Working women and the early COVID-19 shutdowns

Douglas Himes

Economic shutdowns and the resulting job losses and unemployment due to the coronavirus disease 2019 (COVID-19) have been widely reported. How have these job losses affected working women? What can we say about which women were affected? What are the long-term effects likely to be?

In “Women take a bigger hit in the first wave of job losses due to COVID-19,” (kcFed Economic Bulletin, Federal Reserve Bank of Kansas City, April 16, 2020), authors Didem Tuzemen and Thao Tran use data from the Current Employment Statistics survey (the “establishment” survey of employers) and the Current Population Survey (the “household” survey) to get an idea of how working women were affected by COVID-19 during the first month of pandemic-related shutdowns.

Nonfarm payroll employment (reported by the establishment survey) declined by over 700,000 in March 2020. This employment decrease was the largest since the 2007–09 recession, although it was only a fraction of the job losses that would come in April. The March decrease in employment was concentrated in three industries: leisure and hospitality, education and health services, and retail trade.

Women held less than half of all jobs (in all industries) in the United States in March 2020. But more than half of the job losses in that month, the first wave of job losses resulting from COVID-19, were jobs that women held. Using data from the household survey, the authors find that the women without a college degree make up a large portion of the employment in the industries most affected by the early COVID-19 shutdowns.

Looking at data from state unemployment insurance programs, the authors determine that job losses due to COVID-19 continued to be concentrated in the same industries beyond the cut-off date for inclusion in the establishment and household survey data. (These data do not include unemployment insurance data in the calculation of their national employment and unemployment statistics.)

The authors close by stating that even though employment of women, especially college-educated women, was notable during the years of the recovery after the most recent recession (but before the pandemic), women, and particularly women without college degrees, have suffered the brunt of the job losses in the first wave of pandemic-related shutdowns. These job losses could be a harbinger of lower levels of employment and labor market activity for women.
Geographic impact of COVID-19 in BLS surveys by industry

Using microdata from the Current Employment Statistics survey and the Current Population Survey, I illustrate how the local spread of coronavirus disease 2019 (COVID-19) has differentially affected industry employment. Industries that are not very telework friendly are more likely to have job loss related to its spread. In addition, COVID-19’s spread appears to be most correlated with temporary job loss, which could partially explain employment numbers improving slightly in May and June 2020.

The novel coronavirus disease 2019 (COVID-19) pandemic has brought historically high numbers of job loss and unemployment claims in a very short time. Every locality and every sector have been affected, although the impacts have been varied. There are many possible explanations for the variation:

- Consumers staying home to avoid infection
- Employers closing down for safety reasons
- Government-mandated business closures
- Government-mandated orders to stay home
- Loss of demand because of income uncertainty
- Local occupational composition
- Supply-chain issues

The local spread of the virus affects both the decision of individuals to avoid public spaces and the government’s mandates to limit visits to businesses. This fact is important because it emphasizes the economic value to the local labor market in controlling the spread of the virus.

This article uses microdata from the most recent Current Employment Statistics (CES) survey and Current Population Survey (CPS) to provide descriptive evidence on how the local incidence of the virus has affected employment across localities and industries. In a companion working paper, the impacts of the local incidence of the virus on employment are directly estimated, separate from impacts from government mandates and the broad national effect.[1] The working paper shows that a larger portion of the employment decline in leisure and hospitality and other services is unrelated to the spread of the virus. Construction employment, on the other hand,
is more tied to the local spread of the virus. Using current data, the present article expands results by identifying trends in the economy that are relevant for future business and policy decisions.

Data

Establishment-level results are from the CES survey, focusing on responding establishments in April, May, and June from 2019 and 2020. The CES survey collects data from 145,000 businesses and government agencies representing 697,000 worksites. The survey asks about employment, hours, and payroll in the pay period encompassing the 12th of the month. I use the longitudinal aspect of the survey to estimate employment changes within establishments since February. In addition, to identify the county that each establishment is in, I use confidential information about the address of the establishment to match county-level information about incidence of COVID-19.

Household-level results are from the CPS, focusing on responding households in April and May from years 2019 and 2020.[2] The CPS is a monthly survey of about 60,000 households that collects employment status during the week of the 12th of the month, among many other labor force and demographic pieces of information. This survey also has a longitudinal aspect that allows me to estimate the percentage of transitions out of employment since February. I primarily focus on transitions into being “on temporary layoff.” Lastly, I rely on the confidential information to identify the county of residence for each respondent.

For COVID-19 data, I use the published New York Times data,[3] which tracks the number of cases by day and county. Figure 1 shows the number of cases per 100,000 residents in each county as of Saturday, June 13, 2020, which was the last day of the week that included the 12th of the month. The map shows counties that were particularly hard hit in the northeast, southeast, southwest, and around the Great Lakes. The heterogeneity in spread across climates and population densities show this virus is not geographically isolated.
Results

In this section, I present results on employment patterns for the CES survey and CPS separately.

Analysis of Current Employment Statistics microdata

The key measure that I focus on in this article is the change in establishment employment from February to the month of the survey. I choose February because the vast majority of economic impacts did not occur until after February 12 (the reference period for that month’s survey). I calculate the percentage change in employment as

\[ \Delta \text{emp}_{tt} = \frac{\text{emp}_{tt} - \text{emp}_{tt, \text{Feb}}}{\text{emp}_{tt}}, \]  

where

\[ \text{emp}_{tt} = \frac{\text{emp}_{tt} + \text{emp}_{tt, \text{Feb}}}{2}. \]
Equation (1) shows that the change in employment, $\Delta \text{emp}_{it}$, for establishment $i$ in month $t$ is the difference in employment relative to February, divided by $\text{emp}_{it}$, the average employment for the 2 months. Dividing by the average employment bounds the percentage change to between −2 and 2, which will reduce the effect of potential outliers in the data, and it allows for any establishments with zero employment in February to be included. When averaging across establishments in a group, I weight each observation $i$ by the sample weight.

