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A Policy in Search
of a Problem

A Study on the Impact of
Minimum Markup Laws on
Small Businesses and
Gas Stations

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Table of Contents

Introduction.....	4
The History of the Unfair Sales Act.....	5
Methods.....	7
RESULTS: Small Businesses.....	9
RESULTS: Gas Stations.....	10
RESULTS: Gas-Specific Minimum Markup Law.....	11
Conclusions.....	12
References and Endnotes.....	13

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Executive Summary

Among the key arguments for minimum markup laws is that they protect “the little guy” from the danger of predatory pricing by large and powerful corporations. Protection of small business from larger rivals was the stated purpose for the minimum markup laws that have existed around the country since the 1930s, including the one in Wisconsin. But claims that minimum markup requirements will protect small business have rarely been tested. If they are true, then one would expect that states with minimum markup protection would have a larger small business sector than states that do not. One would also expect that states that single out gas stations for special “minimum markup” treatment – like Wisconsin – would have more stations than those who do not.

This study tests these claims. Using a rigorous econometric analysis of data from all 50 states, we conducted an extensive analysis of the effect of minimum markup laws on the number of small business retailers and the number of gas stations in a state.

Quite simply, we found that minimum markup laws do not achieve their stated purpose. Among the key findings:

Minimum markup laws have no effect on the number of small business retailers in a state. Once appropriate controls are included, the presence of a minimum markup law does not increase (or decrease) the number of small businesses in a state.

General minimum markup laws have no effect on the number of gas stations in a state. In an analysis that includes 20 years of national data, the presence of a minimum markup law does not increase (or decrease) the number of gas stations in a state.

Gasoline-specific minimum markup laws have no effect on the number of gas stations in a state. Even in states that have minimum markup laws that apply exclusively to gas stations, no effect of the laws was found on the number of gas stations in an analysis of 20 years of data.

for each day that the violator was selling below cost.¹ This structure of the penalties – which applies to tobacco sales as well – ensures a vigorous enforcement of the law without requiring the government to do a thing, save for adjudicating the occasional trial associated with various claims. The competition that is prohibited would tend to result in lower costs for consumers. In essence, the state of Wisconsin guarantees a robust profit to retailers in the state by keeping prices higher than they otherwise would be in most locales.

On other consumer goods, the Wisconsin markup is equal to the invoice or replacement cost of the product, whichever is lower. Violations of the law can lead to a fine from \$50 to \$200 for the first violation, and \$200 to \$2,500 for subsequent offenses. “Loss leaders” – at least those that are not disguised in some way that the law permits or that are not detected – are prohibited. Again, the outcome is that consumers pay more for goods than they otherwise would.

What do the citizens of Wisconsin get for these higher prices? Do these rules benefit anyone other than the otherwise non-competitive retailers that they protect? Does protecting those retailers help anyone else? The theory, as noted above, is that minimum-markup laws protect smaller retailers who cannot meet lower prices, from being driven from the market. The idea is that they keep more competitors – more gas stations and other retailers – in the market. But, if the theory is right, there should be evidence that these laws actually do reduce retailer attrition, i.e., that they really do result in a greater number of retailers.

By using national-level data, we seek to explore the relationship between minimum markup laws and the number of retailers and gas stations in a state. Our econometric analysis shows that the theory underlying these laws is wrong. There is no statistically significant relationship between such laws and the number of small businesses or gas stations. As a result, there is no evidence that Wisconsin’s minimum markup law has affected the concentration in the retail market. Wisconsin consumers would be better served if the state allowed them to pay lower prices for gasoline and other consumer goods.

The History of the Unfair Sales Act

The Unfair Sales Act, originally enacted in the 1930s, reads as follows:

The practice of selling certain items of merchandise below cost in order to attract patronage is generally a form of deceptive advertising and an unfair method of competition in commerce. Such practice causes commercial dislocations, misleads the consumer, works back against the farmer, directly burdens and obstructs commerce, and diverts business from dealers who maintain a fair price policy. Bankruptcies among merchants who fail because of the competition of those who use such methods result in unemployment, disruption of leases, and nonpayment of taxes and loans, and contribute to an inevitable train of undesirable economic consequences, including economic depression. (Wis. Stat. § 100.30(1))

Figure 1 on the opposite page shows the states in which minimum markup laws similar to Wisconsin are still in place. States in red have minimum markup laws that apply to all retail goods, similar to Wisconsin.² States

in purple have laws that apply exclusively to the sale of motor fuel.

