly added to my model, but this was not available. Only VAT revenue was accessible, but not for the entire period under study. Finding the needed data was a major limitation.

In contrast, both Bossler & Oberfichtner and Senftleben-König (2014) use employment data from the Establishment History Panel (BHP) of the Institute for Employment Research. As a UCF student, I could not obtain access to this database. Obtaining access through a German institution would have been beyond the scope of my undergraduate thesis, but this data would have been beneficial to my research.

Like Bossler & Oberfichtner and Senftleben-König, my research was likely affected by the Great Recession. The recession occurred just after deregulation laws were enacted, affecting the economic situation in Germany from at least 2008 on. This makes it very difficult to examine post-deregulation effects in isolation. Removing the pre-recession year 2007 and the recession year 2008, as in Appendix Table A5, still does not solve this issue because of inherent lingering recessionary effects beyond 2008. Much of the variation due to the recession has been addressed through the use of year fixed effects because these control for characteristics of each particular year. The year fixed effects are a kind of yearly average for the
German states. In reality, though, some states were hurt more by the recession than others: between 2006 and 2009, Saarland’s GDP fell 5.2%, while Berlin’s increased 3.9% (Losse, 2010).

During the time period of deregulation, online retailing was on the rise in Germany too, probably influencing the survival of brick-and-mortar stores and the decision to deregulate. According to retailers association HDE, overall retail sales in Germany are expected to increase very modestly, with diminishing sales at physical stores offset by online growth (Sloat, 2014). It is estimated that as many as 50,000 physical stores could “be wiped off the map by the digital wave” by 2020 (Sloat). The article mentions that weekends and evenings are the strongest periods for online shopping, when most brick-and-mortar shops are closed. Growth in online retailing is likely also affecting store opening hour decisions and financial survival. With respect to deregulation, online retailing makes opening hour constraints less binding. Because online shopping was increasing over the years, this change is mostly contained in year fixed effects, unless there are significant differences in online purchase behavior between the states.  

Future Research Extensions

Bossler & Oberfichtner also conducted their deregulation research at the district level in Germany. They found that the state-level approach I used was “very conservative” and had “little power to detect effects of moderate size” (p. 11). My research approach could be extended to the district level to uncover such effects and increase the number of observations.

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7 For example, internet shopping may be a substitute for shopping at physical stores in more rural areas, whereas in urban areas, internet shopping may act as a complement.
Research like this could be undertaken with other European countries that have recently deregulated, like Sweden or Denmark. A longer post-deregulation period, and without the impact of the recession, would likely lead to better data and more significant results. If the data needed are available, such research could lead to new insights into the effects of shopping hour deregulation in different nations.

Beyond the number of stores, store hour deregulation has likely had other effects, both economically and socially. Data specifically on retail bankruptcies could also be used as the dependent variable in an OLS regression with the deregulation term. For example, it may even be possible to locate in other databases bankruptcies or revenues at the store size level, and these relationships could be modeled. A model with bankruptcies by store size, for instance, would avoid the movement between store sizes that confounds the deregulation effect. It would also be interesting to examine the welfare effects of deregulation on society as a whole, or individually, on households and business owners. Policy deregulation can affect many economic variables, and most, except employment, have not yet been widely studied.
Conclusion
The results of my empirical models did not support the theoretical framework I derived from the literature. No significant effects of deregulation on the number of stores by size category could be found. The year and state fixed effects alone explained 99% of the variation in the number of retail stores by size (Table 6). This is consistent with the trends that occurred in Germany during this time, including the Great Recession and rise of e-commerce. Other than these year- and state-specific factors, stores appear not to have significantly adjusted their sizes in response to deregulation.

This could be due, for example, to different German institutional factors of the retail sector, or cross-cultural differences. For instance, employees in Germany usually have more rights, so retail firms may be less able to respond to regulatory changes through increased hours than one might expect in the U.S. It may be too difficult to explain variation in the number of stores due to deregulation alone because a multitude of individual factors affect the hiring or shut-down decisions of stores. With more data about the retail sector, especially over a longer time frame, it might be possible to identify clearer repercussions of store hour deregulation on the number of stores by size. Right now it may ultimately be a case of “too early to tell,” where the full deregulatory effects and changes in shopping behavior have yet to be seen in the German retail sector.

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8 Specifically, a store might hire an additional worker to extend hours on an experimental basis. Compared to the U.S., German employment laws would make it more difficult to fire this worker. Therefore, more risk is involved on the owner’s end. It is worth noting that the German Act Against Unfair Dismissal only applies to businesses with more than 10 employees, providing an incentive for firms to remain small.
The shopping hour constraints do not appear to be binding, as the observational data suggests. The deregulated hours have only been adopted by a limited number of retailers, especially with respect to smaller stores, and most customers have not considerably changed shopping habits. If shoppers would like to make purchases during off-peak hours, they may do so through catalogs or increasingly, the Internet. Therefore, there seems to be no significant effect on retail market shares.

Deregulation can only have economic effects if individuals and businesses actually significantly change their shopping behaviors at brick-and-mortar retailers. Thus, it is possible that there is almost no deregulation effect, which would mean that we are looking for something that does not exist. In this case, deregulation could possibly lead to economic growth (if there is sufficient evidence for this) and an increase in consumer welfare without negative effects on small businesses.
### Table 1: IKEA Store Hours by State

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BADEN-WÜRTTEMBERG</td>
<td>6</td>
<td>9-10am to 8-9pm</td>
<td>9-10am to 8-10pm</td>
<td>9-10am to 8-9pm</td>
<td>0</td>
</tr>
<tr>
<td>BAVARIA</td>
<td>6</td>
<td>9-10am to 8 pm</td>
<td>9-10am to 8 pm</td>
<td>9-10am to 8 pm</td>
<td>0</td>
</tr>
<tr>
<td>BERLIN</td>
<td>3</td>
<td>10am to 9pm</td>
<td>10am to 9pm</td>
<td>10am to 9pm</td>
<td>0</td>
</tr>
<tr>
<td>BRANDENBURG</td>
<td>1</td>
<td>10am to 8pm</td>
<td>10am to 9pm</td>
<td>10am to 9pm</td>
<td>0</td>
</tr>
<tr>
<td>HAMBURG</td>
<td>3</td>
<td>10am to 7:30-9pm</td>
<td>10am to 7:30-9pm</td>
<td>10am to 7:30-9pm</td>
<td>0</td>
</tr>
<tr>
<td>HESSE</td>
<td>4</td>
<td>10am to 8-9pm</td>
<td>10am to 9-10pm</td>
<td>10am to 8-9pm</td>
<td>0</td>
</tr>
<tr>
<td>LOWER SAXONY</td>
<td>6</td>
<td>10am to 8-9pm</td>
<td>10am to 8-10pm</td>
<td>10am to 8-9pm</td>
<td>0</td>
</tr>
<tr>
<td>MECKLENBURG-W. POMERANIA</td>
<td>1</td>
<td>10am to 8pm</td>
<td>10am to 8pm</td>
<td>10am to 8pm</td>
<td>0</td>
</tr>
<tr>
<td>NORTHRHINE-WESTPHALIA</td>
<td>10</td>
<td>10am to 8-9pm</td>
<td>10am to 9-10pm</td>
<td>10am to 8-9pm</td>
<td>0</td>
</tr>
<tr>
<td>RHINELAND-PALATINATE</td>
<td>1</td>
<td>10am to 8pm</td>
<td>10am to 8pm</td>
<td>10am to 8pm</td>
<td>0</td>
</tr>
<tr>
<td>SAARLAND</td>
<td>1</td>
<td>10am to 8pm</td>
<td>10am to 8pm</td>
<td>10am to 8pm</td>
<td>0</td>
</tr>
<tr>
<td>SAXONY</td>
<td>2</td>
<td>10am to 8-9pm</td>
<td>10am to 10pm</td>
<td>10am to 8-9pm</td>
<td>0</td>
</tr>
<tr>
<td>SAXONY-ANHALT</td>
<td>1</td>
<td>10am to 8pm</td>
<td>10am to 10pm</td>
<td>10am to 8pm</td>
<td>0</td>
</tr>
<tr>
<td>SCHLESWIG-HOLSTEIN</td>
<td>2</td>
<td>10am to 8pm</td>
<td>10am to 8pm</td>
<td>10am to 8pm</td>
<td>0</td>
</tr>
<tr>
<td>THURINGIA</td>
<td>1</td>
<td>10am to 8pm</td>
<td>10am to 9pm</td>
<td>10am to 8pm</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: There are no IKEA stores in Bremen.
Table 2: Opening Hours of a Small Business Sample from Bautzen, Saxony