For figure 2, I alter equation (1) slightly, by summing across establishments in both the same metropolitan statistical area (MSA) and industry with a reported employment in both February and June 2020.[4] Therefore, for each MSA, I use equation (2):

$$\Delta \text{emp}_{mj} = \frac{\sum_{i \in m} 1(i \in j) \times \left(\text{emp}_{i,\text{June}} - \text{emp}_{i,\text{Feb}}\right) \times \omega_i}{\text{emp}_{mj}},$$

(2)

where

$$\text{emp}_{mj} = \frac{\sum_{i \in m} 1(i \in j) \times \left(\text{emp}_{i,\text{June}} - \text{emp}_{i,\text{Feb}}\right) \times \omega_i}{2}.$$

$\Delta \text{emp}_{mj}$ is the change in employment for MSA $m$ in industry $j$ from February 2020 to June 2020. This formula is calculated as the difference in summed employment for all establishments, with reported employment for both February 2020 and June 2020 in that MSA $i \in m$ and in that industry $j \in j$, and is weighted by the sample weight in June, $\omega_i$. 
Calculated with equation (2), major industry employment estimates by MSAs are shown in figure 2. Figure 2 reveals that the employment effects of the pandemic are varied by both geography and industry.

Across all industries, the northeast (New York, in particular) has had large declines in employment. In many industries, the southwest also has had large declines in employment. In addition, several industries, including manufacturing, have seen employment decline notably in locations around the Great Lakes. These geographic areas are worth pointing out because they also had some of the highest incidences of COVID-19 in the country.

Industries with a sufficient sample size consistently reveal large drops in employment across all MSAs. Retail trade is notable because the declines were minimal, with the main exception of the northeast. Leisure and hospitality, construction, and health care appear to have the most similar geographic distributions of high job loss in figure 2 and high incidence in figure 1.

To more clearly illustrate the relationship between incidence of COVID-19 and employment, figure 3 plots average employment change relative to local incidence of COVID-19. To calculate the employment change for each establishment, I use equation (1). I then calculate the average employment change across establishments for each grouping of county virus incidence. The x-axis plots groups of establishments on the basis of the number of new
cases of COVID-19 per 100,000 residents in the county in the 4 weeks before and including the reference period of the survey, as shown in the following:

- For June data, the number of new cases in the 4 weeks leading up to June 13
- For May data, the number of new cases in the 4 weeks leading up to May 16
- For April data, the number of new cases in the 4 weeks leading up to April 18

April, May, and June 2019 are also included in figure 3 as dashed lines, mapped to the same county incidence rates as their corresponding month in 2020. Each establishment is weighted with the use of the accompanying sample weights from the CES, and 95-percent confidence intervals are shown for each plot with the triangles.

COVID-19 incidence is likely correlated with certain geographic characteristics (population density, climate). The 2019 data are included to illustrate that neither seasonal nor geographic trends explain the observed correlations between incidence of the virus and employment decline. Direct comparison with the same month in the previous year prior to the pandemic illustrates how much seasonal patterns may explain employment patterns. In addition,
Comparing the same grouped geographies with trends prior to the pandemic also rules out that the observed employment trends during the pandemic can be explained by common geographic characteristics.

Employment growth was minimal for the months for 2019, consistent across all COVID-19 incidence groups, as illustrated by the flat lines depicted in figure 3. However, April, May, and June 2020 depict a clear pattern that the higher the local incidence of COVID-19, the bigger the decline in employment beginning in February for the establishment. Employment in May and June 2020 improved slightly compared with employment in April 2020, although the decline in employment from February is still very large.

Figure 4 is similar to figure 3 but is broken down by industry. Both leisure and hospitality and other services show the largest shifts downward in their curves, meaning the biggest declines in employment in all months in 2020. From the 2019 data, finance and insurance is the only industry with no apparent change in employment.

### Figure 4. Average percent change in employment and number of confirmed coronavirus disease 2019 cases, by industry, from February to reference period

Choose an industry: Leisure and hospitality

Percent change:
- Apr 2019
- May 2019
- Jun 2019
- Apr 2020
- May 2020
- Jun 2020

Number of cases per 100,000 residents as of reference period

Click legend items to change data display. Hover over chart to view data.

Note: CI = confidence interval. Triangles show 95% CI.

Leisure and hospitality, retail trade, construction, transportation and warehousing, management services, other services, and wholesale trade industries have the most apparent downward trend for all months in 2020. Manufacturing has a slight downward trend for April 2020 but not for May or June 2020.

In a working paper published in 2020, Jonathan I. Dingel and Brent Neiman identify industries in order of telework friendliness.[7] The order of friendliness from least to greatest is as follows:

- Leisure and hospitality
- Retail trade
- Construction
- Transportation and warehousing
- Manufacturing
- Health care
- Management services
- Other services
- Public administration
- Real estate
- Wholesale trade
- Information
- Finance and insurance
- Professional services
- Educational services

Combined with the results about telework in Dingel and Neiman, figure 4 data illustrate that the least telework-friendly industries have the steepest decline in employment. A job that must be done in a certain location and away from home often means that workers must interact directly with customers or interact with other employees. Higher incidence of the virus in a county can influence customers' decisions (choosing not to leave home or go to an establishment), and it can influence government decisions about what businesses can remain open. Being able to work from home allows one to maintain his or her job even when the government orders the establishment closed. Working from home also means that workers can continue to meet demand while minimizing in-person interactions with customers and other coworkers. Employees in industries with limited telework capabilities will face reduced demand and increased restrictions from government mandates as the local incidence of the virus grows. With such limitations, employees in these industries are at elevated risk for job loss and income uncertainty in the short and medium terms.

