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- Short summary of research: I am an Assistant Professor of Economics and my primary research interests are Economic History, Political Economy, Asset Pricing, and Economic Development. One stream of my research focuses on understanding how political changes affect economic activity, institutions and conflict. For instance, in one of my papers, I investigate the extent to which conflicts between Native American tribes and U.S. Army troops were caused by the business cycle or diversionary motives when first term presidents were running for reelection. In a second paper in this line of research, I examine the impact of political control of bank supervision on bank and business failures during the Progressive Era. Using instrumental variables and exogenous gubernatorial elections I find that in quarters preceding gubernatorial elections, bank failure rates fell substantially in states whose governors had discretionary authority to hire and fire bank regulators. In a second stream of my research, I study how health and weather shocks , and government announcements affect asset prices. In one of my papers, I study the effect of the 1918 pandemic on stock prices and I find that the flu death rate can explain up to 24 percent of the forecast error variance in the aggregate stock index from September 1918 until the end of the pandemic in March 1920. I also find that the flu had a significant, but varied impact on nine NYSE sectors. In another line of research, I investigate how multinational companies' trade decisions are affected by political changes and weather shocks. In one of my papers, I test the hypothesis that child labor intensive industries tend to outsource more of their production rather than producing them in-house. I find a negative relationship between the share of imports that are intra-firm and the child labor intensity of the industry. For industries specialized in the use of child labor, the estimated effect of one standard deviation increase in industry's child labor intensity is of similar magnitude to the effect of Heckscher-Ohlin skill and capital determinants. To better understand the causal mechanism underlying this relationship, I exploit exogenous variation in rainfall and temperature across countries to examine how weather shocks affect outsourcing. My estimates show that positive rainfall shocks increase insourcing, while hot temperature increases outsourcing in child labor intensive industries. Lastly, using historical data on the English East India Company, I study how regime changes in England and financial volatility affected EIC's trade and investment decisions.
- Summer Institute sessions: Development of the American Economy, Development Economics, Asset Pricing, and International Trade & Macroeconomics.
- Date of Ph.D. : August 2019
- Website: https://www.calstatela.edu/business/facultyprofiles/marco-del-angel

Thank you very much for reviewing my application, please do not hesitate to contact me if you have any questions.

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ACADEMIC POSITIONS

Assistant Professor of Economics, California State University Los Angeles	Since August 2019
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EDUCATION

Ph.D. in Economics, University of California Irvine	2019
M.A. in International Development, Harvard University	2013
M.A. in Economics, El Colegio de México	2005
B.A. in Economics, ITESM	2002

PUBLICATIONS

"Chinese Import Exposure and U.S. Occupational Employment" (with Antonio Rodriguez and Sanjana Goswani) in the Economic Research Institute for Asean and East Asia (ed). **World Trade Evolution** (2018)

WORKING PAPERS

"How the West was Won" (Joint with Marc Weidenmier and Greg Hess). *Under Review*

"Do Global Pandemics Matter for Stock Prices? Lessons from the 1918 Spanish Flu. NBER Working Paper No. w28356 https://www.nber.org/papers/w28356

WORK IN PROGRESS

"Should Regulators Have Independence from Political Pressures? Politics, Banking, and Bankruptcies During the Progressive Era" (Joint with Gary Richardson)

"Bank Failures Triggered Business Failures in the United States" (Joint with Gary Richardson and Michael Gou)

"Governments and the performance of the English East India Company" (Joint with Dan Bogart)

"The Effects of Framing of Government Announcements on Asset Prices"(Joint with Jeffrey Frankel)

"Enforcement Actions and Water Quality" (Joint with Maura Allaire)

"Outsourcing Child Labor"

"Statistical Tests for Disparate Impact Discrimination" (Joint with Dennis Aigner)

SEMINARS AND CONFERENCE PRESENTATIONS

2021 (March 2021) Rutgers University; WEAI (Scheduled); Monetary and Financial History Workshop (Scheduled); Institute of Historical Research (Scheduled).

2019: ITAM, Environmental Sustainability and Performance of Mexican Firms (November 2019); 2019 EHA Meeting, Atlanta (September 2019)- Paper presented by coauthor; 11th Annual ARCS Research Conference, North Carolina (July 2019); Midwest Macroeconomics Conference, Georgia (May 2019).

GRANTS

Research Mini Grant, California State University Los Angeles 2019

TEACHING

Econ 5610-Seminar in International Economics (CSULA; Spring 2020);

Econ 3060 -Statistics for Business Analysis (CSULA; Fall 2019 & Spring 2020);

MGSC 310-Statistical Models Business Analytics (Chapman University; Spring 2019)

NBER WORKING PAPER SERIES

DO GLOBAL PANDEMICS MATTER FOR STOCK PRICES? LESSONS FROM THE 1918 SPANISH FLU

Marco Del Angel
Caroline Fohlin
Marc D. Weidenmier

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Do Global Pandemics Matter for Stock Prices? Lessons from the 1918 Spanish Flu
Marco Del Angel, Caroline Fohlin, and Marc D. Weidenmier
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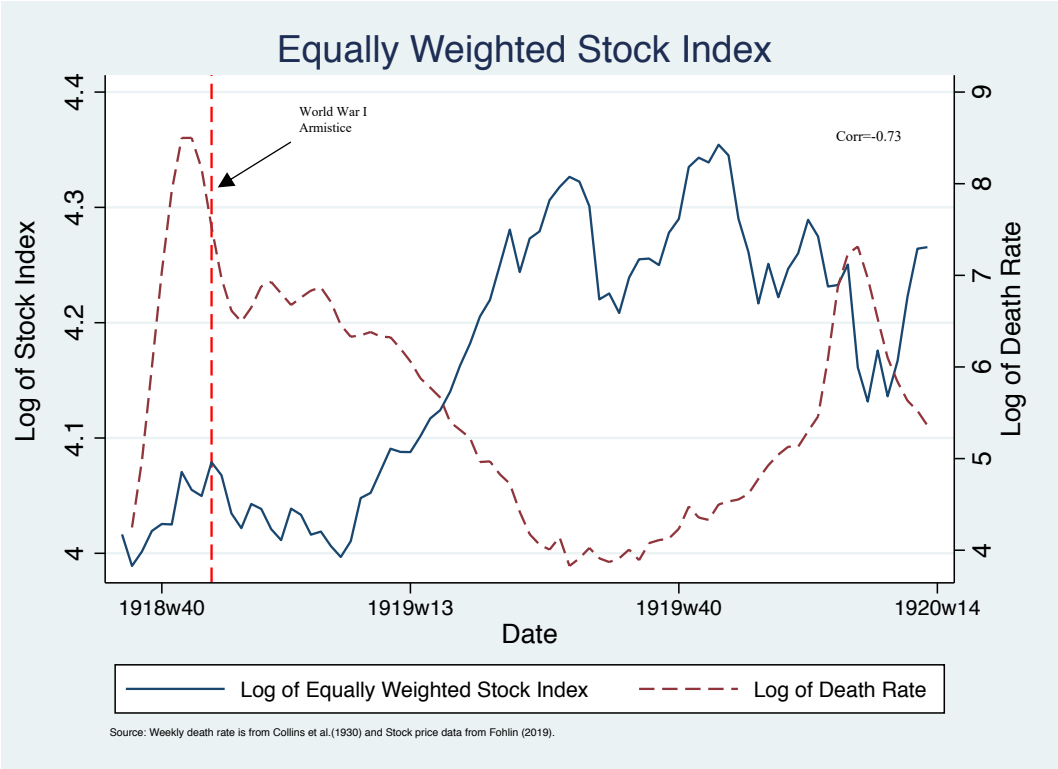
ABSTRACT