<table>
<thead>
<tr>
<th>STORE NAME</th>
<th>LINE OF RETAIL</th>
<th>MON.-FRI.</th>
<th>SAT.</th>
<th>SUN.</th>
</tr>
</thead>
<tbody>
<tr>
<td>KRETSCHMAR BUCHHANDLUNG</td>
<td>Books</td>
<td>9:00 - 19:00</td>
<td>9:00-16:00</td>
<td>X</td>
</tr>
<tr>
<td>FUSS UND SCHUH</td>
<td>Shoes</td>
<td>10:00 - 18:00</td>
<td>10:00-14:00</td>
<td>X</td>
</tr>
<tr>
<td>BETTENHAUS HEBER</td>
<td>Bedding</td>
<td>9.30 - 18.00</td>
<td>09:30 - 12.00</td>
<td>X</td>
</tr>
<tr>
<td>EP: DIE FERNSEHERWERKSTATT</td>
<td>Electronics</td>
<td>09:00-19:00</td>
<td>09:00-13:00</td>
<td>X</td>
</tr>
<tr>
<td>SCHUHHAUS MUTSCHER</td>
<td>Shoes</td>
<td>9.00 - 18.30</td>
<td>09:00-13:00</td>
<td>X</td>
</tr>
<tr>
<td>GESCHENKARTIKEL KREATIVLING</td>
<td>Arts and crafts store</td>
<td>10.00 - 18.00</td>
<td>10:00-13:00</td>
<td>X</td>
</tr>
<tr>
<td>ZOO KUNATH</td>
<td>Pet supplies</td>
<td>10:00-18:00</td>
<td>9:00-12:00</td>
<td>X</td>
</tr>
<tr>
<td>SEILEREI SCHÄFER</td>
<td>Rope products</td>
<td>09:00 - 12:00, 13:00-17:00</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>TOM'S BABY- UND KINDERWELT</td>
<td>Child clothing</td>
<td>09.30 - 18.30</td>
<td>09.30 - 14.00</td>
<td>X</td>
</tr>
<tr>
<td>ANNES BOUTIQUE</td>
<td>Apparel</td>
<td>10.00 - 19.00</td>
<td>10.00 - 16.00</td>
<td>X</td>
</tr>
</tbody>
</table>
**Table 3: Ordinary Least Squares Regression Model with Scale Treatment**

<table>
<thead>
<tr>
<th>DEPENDENT VARIABLES</th>
<th>SMALL STORES</th>
<th>LARGE STORES</th>
<th>SMALL/MEDIUM STORES</th>
<th>MEDIUM/LARGE STORES</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTX</td>
<td>901.6</td>
<td>-6.829</td>
<td>673.6</td>
<td>-23.66</td>
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<td>0.358</td>
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<td>-0.0826</td>
<td>0.00975***</td>
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<tr>
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<td>(0.000531)</td>
<td>(0.0504)</td>
<td>(0.00203)</td>
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<td>0.00503</td>
<td>0.122</td>
<td>0.000230</td>
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<tr>
<td>RETAILEMP</td>
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<td>0.000431***</td>
<td>-0.0975***</td>
<td>0.00280***</td>
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<td>(0.0237)</td>
<td>(0.000590)</td>
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<td>6.36e-06</td>
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<tr>
<td>STATEPOPULATION</td>
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<td>2.25e-05</td>
<td>0.0139**</td>
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<td>0.0121</td>
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<td>0.996</td>
<td>0.999</td>
<td>0.999</td>
</tr>
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</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Table 4: OLS Model for LARGE Stores with Scale Treatment and Modifications

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>ALL INDPT.</th>
<th>WITHOUT BANKRUPTC IES</th>
<th>WITHOUT RETAILEMP</th>
<th>WITHOUT STATEPOP</th>
<th>WITHOUT RETAILEMP &amp; STATEPOP</th>
<th>WITHOUT BANKRUPTC IES, RETAILEMP &amp; STATEPOP</th>
<th>LOG (LARGE STORES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTX</td>
<td>-6.829</td>
<td>-4.776</td>
<td>-8.346</td>
<td>-7.250</td>
<td>-9.799</td>
<td>-7.629</td>
<td>0.0378</td>
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<td>P-VALUES</td>
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<td>0.587</td>
<td>0.360</td>
<td>0.340</td>
<td>0.423</td>
<td>0.595</td>
<td>0.551</td>
</tr>
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<td>BANKRUPTC IES</td>
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<td>(0.000476)</td>
<td>(0.000460)</td>
<td>(5.75e-06)</td>
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<td></td>
</tr>
<tr>
<td>P-VALUES</td>
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<td>0.00153</td>
<td>0.00294</td>
<td>0.00223</td>
<td>0.493</td>
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<td></td>
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<tr>
<td>RETAILEMP</td>
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<td>0.000456***</td>
<td>0.000493***</td>
<td>1.02e-06</td>
<td>1.42e-06</td>
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<td></td>
</tr>
<tr>
<td>P-VALUES</td>
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<td>9.34e-05</td>
<td>2.68e-05</td>
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<td>STATEPOP</td>
<td>2.25e-05</td>
<td>1.39e-05</td>
<td>4.44e-05*</td>
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<td>P-VALUES</td>
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<td>(3.34e-05)</td>
<td>(2.45e-05)</td>
<td>(3.01e-07)</td>
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Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Table 5: OLS Model with Scale Treatment, Regressing Bankruptcies or Retail Employment only on the Interaction Term and State and Year Fixed Effects

<table>
<thead>
<tr>
<th></th>
<th>BANKRUPTCIES</th>
<th>RETAIL EMPLOYMENT</th>
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<tr>
<td><strong>INTX</strong></td>
<td>1,282</td>
<td>-5,161</td>
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<tr>
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<td>(2,038)</td>
<td>(9,496)</td>
</tr>
<tr>
<td><strong>P-VALUES</strong></td>
<td>0.539</td>
<td>0.595</td>
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<tr>
<td><strong>ADJUSTED R-SQUARED</strong></td>
<td>0.943</td>
<td>0.999</td>
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</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Table 6: OLS Model with Scale Treatment, Regressing Store Size only on State and Year Fixed Effects

