

Impact of Market Concentration on Employment and Wages: A Look at the Insurance Industry

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Abstract

The falling share of labor in national income is a global concern. This study examines the impact of changes in market concentration ratios in the insurance industry on employment, the share of wages, sales (premiums), and annual wages. We analyze the panel data during the period 2001 to 2012 for life, property, and health insurance industry, available from the Bureau of Economic Analysis, Bureau of Labor Statistics, and SNL database. Using a fixed effects model, we find that a higher market concentration is associated with lower employment in the industry and a lower share of wages. However, there is no statistically significant association between concentration and average annual wage. Moreover, there is evidence that that market concentration is positively associated with higher total sales (premiums received by the companies). Thus, we hypothesize that lower employment is not driven by the poor economic performance of the industry.

JEL: L1, J2, J3

Keywords: Industry Concentration, Insurance, Jobs, Share of Labor

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Introduction

The global decline in the share of labor in national income has been well documented (Karabarbounis & Neiman 2013; Piketty 2014). The United States has also witnessed this trend, where wages are growing more slowly than productivity. A variety of explanations have been provided for this phenomenon: Barkai (2016) attributed this decline in share of labor to an increase in the mark up of firms. Loecker and Eeckhout (2017) claimed that this phenomenon is due to an increase in market power. Karabarbounis and Neiman (2013) argued that it is a greater use of information and communication technology. Guscina (2006) and Krugman and Venables (1995) argued it is globalization and mobility of labor from developing countries. Whereas Feldmann (2013 and 2015) focused his analysis on the concentration ratios in the banking sector (in addition to others).

This study adds to the literature on the declining share of labor by utilizing data from the insurance industry in the United States. Particularly, we focus on the insurance industry because it allows us to treat every state as a distinct geographical market for selling insurance policies. The McCarran Fergusson Act of 1945 makes the regulation of insurance a state subject, exempt from most federal regulations, including federal anti-trust laws (Macey and Miller 1993). To operate in a state, the insurance companies are required to obtain a license from the state's Department of Insurance. Insurance companies are also not allowed to cross-subsidize across states or sell across states. Within each state, each individual insurance company has to maintain certain solvency requirements. The Department of Insurance in every state is mandated to regularly test whether the insurance firms operating in their state are solvent.

In addition to the uniquely structured data, the insurance sector is also an important component of the U.S. economy. According to the Insurance Department Resources Report (2017) published by the National Association of Insurance Commissioners (NAIC), revenue from insurance policies sold grew four percent to \$2.2 trillion in 2016. This is approximately 12 percent of the US Gross Domestic Product (GDP). According to the Insurance Information Institute, the sector also provided employment to 2.6 million people in 2017. It is an important sector because a large fraction of U.S population has some exposure to forms of insurance. Hence any structural change in the industry will have a significant economic and political impact.

Studies have shown that concentration in the labor market, few firms dominating the hiring market, is rising across sectors in the United States (Azar et al. 2017; Azar et al. 2018). In this paper, we specifically focus on the market concentration in the insurance markets as measured by Herfindahl Hirschman Index (HHI). We find that there is a negative relationship between market concentration in the insurance industry and the number of jobs in the insurance industry. In particular, a mean increase, which is about ten percent, in market concentration in the insurance industry in a state causes a loss of about 86 jobs. Since there may be a time lag in laying off workers, we examine the impact of market concentration with a time lag. We find evidence that this loss of jobs in the sector due to market concentration changes is felt for a couple of years.

Consistent with the existing literature, the share of labor is defined as the ratio of total wages in the insurance industry to the total sales (or total direct premiums written) by the industry. While market concentration has no impact on wages received by the people working in the insurance industry, there is evidence that there is an inverse relationship between market

concentration and share of labor. We find that a 10 percent increase in market concentration causes a -1.7 percent reduction in the share of labor.

There is a concern that economic conditions translating into lower demand might be driving an increase in market concentration and also causing lower employment. To address this concern, we look at the effect of market concentration on total sales by the insurance industry and find a strong positive and statistically significant relationship between them. Dafny et al. (2012) also reported that higher market concentration leads to higher premiums on health insurance policies. This rules out the concern that poor economic conditions faced by the industry might be driving these trends.

Our findings are also consistent with Autor et al. (2017) who showed an inverse relationship between market concentration and share of labor using data across countries and sectors. They have also provided a theoretical model which shows that the labor share of a firm would be lower if the mark up in profits is higher. Benmelech et al. (2018) also found a negative relation between labor market concentration and wages.

