The Impact of Self-insuring for Workers' Compensation on Worker Fatality Rates

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Introduction

- Economic theory predicts that self-insured or experience rated firms have a higher economic incentive than insured firms to invest in workplace safety and to experience fewer worker injuries.

- There also is moderate empirical evidence that workers in self-insured firms have low injury rates, compared to workers in insured firms.

  (Ruser 1985, 1991; Worrall et al., 1988; Krueger, 1990; Bruce et al., 1993; Thomason and Pozzebon, 2002).

- A recent study showed that workers in states with an above the median percentage of self-insured firms --approximated by the amount of workers' compensation benefit paid by such firms in each state-- had lower *nonfatal* injury rates than workers in other states.

  (Asfaw and Pana-Cryan, 2009).

- It is unclear whether these lower rates are associated with higher safety investments or underreporting.

Introduction (cont.)

- A 'safety investment effect' would result in self-insured firms having a higher economic incentive to invest in safety and health, since they bear the full costs of worker injuries.

- An 'underreporting effect' would result in self-insured firms having a higher incentive to engage in claim management and, consequently, report less injuries than the actual ones.

- There is no consensus on the magnitude of these effects.

- The issue is complicated by the lack of reliable data on:
  - o The amount of safety investments made by firms
  - o The extent of illegal claim management practices of firms

Objective

- To examine the impact of self-insuring on *fatal* worker injuries in order to better understand the effects of investing in safety and underreporting because:

    1. Fatalities are hard to hide, contest, or misreport
    2. Investing in safety reduces the risk of fatal injuries

Hypotheses

- If self-insuring predominantly has a claims underreporting effect, there would be no significant association between self-insuring and fatal injury.

- If self-insured firms have a higher economic incentive to invest in workplace safety than other firms, there would be a negative and significant association between self-insuring and fatal injury.

Data & Measurement of Variables

- We used panel data from the Bureau of Labor Statistics (BLS) and National Academy of Social Insurance (NASI).

- The data cover almost all states between 1999 and 2005.

- Dependent variable: fatal occupational injury/1000 full-time workers.

- Self-insurance : percentage of workers' compensation benefit paid by self-insured firms in each state year and measured as a continuous and dichotomous (above or below the median value) variable.

  Note: The variable self-insured did not include experience rated firms

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Data & Measurement of Variables (cont.)

- Other variables included:
  - GDP per capita
  - Percentage of women, black, young, and unionized workers
  - Percentage of workers in manufacturing industry
  - Percentage of large firms
  - State laws on whether private carriers are not allowed to provide workers' compensation

- We measured most of these variables as dummies:
  - 1 above or 0 below the median value, or
  - 1 if not allowed, 0 otherwise)

Method

- We estimated the following equation using a Fixed Effects Vector Decomposition (FEVD) method:

$$F_{st} = X'_{st}\beta + Z'_s\varphi + \gamma R_{st} + \eta_s + \varepsilon_{st}$$

Where

- F is a worker fatality per one thousand full-time workers, s indexes state and t time,
- X is a vector of variables that affect the fatality rate,
- Z is a vector of time invariant variables such as state laws
- R is the share of self-insured firms,
- η_s measure individual state fixed effects,
- ε_{st} are the error terms over the whole sample with constant variance and are assumed to be independent for each *s* over all *t*, and
- β and φ are parameters to be estimated.