We study the impact of the 1918 Spanish Flu on U.S. stock prices. We use the death rate to control for the impact of the global pandemic and war news reported in the New York Times to capture the positive effects of the end of World War I on stock prices. Using a new weekly hand collected NYSE stock price index, we show that there is a -.73 correlation between the aggregate stock market and the death rate. Furthermore, vector autoregressions demonstrate that the death rate can explain up to 24 percent of the forecast error variance in the aggregate stock index from September 1918 until the end of the pandemic in March 1920. We also find that the flu had a significant, but varied impact on nine NYSE sectors. The empirical analysis indicates that pandemics can matter big time for stock prices.

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I. Introduction

We provide an historical perspective on the impact of a global pandemic on stock prices. The Spanish flu was the deadliest pandemic of the twentieth century. It killed approximately 2 percent of the global population and 675,000 Americans over a two-year period that covered four waves of the virus. We examine the effect of the 1918 Spanish Flu on the aggregate U.S. stock market given that the influenza was the last global pandemic that is similar in magnitude to the current coronavirus outbreak. Our study uses a new weekly, equally-weighted stock index of 149 firms constructed from stock prices taken from the *New York Times*. Simple descriptive statistics suggest that the pandemic may have mattered big time for stock prices given that the simple correlation coefficient between the log death rate and the log of the aggregate stock index is -.73

from September 1918 to March 1920. The nine NYSE sectors in our sample also have correlation coefficients with the flu variable ranging from -.40 to -.76.[1]

We focus on the impact of the virus on the aggregate stock market as opposed to GDP because macroeconomic data are often only available at the annual frequency for this time period and of questionable quality given that national income accounting was developed in the post-World War II period. Furthermore, the aggregate stock market has been shown to forecast future economic activity (Fama 1990; Schwert, 1990). Our new weekly U.S. stock index provides high frequency identification and a window into the effects of the influenza on the aggregate stock market as well as different stock market sectors.[2]

An empirical analysis of the Spanish flu is potentially complicated by the fact that the grip was concurrent with the end of World War I. It is likely that the influenza had a negative impact on stock prices while asset prices increased in value with good war news and an end to the World War. To separately identify the two factors, we estimate vector autoregressions to measure the dynamic impact of the Spanish flu and World War I on U.S. stock prices. We use the death rate to control for the impact of the grip on stock prices and war news reported in the *New York Times* to capture the effect of World War I on asset prices. We employ vector autoregressions for the empirical analysis since we have a small number of stock sectors (9), and a much larger number of weeks (81 weeks) in the data sample.

The empirical analysis demonstrates that the Spanish flu had a large impact on the stock market. Specifically, we find that the Spanish flu can explain 24 percent of the forecast error

[1] In the Appendix we plot the association between sectoral stock market indices and death rate.
[2] Barro et al. (2020) examine the impact of the Spanish flu on economic activity in a cross-section of countries over time. They find that influenza reduced real stock prices in their panel analysis. Bodenhorn and Velde (2020) examine the impact of the Spanish flu on U.S. economic activity. Cortes and Verdickt (2020) examine the impact of the Spanish flu on the U.S. insurance industry.

variance in the aggregate U.S. market from September 1918 until March 1920. Furthermore, we find that the pandemic had a significant, but varying impact across nine NYSE sectors. We also find that war news increased stock prices as the Allies marched to victory in the fall of 1918. Overall, the analysis suggests that the 1918 Spanish flu had a large negative impact on U.S. stock prices and probably depressed the market for more than a year.

We begin the empirical analysis with a brief history of the pandemic in the United States. Then we provide a description of the data used in the study. This is followed by an empirical analysis of the 1918 Spanish flu using vector autoregressions. We then conclude the study with a discussion of the implication of the results for asset returns and pandemics.

II. A Brief History of the 1918 Influenza Pandemic

As the U.S. scaled up training and troop deployments in the last year of World War I, a novel influenza virus began spreading. Detected in Kansas in March of 1918, the new influenza spread through the Army training camp in Fort Riley, Kansas: Over 100 soldiers became ill in March and the number of flu cases increased five-fold within a week (CDC, 2018). The first public mention of the pandemic came in April 1918 with 18 cases and 3 deaths in Haskell, Kansas. The U.S. military grew to 4.7 million soldiers by April 1918, and dozens of camps across the U.S. trained tens of thousands of troops at a time creating ideal conditions for spreading the virus through the military. As the war continued, hundreds of thousands of soldiers traveled to Europe each month. The first wave of the influenza made little news in the U.S., and U.S. cases waned over the summer. Through the spring and summer of 1918

newspapers published articles about the "grip" and "German sickness" – all focused on the spread of flu in Europe and often emphasized its negative impact on the enemy.

By September, the second wave arrived back in the US, appearing first in military bases in the Boston area. "By the end of September, more than 14,000 flu cases are reported at Camp Devens—equaling about one-quarter of the total camp, resulting in 757 deaths" (CDC, 2018). Again, the close quarters facilitated the spread of the virus among the troops, and the movements of troops continued to transport the virus back across the Atlantic to the U.S. The autumn 1918 wave brought far more infections, community spread, and high death rates. According to a "war department" analysis at the time, the pervasive outbreaks of flu among enlisted men cost the Army 8,743,102 work-days in 1918 alone (Byerly, 2010).

The flu struck and spread to different regions across the country, depending both on transportation patterns and on the mitigation measures different cities took. Some locales closed gathering places (movies, theaters, pubs, and some types of schools), required masks in public, and forced sickened individuals and whole families into quarantine. Some cities hosted mass war victory celebrations, which caused huge spikes in infections and deaths.

The third wave developed over the winter and spring of 1919. San Francisco recorded 1,800 new cases and 101 deaths in the first five days of January (CDC, 2018). Even President Wilson was stricken, collapsing at the Versailles conference in April 1919. Flu subsided over the summer of 1919 but more cases emerged over the subsequent winter, creating a fourth wave that continued into the early months of 1920—clearly evident in the "death rate" shown in Figure 1.

III. Data

The data come from the New York Stock Exchange (NYSE) database detailed in Fohlin (2019). The data used in this paper include transaction prices for all common stocks that traded on the NYSE every Friday from 1918 through 1920. The full dataset covers 1911-1925 and incorporates all data reported in the *New York Times* stock tables: The data include the full company names with details on type of security (preferred, rights, trust certificates), ex-dividend days, ex-rights days, and any other details; number of shares traded ("sales"); first and last transaction prices, as well as high and low transaction prices; and the quoted bid and ask prices prevailing at the close of the market. Our total market index is an equally-weighted average of 149 stocks that had no more than two weeks in which they did not trade. The sample covers the period September 1918 through March 1920 for a total of 81 weekly observations.