Data

The data on the number of jobs in the insurance carriers and related activities is available from the Bureau of Economic Analysis (BEA). Bureau of Labor Statistics (BLS) also has data on number of jobs. However, BLS does not disclose data for several states and years due to quality concerns. Besides, BLS has reclassified its employment data within industries during the time

period of study which results in sharp fluctuations in the data. Hence, for the purposes of our paper, the data on the number of jobs available from BEA is more suitable.¹

For the total wages paid by insurance carriers and related activities, the data are available from the Bureau of Labor Statistics. Insurance firms are required to publically disclose certain financial information like premiums written, etc. The SNL database compiles this information and provides data on market concentration in the insurance industry and total sales by the insurance industry. Market concentration as measured by HHI ranges from 3.6 to 71 in our sample.² The HHI is computed based on direct premiums written.³ Parent companies often float subsidiary firms to sell insurance in different segments of insurance markets. The HHI is based on insurance groups. This data are available from 2001, thus the time period of this study is from 2001 to 2012.⁴ The variable on the share of wages is constructed by taking the ratio of total wages and total sales.

In order to accurately measure the impact, we employ a variety of controls. We control for overall trends in employment and economy in the state by using data on the number of jobs in the private non-farm employment in the state. This data are also available from the Bureau of Labor Statistics. We also control for the political orientation of the state by employing controls for the political affiliation of the Governor. Grace et al. (2008) found a negative association between insurance premium tax rates and employment in the insurance industry. Hence, we control for insurance premium tax rates in the state. Besley and Coate (2003) argued that

¹ The data on number of jobs, total wages, and average annual wage for the year 2001 is not available for Wyoming and Alaska.

² HHI is normally calculated in fractions taking a value between 0 and 1. We multiply the fraction by 100 for convenient discussion of results.

³ Direct premiums written are the total premiums received before considering reinsurance ceded.

⁴ This data includes the time period when the Affordable Care Act (ACA, nicknamed Obamacare) began in 2010. When we exclude the years in which Obamacare was in effect, our results hold.

appointed commissioners are pro-industry, while elected commissioners are pro-consumers. It is likely that elected commissioners prefer higher employment in the industry. Hence, we have added a control for whether the insurance commissioner in the state is selected through election or appointment.

In this study we also look at the impact of market concentration on average annual pay in the insurance carriers and related activities. The results are provided in Table five. This data are also available from the Bureau of Labor Statistics. Table 1 provides summary statistics.

Table 1: Summary Statistics

VARIABLES	N	Mean	S.D.	Min	Max
Appointed Commissioner	598	0.78	0.42	0	1
Democratic Governor	598	0.52	0.5	0	1
Effective Premium Tax Rate	598	1.3	0.6	0.17	2.9
Market Concentration	598	12.7	6.1	3.7	71.6
State GDP	598	268	326	19	2,100
Total Wages (insurance) (in \$mn)	598	2.8	3.2	0.02	16
No. of jobs (Private non farm employment) (in '000)	598	3.0e+03	3.2e+03	255	1.9e+04
No. of jobs (Insurance carriers and related areas)	598	46,737	48,644	1,937	240,283
Total sales (in \$mn)	598	28	30	1.3	170

Source: These are our calculations based on data from National Association of Insurance Commissioners (NAIC), Bureau of Economic Analysis (BEA), Bureau of Labor Statistics (BLS) and SNL database.

Stationarity of the panel could also be a concern within our data. Given the number of panels in our dataset, there are several tests for the presence of unit root which allow for multiple panels (for example we do Im–Pesaran–Shin test, Levin–Lin–Chu, Harris–Tzavalis test and

Breitung test). While testing for number of jobs in the insurance industry, we allow for a trend and test for up to 3 lags. We are, in general, able to rule out a unit root when the number of lags are 2 and 3 with a p-value of less than 0.05. For 1 lag, the unit root is ruled out with a p-value of less than 0.09. For premium tax rate, total sales and market concentration the unit root is also ruled out with a p - value of less than 0.05.

The Augmented Dickey Fuller (ADF) Test is also utilized. However, we had to do these tests individually for every state. The results are mixed with ADF. For some states, we were able to rule out the presence of a unit root in the number of jobs in the insurance industry under some specifications. For some states, we were not able to rule out the presence of a unit root. The number of periods in our data set may not be adequate enough to conduct these tests.

Empirical Strategy

To estimate the impact of market concentration on employment in the insurance industry, a fixed effects model is employed with four dependent variables: number of jobs, share of wages, total sales (premiums), and annual wages. In these we use both state and year fixed effects, which allow us to control for omitted variable bias. Given that there is substantial variation in the market concentration across states, and also within states, over the time period of study, this allows the use of a fixed effects model. For example, market concentration as measured by the HHI went up from 51 to 64 in Alabama during the period of the study. In the same period, the HHI in Mississippi went up from 5 to 11. The year fixed effects also allow us to control for the impacts of any major technological changes over this time period (and their effects on employment in the sample).

