The Effect of Pandemics on Labor Markets: Evidence from the 1918 Influenza Pandemic

Haelim Anderson[1], **Jin-Wook Chang**[2], and **Adam Copeland**[3]

[1]Federal Deposit Insurance Corporation
[2]Federal Reserve Board
[3]Federal Reserve Bank of New York

Motivation

- Previous studies argue that pandemics reduce labor supply [3], [6], [5]
- But these studies cannot separately measure labor supply and demand, because of a lack of detailed, comprehensive labor data
- Furthermore, the end of World War I (WWI) on November 11, 1918 presents a significant confounding effect during this period [2]
- We overcome these limits by constructing a new dataset to disentangle the labor market effects of the 1918 Influenza Pandemic

Data

- Construct a new state-level labor market data on job supply and demand (Source: U.S. Employment Service, Labor Market Bulletin)
- Public health information on mortality rates due to the 1918 Influenza pandemic (Source: Mortality Statistics, State Department of Health of New York)
- Geographic information about returning soldiers (Source: Summary of Casualties among Members of the American Expeditionary Forces during the World War, and Current Population Reports Series)

Analysis

- Compute job-finding rates, job-filling rates, and labor market tightness
- Use state-level variation in the severity of the pandemic and labor market conditions to measure the 1918 Influenza's effect on labor demand and supply
- Examine whether the pandemic induced a reallocation of labor across sectors using a detailed dataset on New York State

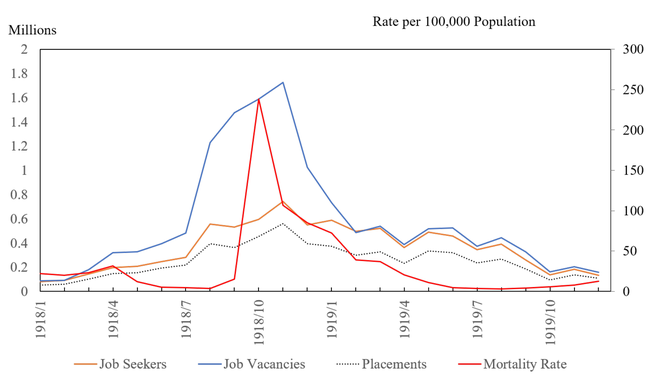

Fig. 1: Labor market supply and demand with mortality rate, U.S.

Results

- The 1918 Influenza Pandemic had little effect on labor supply (see Fig 1, Tab 1, and the first row of Tab 2)
- The labor market tightened because of increased labor demand from industries mobilized for war production (see Fig 2's decline in the job-filling rate until the end of WWI)

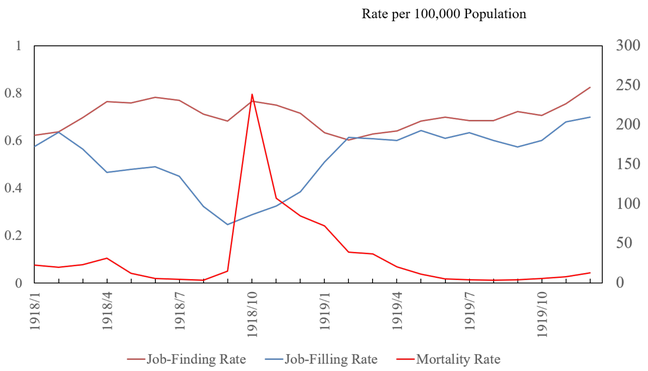

Fig. 2: Labor market supply and demand with mortality rate, U.S.

