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What will the Next Three Months Look Like? Simulating the Impact of Social Distancing on GDP and Employment

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Background

The United States is undergoing a period of Social Distancing to prevent the spread of the COVID-19 disease. This Social Distancing takes many forms, from a Shelter in Place order in San Francisco to restrictions on the size of public events.² These restrictions vary at the state and local level, based upon estimated risk of disease transmission, population density and existing legislation. What each of these actions have in common are reduction in demand for the services provided by many service sector firms. One recent study reported that roughly 28 million US workers, or roughly 1 in 6 work in these sectors. A recent monthly poll reported 18 percent of adults had been let go or had work hours reduced as a result of COVID-19.³

These studies provide a potential scope of the impact on national employment. In this brief analysis, we extend that to Indiana, providing simulations of the likely effect of extreme Social Distancing on the state's economy in 2020.

The Size and Scope of Employment Risk

With a population of over 6.4 million, Indiana has a large service and retail sector in almost every community. However, the large presence of manufacturing, which is more than twice the national share imposes different risks on the state. Table 1 reports 2018

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² <https://www.sfchronicle.com/local-politics/article/Bay-Area-must-shelter-in-place-Only-15135014.php>

³ See Hicks, Michael J., Dagney Faulk and Srikant, Devaraj (2020) "Occupational Exposure to Social Distancing: A Preliminary Analysis Using O*NET Data" Center for Business and Economic Research, Ball State University; and CVBEH1G. NPR/PBS NewsHour/Marist Poll National Tables March 13th through March 14th, 2020

employment levels in thousands, and shares by 2-digit industry classifications (NAICS) for the US and Indiana.

Table 1, Employment by Sector, USA and Indiana in 1,000's (2018)

Note: Includes Full and Part Time Employment, Source: Bureau of Economic Analysis

<u>Industry</u>	<u>USA</u>	<u>Indiana</u>	<u>USA</u>	<u>Indiana</u>
Mining, quarrying, and oil and gas extraction	1,353,700	11,372	1%	0%
Utilities	589,700	14,373	0%	0%
Construction	10,973,300	210,513	6%	5%
Manufacturing	13,501,300	558,603	7%	14%
Wholesale trade	6,422,200	126,838	3%	3%
Retail trade	19,307,500	392,564	10%	10%
Transportation and warehousing	9,364,300	200,575	5%	5%
Information	3,460,100	38,704	2%	1%
Finance and insurance	10,394,600	153,708	5%	4%
Real estate and rental and leasing	9,504,800	149,086	5%	4%
Professional, scientific, and technical services	14,203,900	184,446	7%	5%
Management of companies and enterprises	2,669,500	38,102	1%	1%
Administrative and support and waste management and remediation services	12,472,900	240,637	6%	6%
Educational services	4,771,700	88,477	2%	2%
Health care and social assistance	22,619,800	450,661	11%	12%
Arts, entertainment, and recreation	4,684,900	76,538	2%	2%
Accommodation and food services	15,077,500	284,095	8%	7%
Other services	11,257,900	226,133	6%	6%
Government and government enterprises	24,543,000	447,223	12%	11%
Total	197,172,600	3,892,648		

To simulate the potential impacts of extreme social distancing we rely upon earlier work by the Congressional Budget Office, regarding affected industries.⁴ We modify these slightly since the CBO estimates were focused on capturing the effects of illness and prevention. Our goal is to capture the effects of extreme preventative measures that appear to be more comprehensive than those assumed in the 2006 study. The CBO described a disease scenario where losses were primarily caused by short term illness, and associated disruptions. The CBO notes that:

“The actions of governments could influence the effects of a pandemic on the economy. Attempts to quarantine people would probably amplify the reductions in trade, travel, and tourism. However, government actions could also help mitigate economic impacts. Effective global surveillance and prompt identification of the pandemic strain by government agencies—along with quarantine and social isolation—could provide the opportunity for manufacturers to develop a vaccine to lessen the human and economic costs of a pandemic during its latter stages. (CBO, 2006, pg 11.).

⁴ Congressional Budget Office (2006) *A Potential Influenza Pandemic: Possible Macroeconomic Effects and Policy Issues* (revised, July 27, 2006).

To adapt the CBO estimates to our purpose, we removed the labor supply issues associated with the disease. This caused us to exclude the effect on agriculture, and mining. We also wanted to capture the growth of supply chains that are anecdotally evident in the USA. That led us to assume no negative shocks to wholesaling, and reduced impact on transportation and warehousing. While we expect large negative shocks to sectors involved with moving people, such as airlines, buses, etc. we also expect an increase in transportation related to the delivery of goods to households.

We also believe that demand for healthcare services will rise, and model that as a 10 percent increase. This reflects higher hours for most healthcare workers, and considers demand reductions in some activities such as elective surgery, dental and wellness expenditures. Table 1 illustrates an employment baseline, while Table 2 illustrates the changes we seek to model to assess the overall economic impact of extreme Social Distancing.