We employ weekly death rates from influenza and pneumonia for 35 cities in the United States. The data are taken from Collins et al. (1930). Our sample begins in September 1918, the first month for which there is weekly mortality data from the flu, and ends in March 1920 after the end of the fourth wave of the pandemic. War news is defined as the weekly number of newspaper stories (article, display ad, editorial article, front page and letter to editor) that mention terms related to World War I in the New York Times from September 1918 to March 1920. To construct this variable we searched the *ProQuest Newspaper Archive* for stories that contained the following keywords: i) "world war" or "Great War" or "European War", and ii) one of the following terms : "deaths" or "casualties" or "military conflict" or "invasion" or "blockade" or "killed in action" or "fatalities" or "killed in battle".

IV. Empirical Analysis

We begin the empirical analysis by looking at simple descriptive statistics for the variables used in the empirical analysis. Table 1 reports the mean and standard deviation for the aggregate stock market and control variables. The equally-weighted stock index has a mean value of 65.11 and a standard deviation of 7.26. The death rate variable has a mean of 581.37 and a standard deviation of 907.38. The flu variable has a large standard deviation which reflects the dramatic rise in deaths with the outbreak of the grip in August and September 1918. The log of the pandemic covariate has a -.73 percent correlation with the log of the aggregate stock index. The war news variable has a mean of 2.21 and a standard deviation of 1.53.

Next, we estimate vector autoregressions (VARs) to analyze the dynamic effects of the Spanish flu on U.S. stock prices. We use VARs because our data sample has a small number of stock sectors (9) and a much longer time series of asset prices (81 weeks). The makeup of the data series strongly suggests time series methods as opposed to a panel analysis that relies primarily on the cross-section for identification. Formally, we estimate the following specification:

$$Y_t = \mathbf{A}_0 + \mathbf{A}_1 Y_{t-1} + (\ldots) + \mathbf{A}_P Y_{t-P} + \varepsilon_t, \quad \varepsilon_t \sim N(0, \Sigma) \tag{1}$$

where Y_t is a vector of macroeconomic variables described below, $\mathbf{A}_0$ is a matrix of intercept coefficients, and $\mathbf{A}_1$ through $\mathbf{A}_P$ are matrices of coefficients relative to each lag of Y, ranging from 1 to P. To obtain causal relationships between the variables of the VAR, we estimate equation (1) and map the reduced-form shocks ε_t into structural shocks applying a Cholesky decomposition of the variance-covariance matrix Σ. This procedure—known as *recursive identification* implies that the ordering of the variables matters for determining the dynamic relationships between the VAR variables.

We specify a three-variable vector autoregression (VAR) that includes the log of the equally-weighted stock price index of NYSE firms (NYSE), a World War I news variable (NEWS), and the log of the death rate (DEATH). The sample covers the period from September 1918 until the end of March 1920. We select a lag length of 2 weeks based on the Akaike Information Criteria (AIC). The impulse responses show the impact of a one-standard deviation shock to the death rate and war news on stock prices along with 68 percent confidence intervals. We give the log of the equally-weighted index the first ordering since asset prices quickly respond to new information. War news is given the second ordering since World War I predates the outbreak of the Spanish flu. This means that the log of the death rate is given the third ordering.[3] The impulse responses for the aggregate stock market are reported in Figure 2. A one-standard deviation shock to the death rate reduces the equally-weighted stock index. A shock to the war news variable also has a statistically significant effect on stock prices. As for the forecast error variance, we find that the death rate can explain 24 percent of the movements in stock prices after 16 weeks. On the other hand, the war news variable can only account for about 3.7 percent of the fluctuations in stock prices[4]. The significant, but small impact of the war news variable may be explained by the fact that World War I ended three months into our sample period. If flu data were available starting in 1918, it is likely that war news would have a much larger impact on stock prices. Another possibility is that lags of the aggregate stock market index might also capture the positive effect of war news on asset prices.

[3] The empirical results are robust to giving death rate the second ordering in the Cholesky decomposition. Details are available from the authors by request.

[4] The results are robust if we restrict the sample to years 1918 and 1919. Death rate can explain 42 percent of the movements in stock prices after 16 weeks, while war news can explain 4 percent of the fluctuations in stock prices. Also, at 90% confidence level, death rate continues to have a robust and significant effect on stock prices, while war news has no effect.

Overall, the empirical analysis demonstrates that the Spanish flu had a large and negative impact on the aggregate stock index. [5]

We follow-up the baseline analysis by examining the impact of the Spanish flu on nine sectors of the New York Stock Exchange. The nine sectors are automobile, consumer products, light manufacturing, mining and oil, other manufacturing, railroads, steel, trade and services, and utilities. We use the equally-weighted index to control for overall market conditions. Table 2 reports summary statistics for the nine NYSE sectors. The mean index value ranges from 33.84 for mining and oil sector to 111.19 for trade and services. The standard deviation ranges from 2.56 for mining and oil to 20.40 for automobiles. The log of the nine sector indices has a correlation coefficient ranging from -.40 to -.76 which indicates a strong statistical relationship between the pandemic and the aggregate stock index.

Figure 3a shows the impulse responses of a given sector to a one-standard deviation shock to the log of death rate. We give the log of the sector index the first ordering, followed by the log of the market index, war news, and the log of the death rate.[6] Table 3 shows the forecast error variance for each of the nine sectors. Figure 3a shows that the death rate significantly lowers the automobile index. The Spanish flu can explain 17.7 percent of the movements in the automobile index after 16 weeks. Second, the consumer products index presented in Figure 3a significantly falls in response to a one-standard deviation shock to the flu variable. The death rate can account for 23.3 percent of the movements in the consumer products index after 16 weeks. With respect to light manufacturing, Figure 3a shows that the death rate significantly reduces the light manufacturing sector. The death rate can account for 13.9 percent of the movements in the

[5] We also looked at the impact of mitigation measures on stock prices. Mitigation measures included public gatherings bans and school closures across 39 cities. Although the mitigation measures were statistically significant, they explain less than one percent of the forecast error variance in stock prices

[6] Lag lengths for the sector VARs were selected on the basis of the AIC criteria.

light manufacturing sector index after 16 weeks. A shock to the death rate presented in Figure 3a significantly decreases mining and oil. The grip can explain 23 percent of the movements in the industrial index after 16 weeks. An increase in the death rate significantly reduces the other manufacturing sector in Figure 3b, explaining 19.1 percent of the movements in the sector after 16 weeks.

The railroad index also shown in Figure 3b significantly falls in response to a one-standard deviation shock to the influenza variable. The flu can explain 5.7 percent of the fluctuations in the railroad sector. In addition, the steel sector presented in Figure 3b declines following a shock to the death rate. The influenza variable can explain 13.4 percent of the movements in steel. A shock to the death rate significantly reduces the trade and service index. The death rate can account for 21.4 percent of the movements in the trade and service index after 16 weeks. Finally, the utility sector falls in response to a shock to the death rate. The flu variables explain 24.1 percent of the fluctuations in the utility sector.