Empirical Results

Percentage of self-insured firms and fatal injury rate
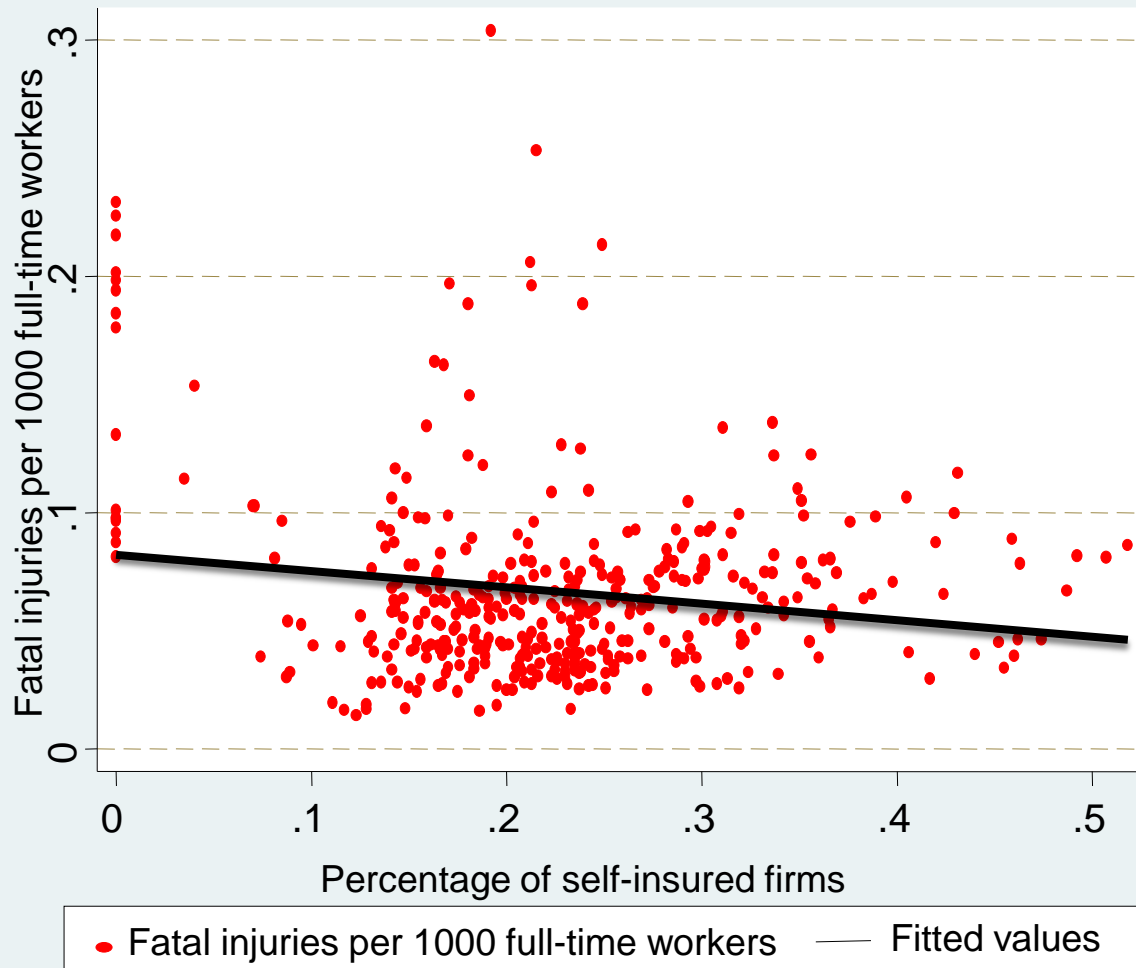
1. Descriptive Results

➢ There was an inverse relationship between the percentage of self-insured firms and fatal injury rates

➢ As the percentage of self-insured firms increased, the fatal injury rate decreased

➢ The correlation between the two variables was -0.16 and was statistically significant (p <0.01)

Empirical Results (cont.)

Explanatory variable	Dependent variable: Ln fatal injury rate			
	Self-insurance : continuous variable		Self-insurance: dummy variable	
	Coef.	Std. err	Coef.	Std. err
Self-insurance status	-0.454***	0.117	-0.038**	0.019
% of female workers	-0.057***	0.018	-0.056***	0.018
% of unionized workers	0.064***	0.020	0.067***	0.020
Per capita GDP (2000 $s)	-0.005	0.020	-0.008	0.020
% of workers aged <=19	0.014	0.020	-0.106***	0.023
% of black workers	-0.112***	0.024	0.144***	0.023
% of large firms	0.149***	0.023	0.121***	0.020
% of manufacturing	0.123***	0.020	0.022	0.020
No private carrier	0.923***	0.052	1.009***	0.048
Observations	399		399	
F(11, 340) (Prob > F)	325 (0.000)		325 (0.000)	
R-squared	0.905		0.905	
Adj. R-squared	0.889		0.889	

*** $p < 0.01$, ** $p < 0.05$

2. FEVD Results

➢ The variables included in the model jointly explained nearly 90% of the within and the between variation in fatality rates

➢ The F-static also shows that the explanatory variables were jointly statistically significant in explaining fatality rates

➢ Most of the variables (except unionized workers and size) took the expected sign and were statistically significant

FEVD Results (cont.)

Explanatory variable	Dependent variable: Ln fatal injury rate			
	Self-insurance : continuous variable		Self-insurance: dummy variable	
	Coefficient	Std. err	Coefficient	Std. err
Self-insurance status	-0.454***	0.117	-0.038**	0.019

➢ Self-insurance as a continuous variable: a ten percentage point increase in the share of self-insured firms decreased fatal injury rate by 4.5%.

➢ Self-insurance as a dichotomous variable: states with an above the median percentage of self-insured firms had nearly 4 % less fatalities than states with a below the median percentage of self-insured firms.

➢ One implication of these results is that self-insuring firms seem to have a higher incentive to invest in workplace safety and this reduces fatality rates.

➢ If self-insurance had only claim-reporting effects, this negative relationship would not hold up for fatal injury rates.

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Conclusion and Limitations

- A higher degree of experience rating seems to better align the economic incentive to invest in prevention and the intended outcome of reducing worker fatality.

- Our self-insurance indicator did not include experience rated firms

- Our analysis was done at the state, not the firm, level

Thank you for your attention

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