Analysis of Current Population Survey microdata

I now move the analysis to the household survey microdata. For the CPS, the sample will be conditional on respondents who were employed in February. I then estimate the proportion of that sample that is on temporary layoff in April and May for both 2019 and 2020.[8] I weight all results by using the standard-person weights in the CPS.

Figure 5 shows similar patterns to figure 3. The proportion of the population that moved from employed to temporary layoff in 2019 was relatively flat. However, in 2020, this proportion rises, corresponding to the rise in the number of COVID-19 cases. Both April and May 2020 show a large upward shift, matching the national trend in
large employment losses. The key result is that transitions from employment to temporary layoff increase as the number of COVID-19 cases increases for both April and May, matching patterns observed in the CES.

As a comparison with figure 5, figure 6 plots the percentage of transitions to not working for all respondents, excluding those on temporary layoff. This definition accounts for all unemployed and not in the labor force designations not covered by figure 5. In figure 6, plots of percentage of employment transitions for May 2020 are flatter compared with percentage plots of employment transitions in figure 5, although the trend shown for April 2020 in both figures is similar. This finding helps illustrate a key point of this analysis: job loss (in particular, temporary layoffs) is likely tied to the local spread of the virus. These results do not preclude many of these temporary layoffs eventually becoming permanent layoffs or preclude structural economic changes in response to a particularly intense local spread of the virus. However, these results do show that job losers whose unemployment is tied to the incidence of the virus may return to work because they have an anticipated date to return to their job. Reducing the spread of the virus not only keeps these layoffs from happening but may also hasten the return of laid-off individuals who have a recall date.
Figure 7 shows the same analysis as figure 5 but is broken down by industry. In the CPS, the industries that have more transitions to temporary layoff as the number of COVID-19 cases grows are construction, transportation and warehousing, and management services for April and May 2020. Leisure and hospitality and other services show an upward trend only for May 2020, and retail trade, real estate, and health care show an upward trend only for April 2020. The results are similar to the results shown in figure 4 in that figure 7 depicts that less telework-friendly industries, as defined in Dingel and Neiman,[9] trend toward more job loss when the local incidence of the virus is higher.
Conclusion

Using the most recent BLS data, this article provides graphical evidence for limiting the spread of the virus in order to improve local labor markets. Layoffs have increased in response to higher incidence of the virus and have disproportionately affected employment in industries that are less telework friendly, such as construction and transportation and warehousing.

Although employment improved slightly in May and June 2020, job loss continues to be historically high. For industries such as construction and transportation and warehousing, the concern is that as the virus continues to spread, employees in these industries may face the prospect of additional layoffs. The first-order effect of the pandemic on workers' employment status is clear, but the potential second-order effect of income uncertainty leading to even more reduced demand will also affect the local economy. Evidence shows that during the Great Recession, increased uncertainty likely led to a worsening of the Great Recession, partially because of reduced demand.[10] In addition, researchers have found that increased job uncertainty leads to reduced demand.[11] As shown in a recent press release from the U.S. Bureau of Economic Analysis, savings dramatically increased in...
April 2020. One potential explanation is that individuals are choosing to save in response to future economic uncertainty.\[12\] These considerations should be kept in mind as decisions surrounding opening up businesses are made.

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NOTES


2 Because of the sample design of the Current Population Survey (CPS), in which households are interviewed for 4 consecutive months, no respondents in June are also interviewed in February. For this reason, the most recent survey responses used are for May.


5 An MSA is shown in figure 2 only if it has at least five establishments in that industry responding to the survey.

6 This finding differs slightly from published estimates from the Current Employment Statistics (CES). This difference is because many retail establishments were rotated out of the sample in April and a new rotation of establishments entered the sample. The published estimates from the CES are based on the new sample that only began being interviewed in April, whereas the estimates presented here are on a subset of the sample that was interviewed in both June and February.


8 Households in the CPS are only interviewed for 4 consecutive months. As a result, the final consecutive interview will be in May for a household interviewed in February. In order to ensure a comparison with a month prior to most of the impacts of the pandemic in the United States, the analytical sample is restricted to having an interview in February. As a result, the most recent household interviews that can be included are in May.

9 Dingel and Neiman, “How many jobs can be done at home?”


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The impact of the COVID-19 pandemic on food price indexes and data collection

This article describes the impact the COVID-19 pandemic has had on price changes for food categories within the U.S. Bureau of Labor Statistics import/export price indexes, producer price indexes, and consumer price indexes. In addition, the article assesses the pandemic’s impact on price data collection efforts. Safety precautions established during the pandemic created data collection challenges for some price indexes more than others.

In March 2020, the spread of coronavirus disease 2019 (COVID-19) and the actions taken in response to it drastically shifted food consumption from restaurants to homes as stay-at-home orders went into effect. At the same time, collecting price data became more difficult; first, stores and businesses closed, and second, Bureau of Labor Statistics data (BLS) collectors stopped in-person data collection. Despite the reduction in collected price quotes, BLS successfully maintained the quality of the broad price indexes while excluding very few detailed price indexes from publication. BLS price surveys were able to retain sufficient price quotes by shifting data collection techniques. This change in collection particularly affected the Consumer Price Index (CPI).

This article describes both the price changes during the pandemic and the challenges and adjustments to data collection that the pandemic required. We first take a look at the global market with import and export prices. Next, we move to the prices seen by producers and then to prices as consumers experienced them. Finally, we take a look at the collection and response rates for the three surveys.

Price changes since the pandemic
Demand shocks and problems with supply chains contributed to increased volatility in import, export, producer, and consumer prices in the months following the onset of the COVID-19 pandemic in the United States. Meat, fish, dairy, and eggs were especially affected by the shifting economy brought on by the pandemic.