<table>
<thead>
<tr>
<th>DEPENDENT VARIABLES</th>
<th>SMALL STORES</th>
<th>LARGE STORES</th>
<th>SMALL/MEDIUM STORES</th>
<th>MEDIUM/LARGE STORES</th>
</tr>
</thead>
<tbody>
<tr>
<td>_ISTATE_2</td>
<td>30,814***</td>
<td>53.25***</td>
<td>32,869***</td>
<td>291.9***</td>
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<tr>
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<td>(1.06e-09)</td>
<td>(0)</td>
<td>(7.76e-10)</td>
<td>(0)</td>
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<tr>
<td>_ISTATE_3</td>
<td>-68,428***</td>
<td>-85.45***</td>
<td>-76,165***</td>
<td>-1,396***</td>
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<tr>
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<td>(9.92e-10)</td>
<td>(0)</td>
<td>(3.22e-10)</td>
<td>(0)</td>
</tr>
<tr>
<td>_ISTATE_4</td>
<td>-72,515***</td>
<td>-132.1***</td>
<td>-79,829***</td>
<td>-1,546***</td>
</tr>
<tr>
<td></td>
<td>(1.01e-09)</td>
<td>(0)</td>
<td>(3.13e-10)</td>
<td>(0)</td>
</tr>
<tr>
<td>_ISTATE_5</td>
<td>-87,821***</td>
<td>-129.6***</td>
<td>-96,610***</td>
<td>-1,663***</td>
</tr>
<tr>
<td></td>
<td>(1.03e-09)</td>
<td>(0)</td>
<td>(3.12e-10)</td>
<td>(0)</td>
</tr>
<tr>
<td>_ISTATE_6</td>
<td>-75,319***</td>
<td>-64.35***</td>
<td>-83,105***</td>
<td>-1,399***</td>
</tr>
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<td>(1.03e-09)</td>
<td>(0)</td>
<td>(3.03e-10)</td>
<td>(0)</td>
</tr>
<tr>
<td>_ISTATE_7</td>
<td>-37,596***</td>
<td>-41.80***</td>
<td>-41,637***</td>
<td>-733.0***</td>
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<tr>
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<td>(9.92e-10)</td>
<td>(0)</td>
<td>(2.87e-10)</td>
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<tr>
<td>_ISTATE_8</td>
<td>-25,938***</td>
<td>-72.45***</td>
<td>-27,911***</td>
<td>-560.6***</td>
</tr>
<tr>
<td></td>
<td>(9.93e-10)</td>
<td>(0)</td>
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<td>(0)</td>
</tr>
<tr>
<td>_ISTATE_9</td>
<td>-79,516***</td>
<td>-137.8***</td>
<td>-87,425***</td>
<td>-1,648***</td>
</tr>
<tr>
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<td>(1.01e-09)</td>
<td>(0)</td>
<td>(2.93e-10)</td>
<td>(0)</td>
</tr>
<tr>
<td>_ISTATE_10</td>
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<td>150.6***</td>
<td>66,984***</td>
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</tr>
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<td>(0)</td>
<td>(4.25e-10)</td>
<td>(0)</td>
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<tr>
<td>_ISTATE_11</td>
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<td>-106.7***</td>
<td>-62,200***</td>
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<td>(9.92e-10)</td>
<td>(0)</td>
<td>(2.82e-10)</td>
<td>(0)</td>
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<tr>
<td>_ISTATE_12</td>
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<td>-92,194***</td>
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<td>(9.98e-10)</td>
<td>(0)</td>
<td>(2.83e-10)</td>
<td>(0)</td>
</tr>
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<td>_ISTATE_13</td>
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<td>-119.6***</td>
<td>-64,973***</td>
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<td>(2.82e-10)</td>
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<td>(2.82e-10)</td>
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<tr>
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<td>-110.1***</td>
<td>-73,695***</td>
<td>-1,325***</td>
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<td>(9.92e-10)</td>
<td>(0)</td>
<td>(2.83e-10)</td>
<td>(0)</td>
</tr>
<tr>
<td>----------------</td>
<td>------------</td>
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<td>-------</td>
</tr>
<tr>
<td>_ISTATE_16</td>
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<td>-81,249***</td>
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<tr>
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<td>0.461</td>
<td>0.571</td>
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<td>3,084***</td>
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<td>2,777***</td>
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<td>(491.3)</td>
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<td>4.27e-05</td>
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<td>1.875</td>
<td>2,335***</td>
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<td>(408.9)</td>
<td>(17.20)</td>
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<td>0.0550</td>
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<td>_IYEAR_2007</td>
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<td>5.563</td>
<td>1,815***</td>
<td>58**</td>
</tr>
<tr>
<td>(338.9)</td>
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<td>0.0794</td>
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<td>(20.26)</td>
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<td>0.706</td>
<td>0.193</td>
<td>0.878</td>
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<tr>
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<td>0.00671</td>
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<td>101,418***</td>
<td>1,767***</td>
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<td>(271.2)</td>
<td>(16.79)</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ADJUSTED R-</td>
<td>0.999</td>
<td>0.993</td>
<td>0.999</td>
<td>0.998</td>
</tr>
<tr>
<td>SQUARED</td>
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</tr>
</tbody>
</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Appendix: Additional Figures and Tables
Figure A 1: Treatment and Control Group Averages Combined

The graphs below present the average number of stores by category in the treatment and control groups. The number of stores can be found in Table A2. With these graphs, we are looking for similar trends in the two groups before deregulation and then a change in the treatment group’s trend after deregulation. Recession years are indicated through dashed lines.
Figure A 2: Percentage Change in Population of States (from Statistisches Bundesamt)
Table A 1: Shopping hour deregulation in Germany (Reddy, 2012)

<table>
<thead>
<tr>
<th>STATE</th>
<th>DATE IN FORCE</th>
<th>YEARLY HOURS</th>
<th>CHANGE SINCE LAST REGULATION</th>
<th>REGULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BADEN-WÜRTTEMBERG</td>
<td>3/6/2007</td>
<td>7261</td>
<td>3053</td>
<td>M-Sa 0-24, Sundays 5 hrs x 3</td>
</tr>
<tr>
<td>BAVARIA</td>
<td>6/1/2003</td>
<td>4209</td>
<td>0</td>
<td>M-Sa 6-20</td>
</tr>
<tr>
<td>BERLIN</td>
<td>11/15/2006</td>
<td>7336</td>
<td>3128</td>
<td>M-Sa 0-24, Sundays 7 hrs x 6</td>
</tr>
<tr>
<td>BRANDENBURG</td>
<td>11/29/2006</td>
<td>7316</td>
<td>3107</td>
<td>M-Sa 0-24, Sundays 7 hrs x 6</td>
</tr>
<tr>
<td>BREMEN</td>
<td>4/1/2007</td>
<td>7314</td>
<td>3106</td>
<td>M-Sa 0-24, Sundays 5 hrs x 4</td>
</tr>
<tr>
<td>HAMBURG</td>
<td>1/1/2007</td>
<td>7314</td>
<td>3106</td>
<td>M-Sa 0-24, Sundays 5 hrs x 4</td>
</tr>
<tr>
<td>HESSE</td>
<td>12/1/2006</td>
<td>7294</td>
<td>3086</td>
<td>M-Sa 0-24, Sundays 6 hrs x 4</td>
</tr>
<tr>
<td>LOWER SAXONY</td>
<td>4/1/2007</td>
<td>7294</td>
<td>3086</td>
<td>M-Sa 0-24</td>
</tr>
<tr>
<td>MECKLENBURG-WESTERN POMERANIA</td>
<td>7/2/2007</td>
<td>7177</td>
<td>2969</td>
<td>M-Fri 0-24, Sa 0-22, 0-24 (4x), Sundays 5 hrs x 4</td>
</tr>
<tr>
<td>NORTH RHINE-WESTPHALIA</td>
<td>11/21/2006</td>
<td>7250</td>
<td>3041</td>
<td>M-Sa 0-24</td>
</tr>
<tr>
<td>RHINELAND-PALATINATE</td>
<td>11/29/2006</td>
<td>4856</td>
<td>647</td>
<td>M-Sa 6-22, Sundays 5 hrs x 4</td>
</tr>
<tr>
<td>SAARLAND</td>
<td>11/15/2006</td>
<td>4240</td>
<td>31</td>
<td>M-Sa 6-20, Sundays 5 hrs x 4, weekday 6-24 (1x)</td>
</tr>
<tr>
<td>SAXONY-ANHALT</td>
<td>11/30/2006</td>
<td>7029</td>
<td>2820</td>
<td>M-Fri 0-24, Sa 0-20</td>
</tr>
<tr>
<td>SAXONY</td>
<td>4/1/2007</td>
<td>5865</td>
<td>1656</td>
<td>M-Sa 6-22, Sundays 6 hrs x 4, weekdays 0-24 (5)</td>
</tr>
<tr>
<td>SCHLESWIG-HOLSTEIN</td>
<td>12/1/2006</td>
<td>7294</td>
<td>3086</td>
<td>M-Sa 0-24</td>
</tr>
<tr>
<td>THURINGIA</td>
<td>11/24/2006</td>
<td>7049</td>
<td>2840</td>
<td>M-Fri 0-24, Sa 0-20</td>
</tr>
</tbody>
</table>