Table 2. CBO and CBER Assumptions

Industry	<u>CBER</u>	<u>CBO</u>
Agriculture	0%	-10%
Mining, quarrying, and oil and gas extraction	0%	-10%
Utilities	0%	0%
Construction	-10%	-10%
Manufacturing	-10%	-10%
Wholesale trade	0%	-10%
Retail trade	-10%	-10%
Transportation and warehousing	-10%	-67% ⁵
Information	0%	0%
Finance and insurance	-10%	0%
Real estate and rental and leasing	0%	0%
Professional, scientific, and technical services	0%	0%
Management of companies and enterprises	0%	0%
Administrative and support and waste management and remediation services	0%	0%
Educational services	0%	0%
Health care and social assistance	+10%	+15%
Arts, entertainment, and recreation	-80%	-80%
Accommodation and food services	-80%	-80%
Other services (except government and government enterprises)	-80%	-5%

To model these impacts, we assume these levels of lost income, using REMI, Inc.’s computable general equilibrium model. We use the natural disaster block, reducing

⁵ This decline of 67% was for air, rail and transit only (see Table A-2, page 44).

incomes for each sector as described in Table 2. In lieu of offering variable effects (severe versus mild), as the CBO did, we simply scale extreme Social Distancing over 45 and 90 days. So, for example, we reduce incomes for 45 days, by 80 percent in the Accommodations and food services sector.

We follow this approach for each of the 9 sectors listed in Table 2, for a single state (Indiana). The choice of individual state modeling is necessary, since national income is an endogenous variable. We can calculate an exogenous (external) shock to state level incomes for each sector using the natural disaster block of REMI. We then scale the overall state losses to the national level, accounting for the differences in employment and productivity levels between the United States and Indiana. We model lost income, changes in employment, national and state GDP changes and unemployment rate changes.

This model can be adapted to a longer period, but the full general equilibrium results of a CGE model are not clear in the first period. For obvious reasons, certainty about effects dissipates quickly, so we choose not to model longer duration effects in this study. Table 3 shows Indiana and US lost income for the two scenarios.

Table 3. Lost Income across Two Scenario's (\$1,000's)

Industry	Indiana		USA	
	45 days	90 days	45 days	90 days
Construction	-\$168,615	-\$337,230	-\$9,506,564	-\$19,013,129
Manufacturing	-\$557,709	-\$1,115,417	-\$9,506,564	-\$19,013,129
Retail trade	-\$157,895	-\$315,790	-\$72,317	-\$144,633
Transportation and warehousing	-\$124,765	-\$249,529	-\$8,701,595	-\$17,403,189
Finance and insurance	-\$125,943	-\$251,886	-\$5,400,851	-\$10,801,701
Health care and social assistance	\$349,031	\$698,061	\$2,586,526	\$5,173,052
Arts, entertainment, and recreation	-\$200,911	-\$401,821	-\$136,219,266	-\$272,438,532
Accommodation and food services	-\$636,983	-\$1,273,966	-\$15,882,115	-\$31,764,230
Other services (except government and government enterprises)	-\$836,059	-\$1,672,119	-\$42,474,181	-\$84,948,362
Government and government enterprises	<u>\$162,406</u>	<u>\$324,811</u>	<u>\$2,781,376</u>	<u>\$5,562,752</u>
Total	-\$2,297,443	-\$4,594,886	-\$222,395,550	-\$444,791,100

As may be apparent, these two scenarios are simply linear, 90 days is twice the 45 day impact. In fact, longer duration losses tend to have compounding effects, which are partially on display in the model results. Also, we do not include lost income in the form of tips for certain service occupations.

Below we report three additional variables for each scenario. The first variable we report is the change in GDP over 2020 resulting from the two different scenarios. Again, this is not a forecast, but is how much lower GDP will be than it would have otherwise been due to these measures.

We then focus on the short run, 45 and 90 effects on joblessness. We do this to emphasize the significant downturn concentrated over this very short period. Typically, recessions move slowly, resulting in employment and income variations across industries and regions over several quarters.⁶ The extreme Social Distancing we observe is happening everywhere in a matter of days. Thus, it is important to understand the surge in unemployment which is occurring now, and in the coming weeks. We report the 45 day estimates in Table 4 below.

Table 4. GDP and Employment effects of 45 Day Social Distancing

	GDP Change in 2020	Maximum Unemployment Rate	Change in unemployment level (45 days)
USA	-0.5%	10.5%	-10,625,000
Indiana	-0.4%	10.0%	-121,000

Table 4 shows that the effect of a 45-day Social Distancing will reduce GDP significantly, and cause relatively large job losses of nearly 121,000 jobs in Indiana, and 10.6 million, nationally. This will result in an unemployment rate in Indiana of 10.0 percent and in the USA of 10.5 percent within 45 days.