Import/Export Price Index

While the United States declared a national emergency on March 13, the beginning of the pandemic dates back to the first reported case in China on November 17, 2019, which led to household lockdowns beginning there in mid-January 2020. The downward impact on food demand and export prices began in January and accelerated, as countries closed businesses and kept people home. Demand for some key exports such as soybeans and other grains remained steady because these products are used for animal feed rather than household consumption; however, there was a reduction in demand for other food products, especially meat.

Import meat prices declined 2.3 percent in January 2020, after seeing pork-driven increases of 2.6 percent and 3.1 percent in the previous 2 months. Chinese pork producers lost substantial production in the latter part of 2019 because an outbreak of African swine fever wiped out much of their pigs. In January 2020, China largely pulled out of the market for Australian beef because of the COVID-19 pandemic, putting more supply on the world market for that product. Prices for import meat continued to decline overall because of weak Asian demand, falling 8.9 percent from January to April 2020, the largest 3-month drop in import prices since the final quarter of 2015.

The reduction in world meat demand, especially from Asia, resulted in declining U.S. export meat prices. The dollar value of U.S. exports of meat products and meat packaging products fell 22.5 percent from March to May 2020. Export meat prices decreased 1.8 percent in February 2020, then edged up 0.3 percent in March and then declined 4.0 percent in April 2020.

From mid-April 2020 onward, the effects of the pandemic began to accelerate in the United States. Outbreaks in a number of U.S. meat processing facilities led to a domestic meat shortage, causing a subsequent increase in demand for imports. In turn, import meat prices rose 16.0 percent in May 2020, the largest 1-month jump since the index was first published monthly in December 1993. Export meat prices also rose, advancing 5.0 percent in May 2020 as less meat was available for export. Despite most U.S. meat processing facilities coming back online, import meat prices continued to rise in June 2020, advancing a further 8.1 percent as demand from Asia slowly increased with countries reopening. In contrast, export meat prices fell 0.4 percent.

Both export and import fish and shellfish prices experienced shocks from the demand reductions and supply chain disruptions caused by the pandemic. In particular, lobster prices decreased because of the reduction in demand from restaurants and the cruise industry, which was effectively shut down. Overall, export fish and shellfish prices fell 17.1 percent from January to June 2020 and import fish and shellfish prices declined 8.4 percent over the same period.

A few other export areas experienced demand reduction from the pandemic. Export prices for dairy products and eggs fell 5.3 percent from January to April 2020 before declining 11.9 percent in May 2020. An oversupply for both milk and cheese as the food service industry largely shut down led to the declines. In June 2020, dairy prices rebounded sharply, increasing 24.5 percent. Higher input costs, coupled with low inventories and cold storage

stocks, pushed cheese prices dramatically higher. Demand appeared to recover as more states opened up and food service slowly resumed. Milk also contributed to higher prices because of large government purchases as part of the U.S. Department of Agriculture Farmers to Families Food Box program. Export nut prices decreased 20.5 percent from December 2019 to June 2020. Some of the decline resulted from a loss in demand from Asia due to restaurant closures and decreasing purchases of some nuts (perceived luxury foods), but a record almond crop in California also supported the drop in prices.

Corn was another food export that recorded lower prices in response to the pandemic, but this price decline stems from corn’s role as an energy rather than food product. In 2019, 39.4 percent of all corn harvested in the United States was used for the production of ethanol. After the onset of the pandemic, the initial reduction in energy demand from Asia coincided with an oil price war between Russia and Saudi Arabia, leading to a plunge in oil prices. Low oil prices put downward pressure on prices for related energy products such as ethanol, a situation only exacerbated by lower fuel demand in the United States once the pandemic began to spread. Export corn prices fell 16.0 percent from February to May 2020. By June 2020, agreements within the Organization of the Petroleum Exporting Countries (OPEC) to cut oil production, some renewed demand for energy prices as economies began to reopen, and lower corn acreage than originally forecast led to a 3.8-percent increase in export corn prices.

Tables 1 and 2 show changes in the overall export and import price indexes for foods, feeds, and beverages, as well as for food products affected by the pandemic. Note that there was price movement for other food areas such as fruits and vegetables, although these changes were more attributable to factors such as weather that also impacted the overall price indexes.

Table 1. Export price indexes for select food categories, monthly percent changes, January–June 2020

<table>
<thead>
<tr>
<th>Category</th>
<th>January 2020</th>
<th>February 2020</th>
<th>March 2020</th>
<th>April 2020</th>
<th>May 2020</th>
<th>June 2020</th>
<th>3-month change (March 20–June 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foods, feeds, and beverages</td>
<td>2.3</td>
<td>-3.0</td>
<td>-1.5</td>
<td>-3.1</td>
<td>-0.5</td>
<td>1.1</td>
<td>-2.5</td>
</tr>
<tr>
<td>Meat, poultry, and other animal products</td>
<td>0.1</td>
<td>-1.8</td>
<td>0.3</td>
<td>-4.0</td>
<td>5.0</td>
<td>-0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Fish and shellfish</td>
<td>2.9</td>
<td>-0.6</td>
<td>-5.0</td>
<td>1.3</td>
<td>-2.0</td>
<td>-11.5</td>
<td>-12.2</td>
</tr>
<tr>
<td>Dairy products and eggs</td>
<td>1.1</td>
<td>-1.1</td>
<td>-2.7</td>
<td>-1.5</td>
<td>-11.9</td>
<td>24.5</td>
<td>8.1</td>
</tr>
<tr>
<td>Nuts and preparations</td>
<td>-3.0</td>
<td>-3.1</td>
<td>-3.9</td>
<td>-5.2</td>
<td>-1.5</td>
<td>-5.7</td>
<td>-12.0</td>
</tr>
<tr>
<td>Corn</td>
<td>2.2</td>
<td>0.1</td>
<td>-0.8</td>
<td>-10.2</td>
<td>-5.8</td>
<td>3.8</td>
<td>-12.2</td>
</tr>
</tbody>
</table>