Notes:

- There is some year-to-year variation in the number of opening hours based on the different holidays celebrated in each state, which may fall on workdays. These figures incorporate that possibility (p.54).

- The last federal opening restrictions remain in force in Bavaria.
### Table A 2: Values for Variables Used in Regressions (from Statistisches Bundesamt)

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9 Starting with 2006, the Statistisches Bundesamt slightly adjusted its calculation method; thus, the variable was renamed WZ08-G. For 2006, both WZ-G and WZ08-G are available, so I used the mean in my calculations.
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Table A 3: Percentage Change in German Retail Businesses by Size (from Statistisches Bundesamt)

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Note: For the year 2006, the mean measures shown in the previous table were used.
### Table A 4: Scale (0-1) Treatment Values for German States (Senftleben-König, 2014, p. 5)

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<td>0.7379</td>
<td>SAXONY</td>
<td>0.3935</td>
</tr>
<tr>
<td>HAMBURG</td>
<td>0.7379</td>
<td>SAXONY-ANHALT</td>
<td>0.67</td>
</tr>
<tr>
<td>HESSE</td>
<td>0.7331</td>
<td>SCHLESWIG-HOLSTEIN</td>
<td>0.7331</td>
</tr>
<tr>
<td>LOWER SAXONY</td>
<td>0.7331</td>
<td>THURINGIA</td>
<td>0.6747</td>
</tr>
<tr>
<td></td>
<td>SMALL STORES</td>
<td>LARGE STORES</td>
<td>SMALL/MEDIUM STORES</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------</td>
<td>--------------</td>
<td>---------------------</td>
</tr>
<tr>
<td><strong>INTX</strong></td>
<td>766.2</td>
<td>-8.308</td>
<td>497.1</td>
</tr>
<tr>
<td><strong>P-VALUES</strong></td>
<td>0.472</td>
<td>0.233</td>
<td>0.614</td>
</tr>
<tr>
<td><strong>BANKRUPTCIES</strong></td>
<td>-0.214***</td>
<td>0.00169***</td>
<td>-0.154**</td>
</tr>
<tr>
<td><strong>P-VALUES</strong></td>
<td>0.00190</td>
<td>0.00601</td>
<td>0.0145</td>
</tr>
<tr>
<td><strong>RETAILEMP</strong></td>
<td>-0.127***</td>
<td>0.000435***</td>
<td>-0.110***</td>
</tr>
<tr>
<td><strong>P-VALUES</strong></td>
<td>4.45e-05</td>
<td>3.40e-05</td>
<td>0.000330</td>
</tr>
<tr>
<td><strong>STATEPOPULATION</strong></td>
<td>0.0136***</td>
<td>1.86e-05</td>
<td>0.0139***</td>
</tr>
<tr>
<td><strong>P-VALUES</strong></td>
<td>0.00753</td>
<td>0.323</td>
<td>0.00627</td>
</tr>
<tr>
<td><strong>ADJUSTED R-SQUARED</strong></td>
<td>0.999</td>
<td>0.996</td>
<td>0.999</td>
</tr>
</tbody>
</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Table A6: Stata Results, OLS, with Strict Definition of Treatment

Saxony, Rhineland-Palatinate, Bavaria, and Saarland are not in the treatment group

<table>
<thead>
<tr>
<th>DEPENDENT VARIABLES</th>
<th>SMALL STORES</th>
<th>LARGE STORES</th>
<th>SMALL/MEDIUM STORES</th>
<th>MEDIUM/LARGE STORES</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTX</td>
<td>385.3</td>
<td>-2.858</td>
<td>253.1</td>
<td>-15.52</td>
</tr>
<tr>
<td></td>
<td>(633.4)</td>
<td>(3.880)</td>
<td>(577.2)</td>
<td>(13.18)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.552</td>
<td>0.473</td>
<td>0.667</td>
<td>0.257</td>
</tr>
<tr>
<td>BANKRUPTCIES</td>
<td>-0.138**</td>
<td>0.00173***</td>
<td>-0.0809</td>
<td>0.00978***</td>
</tr>
<tr>
<td></td>
<td>(0.0517)</td>
<td>(0.000551)</td>
<td>(0.0501)</td>
<td>(0.00206)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.0175</td>
<td>0.00677</td>
<td>0.127</td>
<td>0.000260</td>
</tr>
<tr>
<td>RETAILEMP</td>
<td>-0.115***</td>
<td>0.000438***</td>
<td>-0.0983***</td>
<td>0.00281***</td>
</tr>
<tr>
<td></td>
<td>(0.0225)</td>
<td>(6.56e-05)</td>
<td>(0.0236)</td>
<td>(0.000580)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.000124</td>
<td>7.37e-06</td>
<td>0.000816</td>
<td>0.000216</td>
</tr>
<tr>
<td>STATEPOPULATION</td>
<td>0.0134**</td>
<td>2.42e-05</td>
<td>0.0137**</td>
<td>0.000170**</td>
</tr>
<tr>
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<td>(0.00493)</td>
<td>(2.21e-05)</td>
<td>(0.00484)</td>
<td>(6.15e-05)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.0159</td>
<td>0.291</td>
<td>0.0124</td>
<td>0.0144</td>
</tr>
<tr>
<td>ADJUSTED R-SQUARED</td>
<td>0.999</td>
<td>0.996</td>
<td>0.999</td>
<td>0.999</td>
</tr>
</tbody>
</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Table A7: Stata Results, OLS, with Strict Definition of Treatment for W. German states

