Impact of COVID-19 on the BLS Price Programs

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Data Users’ Conference
April 28, 2021
Big picture questions

- How have key BLS price indexes moved during the COVID-19 pandemic?
- How has the pandemic affected procedures and response rates in BLS price indexes?
- What should we keep in mind when interpreting BLS price indexes from the pandemic period?
Impact of COVID-19 on Price Movements and Response Rates

Dave Mead
International Price Program
Prices during COVID-19

- Overall, the pattern of prices were characterized by the following:
  - Sharp drops from March to May
  - Large upward price movements in the months that followed
  - Smaller advances throughout the rest of 2020
  - An upward trend in the pace of higher prices in early 2021 as economies re-open

- Despite challenges, the pandemic did not impact the ability to produce price indexes
Import prices during COVID-19

Imports broken out by fuel and nonfuel, January 2020 to March 2021

- All Imports
- Nonfuel Imports
- Fuel Imports
Oil prices

- Following the onset of the pandemic, import oil prices fell sharply, plunging 62.8 percent from January to April.

- Once OPEC+ agreed to initiate production cuts, import oil prices then surged 92.4 percent from April to July.

- Prices then remained steady until they began to rise again near the end of the year, increasing 52.1 percent from October to March.
Import prices during COVID-19: nonfuel import prices

Major components of nonfuel import prices: January 2020 to March 2021
Import prices during COVID-19: import food prices

Import food prices, January 2020 to March 2021

- Foods, feeds, and beverages
- Meat
- Fruit
- Vegetables
- Fish
Import prices during COVID-19: import industrial supplies

Import industrial supplies prices, January 2020 to March 2021
Import prices during COVID-19: import industrial supplies (cont.)

Import industrial supplies prices, January 2020 to March 2021

Nonfuel industrial supplies
Chemicals
Metals
Inbound prices during COVID-19

Inbound air freight prices, January 2020 to March 2021

- Inbound air freight
- Freight from Europe
- Freight from Asia
Export prices during COVID-19

Major components of export prices, January 2020 to March 2021
Export prices during COVID-19: food prices

Export food prices, January 2020 to March 2021

- Foods, feeds, and beverages
- Fruit
- Dairy
- Nuts

January 2020 to March 2021
Export prices during COVID-19: export grain prices

Export grain prices, January 2020 to March 2021

- Soybeans
- Corn
- Wheat

Foods, feeds, and beverages
Export prices during COVID-19

Export industrial supplies, January 2020 to March 2021

- Industrial supplies
- Cotton
- Fuel
- Unferrous metals
- Chemicals
Export prices during COVID-19: export finished goods

Export finished goods prices, January 2020 to March 2021

- Capital goods
- Automotive vehicles
- Consumer Goods
Imports during COVID-19
Import price by country, January 2020 to March 2021
U.S. terms of trade during COVID-19

Terms of trade indexes by country, January 2020 to March 2021

China | Japan | EU | Mexico | Canada

[Graph showing the terms of trade indexes for China, Japan, EU, Mexico, and Canada from January 2020 to March 2021.]
U.S. terms of trade during COVID-19: terms of trade by country

Terms of trade indexes by country, January 2020 to March 2021

- China
- Japan
- EU
- Mexico
Data Collection for Imports and Exports

- Teleworking

- Both the staff in Washington and the staff in the field that initiate new items have been in a full-time telework environment

- Despite challenges, this has not impacted the division’s ability to publish the import and export price indexes on schedule
Data Collection for Imports and Exports (cont.)

- Changes Needed Because of the Pandemic

- Only minor changes to collection: everything now collected through a secure internet site

- No changes were needed to the calculation methodology

- A small number of published indexes had to be suppressed from publication (depending on the month, 6-10 out of over a 1000)
Data Collection for Imports and Exports: response rates

Response rates, February 2020 to March 2021

Imports
Exports
Impact of COVID-19 on Price Movements and Response Rates

Scott Sager
Producer Price Program
PPI during COVID-19 pandemic

- First effect on domestic prices in March 2020
  - Energy prices lower
    - Cost push due to lower input prices
  - Food prices mixed
    - Demand shocks affected supply chain
      - Final demand food volatile
      - Unprocessed food prices initially lower, before moving higher
  - Core goods and services relatively prices steady before moving higher later in 2020 and into 2021
PPI during COVID-19 Pandemic: final demand and components

Producer Price Index for Final demand and components, seasonally adjusted, January 2020 – March 2021

January 2020 = 100
PPI energy during COVID-19

- Lower world-wide prices for Crude petroleum starting in Feb 2020 as COVID-19 shutdowns depressed demand for petroleum products in Asia and Europe
- Lower input prices pass through to domestic refined petroleum products
- Domestic COVID-19 shutdowns and travel restrictions in March 2020 depress demand sending prices ever lower
PPI energy during COVID-19 (cont.)