Table 2. Import price indexes for select food categories, monthly percent changes, January–June 2020

<table>
<thead>
<tr>
<th>Category</th>
<th>January 2020</th>
<th>February 2020</th>
<th>March 2020</th>
<th>April 2020</th>
<th>May 2020</th>
<th>June 2020</th>
<th>3-month change (March 20–June 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foods, feeds, and beverages</td>
<td>0.5</td>
<td>1.2</td>
<td>-1.0</td>
<td>-1.6</td>
<td>2.3</td>
<td>-0.1</td>
<td>0.6</td>
</tr>
<tr>
<td>Meat, poultry, and other animal products</td>
<td>-2.3</td>
<td>-1.0</td>
<td>-4.0</td>
<td>-4.1</td>
<td>16.0</td>
<td>8.1</td>
<td>20.3</td>
</tr>
<tr>
<td>Fish and shellfish</td>
<td>1.9</td>
<td>-1.0</td>
<td>-1.4</td>
<td>-1.8</td>
<td>-2.9</td>
<td>-1.7</td>
<td>-6.3</td>
</tr>
</tbody>
</table>

See footnotes at end of table.
Producer Price Index

The COVID-19 pandemic led to fluctuations in domestic producer prices, particularly in the food sector, as many places instituted stay-at-home orders in an effort to limit the spread of the disease. These restrictions reduced demand from restaurants, which were effectively turned into takeout establishments, while demand from grocery stores rose as consumers, unaware of how long they would be quarantined at home, increased purchases of food. Suppliers had a difficult time meeting this increased consumer-driven demand as some businesses had to shut down or limit production capacity when COVID-19 outbreaks occurred at their plants. In addition, producers were trying to reorient their processing and supply channels from restaurants and institutional customers to supermarkets, which have different product sizes and packaging requirements. This reduction in demand by processors forced farmers to either accept lower prices for their product or destroy perishable products because of the lack of an available market.

Overall, the Producer Price Index (PPI) for final-demand foods decreased only 0.1 percent between March and June 2020, but the minimal cumulative movement masked an underlying monthly volatility within the index. With no change in March 2020, prices for final-demand foods fell 0.5 percent in April 2020, as the index for corn dropped 19.1 percent and prices for dairy products declined 4.4 percent. In May 2020, the index for final-demand foods jumped by a record 6.0 percent, as meat prices surged 40.4 percent. In June 2020, the index for final-demand foods reversed course again, falling 5.2 percent, as prices for meats dropped 27.7 percent and the index for eggs fell 12.7 percent. (See table 3.)

The price patterns seen in international trade are also reflected in the domestic prices for meat, dairy, eggs, and corn. The PPIs that reflect the supply chain of meat consumption saw many significant price changes. Slaughter livestock and meats both experienced large price changes since March 2020. After declining early in 2020 as a result of lower domestic seasonal demand following the holidays, the PPI for meats jumped nearly 50 percent between March and May 2020, mainly because of the combination of lower supplies from processors and higher consumer demand. A bottleneck at processing plants (caused by retooling packaging lines) and COVID-19 shutdowns reduced demand for slaughter livestock, whose prices fell over 8 percent in March 2020, forcing ranchers to either accept lower prices or withhold their livestock from sale. In June 2020, as stay-at-home orders were lifted throughout the country, restaurant demand increased, and supply chains started to revert to normal, as measured by the PPI for meats, which dropped over 25 percent, returning to near its pre-COVID-19 levels.

Dairy products were also heavily influenced by the pandemic. The PPI for dairy products fell 2.7 percent between February and June 2020, as school closures and stay-at-home orders substantially reduced dairy demand from restaurants and school lunch programs. Like meat processors, dairy producers were unable to quickly reorient their production facilities from institutional-sized to consumer-sized product packaging. Because demand for raw milk by dairy product manufacturers was very low, some dairy farmers could not find a market for their product, seeing no other option but to dump their perishable inventory rather than ship it for further processing. Overall, the PPI for raw milk fell about 40 percent between February and June 2020.

Prices for eggs as measured by the PPI initially increased over 50 percent between February and April 2020. This initial increase was due to higher demand for eggs in preparation for the upcoming Easter holiday. Eggs were used for cooking and decorative purposes, and demand for them was driven by consumer panic buying resulting from...
the stay-at-home orders implemented in response to the COVID-19 pandemic. In May 2020, eggs once destined for newly closed restaurants and food service buyers were redirected into supermarket supply channels. These increased supplies, coupled with lower demand after the Easter holiday, resulted in a price drop of over 40 percent in May 2020. To bring supplies and demand back into balance, some egg producers culled their flocks or donated their eggs to food banks.

World economic contraction due to the COVID-19 pandemic and a crude petroleum price war between OPEC and Russia led to historically low prices for crude petroleum. Corn’s relationship with the energy sector is demonstrated by movements in the PPI for corn. Domestic corn prices trended with export prices, falling from February to May 2020 and rising in June 2020. The earlier downward trend was due to the role of corn in the production of ethanol, which is blended with crude petroleum to produce gasoline. Although planting and growth progress were close to historical averages, ensuring stable supply, the demand for corn to produce ethanol dropped precipitously as gasoline demand plummeted in late March and early April 2020. Corn prices fell with rising inventory levels of refined petroleum products, as consumers and industry depressed demand after the implementation of stay-at-home orders. Market conditions in the petroleum sector severely reduced the production of ethanol and led to the closure of some ethanol producing facilities. In addition, a number of state governments campaigned to support the domestic oil and gas industries by waiving ethanol blending requirements from the Renewable Fuel Standard during the COVID-19 crisis; this prospect of a further reduction in demand put additional pressure on the price of corn. Overall, the PPI for corn prices fell more than 20 percent between February and May 2020. In June 2020, the price for corn rose about 6 percent as ethanol production increased with state economies slowly beginning to reopen and consumers becoming more comfortable leaving the house and traveling, causing demand for gasoline to rise.