Rhineland-Palatinate, Bavaria, and Saarland are not in the treatment group

<table>
<thead>
<tr>
<th>DEPENDENT VARIABLES</th>
<th>SMALL STORES</th>
<th>LARGE STORES</th>
<th>SMALL/MEDIUM STORES</th>
<th>MEDIUM/LARGE STORES</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTX</td>
<td>495.2</td>
<td>-5.008</td>
<td>293.2</td>
<td>-24.65</td>
</tr>
<tr>
<td></td>
<td>(798.7)</td>
<td>(4.847)</td>
<td>(752.9)</td>
<td>(20.21)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.551</td>
<td>0.328</td>
<td>0.706</td>
<td>0.254</td>
</tr>
<tr>
<td>BANKRUPTCIES</td>
<td>0.0300</td>
<td>0.00200**</td>
<td>0.0847</td>
<td>0.0111***</td>
</tr>
<tr>
<td></td>
<td>(0.0826)</td>
<td>(0.000690)</td>
<td>(0.0784)</td>
<td>(0.00294)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.725</td>
<td>0.0178</td>
<td>0.308</td>
<td>0.00447</td>
</tr>
<tr>
<td>RETAILEMP</td>
<td>-0.115***</td>
<td>0.000458***</td>
<td>-0.0964***</td>
<td>0.00304***</td>
</tr>
<tr>
<td></td>
<td>(0.0201)</td>
<td>(7.76e-05)</td>
<td>(0.0219)</td>
<td>(0.000677)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.000286</td>
<td>0.000229</td>
<td>0.00173</td>
<td>0.00150</td>
</tr>
<tr>
<td>STATEPOPULATION</td>
<td>0.0231***</td>
<td>4.00e-05</td>
<td>0.0230***</td>
<td>0.000223</td>
</tr>
<tr>
<td></td>
<td>(0.00651)</td>
<td>(3.06e-05)</td>
<td>(0.00644)</td>
<td>(0.000139)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.00628</td>
<td>0.224</td>
<td>0.00594</td>
<td>0.143</td>
</tr>
<tr>
<td>ADJUSTED R-SQUARED</td>
<td>0.999</td>
<td>0.996</td>
<td>0.999</td>
<td>0.999</td>
</tr>
</tbody>
</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Table A 8: Stata Results, OLS, with Less Strict Definition of Treatment

Bavaria and Saarland are not in the treatment group

<table>
<thead>
<tr>
<th></th>
<th>SMALL STORES</th>
<th>LARGE STORES</th>
<th>SMALL/MEDIUM STORES</th>
<th>MEDIUM/LARGE STORES</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTX</td>
<td>482.0</td>
<td>-7.408</td>
<td>404.9</td>
<td>0.992</td>
</tr>
<tr>
<td></td>
<td>(482.0)</td>
<td>(5.681)</td>
<td>(443.7)</td>
<td>(14.42)</td>
</tr>
<tr>
<td><strong>P-VALUES</strong></td>
<td>0.333</td>
<td>0.212</td>
<td>0.376</td>
<td>0.946</td>
</tr>
<tr>
<td>BANKRUPTCIES</td>
<td>-0.134**</td>
<td>0.00171***</td>
<td>-0.0784</td>
<td>0.00956***</td>
</tr>
<tr>
<td></td>
<td>(0.0523)</td>
<td>(0.000490)</td>
<td>(0.0503)</td>
<td>(0.00214)</td>
</tr>
<tr>
<td><strong>P-VALUES</strong></td>
<td>0.0217</td>
<td>0.00333</td>
<td>0.140</td>
<td>0.000444</td>
</tr>
<tr>
<td>RETAILEMP</td>
<td>-0.115***</td>
<td>0.000419***</td>
<td>-0.0976***</td>
<td>0.00287***</td>
</tr>
<tr>
<td></td>
<td>(0.0224)</td>
<td>(6.66e-05)</td>
<td>(0.0234)</td>
<td>(0.000593)</td>
</tr>
<tr>
<td><strong>P-VALUES</strong></td>
<td>0.000122</td>
<td>1.45e-05</td>
<td>0.000814</td>
<td>0.000221</td>
</tr>
<tr>
<td>STATEPOPULATION</td>
<td>0.0138**</td>
<td>1.73e-05</td>
<td>0.0141**</td>
<td>0.000171**</td>
</tr>
<tr>
<td></td>
<td>(0.00491)</td>
<td>(1.79e-05)</td>
<td>(0.00489)</td>
<td>(6.61e-05)</td>
</tr>
<tr>
<td><strong>P-VALUES</strong></td>
<td>0.0130</td>
<td>0.349</td>
<td>0.0114</td>
<td>0.0204</td>
</tr>
<tr>
<td>ADJUSTED R-SQUARED</td>
<td>0.999</td>
<td>0.997</td>
<td>0.999</td>
<td>0.999</td>
</tr>
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</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
**Table A 9: OLS Model for LARGE Stores with Strict Treatment with Modifications**

<table>
<thead>
<tr>
<th>ALL INDPT. VARIABLES</th>
<th>WITHOUT BANKRUPTCIES</th>
<th>WITHOUT RETAILEMP</th>
<th>WITHOUT STATEPOP</th>
<th>WITHOUT RETAILEMP &amp; STATEPOP</th>
<th>WITHOUT BANKRUPTCIES, RETAILEMP &amp; STATEPOP</th>
<th>LOG (LARGE STORES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTX</td>
<td>-2.858</td>
<td>-1.452</td>
<td>-3.717</td>
<td>-2.874</td>
<td>-4.049</td>
<td>-2.669</td>
</tr>
<tr>
<td></td>
<td>(3.880)</td>
<td>(4.983)</td>
<td>(5.125)</td>
<td>(4.454)</td>
<td>(7.020)</td>
<td>(8.005)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.473</td>
<td>0.775</td>
<td>0.480</td>
<td>0.529</td>
<td>0.573</td>
<td>0.743</td>
</tr>
<tr>
<td>BANKRUPTCIES</td>
<td>0.00173***</td>
<td>0.00179***</td>
<td>0.00167***</td>
<td>0.00167***</td>
<td>3.75e-06</td>
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</tr>
<tr>
<td></td>
<td>(0.000551)</td>
<td>(0.000490)</td>
<td>(0.000489)</td>
<td>(0.000477)</td>
<td>(5.82e-06)</td>
<td></td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.00677</td>
<td>0.00239</td>
<td>0.00386</td>
<td>0.00329</td>
<td>0.529</td>
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</tr>
<tr>
<td>RETAILEMP</td>
<td>0.000438***</td>
<td>0.000463***</td>
<td>0.000505***</td>
<td>1.08e-06</td>
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</tr>
<tr>
<td></td>
<td>(6.56e-05)</td>
<td>(8.91e-05)</td>
<td>(0.000101)</td>
<td>(1.42e-06)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-VALUES</td>
<td>7.37e-06</td>
<td>0.000108</td>
<td>0.000163</td>
<td>0.459</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STATEPOP</td>
<td>2.42e-05</td>
<td>1.51e-05</td>
<td>4.67e-05</td>
<td></td>
<td>2.63e-07</td>
<td></td>
</tr>
<tr>
<td>P-VALUES</td>
<td>(2.21e-05)</td>
<td>(3.50e-05)</td>
<td>(2.79e-05)</td>
<td>(2.93e-07)</td>
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<td></td>
</tr>
<tr>
<td>ADJUSTED R-SQUARED</td>
<td>0.996</td>
<td>0.995</td>
<td>0.995</td>
<td>0.996</td>
<td>0.995</td>
<td>0.993</td>
</tr>
</tbody>
</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10
Table A 10: OLS Model for LARGE Stores with Less Strict Treatment with Modifications