Included are one- and two-year time lags in the impact of changes in market concentration. For robustness checks and easier interpretation of the results, regressions are also reported in log form. The following equations are estimated:

$$X_{st} = \alpha + \beta \text{Market Concentration}_{st} + \gamma \emptyset_{st} + e_{st} \quad (1)$$

Where X is the *Number of Jobs*, *Share of Wages*, *Total Sales*, and *Annual Wages* in the industry, each estimated separately. Where \emptyset are the controls in a given state, s , for each year, t , such as the total employment in the state, premium tax rate, the selection method of the insurance commissioner, political affiliation of the governor, and state GDP. The errors, e , are clustered at the state level and robust to heteroscedasticity.

Results

Table 2 provides empirical evidence on the negative association between market concentration and number of jobs in the insurance industry. In the first regression (column 1), market concentration is in log form for easier interpretation of results. Accordingly, as the market concentration doubles, on an average, the number of jobs in the insurance carriers and related activities go down by 2,330. A one percent increase in market concentration is associated with a loss of 23 jobs in the insurance industry in a state. As suggested by Grace et al. (2008), we find a negative association between insurance premium tax rates and employment in the insurance industry. Regression (1) has been run with other controls (like state population and state GDP) and the results hold. We have not included these variables in regression (1) to address multicollinearity concerns as these variables might be correlated with total employment. We also find that states with appointed insurance commissioners tend to have more people employed in the industry. However, this association is not statistically significant across all specifications.

There is also no statistically significant association between political affiliation of the Governor of the state and the number of jobs in the insurance industry.

Table 2: Impact of Market Concentration on the Number of Jobs in the Insurance Industry.

VARIABLES	Employment (t)	Employment (t)	Employment (t+1)	Employment (t+2)
	(1)	(2)	(3)	(4)
Market Concentration	-2,328* (1,300)	-86* (45)	-85** (39)	-82*** (30)
Total Employment	4.8*** (1.6)	4.8*** (1.7)	4.5 (3.1)	4.5 (5.2)
ln (Tax rate)	-3,789** (1,416)	-3,294*** (1,146)	-3,122*** (1,058)	-2,863*** (1,012)
Appointed Regulator	4,865*** (1,416)	4,852*** (1,414)	4,385 (2,731)	4,022 (4,667)
Democratic Governor	-458 (308)	-449 (322)	-302 (364)	-131 (581)
Constant	34,494*** (5,501)	30,157*** (3,989)	31,223*** (6,895)	31,848*** (11,290)
State Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	598	598	598	598
Adjusted R-squared	0.26	0.22	0.18	0.16
Number of states	50	50	50	50
The errors in parenthesis are clustered at the state level and robust to heteroscedasticity; *** p<0.01, ** p<0.05, * p<0.1. The data on employment (or number of jobs) in the insurance industry are available from Bureau of Economic Affairs. For regressions (1) & (2), the time period is 2001 to 2012. For regression (3), the time period is 2001 to 2013. For regression (4), the time period is 2001 to 2014.				

In regression (2), we use market concentration in the non-log form as a robustness check and continue to find a statistically significant negative association between market concentration and the number of jobs in the insurance industry. In regressions (3) and (4), we allow for a one-year and two-year time lag between market concentration and the number of jobs to measure any evidence of lagged effects or how this changes the results found in the previous models.

Continuing to find that even with one- and two-year lags, the association between market

concentration and the number of jobs is statistically significant. All these results occur with controls for state and year fixed effects.

Table 3 examines the association between market concentration and share of wages. In regression (1), uses the log form of market concentration and share of wages. There is evidence that the elasticity of the share of wage and market concentration is -0.169. That is, a one percent increase in market concentration leads to a 0.169 percent reduction in the share of income. In the additional checks on the impact of the share of wages we continue to find a negative and significant effect of the market concentration on the share of wages. In regression (2), the share of wages is in non-log form. Controls, such as political affiliation of the state's Governor, the selection method of state's insurance commissioner, and state GDP are used. In regression (3), uses state's population as an additional robustness check. Regression (4), uses the non-log form of market concentration. Regression (5) and (6) allow for one-year and two-year time lag on the impact of market concentration and share of wages. When controlling for the state population, the non-log form, or the time lags, we continue to find that there is a significant reduction in the share of income with an increase in the market concentration.

Table 3: Impact of Market Concentration on the Share of Wages in the Insurance industry.