With respect to the impact of war news on stock prices, Figures 4a and 4b show that a one-standard deviation shock to war news has a statistically significant effect on four of the nine sector indices. A one-standard deviation shock to war news significantly increased consumer products, light manufacturing, steel, and trade and services. War news can explain 5.5, 3.7, 2.0, and 6.3 percent of the forecast error variance (FEVD) for the four sectors at a sixteen-week forecast horizon, respectively.

The rise in the U.S. stock market in 1918-1920 also reflects the return to a peacetime economy that was shifting from producing guns to butter. Trading activity on the NYSE, for example, grew rapidly at the end of World War I and the early 1920s. The number of actively traded common stocks increased from roughly 150 to 250 between 1918 and 1920. Meanwhile,

volume (number of shares traded) rose from an average of 380 thousand shares in the 1911-14 period to nearly 870 thousand shares on average in the 1919-22 period. Dollar volume, in nominal terms, rose less dramatically, from an average of $37 million per day in the early period to about $55.5 million per day in the post-war period.

V. Conclusion

We examine the effect of the 1918 Spanish flu, a global pandemic, on U.S. stock prices. We estimate simple vector autoregressions to assess the impact of the influenza on firms that traded on NYSE using a new weekly stock price index collected from the *New York Times* as well as news articles to control for the impact of the end of World War I. Simple summary statistics show that there a -.73 correlation between the log of the death rate and the log of the aggregate stock index. Then we estimate vector autoregressions that demonstrate that the grip can explain up to 24 percent of the forecast error variance of the aggregate U.S. stock market after 16 weeks. We follow-up the aggregate analysis by examining the effect of the influenza on nine NYSE sectors. The analysis shows that the pandemic had a significant and negative impact on all nine sectoral indices. The empirical analysis demonstrates that the Spanish flu mattered big time for U.S stock prices from 1918-1920.

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Table 1. Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Equally Weighted Stock Market Index	81	65.11	7.26	54	77.82
Death Rate	81	581.37	907.38	46	4915
War News	81	2.21	1.53	0	7

Source: Author's calculations

Table 2. Summary Statistics, NYSE Sectors

Sector	Obs.	Mean	Std. Dev.	Min	Max
Automobile	81	90.42	20.40	63.73	129.01
Consumer Products	81	102.18	14.11	82.09	128.11
Light Manufacturing	81	70.42	11.14	49.39	86.78
Mining & Oil	81	33.84	2.56	28.30	39.11
Other Manufacturing	81	75.90	10.28	56.73	92.61
Railroads	81	55.50	3.24	47.66	62.80
Steel	81	54.70	6.53	42.88	66.32
Trade & Service	81	111.19	10.69	91.70	129.03
Utilities	81	39.60	4.13	33.59	49.93

Source: Author's calculations

Table 3. Forecast Error Variance Decompositions for Nine NYSE Sectors

A. Death Rate

Weeks	Automobile	Consumer Products	Light Manufacturing	Mining & Oil	Other Manufacturing	Railroads	Steel	Trade & Service	Utility
4	4.1%	4.3%	2.5%	3.2%	4.2%	2.7%	1.2%	4.7%	6.9%
8	15.3%	21.2%	11.5%	17.7%	17.2%	5.7%	7.6%	18.9%	22.3%
12	18.0%	25.0%	14.6%	23.0%	20.6%	5.5%	11.9%	22.1%	24.8%
16	17.7%	23.3%	13.9%	23.0%	19.1%	5.7%	13.4%	21.4%	24.1%

B. War News

Weeks	Automobile	Consumer Products	Light Manufacturing	Mining & Oil	Other Manufacturing	Railroads	Steel	Trade & Service	Utility
4	0.9%	2.4%	1.1%	0.2%	0.7%	0.1%	1.9%	2.3%	0.1%
8	1.8%	4.8%	2.5%	0.9%	1.1%	0.1%	2.5%	4.8%	0.3%
12	2.2%	5.4%	3.4%	1.3%	1.2%	0.2%	2.2%	5.9%	0.5%
16	2.5%	5.5%	3.7%	1.5%	1.2%	0.3%	2.0%	6.3%	0.5%

Source: Author's calculations

Figure 1

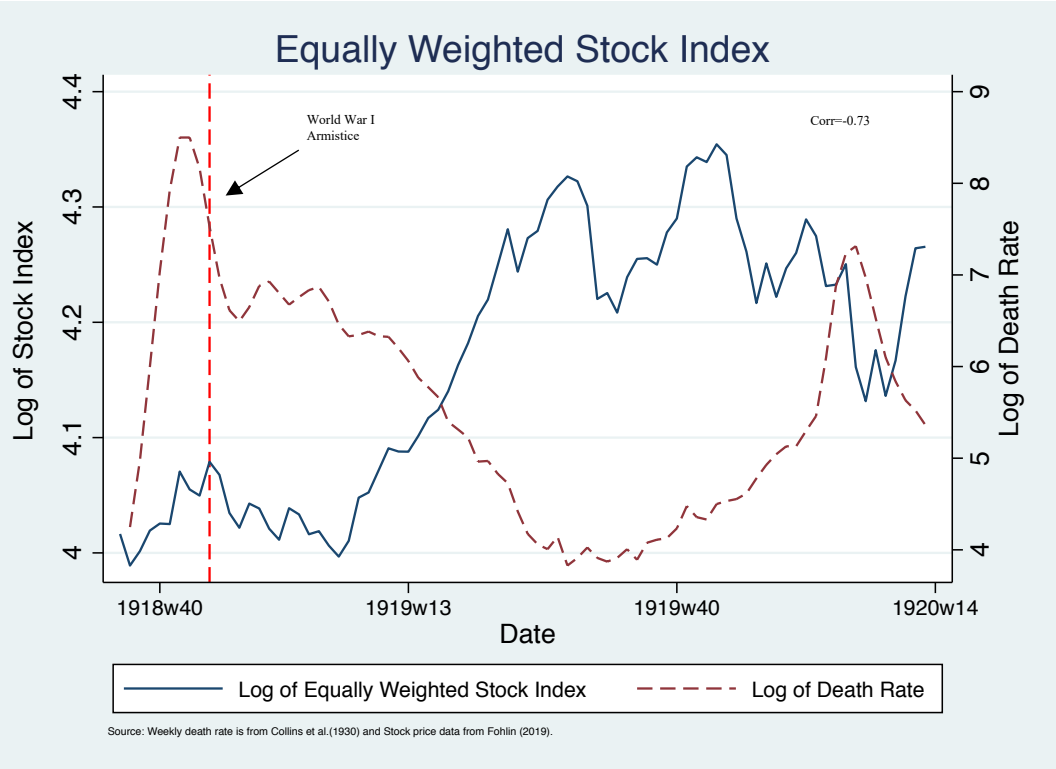

Equally Weighted Stock Index
World War I
Armistice
Corr=-0.73
Log of Stock Index
4
4.1
4.2
4.3
4.4
Log of Death Rate
4
5
6
7
8
9
1918w40
1919w13
1919w40
1920w14
Date
Log of Equally Weighted Stock Index
Log of Death Rate
Source: Weekly death rate is from Collins et al.(1930) and Stock price data from Fohlin (2019).