<table>
<thead>
<tr>
<th>ALL INDPT. VARIABLES</th>
<th>WITHOUT BANKRUPT CIES</th>
<th>WITHOUT RETAILEMP &amp; STATEPOP</th>
<th>WITHOUT RETAILEMP</th>
<th>WITHOUT BANKRUPT CIES, RETAILEMP &amp; STATEPOP</th>
<th>LOG (LARGE STORES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTX</td>
<td>-7.408</td>
<td>-8.947</td>
<td>-8.183</td>
<td>-11.23</td>
<td>-10.46</td>
</tr>
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<td>(7.840)</td>
<td>(6.256)</td>
<td>(9.823)</td>
<td>(12.02)</td>
</tr>
<tr>
<td><strong>P-VALUE</strong></td>
<td>0.212</td>
<td>0.272</td>
<td>0.211</td>
<td>0.271</td>
<td>0.398</td>
</tr>
<tr>
<td>BANKRUPTCIES</td>
<td>0.00171***</td>
<td>0.00175***</td>
<td>0.00167***</td>
<td>0.00166***</td>
<td>4.31e-06</td>
</tr>
<tr>
<td></td>
<td>(0.000490)</td>
<td>(0.000419)</td>
<td>(0.000443)</td>
<td>(0.000399)</td>
<td>(5.51e-06)</td>
</tr>
<tr>
<td><strong>P-VALUE</strong></td>
<td>0.00333</td>
<td>0.000797</td>
<td>0.00188</td>
<td>0.000827</td>
<td>0.446</td>
</tr>
<tr>
<td>RETAIL EMP</td>
<td>0.000419**</td>
<td>0.000440**</td>
<td>0.000462***</td>
<td></td>
<td>9.55e-07</td>
</tr>
<tr>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(6.66e-05)</td>
<td>(9.41e-05)</td>
<td>(7.07e-05)</td>
<td></td>
<td>(1.45e-06)</td>
</tr>
<tr>
<td><strong>P-VALUE</strong></td>
<td>1.45e-05</td>
<td>0.000299</td>
<td>9.34e-06</td>
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<td>0.522</td>
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<tr>
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<td>1.73e-05</td>
<td>8.62e-06</td>
<td>3.73e-05*</td>
<td></td>
<td>2.68e-07</td>
</tr>
<tr>
<td></td>
<td>(1.79e-05)</td>
<td>(3.11e-05)</td>
<td>(2.09e-05)</td>
<td></td>
<td>(3.00e-07)</td>
</tr>
<tr>
<td><strong>P-VALUE</strong></td>
<td>0.349</td>
<td>0.785</td>
<td>0.0949</td>
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<td>0.385</td>
</tr>
<tr>
<td>ADJUSTED R-SQUARED</td>
<td>0.997</td>
<td>0.995</td>
<td>0.996</td>
<td>0.996</td>
<td>0.994</td>
</tr>
</tbody>
</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Table A 11: OLS Model for SMALL Stores with Strict Treatment with Modifications

<table>
<thead>
<tr>
<th>ALL INDPT. VARIABLES</th>
<th>WITHOUT BANKRUPTCIES &amp; RETAILEMP</th>
<th>WITHOUT STATEPOP</th>
<th>WITHOUT RETAILEMP</th>
<th>WITHOUT BANKRUPTCIES &amp; STATEPOP</th>
<th>LOG (SMALL STORES)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTX</strong></td>
<td>385.3</td>
<td>273.0</td>
<td>611.4</td>
<td>376.7</td>
<td>558.4</td>
</tr>
<tr>
<td></td>
<td>(633.4)</td>
<td>(689.7)</td>
<td>(734.7)</td>
<td>(555.7)</td>
<td>(537.6)</td>
</tr>
<tr>
<td><strong>P-VALUES</strong></td>
<td>0.552</td>
<td>0.698</td>
<td>0.418</td>
<td>0.508</td>
<td>0.315</td>
</tr>
<tr>
<td><strong>BANKRUPTCIES</strong></td>
<td>-0.138**</td>
<td>-0.153***</td>
<td>-0.173</td>
<td>-0.172**</td>
<td>-1.07e-06</td>
</tr>
<tr>
<td></td>
<td>(0.0517)</td>
<td>(0.0416)</td>
<td>(0.104)</td>
<td>(0.0590)</td>
<td></td>
</tr>
<tr>
<td><strong>P-VALUES</strong></td>
<td>0.0175</td>
<td>0.00221</td>
<td>0.119</td>
<td>0.0106</td>
<td>0.573</td>
</tr>
<tr>
<td><strong>RETAILEMP</strong></td>
<td>-0.115***</td>
<td>-0.117***</td>
<td>-0.0781**</td>
<td>9.69e-07</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0225)</td>
<td>(0.0194)</td>
<td>(0.0297)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>P-VALUES</strong></td>
<td>0.000124</td>
<td>2.26e-05</td>
<td>0.0190</td>
<td>0.00304</td>
<td></td>
</tr>
<tr>
<td><strong>STATEPOPULATION</strong></td>
<td>0.0134**</td>
<td>0.0141**</td>
<td>0.00745</td>
<td>3.28e-08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.00493)</td>
<td>(0.00638)</td>
<td>(0.00558)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>P-VALUES</strong></td>
<td>0.0159</td>
<td>0.0428</td>
<td>0.202</td>
<td>0.786</td>
<td></td>
</tr>
<tr>
<td><strong>ADJUSTED R-SQUARED</strong></td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
</tr>
</tbody>
</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10
**Table A 12: OLS Model for SMALL Stores with Scale Treatment with Modifications**

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>ALL INDPT.</th>
<th>WITHOUT BANKRUPTCIES</th>
<th>WITHOUT RETAILEMP</th>
<th>WITHOUT STATEPOP</th>
<th>WITHOUT RETAILEMP &amp; STATEPOP</th>
<th>LOG (SMALL STORES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTX</td>
<td>901.6</td>
<td>737.1</td>
<td>1,304</td>
<td>648.0</td>
<td>1,048</td>
<td>826.0</td>
</tr>
<tr>
<td></td>
<td>(783.0)</td>
<td>(855.5)</td>
<td>(1,069)</td>
<td>(891.9)</td>
<td>(832.3)</td>
<td>(1,101)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.268</td>
<td>0.402</td>
<td>0.241</td>
<td>0.479</td>
<td>0.227</td>
<td>0.465</td>
</tr>
<tr>
<td>BANKRUPTCIES</td>
<td>-0.140**</td>
<td>-0.155***</td>
<td>-0.173</td>
<td>-0.173**</td>
<td>-1.10e-06</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0518)</td>
<td>(0.0412)</td>
<td>(0.104)</td>
<td>(0.0595)</td>
<td>(1.83e-06)</td>
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</tr>
<tr>
<td>P-VALUES</td>
<td>0.0166</td>
<td>0.00193</td>
<td>0.118</td>
<td>0.0107</td>
<td>0.556</td>
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</tr>
<tr>
<td>RETAILEMP</td>
<td>-0.115***</td>
<td>-0.117***</td>
<td>-0.0774**</td>
<td></td>
<td>9.92e-07***</td>
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</tr>
<tr>
<td></td>
<td>(0.0227)</td>
<td>(0.0195)</td>
<td>(0.0303)</td>
<td></td>
<td>(2.15e-07)</td>
<td></td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.000145</td>
<td>2.55e-05</td>
<td>0.0221</td>
<td>0.000337</td>
<td>0.000337</td>
<td>3.94e-08</td>
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<tr>
<td>STATEPOP</td>
<td>0.0136**</td>
<td>0.0143**</td>
<td>0.00781</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ULATION</td>
<td>(0.00492)</td>
<td>(0.00637)</td>
<td>(0.00532)</td>
<td></td>
<td>(1.17e-07)</td>
<td></td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.0145</td>
<td>0.0403</td>
<td>0.163</td>
<td>0.740</td>
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<td></td>
</tr>
<tr>
<td>ADJUSTED R-SQUARED</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
</tr>
</tbody>
</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
### Table A 13: OLS Model for SMALL Stores with Less Strict Treatment with Modifications