There are two problems with the rationale for minimum markup laws. First, it gets the economics completely wrong. Falling prices were not a cause of the Great Depression, but rather an outcome (Calmoris 1993). During a steep economic downturn, falling prices from a decline in aggregate demand lessen the concomitant reduction in production and sales in the economy. Put simply, an economy where demand falls by 20 percent and prices by 10 percent will see a much smaller reduction in the supply of goods and services -- as well as a smaller reduction in the employment of people who produce these goods and services -- than if prices didn't fall at all. More people can afford to buy things. More people remain employed to make and sell these things.

Second, the predatory pricing, which such laws aim to prevent, has rarely been observed. (DiLorenzo and Thomas 1992). And it could rarely succeed were it tried. The hypothesis is that a well-heeled competitor could lower its prices, drive smaller competitors out of the market, and then, with the field cleared, raise prices to an even higher level, reaping exorbitant profit. But that strategy won't work unless the predator can also create some sort of barrier that prevents new competitors from entering the market when they see the incumbents earning sizeable profits. If there are no barriers to entry, the predator's "excess" profit will bring the competition that has been driven out -- if not the same competitors -- right back in. Absent assistance from the government, predatory pricing has generally proven to be an untenable strategy (Isaac and Smith 1985).

Even in a market, like retail gasoline, which requires some significant capital investment, keeping competitors out is quite especially difficult when there is money to be made. If a gas station were to be driven out of a market by cut-throat prices that are subsequently raised, there is nothing to stop another owner from buying the pumps and running his own station.

Economists call such markets contestable (Cairns and Mahabir 1988). The only way for cut-throat competition to keep new entrants out of the market is to maintain prices so low that no one has the incentive to enter. But this defeats the purpose of the predatory scheme in the first place, as the idea must be to eventually raise prices and recover any losses from selling below cost. It means that the evil to which the Unfair Sales Act was directed won't happen.

In fact, existing scholarly evidence does suggest that laws like the Unfair Sales Act actually have an anti-competitive effect in the marketplace and have made gasoline more costly for consumers. Anderson and Johnson (1999) found that such laws that are specifically targeted towards gasoline directly increase profits for gas retailers. Brannon (2003) took advantage of a change in the penalties for violations of the Unfair Sales Act to test the effect of the law on consumer prices. In 1998, responding to a decline in the number of gas stations, the Wisconsin legislature strengthened the Unfair Sales Act. The new version mandates a minimum markup based on the posted wholesale price at a location closest to the station and imposes substantially higher penalties for violating the law--up to \$2,000 per day, per violation. He found that prices in Wisconsin increased substantially more than in neighboring states after the law was toughened.

While it is true that there are fewer gas stations in Wisconsin today than there have been in the past, this does not support the need for the Unfair Sales Act as much as it demonstrates its inefficacy. The reality is that it was primarily various environmental regulations that killed off most of the small mom and pop retailers. An EPA mandate that gasoline stations have underground storage tanks much less prone to leaking by the late 1990s, resulted in an exodus of small retailers for which such new investments were not cost effective (Marxsen 1999).

The change in the law has not increased the number of gas stations (or even halted their decline.) It did create a gigantic incentive for stations to police their competitors and promptly report any violations. The result, predictably, was a flood of complaints from station owners claiming to have been injured, as well as lawsuits challenging the legality and constitutionality of the law (Brannon 2003). The main outcome of the law's change has been a dramatic increase in legal activity concerning the law, as well as higher prices and profits for gas stations.

Methodology of Study

We chose to pursue a different empirical approach in this paper than existing research that has been primarily focused on the effect of minimum markup laws on consumer prices, to examine what is ostensibly the benefit of such laws in reducing retailer concentration. One of the chief arguments in support of minimum markup laws is that they protect small business retailers from being driven out of the market by large corporations. If the law works as intended, we should be able to observe more retailers in states that have minimum markup laws than in those that do not.

To that end, we conducted two analyses. One on the effect of general minimum markup laws on all small retailers, and the second on the effect of minimum markup laws on gas stations, specifically over the past twenty years. In analysis 1, we obtained data on the number of small business retailers -- retail businesses with fewer than 500 employees -- in each state obtained from the Small Business Administration's (SBA) annual report on the number of small businesses in the states (SBA 2016). While firms up to 500 employees are considered small businesses by the SBA, it is important to note that the vast majority (over 91%) of these firms have fewer than 20 employees. Data on the number of gas station retailers in each state was obtained from the Bureau of Labor Statistics for each year and each state dating from 1996 to 2016. We chose that time period because the change in environmental rules governing underground storage tanks took effect then, which hastened the demise of many small stations unable to replace them.