- Prices bottom out in April 2020
  - OPEC agrees to production cuts, putting a floor under Crude petroleum prices.
- In May 2020, the U.S. starts to reopen, bolstering demand for refined petroleum products.
  - The combination of lower inventories and increased demand allow prices to start moving higher.
PPI energy during COVID-19: price trends

- Prices continued to trend higher through the remainder of the year.
  - Recovery of crude petroleum prices as production remained limited.
  - Domestic demand increased for refined products as the U.S. continued to reopen.
PPI energy during COVID-19: selected energy products

Producer Price Index for selected energy products, seasonally adjusted, January 2020 – March 2021

January 2020 = 100
PPI food during COVID-19 (cont.)

Producer Price Index Food aggregate indexes, seasonally adjusted, January 2020 – March 2021

Final demand foods
Processed foods and feeds
Unprocessed foodstuffs and feedstuffs

January 2020 = 100
PPI food during COVID-19

- Stay-at-home orders instituted on widespread basis in mid-March 2020
  - Restaurants reduced or eliminated in person dining
  - Supermarkets saw increased demand from consumers
  - Food suppliers shut down or severely curtailed production
    - Illness among staff
    - Facilities not equipped to handle new customers
  - Farmers have no market for their products
PPI food during COVID-19: food items

Disparity in movement between unprocessed and processed foods

Timing differed based on perishability of products

- Slaughter livestock vs. Meats
  - Slaughter livestock prices lower though April due to lack of processor capacity
  - Meat prices increase through May due to lower supplies and increased consumer demand

- Raw milk vs. Dairy products
  - Raw milk fell consistently through June
  - Dairy products started to recover in June as inventories became depleted
PPI food during COVID-19: holiday demand

Eggs

- Higher prices through April due to increased demand from Easter and consumer-fueled panic buying
- In May, lower post-holiday demand coupled with a increased supplies, resulted in significantly lower prices through the Summer.
PPI core goods during COVID-19

Producer Price Index Core goods indexes, seasonally adjusted, January 2020 – March 2021

Final demand core goods
Processed core goods
Unprocessed core goods

January 2020 = 100
PPI core goods during COVID-19 (cont.)

- Final demand core goods prices remained relatively constant
- Processed core goods prices fell though May as world-wide closures hampered demand for manufacturing materials.
- Unprocessed core goods prices fell through April before increasing rapidly later in the year, as reopenings spurred economic growth
PPI core goods during COVID-19: final demand core goods

- Little movement among Final demand core goods, as highly weighted components had prices that remained relatively stable
  - Motor vehicles
  - Pharmaceuticals
  - Tobacco products
  - Aircraft
PPI core goods during COVID-19: selected core goods

Producer Price Index for selected Core goods, seasonally adjusted, January 2020 – March 2021

Industrial chemicals
Plastic resins
Lumber
Steel scrap (nsa)
Corn
PPI core goods during COVID-19: processed core goods

- Moderate movement lower for processed core goods through May, then moving higher through the remainder of the year as the country reopened
  - Industrial chemicals
  - Plastic resins
  - Lumber
PPI core goods during COVID-19: unprocessed core goods

- Unprocessed core goods fell moderately in April, but rebounded strongly throughout the remainder of the year
  - Iron and steel scrap
  - Corn (for ethanol)
PPI services during COVID-19

Little aggregate volatility because heavily weighted components were unaffected

- Healthcare – about a quarter of Final demand services
  - Reimbursement rates set by annual agreements
    - Private insurance
    - Medicaid
    - Medicare
PPI services during COVID-19 (cont.)

- Services areas with significant movement
  - Guestroom rental and Airline passenger services
    - Significant price declines as stay-at-home orders resulted in no demand for travel
  - Portfolio management
    - Increases throughout the year as portfolio managers compensation is based on stock market returns
PPI response rates during COVID-19

Producer Price Index initial response rate by reference month

- March 2019
- February 2020 average
- Mar-20
- Apr-20
- May-20
- Jun-20
- Jul-20
- Aug-20
- Sep-20
- Oct-20
- Nov-20
- Dec-20
- Jan-21
- Feb-21
- Mar-21
PPI response rates during COVID-19 (cont.)

- Response rates improved during COVID-19
  - 12-month average pre-COVID-19: 69%
  - Average since onset of COVID-19: 73%

- Anecdotal information
  - Respondents’ remote-work posture provided greater efficiencies for price submissions and better accessibility to PPI staff for follow-up
Impact of COVID-19 on Price Movements and Response Rates

Steve Reed
Consumer Price Program
Consumer Price Index

- Movements in major CPI indexes
- Indexes with unusual movements during pandemic period
- Trends and issues in CPI rent and Owners’ Equivalent Rent (OER) indexes during pandemic
Headline CPI during COVID-19

CPI All items and All items less food and energy, seasonally adjusted, January 2020-March 2021
CPI food indexes during COVID-19

Consumer Price Index for major food categories, seasonally adjusted, January 2020-March 2021