<table>
<thead>
<tr>
<th>ALL INDPT. VARIABLES</th>
<th>WITHOUT BANKRUPTCIES</th>
<th>WITHOUT RETAILEMP</th>
<th>WITHOUT STATEPOP</th>
<th>WITHOUT RETAILEMP &amp; STATEPOP</th>
<th>WITHOUT BANKRUPTCIES, RETAILEMP &amp; STATEPOP</th>
<th>LOG (SMALL STORES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTX</td>
<td>482.0</td>
<td>452.0</td>
<td>904.0</td>
<td>-135.6</td>
<td>393.9</td>
<td>317.3</td>
</tr>
<tr>
<td></td>
<td>(482.0)</td>
<td>(582.5)</td>
<td>(953.7)</td>
<td>(460.3)</td>
<td>(607.6)</td>
<td>(835.6)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.333</td>
<td>0.450</td>
<td>0.358</td>
<td>0.772</td>
<td>0.527</td>
<td>0.709</td>
</tr>
<tr>
<td></td>
<td>(0.0523)</td>
<td>(0.0412)</td>
<td>(0.104)</td>
<td>(0.0595)</td>
<td>(1.82e-06)</td>
<td></td>
</tr>
<tr>
<td>BANKRUPTCIES</td>
<td>-0.134**</td>
<td>-0.147***</td>
<td>-0.167</td>
<td>-0.167**</td>
<td>-9.14e-07</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0224)</td>
<td>(0.0193)</td>
<td>(0.0307)</td>
<td>(0.0595)</td>
<td>(1.87e-07)</td>
<td></td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.0217</td>
<td>0.00285</td>
<td>0.131</td>
<td>0.0135</td>
<td>0.623</td>
<td></td>
</tr>
<tr>
<td>RETAILEMP</td>
<td>-0.115***</td>
<td>-0.117***</td>
<td>-0.0804**</td>
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<td>(0.0224)</td>
<td>(0.0193)</td>
<td>(0.0307)</td>
<td></td>
<td>(1.87e-07)</td>
<td></td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.000122</td>
<td>2.31e-05</td>
<td>0.0194</td>
<td>0.000114</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STATEPOPULATION</td>
<td>0.0138**</td>
<td>0.0145**</td>
<td>0.00835</td>
<td></td>
<td>4.34e-08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.00491)</td>
<td>(0.00636)</td>
<td>(0.00530)</td>
<td></td>
<td>(1.21e-07)</td>
<td></td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.0130</td>
<td>0.0374</td>
<td>0.136</td>
<td>0.725</td>
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<td></td>
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<tr>
<td>ADJUSTED R-SQUARED</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
</tr>
</tbody>
</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10
Table A 14: OLS Model for SMALL & MEDIUM Stores with Strict Treatment with Modifications

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<thead>
<tr>
<th>VARIABLES</th>
<th>LOG (S/M STORES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL INDPT.</td>
<td>0.0113</td>
</tr>
<tr>
<td>WITHOUT BANKRUPTCIES</td>
<td>(0.0117)</td>
</tr>
<tr>
<td>WITHOUT RETAILEMP &amp; STATEPOP</td>
<td>0.350</td>
</tr>
<tr>
<td>WITHOUT RETAILEMP &amp; STATEPOP</td>
<td>-7.74e-07</td>
</tr>
<tr>
<td>WITHOUT BANKRUPTCIES, RETAILEMP &amp; STATEPOP</td>
<td>(1.67e-06)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>P-VALUES</th>
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</thead>
<tbody>
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<td>INTX</td>
<td>0.667</td>
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<td>(0.0501)</td>
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<td></td>
<td>0.127</td>
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<td>(0.0236)</td>
</tr>
<tr>
<td>BANKRUPTCIES</td>
<td>0.111</td>
</tr>
<tr>
<td></td>
<td>(0.0308)</td>
</tr>
<tr>
<td></td>
<td>0.650</td>
</tr>
<tr>
<td></td>
<td>(1.97e-07)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>P-VALUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>RETAILEMP</td>
<td>0.000816</td>
</tr>
<tr>
<td></td>
<td>0.000205</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>P-VALUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATEPOPULATION</td>
<td>0.0124</td>
</tr>
<tr>
<td></td>
<td>0.695</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>P-VALUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADJUSTED R-SQUARED</td>
<td>0.999</td>
</tr>
<tr>
<td></td>
<td>0.999</td>
</tr>
<tr>
<td></td>
<td>0.999</td>
</tr>
<tr>
<td></td>
<td>0.999</td>
</tr>
<tr>
<td></td>
<td>0.999</td>
</tr>
</tbody>
</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Table A 15: OLS Model for SMALL & MEDIUM Stores with Scale Treatment with Modifications

<table>
<thead>
<tr>
<th>ALL INDPT. VARIABLES</th>
<th>WITHOUT BANKRUPTCIES</th>
<th>WITHOUT RETAILEMP</th>
<th>WITHOUT STATEPOP</th>
<th>WITHOUT RETAILEMP &amp; STATEPOP</th>
<th>WITHOUT BANKRUPTCIES, RETAILEMP &amp; STATEPOP</th>
<th>LOG (S/M STORES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTX</td>
<td>673.6</td>
<td>576.3</td>
<td>1,016</td>
<td>414.7</td>
<td>723.1</td>
<td>573.2</td>
</tr>
<tr>
<td></td>
<td>(711.0)</td>
<td>(741.5)</td>
<td>(920.4)</td>
<td>(844.3)</td>
<td>(687.7)</td>
<td>(851.9)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.358</td>
<td>0.449</td>
<td>0.287</td>
<td>0.630</td>
<td>0.310</td>
<td>0.511</td>
</tr>
<tr>
<td>BANKRUPTCIES</td>
<td>-0.0826</td>
<td>-0.0953**</td>
<td>-0.116</td>
<td>-0.117</td>
<td>-8.10e-07</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0504)</td>
<td>(0.0402)</td>
<td>(0.104)</td>
<td>(0.0691)</td>
<td>(1.64e-06)</td>
<td></td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.122</td>
<td>0.0315</td>
<td>0.281</td>
<td>0.111</td>
<td></td>
<td>0.629</td>
</tr>
<tr>
<td>RETAILEMP</td>
<td>-0.0975***</td>
<td>-0.0987***</td>
<td>-0.0596*</td>
<td></td>
<td></td>
<td>9.81e-07***</td>
</tr>
<tr>
<td></td>
<td>(0.0237)</td>
<td>(0.0218)</td>
<td>(0.0313)</td>
<td></td>
<td></td>
<td>(1.98e-07)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.000909</td>
<td>0.000395</td>
<td>0.0761</td>
<td></td>
<td></td>
<td>0.000174</td>
</tr>
<tr>
<td>STATEPOPULATION</td>
<td>0.0139**</td>
<td>0.0143**</td>
<td>0.00896*</td>
<td></td>
<td></td>
<td>4.98e-08</td>
</tr>
<tr>
<td></td>
<td>(0.00487)</td>
<td>(0.00571)</td>
<td>(0.00500)</td>
<td></td>
<td></td>
<td>(1.09e-07)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.0121</td>
<td>0.0243</td>
<td>0.0933</td>
<td></td>
<td></td>
<td>0.654</td>
</tr>
<tr>
<td>ADJUSTED R-SQUARED</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
</tr>
</tbody>
</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Table A16: OLS Model for SMALL & MEDIUM Stores with Less Strict Treatment with Modifications