Figure 2. Impulse Response Functions for Aggregate Stock Market Index

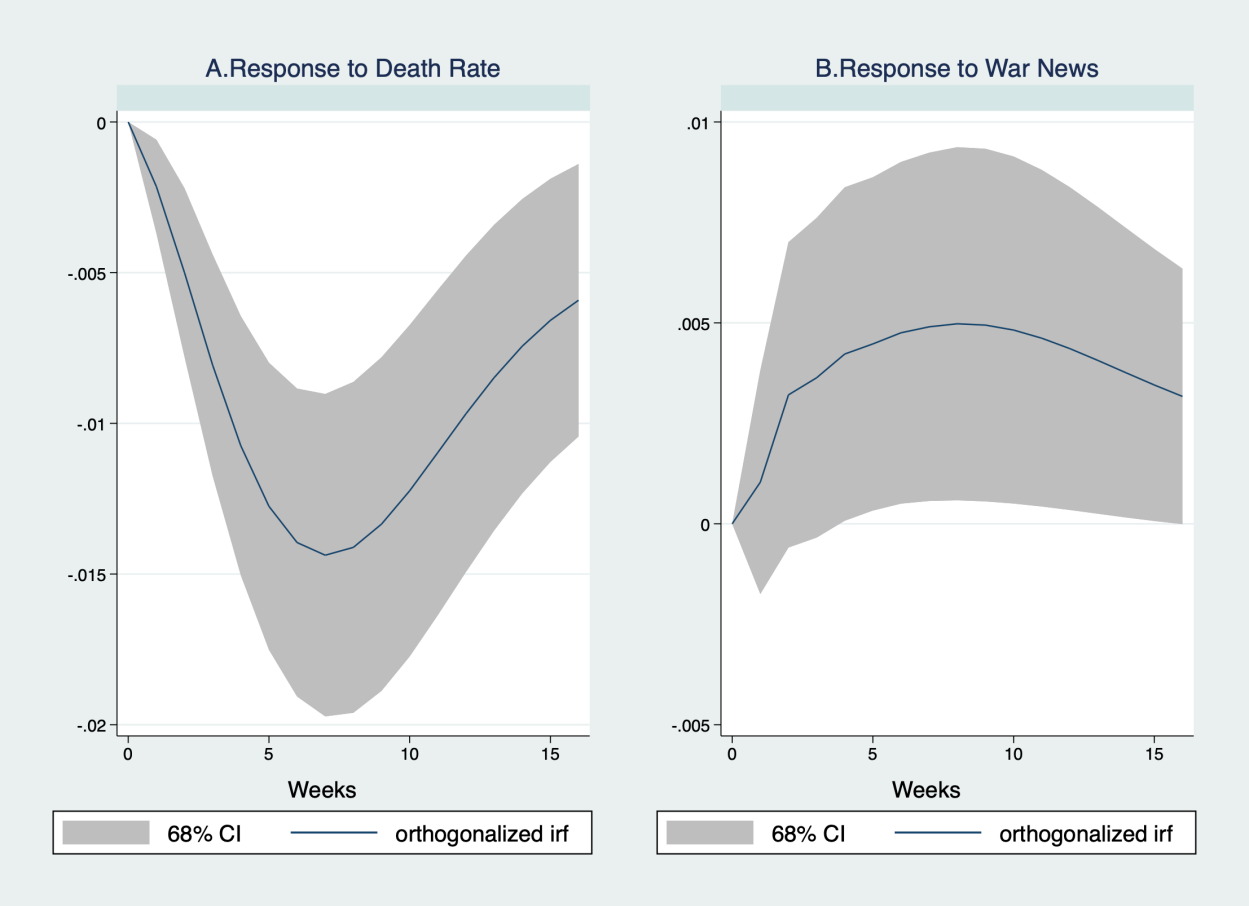


Figure 3A. Impulse responses of a given sector to a one-standard deviation shock to the log of death rate.

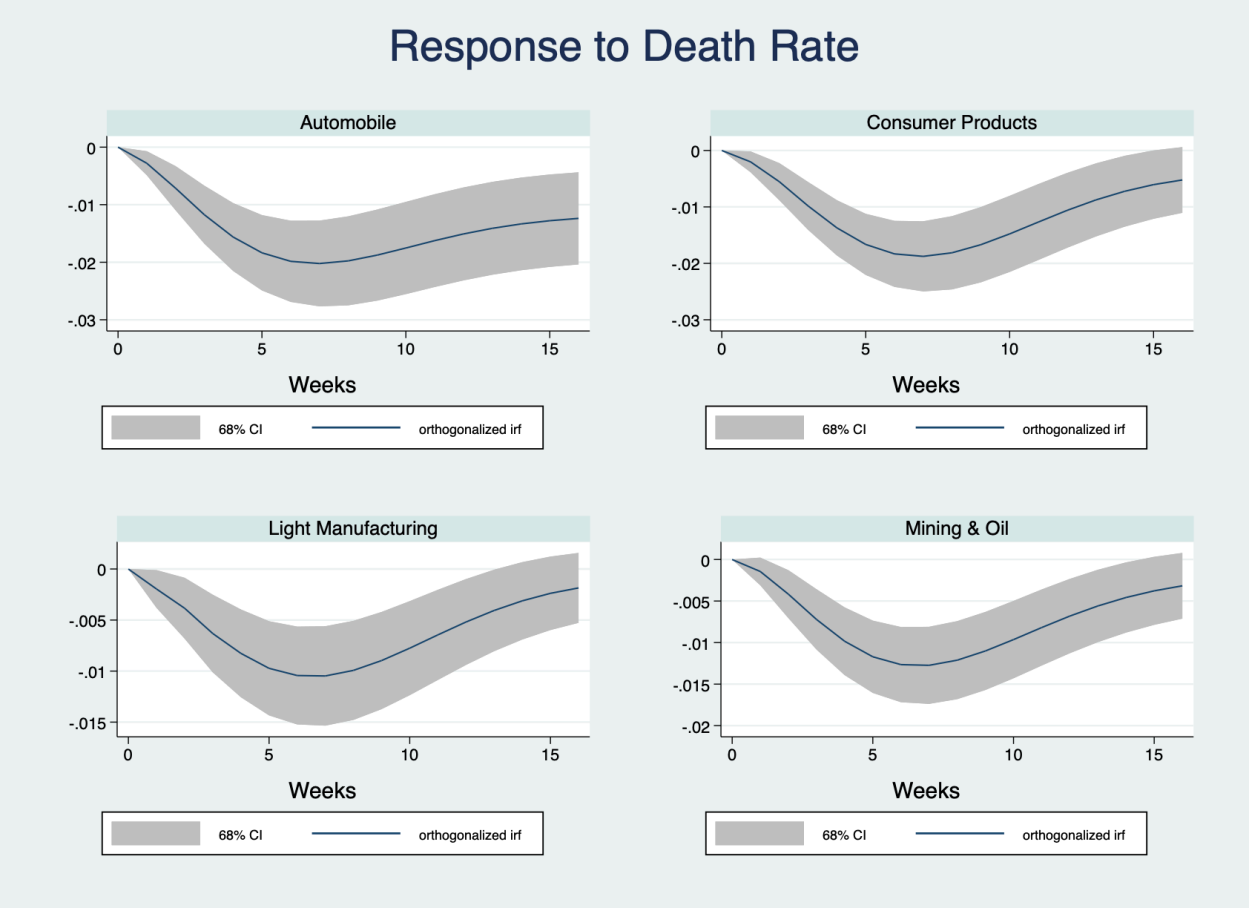


Figure 3B. Impulse responses of a given sector to a one-standard deviation shock to the log of death rate.