	1917:M6-1918:M6	1919:M6-1920:M6	Difference
Job-Finding Rates	0.745	0.864	-0.119
	-0.023	-0.112	-0.115
Job-Filling Rates	0.553	0.65	-0.097***
	-0.034	-0.022	-0.041
V-U Ratio	1.676	1.326	0.349
	-0.148	-0.113	-0.186

Tab. 1: Labor market conditions betwen periods 1917-1918 and 1919-1920 using state-level data

	(1)	(2)	(3)	(4)	(5)	(6)
	Labor Demand Growth	Labor Supply Growth	New Hire Growth	Job-Finding Rates	Job-Filling Rates	V-U Ratio
Flu Death Rate	-0.003	-0.004	-0.004	-0.000	-0.000	-0.000
	-0.002	-0.003	-0.003	-0.000	-0.000	-0.000
WWI Death Rate	0.002	-0.004	-0.000	-0.001	-0.003**	0.004
	-0.019	-0.02	-0.021	-0.003	-0.001	-0.005
Returned Soldier Rate	-0.001	-0.002	-0.002	0	-0.0002**	0.001*
	-0.001	-0.001	-0.001	0	0	0
Population Growth Rate	31.668	30.176	32.532	2.609	5.296**	-4.245
	-23.414	-25.147	-26.27	-4.261	-1.836	-6.785
Observations	27	27	27	27	27	27
R-squared	0.537	0.45	0.497	0.462	0.822	0.682

Tab. 2: Influenza and WWI Mortalities on Labor Market Conditions

- We use more granular data of NY state to examine the reallocation of labor across sectors
- Dispersion in labor shortages across sectors in NY reached the highest point with the industries for war production facing the biggest labor shortages
- Decline in labor market tightness after the pandemic was driven by a reduction in labor demand from war-related industries, which contracted labor demand by more than 30 percent following the end of WWI (see Tab 3)

	Labor Supply Growth	Labor Demand Growth	New Hire Growth
	1918:M11-1919:M1	1918:M11-1919:M1	1918:M11-1919:M1
Percentage Change, Relative to 1918:M10	-5.127	-35.097	-6.362
By Industry			
Agriculture	-0.564	-0.852	-1.624
Building	-2.353	-5.7	-2.713
Clerical	1.567	-0.517	-1.436
Hotels	0.358	-0.02	0.586
Laborers	-4.052	-20.448	-1.466
Manufacturing	-0.935	-6.949	-2.792
Miscellaneous	-1.442	-3.44	-0.249
Transportation	1.17	-1.802	0.626
Wholesale	0.915	1.577	0.241

Tab. 3: Contributions to changes in supply, demand, and hires, NY

Conclusion

- Labor market tightness was mainly driven by an increase in labor demand rather than a reduction in labor supply due to the pandemic
- An increase in the number of job vacancies from industries that faced labor supply constraint during WWI may have given the impression that the 1918 Influenza created a negative labor supply shock [1], [2], [4], [5],[7]
- Our study highlights the importance of accurately measuring labor market conditions: It was the end of WWI, not the 1918 Influenza Pandemic, that created a large shock to the labor market

References

[1] Robert J Barro. *Non-pharmaceutical interventions and mortality in US cities during the great Influenza pandemic, 1918-1919*. Tech. rep. national bureau of economic Research, 2020.

[2] Benjamin Bridgman and Ryan Greenaway-McGrevy. "The Economic Impact of the 1918 Influenza Pandemic: Evidence from US States". In: *Preprint* (2020).

[3] Bruce MS Campbell. "Matching supply to demand: crop production and disposal by English demesnes in the century of the Black Death". In: *The Journal of Economic History* 57.4 (1997), pp. 827–858.

[4] Sergio Correia, Stephan Luck, and Emil Verner. "Pandemics depress the economy, public health interventions do not: Evidence from the 1918 flu". In: *Working paper* (1918).

[5] Thomas A Garrett. "War and pestilence as labor market shocks: US manufacturing wage growth 1914–1919". In: *Economic Inquiry* 47.4 (2009), pp. 711–725.

[6] Eona Karakacili. "English agrarian labor productivity rates before the Black Death: a case study". In: *The Journal of Economic History* 64.1 (2004), pp. 24–60.

[7] Francois R Velde. "What happened to the US economy during the 1918 influenza pandemic? A view through high-frequency data". In: (2020).