We also obtained data on the unemployment rate in each state from the Bureau of Labor Statistics, average per capita income of residents in each state from the Census Bureau. State Domestic Product was included in our analysis of small retailers as an additional measure of state economic health, and the number of cars per capita in each state from the Bureau of Economic Analysis was included in our analysis of gas stations as a measure of demand. We included the unemployment rate for each state as a proxy for the state's economic health. Finally, we included a "dummy variable³" that equals 1 if a state had a minimum markup law in place in a particular year and 0 if not.⁴ As noted above, some states have minimum markup laws that

apply to all retail sales, and some only to gas. To test for the possibility that minimum markup laws related only to gas will be enforced more heavily on gas stations, we utilize another dummy variable that equals 1 only in the case of gas-specific minimum markup laws.

Table 1 below shows the descriptive statistics for each of the variables in the paper. Recall that there are multiple years of data on each state, so the averages reported in table one should be interpreted as the average for all states over the period studied.

Table 1. Summary Statistics of Key Variables

Variable	Mean(SD)
Number of Small Retailers	51,275(56956.3)
Number of gas stations	3,334.47(2875.72)
Minimum Markup Law	0.43
Minimum Markup-Gas	0.18(0.38)
Population(millions)	5.72(6.38)
Unemployment Rate	0.06(0.02)
Per Capita Cars	0.45(0.07)
Per Capita Income	50,975(8765.72)

43% of the states in our sample have a minimum markup law that applies, as in Wisconsin, to most retail products. There are, of course, differences in the stiffness of the penalties associated with violation of these laws. For example, in some states violating the law can lead to a loss of one's business license. Nebraska actually classifies violations of minimum markup law as a felony.⁵ Our analysis does not distinguish among these states based upon the nature of the penalties for violation of the law.⁶

About 17% of our sample has a minimum markup law that applies only to gasoline.

Wisconsin ranks slightly above average in the number of retailers per million residents at 8,659. The state is very close to the national average in terms of cars per 1,000 people (948), unemployment (4.0), and income (\$50,395). The state has a total population somewhat below the national average at 5.75 million residents, according to the most recent Census data.

Table 2. Wisconsin's Values on Key Study Variables

Retailers per Million	8,659
Cars per 1,000 people	948
Unemployment Rate	4.0
Population	5.75M
Per Capita Income	\$50,395

Our goal is to construct a reduced-form model with control variables that might be expected to explain much of the state-by-state variation in the retailer density, and to see whether our key variable -- the absence or presence of laws that mandate a minimum markup -- have an additional statistically significant effect.

For example, a higher unemployment rate presumably reflects worse economic health and less demand for products. Higher per capita income, by itself, should result in greater demand for gasoline and retail goods in general, *ceteris paribus*, we reason. The number of vehicles per capita presumably will affect the demand for gasoline both directly and, perhaps, as a proxy for the degree of urban sprawl. States with more vehicles per person tend to have cities typified by sprawl, with more retailers and higher gasoline demand.

Formally, in Analysis 1, for each state the following equation is estimated:

$$\text{Small Businesses}_s = \alpha + \beta_{1s} (\text{Minimum Markup Law}) + \beta_{2s} (\text{Controls})$$

In Analysis 2, for states in year t , the following equation is estimated:

$$\text{Gas Stations}_{st} = \alpha + \beta_{1st} (\text{Minimum Markup Law}) + \beta_{2st} (\text{Controls})$$

In each equation, α equals the baseline number of gas stations in the state. If minimum markup laws have their intended effect of increasing marketplace access for prospective gas station owners, we would expect to see a positive coefficient on β_1 . β_2 is the vector of control variables described above with the addition of dummy variables for each year. If minimum markup laws have a positive effect on the number of retailers as predicted by advocates for the law, we would expect a positive, significant coefficient on β_1 in both analyses. To account for additional unique factors in each state that may affect the number of gas stations, observations are clustered by state (Nichols and Schaffer 2007).

RESULTS: Small Businesses

Table 3 on the next page reports the results from the regression analysis described in equation 1. The control variables have effects in line with our expectations. States with higher unemployment have fewer small businesses, as do states with a lower per capita income. Obviously, the population of the state is one of the biggest drivers of the number of retailers. However, our key variable, minimum markup law, does not have an impact on the number of small businesses. The coefficient on minimum markup is positive, but does not even approach the traditional boundaries of statistical significance ($p < .65$).

Table 3. Effect of Minimum Markup Law on Number of Small Business Retailers

VARIABLES	Number of small business retailers
Minimum Markup Law	-725.2 (1,587)
Gross State Product	0.190 (0.133)
Unemployment Rate	-1,788** (877.2)
Income	-0.362** (0.144)
Population	8,023*** (116.0)
Constant	17,887** (7,287)
Observations	50
R-squared	0.992

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<.1

While these results are suggestive of no relationship between minimum markup laws and the number of businesses, they only represent a one-year snapshot of data. To further verify the lack of a relationship found here, we take advantage of multiple years of data on the number of gas stations in each state.