<table>
<thead>
<tr>
<th>ALL INDEP.</th>
<th>WITHOUT BANKRUPTCIES</th>
<th>WITHOUT RETAILEMP</th>
<th>WITHOUT STATEPOP</th>
<th>WITHOUT RETAILEMP &amp; STATEPOP</th>
<th>WITHOUT BANKRUPTCIES, RETAILEMP &amp; STATEPOP</th>
<th>LOG (S/M STORES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTX</td>
<td>404.9</td>
<td>387.3</td>
<td>763.5</td>
<td>-224.9</td>
<td>186.5</td>
<td>135.1</td>
</tr>
<tr>
<td></td>
<td>(443.7)</td>
<td>(487.4)</td>
<td>(810.8)</td>
<td>(471.2)</td>
<td>(432.9)</td>
<td>(576.3)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.376</td>
<td>0.439</td>
<td>0.361</td>
<td>0.640</td>
<td>0.673</td>
<td>0.818</td>
</tr>
<tr>
<td>BANKRUPTCIES</td>
<td>-0.0784</td>
<td>-0.0892**</td>
<td>-0.112</td>
<td>-0.112</td>
<td></td>
<td>-6.49e-07</td>
</tr>
<tr>
<td></td>
<td>(0.0503)</td>
<td>(0.0394)</td>
<td>(0.104)</td>
<td>(0.0685)</td>
<td></td>
<td>(1.62e-06)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.140</td>
<td>0.0388</td>
<td>0.299</td>
<td>0.123</td>
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<td>0.695</td>
</tr>
<tr>
<td>RETAILEMP</td>
<td>-0.0976***</td>
<td>-0.0986***</td>
<td></td>
<td>-0.0624*</td>
<td></td>
<td>9.69e-07</td>
</tr>
<tr>
<td></td>
<td>(0.0234)</td>
<td>(0.0215)</td>
<td>(0.0316)</td>
<td>*(1.81e-07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.000814</td>
<td>0.000362</td>
<td>0.0666</td>
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<td></td>
<td>8.26e-05</td>
</tr>
<tr>
<td>STATEPOP</td>
<td>0.0141**</td>
<td>0.0145**</td>
<td>0.00944*</td>
<td></td>
<td></td>
<td>5.54e-08</td>
</tr>
<tr>
<td>ULATION</td>
<td>(0.00489)</td>
<td>(0.00573)</td>
<td>(0.00501)</td>
<td></td>
<td></td>
<td>(1.13e-07)</td>
</tr>
<tr>
<td>P-VALUES</td>
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<td>0.0230</td>
<td>0.0788</td>
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<td></td>
<td>0.630</td>
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<td>ADJUSTED R- SQUARED</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
<td>0.999</td>
</tr>
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</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Table A17: OLS Model for MEDIUM & LARGE Stores with Strict Treatment with Modifications

<table>
<thead>
<tr>
<th>ALL INDP.</th>
<th>WITHOUT BANKRUPTC</th>
<th>WITHOUT RETAILEMP</th>
<th>WITHOUT STATEPOP</th>
<th>WITHOUT RETAILEMP &amp; STATEPOP</th>
<th>WITHOUT BANKRUPTC &amp; RETAILEMP &amp; STATEPOP</th>
<th>LOG (M/L STORES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VARIABLES</td>
<td>IES</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>INTX</td>
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<td>-7.574</td>
<td>-21.02</td>
<td>-15.63</td>
<td>-23.26</td>
<td>-15.53</td>
</tr>
<tr>
<td></td>
<td>(13.18)</td>
<td>(19.30)</td>
<td>(18.34)</td>
<td>(14.62)</td>
<td>(27.33)</td>
<td>(34.76)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.257</td>
<td>0.700</td>
<td>0.270</td>
<td>0.302</td>
<td>0.408</td>
<td>0.661</td>
</tr>
<tr>
<td>BANKRUPTC</td>
<td>0.00978***</td>
<td>0.0101***</td>
<td>0.00934***</td>
<td>0.00933***</td>
<td></td>
<td>-2.16e-06</td>
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<tr>
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<td>(0.00185)</td>
<td>(0.00166)</td>
<td>(0.00244)</td>
<td></td>
<td>(2.40e-06)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.000260</td>
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<td>0.00168</td>
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<td>0.382</td>
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<td>0.00281***</td>
<td>0.00295***</td>
<td>0.00328***</td>
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<td></td>
<td>1.10e-06</td>
</tr>
<tr>
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<td>(0.000580)</td>
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<td>(0.000728)</td>
<td></td>
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<td>(6.88e-07)</td>
</tr>
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<td>0.00324</td>
<td>0.000416</td>
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<td></td>
<td>0.132</td>
</tr>
<tr>
<td>STATEPOP</td>
<td>0.000170**</td>
<td>0.000119</td>
<td>0.000315**</td>
<td></td>
<td></td>
<td>1.74e-07</td>
</tr>
<tr>
<td>UATION</td>
<td>(6.15e-05)</td>
<td>(0.000125)</td>
<td>(0.000113)</td>
<td></td>
<td></td>
<td>(1.08e-07)</td>
</tr>
<tr>
<td>P-VALUES</td>
<td>0.0144</td>
<td>0.357</td>
<td>0.0136</td>
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<td></td>
<td>0.130</td>
</tr>
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<td>0.999</td>
<td>0.999</td>
<td>0.998</td>
<td>0.998</td>
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<tr>
<td>SQUARED</td>
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<td></td>
</tr>
</tbody>
</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Table A 18: OLS Model for MEDIUM & LARGE Stores with Scale Treatment with Modifications

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>ALL INDPT.</th>
<th>WITHOUT BANKRUPTCIES</th>
<th>WITHOUT RETAILEMP</th>
<th>WITHOUT STATEPOP</th>
<th>WITHOUT RETAILEMP &amp; STATEPOP</th>
<th>WITHOUT BANKRUPTCIES, RETAILEMP &amp; STATEPOP</th>
<th>LOG (M/L STORES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTX</td>
<td>-23.66</td>
<td>-12.17</td>
<td>-33.51</td>
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<td>(0.000590)</td>
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<td>P-VALUE</td>
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<td>0.000306**</td>
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<td>0.999</td>
<td>0.999</td>
<td>0.998</td>
<td>0.998</td>
<td>0.997</td>
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Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.
Table A 19: OLS Model for MEDIUM & LARGE Stores with Less Strict Treatment with Modifications

<table>
<thead>
<tr>
<th>ALL INDPT. VARIABLES</th>
<th>WITHOUT BANKRUPTCIES</th>
<th>WITHOUT RETAILEMP</th>
<th>WITHOUT STATEPOP</th>
<th>WITHOUT RETAILEMP &amp; STATEPOP</th>
<th>WITHOUT BANKRUPTCIES, RETAILEMP &amp; STATEPOP</th>
<th>LOG (M/L STORES)</th>
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<td>-6.659</td>
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<td>(14.42)</td>
<td>(26.89)</td>
<td>(29.55)</td>
<td>(17.91)</td>
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<td>(0.00195)</td>
<td>(0.00176)</td>
<td>(0.00247)</td>
<td>(2.63e-06)</td>
<td>(2.63e-06)</td>
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<td>0.00988***</td>
<td>0.00916***</td>
<td>0.00915***</td>
<td>-2.27e-06</td>
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</tr>
<tr>
<td></td>
<td>(0.000593)</td>
<td>(0.000885)</td>
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<td>(6.72e-07)</td>
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<td></td>
</tr>
<tr>
<td>P-VALUES</td>
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<tr>
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<td>0.999</td>
<td>0.998</td>
<td>0.998</td>
<td>0.997</td>
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Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Table A 20: OLS Model for Stores with Strict Treatment, Regressing Other Variables

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<th>BANKRUPTCIES</th>
<th>RETAIL EMPLOYMENT</th>
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<td>INTX</td>
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<td><strong>ADJUSTED R-SQUARED</strong></td>
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<td>0.999</td>
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</table>

Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Table A 21: OLS Model for Stores with Less Strict Treatment, Regressing Other Variables

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<th>RETAIL EMPLOYMENT</th>
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<tr>
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<td>(1,555)</td>
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Note: Includes state and year fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
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<th>(3)</th>
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