The 90 day impact is not a linear adjustment of the 45 day estimate. However, it is reasonably close to twice the impact. What this model does not capture effectively are significant changes to household and businesses that may accompany a lengthy period of Social Distancing. For example, we do not know if traditional sit down restaurants will adopt broader take out options, and whether households might increase spending in that area. While this is a modest example, in aggregate these adjustments may be large. However, there are no clear precedents from which to adapt this model. See table 5.

Table 5. GDP and Employment effects of 90 Day Social Distancing

	GDP Change in 2020	Maximum Unemployment Rate	Change in unemployment level (90 days)
USA	-0.9%	14.6%	-21,181,000
Indiana	-0.7%	14.5%	-241,000

Extending Social Distancing to 90 days implies a much larger effect across the year. We should anticipate Indiana GDP to be 0.7 percent beneath baseline as a result of extreme Social Distancing, and a full 0.9 lower in the US. The immediate impacts on employment are similarly sharp. We anticipate the unemployment rate to spike in Indiana to 14.5 percent, and national to 14.6 percent. This would leave an additional

⁶ See Schunk, D. "Regional Dynamics: Heterogeneous Regional Responses to Money and Interest Rates and the Role of Alternative Monetary Aggregates." Ph.D. diss., The University of Tennessee, 1999

241,000 workers unemployed at peak in Indiana, and 21 million unemployed nationally. These levels may be expected within 90 days.

The magnitude of these impacts can be compared to our earlier estimates of potential at-risk jobs due to Social Distancing. In the United States, we reported that nearly 28 million jobs were at risk due to extreme Social Distancing.⁷ The levels of job losses reported here suggest that total job losses would be roughly 75 percent of those jobs currently at risk. We believe this is a conservative estimate, but not markedly so.

The impacts measured here include substantial increases in demand for healthcare services, which may not be met by labor supply adjustments. Occupational licensing makes short-term adjustments in this sector unlikely.

This simulation did not include supply chain disruptions associated with extreme Social Distancing in China since early January. We note that there is significant anecdotal evidence that these disruptions are likely to occur in late March through May across several US industries. Insofar as this study included manufacturing, it was through the effects of Social Distancing and reduced demand for goods.

Impacts of current supply chain effects are non-trivial, and may reduce GDP in 2020 at the levels of 45 day social distancing. However, supply chain interruptions are likely to have a far milder impact on short-term employment than Social Distancing. The focus of this analysis is to outline the magnitude of short-term labor market impacts.

This study does not include the consequences of lost employment due to disruptions in public services. In particular, public schools are closed in a number of states, and some reports include more than 70 percent of the roughly 60 million public school children are out of school. This could affect as many as 40 million families. So, whatever estimates we have of occupational risk, it does not include the need to care for children during this period of extreme Social Distancing.

This study does not include demand reductions due to the wealth effect from the extreme declines in value of financial markets. As of publication, stock indices are down roughly a third from their peak in February. This will lead to an inevitable decline in consumptions, which we have not directly included in this analysis.

Summary and Recommendations

The extreme Social Distancing we are now undergoing in the United States is more than sufficient to result in recession level employment and GDP declines. Indeed, within 45 days we can expect the unemployment rate to exceed 10.5 percent nationally, and cut 0.5

⁷ Ibid., Hicks, Faulk and Devaraj, 2020.

percent from GDP for 2020. This is likely a very conservative estimate, yet it argues that job losses in March, April, May and June may be the four largest in US history, topping the 1.9 million jobs lost in the weeks following V-J Day in September 1945. This level of job losses does not consider the effect of school closures on labor supply by households. This study does not assess the impact of supply chain disruptions on manufacturing, nor does it include the extreme shock to household wealth caused by stock market declines. Despite the shocking level of these estimates, they are clearly conservative.

Thus, current policy considerations are far too modest, even for these short term estimates which are likely conservative. Moreover, this estimate extends only 90 days, and does not include much broader impacts of longer Social Distancing. State policies which speed resources to displaced workers are needed. Policies such as Workshare, and relief from job search, job tenure and earnings requirements are urgently required.

State and Federal policies which encourage extensions to borrowing terms should be broadly encouraged. This should extend to both small businesses and households. Federal policies which supplement income for all residents are required. Universal Basic Income payments, with a fixed duration would provide economic stabilization, while minimizing labor market supply effects.

Beyond stabilization efforts, state and federal governments should prepare for longer duration impacts. Schools across much of the nation are unprepared for lengthy closure. Efforts to expand broadband connectivity and fund technological options for schools should be part of a broader stimulus bill.

The current decline in economic activity both in the United States and worldwide in reaction to COVID-19 is done in response to clear epidemiological evidence regarding morbidity and mortality. The economic effects of these responses will be both immediate, and for some households and firms, lasting. Current policy response is both too modest and insufficiently rapid to fully mitigate its effects.