Table 3. Producer price indexes for select food categories, monthly percent changes, seasonally adjusted, January–June 2020

<table>
<thead>
<tr>
<th>Category</th>
<th>January 2020</th>
<th>February 2020</th>
<th>March 2020</th>
<th>April 2020</th>
<th>May 2020</th>
<th>June 2020</th>
<th>3-month change (March 20–June 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final demand foods</td>
<td>0.2</td>
<td>-1.8</td>
<td>0.0</td>
<td>-0.5</td>
<td>6.0</td>
<td>-5.2</td>
<td>-0.1</td>
</tr>
<tr>
<td>Slaughter livestock</td>
<td>0.3</td>
<td>-4.4</td>
<td>-8.1</td>
<td>-3.1</td>
<td>10.3</td>
<td>-10.5</td>
<td>-4.4</td>
</tr>
<tr>
<td>Meats</td>
<td>-2.1</td>
<td>-2.4</td>
<td>-1.8</td>
<td>4.2</td>
<td>40.4</td>
<td>-27.7</td>
<td>5.7</td>
</tr>
<tr>
<td>Raw milk</td>
<td>-3.8</td>
<td>-1.8</td>
<td>-6.6</td>
<td>-3.8</td>
<td>-22.4</td>
<td>-13.0</td>
<td>-35.1</td>
</tr>
<tr>
<td>Dairy products</td>
<td>-0.4</td>
<td>-0.6</td>
<td>-0.4</td>
<td>-4.4</td>
<td>-4.0</td>
<td>6.6</td>
<td>-2.2</td>
</tr>
<tr>
<td>Eggs for fresh use (NSA)</td>
<td>-35.2</td>
<td>33.4</td>
<td>26.4</td>
<td>31.8</td>
<td>-44.6</td>
<td>-12.7</td>
<td>-36.2</td>
</tr>
<tr>
<td>Corn</td>
<td>4.0</td>
<td>-6.5</td>
<td>-0.2</td>
<td>-19.1</td>
<td>-5.0</td>
<td>6.3</td>
<td>-18.3</td>
</tr>
</tbody>
</table>

Note: NSA = not seasonally adjusted.

Consumer Price Index
Unsurprisingly, consumer prices for food were also affected by COVID-19, with food at home indexes generally rising and food away from home indexes becoming more volatile.

Food at home price movements
Since March 2020, consumer price indexes for food at home posted some of the largest monthly increases of recent years. The global and domestic price trends highlighted by import/export and producer price indexes also show up in the price changes seen in local grocery stores. The food at home price index increased 4.3 percent (seasonally adjusted) from March to June 2020 after rising 1.1 percent over the previous 12 months. This trend was partly driven by the previously noted supply issues in the beef industry; beef prices for consumers rose more than 20 percent from March to June 2020. This increase contributed to the 10-percent increase in the CPI for meats, poultry, fish, and eggs over the same period. However, while prices for meats, poultry, fish, and eggs increased the most among major grocery store food groups, all other food at home CPIs increased broadly from March to June 2020. (See table 4.)

**Table 4. Consumer price indexes for select food at home categories, 12-month and 3-month percent change**

<table>
<thead>
<tr>
<th>Category</th>
<th>12-month percent change, March 2019–March 2020</th>
<th>3-month percent change (SA), March–June 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food at home</td>
<td>1.1</td>
<td>4.3</td>
</tr>
<tr>
<td>Cereals and bakery products</td>
<td>0.1</td>
<td>3.1</td>
</tr>
<tr>
<td>Meats, poultry, fish, and eggs</td>
<td>2.3</td>
<td>10.3</td>
</tr>
<tr>
<td>Beef and veal</td>
<td>3.8</td>
<td>20.4</td>
</tr>
<tr>
<td>Dairy and related products</td>
<td>3.7</td>
<td>2.1</td>
</tr>
<tr>
<td>Fruits and vegetables</td>
<td>-1.9</td>
<td>2.5</td>
</tr>
<tr>
<td>Nonalcoholic beverages</td>
<td>1.4</td>
<td>3.6</td>
</tr>
<tr>
<td>Other food at home</td>
<td>1.4</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Note: SA = seasonally adjusted.

**Food away from home price movements**

The main price indexes within food away from home—full-service and limited-service meals and snacks—typically show very little volatility. With fewer prices in the index and changes in the market, the price indexes for the two major product groups have fluctuated more in recent months. Prices rose more than usual among products in the limited-service meals and snack category, which has shown higher-than-usual price growth since March 2020. Prices for full-service meals and snacks declined in April 2020, but increased sharply in June 2020. Recent increases reflect, in part, higher input costs seen in food at home indexes. (See table 5.)