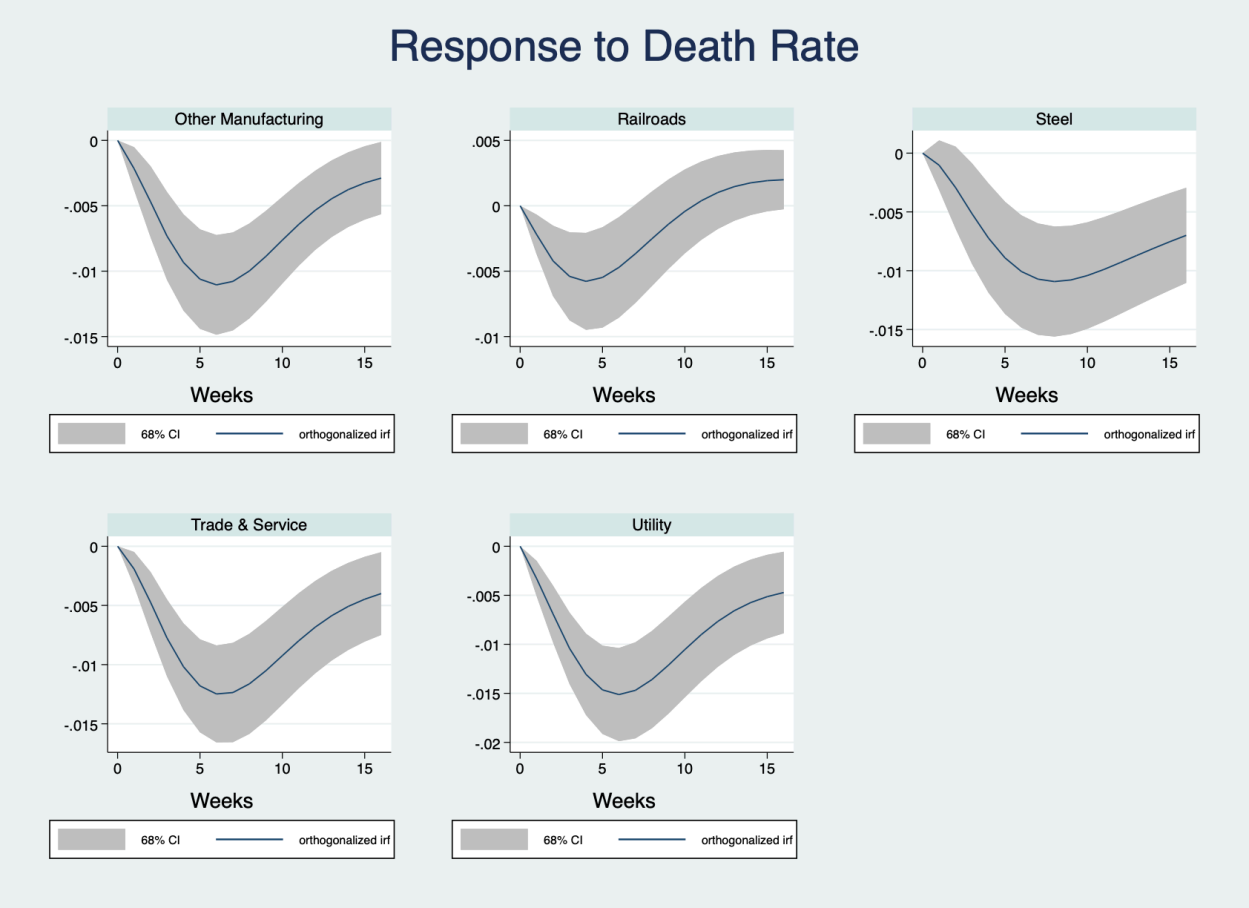


Figure 4A. Impulse responses of a given sector to a one-standard deviation shock to war news.