RESULTS: Gas Stations

Table 4 on the opposite page reports the results from the regression analysis described in the preceding section. Note that dummy variables for each year are included in the analysis but excluded from the table for ease of presentation. First, we note that most of our variables have effects in the expected direction. Most obviously, population is a large driver of the number of gas stations: more populous states have more stations. Second, we see that states with lower per capita income have fewer stations, perhaps indicative of lessened demand for gas in these states.

Table 4. Effect of Minimum Markup Law on Number of Gas Stations

VARIABLES	Gas Stations
Minimum Markup Law	-465.8 (390.4)
Unemployment Rate	-110.9 (94.63)
Per Capita Cars	-1,102 (2,514)
Income	-0.108*** (0.0238)
Population	0.000401*** (6.89e-05)
Observations	867
R-squared	0.762

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Our analysis finds that the number of automobiles per capita has a statistically significant impact on the density of gas stations. However, while statistically significant, the actual impact doesn't seem to be that sizeable -- decreasing by about .0009 retailers for every increase in per capita cars.

Most importantly, we find that the presence of a minimum markup law has no impact on the number of gas stations in a state, controlling for other factors -- the coefficient for the dummy variable that captures the presence of the law is small and it has no statistical significance. If anything, the effect tends towards a negative effect, as the coefficient on the minimum markup variable is less than 0.

Given this finding it's very difficult for supporters of the law to maintain that it has had a salutary impact on the retail market in Wisconsin -- at least from the consumers' perspective.

RESULTS: Gas-Specific Minimum Markup Law

In our final analysis, we look at the states that have a minimum markup law that applies only to gasoline sales. Table 5 on the following page presents these results. Once again, we see that our control variables work in their expected manner. And once again, we see that minimum markup laws even specific to gasoline have an insignificant effect on the number of gas stations in a state.

Table 5. Effect of Gas-Specific Minimum Markup Law on Number of Gas Stations

VARIABLES	Gas Stations
Gas-Specific Minimum Markup Law	639.2 (493.0)
Unemployment	-104.5 (97.60)
Cars per Capita	-1,099 (2,627)
Income	-0.105*** (0.0258)
Population	0.000391*** (7.21e-05)
Observations	867
R-squared	0.764

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Conclusions

The minimum markup provision in the Wisconsin statutes does nothing to achieve its ostensible goal of protecting small independent retailers from excessive competition, according to our empirical analysis. We find no evidence whatsoever that retailer attrition has been any different in the states with such laws. In other words, artificially inflating prices has not saved “mom and pop” retailers.

It is true that there has been a reduction in the number of gasoline stations in Wisconsin and elsewhere, but this was caused by changing markets as well as -- at least before the 2000s -- more stringent government regulations. These days gasoline is rarely sold by a retailer that makes most of its revenue from those sales -- it is simply one item for sale at a retailer that uses gasoline to get customers to shop at the rest of the store.

Previous research has established that strengthening the Unfair Sales Act increased the profit margin for gasoline retailers. In the era of high gasoline prices from 2000-2013, when prices quadrupled, the law mandated that margins increase fourfold as well, an outcome that is independent of any costs incurred by retailers. In essence, we've created an industry that sees its profits grow with its costs.

This is in keeping with modern economic theory. There is absolutely no reason to expect that there would be such an effect. The very notion that predatory competition could be an effective strategy to drive out the competition and reap excess profits has been shown to be incorrect time and time again by economists. The

law is a solution that cannot work to a problem that does not exist.

A better way to conceive of the minimum markup statute is as a tax -- but with the revenue going not only to the government, but to competitors in some instances. This is one of the reasons that laws like these are hard to repeal. Consumers pay more for goods but the fact that they are paying more -- or how much more they are paying -- is hard to see. But the protected competitors are well aware of the benefits they are enjoying and will fight very hard to make sure that those benefits keep coming.

In the meantime, Wisconsin consumers are still waiting for the state to demonstrate just how they benefit from a law that keeps prices artificially high and does not increase competition.

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Endnotes

- 1 Wisconsin Statutes s. 100.30, "The Unfair Sales Act"
- 2 Note that some states have separate laws for gas and other products. These states are counted as having a universal law.

3 A “dummy variable” uses a value 0 or 1 to indicate the absence or presence of something (in this case the presence or absence of a minimum markup law) that may be expected to affect the outcome under study (in this case, the number of small retailers or gas stations).

4 There was some minor variation in states over that period: for instance, Minnesota abolished the law for a period and then reinstated it around the turn of the century.

5 Nebraska Rev. Statute § 59-805

6 We constructed an alternative model with variation in the minimum markup based on the stiffness of penalties associated with violation, but the results did not differ substantively from the model we report here.