**Table 5. Consumer price indexes for select food away from home categories, monthly percent changes, seasonally adjusted, January–June 2020**

<table>
<thead>
<tr>
<th>Category</th>
<th>January 2020</th>
<th>February 2020</th>
<th>March 2020</th>
<th>April 2020</th>
<th>May 2020</th>
<th>June 2020</th>
<th>3-month change (March 20–June 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food away from home</td>
<td>0.4</td>
<td>0.2</td>
<td>0.2</td>
<td>0.1</td>
<td>0.4</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Full-service meals and snacks</td>
<td>0.4</td>
<td>0.2</td>
<td>0.0</td>
<td>-0.3</td>
<td>0.2</td>
<td>0.9</td>
<td>0.7</td>
</tr>
<tr>
<td>Limited-service meals and snacks</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.7</td>
<td>0.6</td>
<td>0.5</td>
<td>1.8</td>
</tr>
</tbody>
</table>

See footnotes at end of table.
Changes to data collection in the face of the pandemic

Safety precautions established during the current pandemic created data collection challenges for some price indexes more than others. While the surveys for import, export, and producer prices were able to continue normal data collection during the pandemic, the survey for consumer prices saw significant data collection challenges, as its data are typically collected by in-person visits that were completely halted across the country in mid-March 2020.

Import/Export Price Index

Price collection for U.S. Import and Export Index for foods, feeds, and beverages dropped after the COVID-19 pandemic started in March 2020. For imports, survey response rates for foods, feeds, and beverages were 4.8 percentage points lower in April 2020 than in April 2019. Response rates were 5.9 percentage points lower in May 2020 than in May 2019, and 5.1 percentage points lower in June 2020 than a year earlier. Although response rates for export foods, feeds, and beverages were higher than those for imports in all 3 months, they were lower than they were in 2019—by 9.0 percentage points in April 2020, 6.8 percentage points in May 2020, and 9.3 percentage points in June 2020. Import and export prices are revised in the 3 months after initial publication. While response rates improved after these revisions, they remained below their year-ago levels. There were no changes in data collection and estimation procedures.

Producer Price Index

In the first few months of the COVID-19 pandemic, PPI response rates remained consistent with historical averages for almost all sectors. Although no concrete evidence exists that could explain why PPI response rates were nominally affected, two factors were working in favor of the PPI. First, monthly pricing data used to calculate the PPI are primarily collected online through the BLS Internet Data Collection Facility. Second, and anecdotally, when BLS staff attempted to follow up with survey respondents about extreme price movements, they found them to be more accessible during the COVID-19 pandemic as many businesses had directed their administrative staff to work from home. Since PPI response rates were largely unaffected, there were no changes in data collection and estimation procedures.

Consumer Price Index

The CPI for commodities and services is calculated from price data that BLS collects in retail stores and restaurants. In-person data collection focuses on specific items in specific stores and locations, and these items are considered to be representative of the consumer market basket. Safety precautions necessitated by the COVID-19 pandemic had a large and immediate impact on the data collection process for the CPI program.

Food price data, both in grocery stores and in restaurants, are typically collected almost entirely by personal visit to the location. This in-person data collection was completely halted across the country on March 16, 2020. Since measuring food price change is essential to the CPI, BLS had to introduce new procedures that would allow for the collection of data in amounts sufficient for the publication of accurate food indexes. These methods included replacing in-person data collection with online data collection. However, the reduction in the number of prices
collected and the transition to the new methods created issues that users should be aware of when interpreting the indexes. In the following sections, we describe the impacts for both food at home and food away from home data collection.

**Food at home data collection**

To measure price change for food at home, BLS collects data from thousands of grocery stores and other establishments that sell grocery food items. Prices are collected and indexes are published for dozens of specific food categories, which are classified into six broad groups. As is the case for many CPI categories, these prices have traditionally been collected in person by hundreds of trained BLS data collectors in the field. Each month, these collectors observe and record thousands of prices, making sure that the prices collected are for the exact items in the sample.

In 2019, about 99 percent of food at home prices were collected via personal visit. In June 2020, typical of recent months, about 96 percent of the prices were collected online, with the remaining 4 percent collected via telephone.

While BLS adapted collection procedures for the CPI by shifting to online price collection, some complications were encountered. Some grocery stores had prices available online, others had prices available only through a third party, and some had no online prices available. For some stores, there was even a queue for accessing their website. The availability of many items also decreased as demand surged.

These logistical and market impacts resulted in a decrease in the total amount of prices collected. Table 6 shows the percentage of prices in the sample collected both before and after the pandemic forced the change in collection methods.

<table>
<thead>
<tr>
<th>Category</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>June 2019</td>
</tr>
<tr>
<td>Food at home</td>
<td>90</td>
</tr>
<tr>
<td>Cereals and bakery products</td>
<td>93</td>
</tr>
<tr>
<td>Meats, poultry, fish, and eggs</td>
<td>91</td>
</tr>
<tr>
<td>Beef and veal</td>
<td>93</td>
</tr>
<tr>
<td>Dairy and related products</td>
<td>93</td>
</tr>
<tr>
<td>Fruits and vegetables</td>
<td>84</td>
</tr>
<tr>
<td>Nonalcoholic beverages</td>
<td>94</td>
</tr>
<tr>
<td>Other food at home</td>
<td>93</td>
</tr>
</tbody>
</table>


Response rates for most food at home categories fell from about 90 percent to 61 percent–74 percent, with rates for meat categories seeing the largest declines. Despite these declines and challenging conditions, the new data collection methods still allowed BLS to collect more than 60 percent of the prices for all the major food categories.
A reduced number of prices collected is not the only issue that complicates price-change measurement for food at home during the pandemic. For some stores in the sample, an item’s online price may be different from, and often higher than, the in-store price for the same day and time. This difference was one of the factors that led to an increase in the food at home index from March to April 2020, because in some cases, online prices were compared with prices previously collected in store.

Food away from home data collection

BLS collects data from thousands of restaurants and other establishments selling nongrocery food items. Restaurants are classified as either full-service or limited-service, with a price index published for each type. In addition, data are collected for employee sites, schools, vending machines, and mobile vendors such as food trucks.