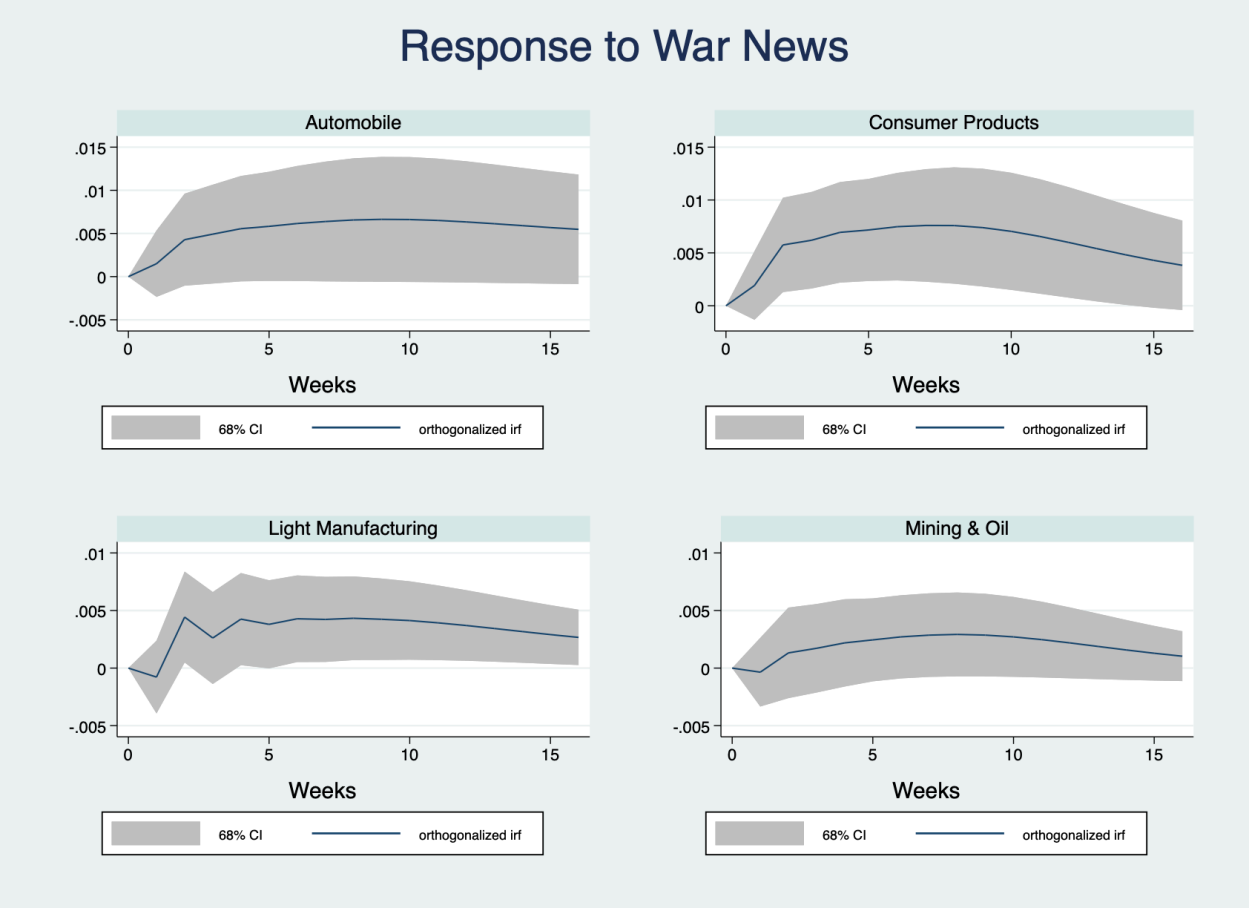
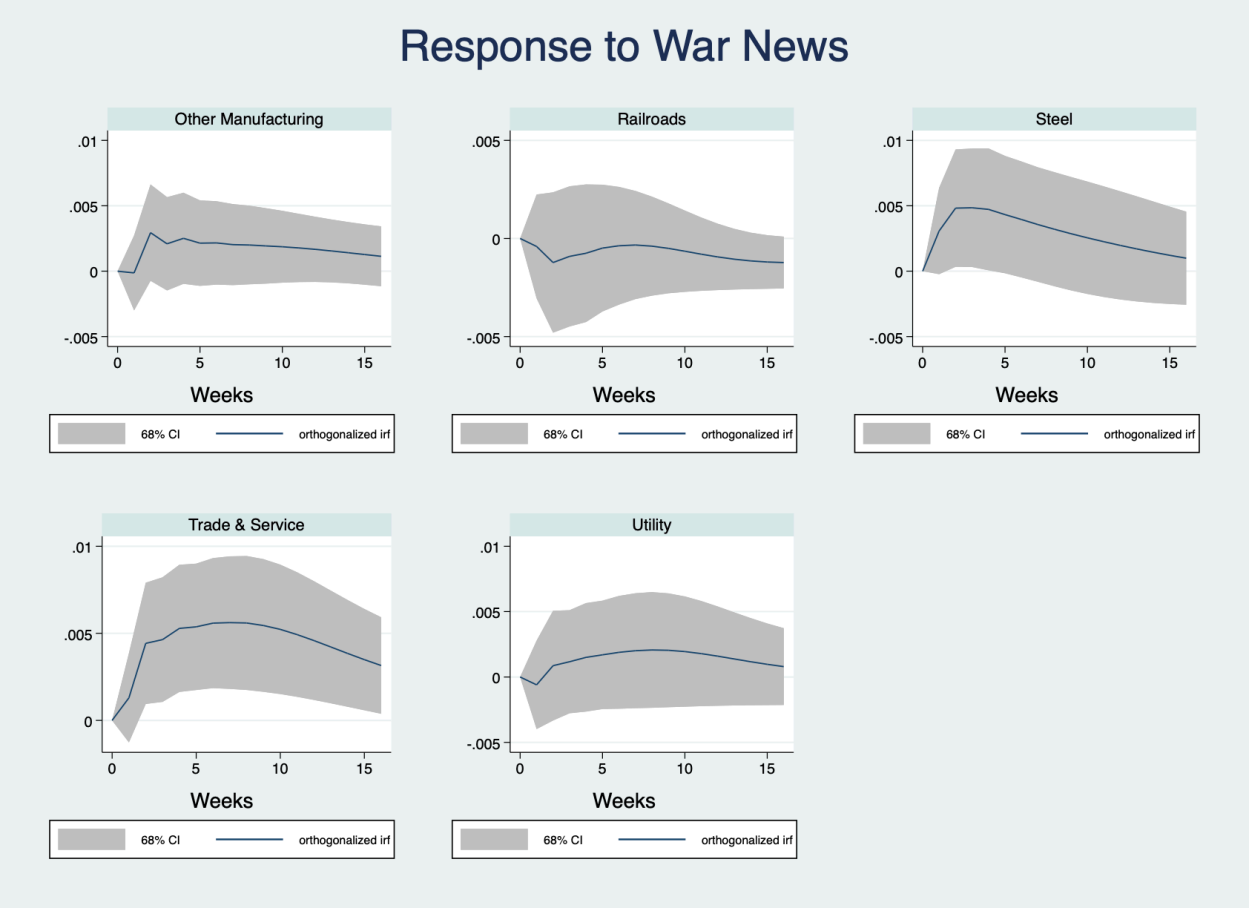
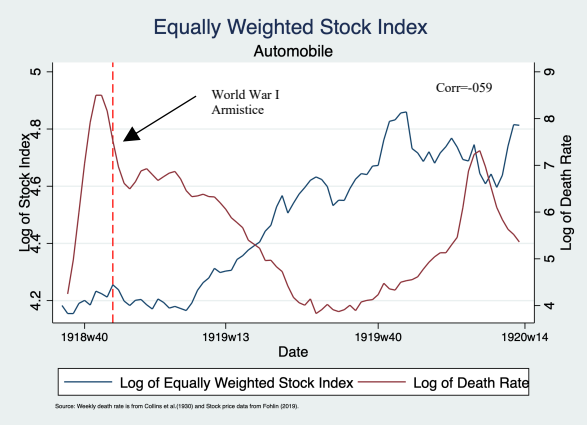


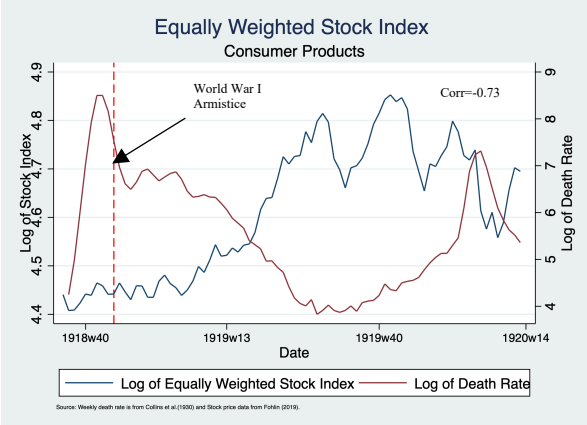
Figure 4B. Impulse responses of a given sector to a one-standard deviation shock to war news.