VARIABLES	ln(Share of Wages) (t)	Share of Wages (t)	Share of Wages (t)	Share of Wages (t)	Share of Wages (t+1)	Share of Wages (t+2)
	(1)	(2)	(3)	(4)	(5)	(6)
ln(Market Concentration)	-0.169*** (0.03)	-1.1*** (0.31)	-1.1*** (0.33)	-0.05* (0.03)	-0.6** (0.25)	-0.5** (0.20)
Appointed Regulator	-0.01 (0.02)	-0.10 (0.16)	0.06 (0.18)	-0.08 (0.17)	-0.14 (0.16)	-0.24 (0.14)
Democratic Governor	0.01 (0.01)	0.17 (0.13)	0.14 (0.13)	0.18 (0.13)	0.14 (0.12)	-0.09 (0.11)
ln(GDP)	-0.24** (0.10)	-2.3*** (0.86)		-2.2** (0.86)	-1.9** (0.90)	-2.2** (1.07)
ln(Population)			-4.30 (2.90)			
Constant	3.680*** (0.5)	24.25*** (4.4)	78.41* (44.0)	21.68*** (4.2)	21.19*** (4.4)	22.09*** (5.2)
State Fixed Effects	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y
Observations	598	598	598	598	550	500
Adjusted R- squared	0.28	0.14	0.13	0.10	0.06	0.05
Number of States	50	50	50	50	50	50
Errors in parenthesis are clustered at the state level and robust to heteroscedasticity; ***p<0.01, **p<0.05, *p<0.1. The share of wages is in percent. The data on total wages paid in the insurance industry are available from BEA. The period of all regressions is from 2001 to 2012.						

There is also a possibility that there is a job loss in the industry not as a result of rising concentration itself, but rather that the industry faces tough economic conditions resulting in a lack of demand which leads to firms exiting the market and jobs being lost. To explore this hypothesis, the association between market concentration and total sales (premiums) are analyzed. There is a statistically significant and positive relationship between market concentration and total sales by the industry in table 4. Regression (1), uses market concentration

in the log form followed by the linear form in regressions (2-4). As market concentration goes up by one percent, the total sales go up by approximately \$500,000.

Table 4: Impact of Market Concentration on Total Sales (or Direct Premiums Written ('000))

VARIABLES	Premiums (t) (2)	Premiums (t) (1)	Premiums (t+1) (3)	Premiums (t+2) (4)
Market Concentration	5052*** (1918)	386*** (49)	198*** (48)	131** (57)
State GDP	51*** (16.00)	53*** (16)	50** (21)	39 (24)
Appointed Regulator	13837*** (1970)	13,695*** (1998)	12,838*** (2706)	10,520*** (3227)
Democratic Governor	284 (688)	244 (684)	745 (908)	1,448 (1076)
Constant	13963** -5728	-6,986** -2,795	309 -3,285	6,047* -3,429
State Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	610	610	559	508
Adjusted R-squared	0.63	0.67	0.58	0.49
Number of states	51	51	51	51
Errors in parenthesis are clustered at the state level and robust to heteroscedasticity; ***p<0.01, **p<0.05, *p<0.1; In regression (1) Market Concentration is in log form. These results also include Washington D.C. The data on total sales are compiled by SNL Financial. The period of analysis is 2001 to 2012.				

Table 5 provides estimates of the impact of market concentration on the average annual wages in the industry. This table shows that an increase in the market concentration has no statistical impact on the annual wages in the industry.

Table 5: Impact of Market Concentration on Average Annual Wage

VARIABLES	Average Annual Wage
Market Concentration	-0.45 (1.3)
State GDP	0.06 (0.1)
Appointed Regulator	26.2 (16)
Democratic Governor	-19.4 (15)
Constant	126*** (22)
State & Year Fixed Effects	Yes
Observations	586
Number of States	49
Adjusted R-squared	0.62
<p>Errors in parenthesis are clustered at the state level and robust to heteroscedasticity: ***p<0.01, **p<0.05, *p<0.1. Data on Average Annual Wage available from Bureau of Labor Statistics. The period of analysis is 2001 to 2012.</p>	

Conclusion

The share of labor in the production process has been declining in the United States and globally. In this study we have been able to utilize data from the insurance industry to measure the impacts of changes in concentration ratios and their effects on employment, share of wages, sales (premiums), and annual wages. When concentration ratios in the insurance industry double, the number of jobs in the insurance carriers and related activities go down by 2,330; thus, a one percent increase in market concentration is associated with a loss of 23 jobs in the insurance industry in a state. There is also evidence that a one percent increase in market concentration leads to a 0.169 percent reduction in the share of labor and that increases in the market

concentration increase the premiums received in the insurance industry. However, we find no effect on the annual wages paid in the industry when there are changes in the market concentration ratio.

This study contributes to the ongoing discussion on the falling share of labor across the globe. Providing evidence that rising product market concentration can explain the loss of wages and jobs. These results help us better understand the impact of industry concentration on the jobs and incomes of people in those industries. This study is unique in its analysis of the impact of market concentration on employment and labor share. However, we encourage further research to examine this relationship within the different segments of the insurance industry.

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