Like food at home price data, most food away from home price data have historically been collected in person. When the pandemic-related restrictions began, new methods had to be developed and implemented to collect these data. Before in-person data collection was ceased, about 80 percent of food away from home price data were collected in person. In June 2020, about three-quarters of the data were collected online, with the remainder collected by telephone.

At the onset of the pandemic-related restrictions, many restaurants and other sampled establishments were closed, and many others had limited online menus, restricting the pricing availability of some specific items in the sample. In addition, data collection was extremely limited for vending machines, employee sites, and schools. This limitation resulted in declines in response rates and in fewer prices collected for food away from home indexes. (See table 7.)

Table 7. Response rates for Consumer Price Index for select food away from home categories, June 2019 and June 2020

<table>
<thead>
<tr>
<th>Category</th>
<th>June 2019</th>
<th>June 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food away from home</td>
<td>87</td>
<td>60</td>
</tr>
<tr>
<td>Full-service meals and snacks</td>
<td>91</td>
<td>59</td>
</tr>
<tr>
<td>Limited-service meals and snacks</td>
<td>93</td>
<td>75</td>
</tr>
<tr>
<td>Food at employee sites and schools</td>
<td>50</td>
<td>19</td>
</tr>
<tr>
<td>Food from vending machines and mobile vendors</td>
<td>80</td>
<td>26</td>
</tr>
</tbody>
</table>


Response rates declined across all categories, with rates for full-service restaurants declining more than those for limited-service restaurants, reflecting more widespread closures. The more minor categories declined sharply, reflecting closures of sites and the infeasibility of online price collection.

Conclusion
In recent months, the pandemic resulted in upward movements for many BLS food price indexes. Large price increases for meat products occurred across the board, and price declines for corn were largely energy driven and did not affect the food purchases of U.S. consumers. Prices for perishable foods with a short shelf life was strongly affected, and disruptions in dairy and egg production and distribution caused the greatest price volatility in all BLS price indexes. The shift away from institutional and restaurant food consumption toward food at home consumption created short-term disruptions and shocks in the economy, particularly for perishable foods. These shocks rippled through the economy and affected the prices consumers pay in the grocery store.

The COVID-19 pandemic also affected BLS price data collection, with collection efforts for consumer price indexes for food being affected more than those for the other BLS price indexes. However, price data continue to be collected, contributing to the production of high-quality price indexes that inform the public.25


4 For more information on U.S. exports of meat products and meat packaging products, see the U.S. Census Bureau Office of Foreign Trade Statistics web page at https://usatrade.census.gov/. Note that a free account is needed to view this data.


8 For more information on the U.S. Department of Agriculture Farmers to Families Food Box program, see “USDA farmers to families food box” (U.S. Department of Agriculture, Agricultural Marketing Service), updated daily, https://www.ams.usda.gov/selling-food-to-usda/farmers-to-families-food-box.


PPI data included in this article that reference indexes for March through June 2020 are first issued. All PPIs are recalculated 4 months after original publication to reflect late reporting by survey respondents.


Note that the impact of COVID-19 on changes in consumer purchasing patterns is not immediately reflected in CPI weights. The estimated quantities of goods and services purchased by consumers are fixed between biennial updates in the CPI.

Additional information is available in each program’s COVID-19 notices: CPI notice, MXPI notice, PPI notice.
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What to do about our aging workforce—the employers’ response

Charlotte M. Irby

People in the United States are living longer. According to the Centers for Disease Control and Prevention, the life expectancy at birth of the average person in America has increased from 76.8 years in 2000 to 78.7 years in 2018. This is just one reason people are working beyond what was once the typical retirement age of 65. Other reasons include insufficient savings, lack of a retirement plan, and the Social Security Administration’s gradual rise of the full retirement age, from 65 to 67.

According to Robert L. Clark and Beth M. Ritter in “How are employers responding to an aging workforce?” (National Bureau of Economic Research, Working Paper 26633, January 2020), “baby boomers”—those born just after World War II, from 1946 to 1964—have reached or surpassed the age of retirement or are approaching it. They point out that the percentage of people 55 and over has doubled in the last 20 years and that this trend is projected to continue. The aging of the population means two things: on one hand, more people are retiring, and on the other hand, many of these older workers are choosing to work longer. In their paper, Clark and Ritter contend that employers need to look at three major areas in which an older workforce may affect their organization. These areas are labor costs, productivity, and sustainability. In addition, the authors examine how some employers are addressing the concerns that arise from an aging workforce and the ways in which they can benefit from it.

In researching these labor matters on aging, the authors consulted labor economists and several human resource professionals at large organizations in both the private and public work sectors. To determine how employers are responding to an aging workforce, Clark and Ritter conducted an employer workshop and three surveys in which the human resources professionals participated.

From the workshop and the data gathered in the surveys, the authors confirmed that for employers, retaining a larger older workforce means higher labor costs—the first major area of concern. These labor costs include salaries, health insurance, paid time off, and other contributions. However, on the flip side, suddenly losing a large number of employees through retirement would also mean losing valuable experience and knowledge that would be difficult for employers to replace.

As for productivity, the second major area, it is a concern not only for some employers but also for the entire nation because many older workers are working beyond the traditional age of retirement. This fact prompts employers to question whether age affects productivity. According to recent studies, the authors found that the answer to this question is inconclusive. Some studies show that older workers are less productive, some show no difference.
between older and younger workers, and others show that older workers are more productive than their younger counterparts.

As for a company’s sustainability, the third area of concern, employers have several points to weigh, such as organizational size, individual occupations, hiring methods, employment policies, and economic growth. Companies are implementing financial and educational programs to accommodate a “multigenerational” workforce. In addition, many companies are updating and changing their compensation and employment policies to meet the needs of older workers. The authors contend that most employers recognize that the workforce is aging and they are working toward modifying and improving older employees’ working conditions.