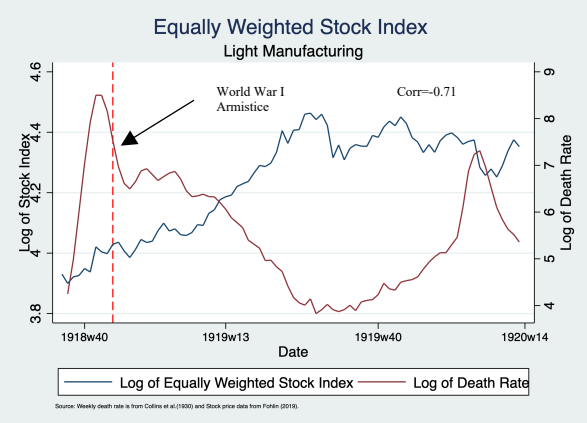


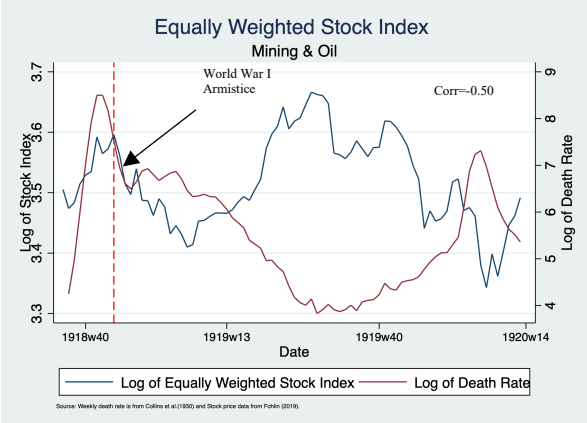
Appendix

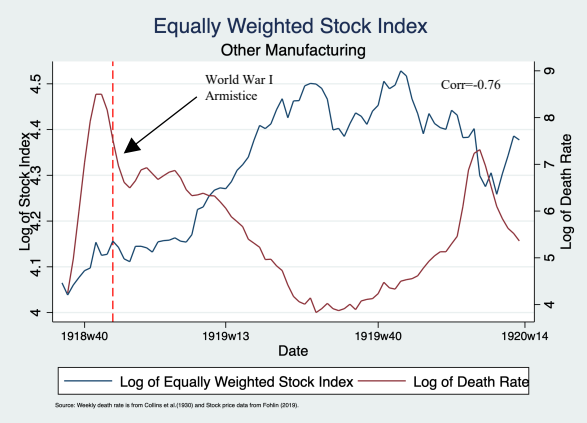
Additional Figures

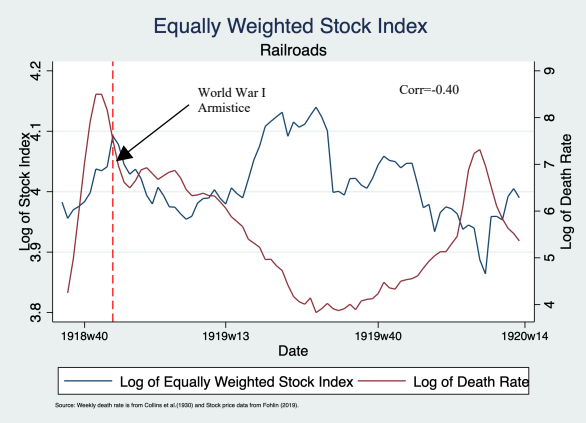


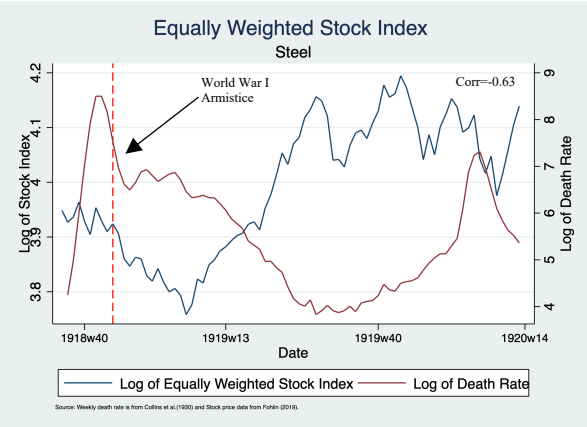


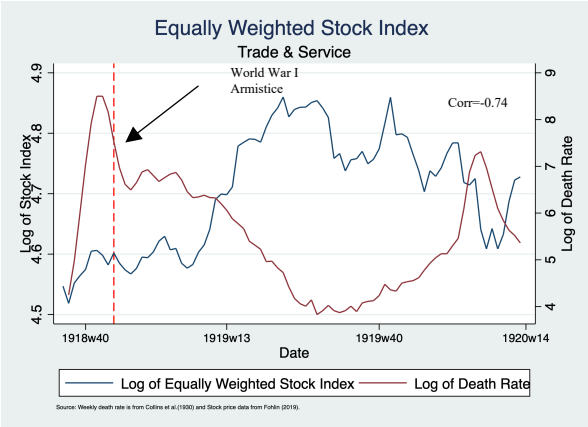


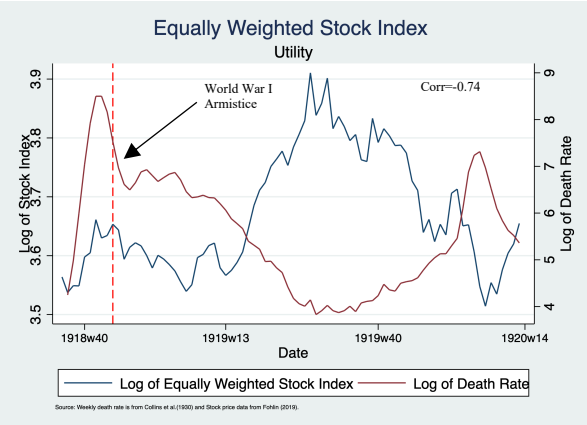







Equally Weighted Stock Index
Steel
World War I
Armistice
Corr=-0.63
Log of Stock Index
Log of Death Rate
4.2
4.1
4
3.9
3.8
9
8
7
6
5
4
1918w40
1919w13
1919w40
1920w14
Date
Log of Equally Weighted Stock Index
Log of Death Rate
Source: Weekly death rate is from Collins et al.(1930) and Stock price data from Fohlin (2019).


Equally Weighted Stock Index
Trade & Service
World War I
Armistice
Corr=-0.74
Log of Stock Index
Log of Death Rate
4.9
4.8
4.7
4.6
4.5
9
8
7
6
5
4
1918w40
1919w13
1919w40
1920w14
Date
Log of Equally Weighted Stock Index
Log of Death Rate
Source: Weekly death rate is from Collins et al.(1930) and Stock price data from Fohlin (2019).


Equally Weighted Stock Index
Utility
World War I
Armistice
Corr=-0.74
Log of Stock Index
Log of Death Rate
3.9
3.8
3.7
3.6
3.5
9
8
7
6
5
4
1918w40
1919w13
1919w40
1920w14
Date
Log of Equally Weighted Stock Index
Log of Death Rate
Source: Weekly death rate is from Collins et al.(1930) and Stock price data from Fohlin (2019).