- Food
- Food at home
- Food away from home
# Food acceleration during COVID-19

CPI food categories, 12-month percent change

<table>
<thead>
<tr>
<th>Category</th>
<th>March 2019-March 2020</th>
<th>March 2020-March 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food at home</td>
<td>1.1</td>
<td>3.3</td>
</tr>
<tr>
<td>Cereals and bakery products</td>
<td>0.1</td>
<td>2.6</td>
</tr>
<tr>
<td>Meats, poultry, fish, and eggs</td>
<td>2.3</td>
<td>5.4</td>
</tr>
<tr>
<td>Beef and Veal</td>
<td>3.8</td>
<td>7.1</td>
</tr>
<tr>
<td>Dairy and related products</td>
<td>3.7</td>
<td>1.6</td>
</tr>
<tr>
<td>Fruits and vegetables</td>
<td>-1.9</td>
<td>3.8</td>
</tr>
<tr>
<td>Nonalcoholic beverages</td>
<td>1.4</td>
<td>3.2</td>
</tr>
<tr>
<td>Other food at home</td>
<td>1.4</td>
<td>2.2</td>
</tr>
<tr>
<td>Food away from home</td>
<td>3.0</td>
<td>3.7</td>
</tr>
<tr>
<td>Full service meals</td>
<td>3.2</td>
<td>3.2</td>
</tr>
<tr>
<td>Limited service meals</td>
<td>2.8</td>
<td>6.5</td>
</tr>
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</table>
CPI gasoline prices during COVID-19

CPI Gasoline all types U.S. city average, January 2020-March 2021
CPI categories with supply disruptions

Consumer Price Index, selected categories, seasonally adjusted, January 2020-March 2021

- Used cars and trucks
- Appliances
CPI categories with demand disruptions

Consumer Price Index, selected categories, seasonally adjusted, January 2020-March 2021

- Lodging away from home
- Airline fares
Impact of data collection changes

- In-person data collection stopped March 16, 2020
- Data collectors attempt to collect data through other means (mostly online)
- Lower response rates, more imputation, though most prices still collected
Impact of data collection changes and altered economic conditions

- Some outlets in the sample have no online presence
- CPI avoided contact when it would cause respondents undue burden
- Some outlets closed, or specific sampled items unavailable for pricing
Impact of data collection changes and altered economic conditions (cont.)

- Lower response rate in most indexes
  - Modest decline across the board
  - Larger declines in certain indexes
- Minor increase in indexes failing data quality standards and being unpublished
  - No major indexes at the U.S. city average level failed publication standards
# CPI response rates

Response rates for the commodities and services price survey, percent

<table>
<thead>
<tr>
<th>Month</th>
<th>2019</th>
<th></th>
<th>2020</th>
<th></th>
<th>2021</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Collected prices</td>
<td>Uncollected prices</td>
<td>Collected prices</td>
<td>Uncollected prices</td>
<td>Collected prices</td>
<td>Uncollected prices</td>
</tr>
<tr>
<td>January</td>
<td>85</td>
<td>15</td>
<td>86</td>
<td>14</td>
<td>77</td>
<td>23</td>
</tr>
<tr>
<td>February</td>
<td>85</td>
<td>15</td>
<td>87</td>
<td>13</td>
<td>79</td>
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<td>March</td>
<td>87</td>
<td>13</td>
<td>76</td>
<td>25</td>
<td>78</td>
<td>22</td>
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<tr>
<td>April</td>
<td>86</td>
<td>14</td>
<td>65</td>
<td>35</td>
<td></td>
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</tr>
<tr>
<td>May</td>
<td>87</td>
<td>13</td>
<td>68</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>86</td>
<td>14</td>
<td>70</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>July</td>
<td>86</td>
<td>14</td>
<td>70</td>
<td>30</td>
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<tr>
<td>August</td>
<td>86</td>
<td>14</td>
<td>72</td>
<td>28</td>
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<tr>
<td>September</td>
<td>86</td>
<td>14</td>
<td>73</td>
<td>27</td>
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<tr>
<td>October</td>
<td>86</td>
<td>14</td>
<td>74</td>
<td>26</td>
<td></td>
<td></td>
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<tr>
<td>November</td>
<td>87</td>
<td>13</td>
<td>75</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>86</td>
<td>14</td>
<td>77</td>
<td>23</td>
<td></td>
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</tr>
</tbody>
</table>
Rent and Owners’ Equivalent Rent

- Reduced response rate in rent sample
- Concerns about handling of rent forgiveness, non-payment
- Some deceleration in rent and Owners’ Equivalent Rent (OER) increases
# Rent and OER: response rates

Response rates for the housing survey, percent

<table>
<thead>
<tr>
<th>Month</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Collected rents</td>
<td>Uncollected rents</td>
<td>Collected rents</td>
</tr>
<tr>
<td>January</td>
<td>68</td>
<td>6</td>
<td>26</td>
</tr>
<tr>
<td>February</td>
<td>67</td>
<td>5</td>
<td>28</td>
</tr>
<tr>
<td>March</td>
<td>67</td>
<td>6</td>
<td>27</td>
</tr>
<tr>
<td>April</td>
<td>68</td>
<td>6</td>
<td>26</td>
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<tr>
<td>May</td>
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<td>September</td>
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<td>October</td>
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<td>25</td>
</tr>
<tr>
<td>December</td>
<td>67</td>
<td>6</td>
<td>27</td>
</tr>
</tbody>
</table>
Rent and OER: 1-month change

CPI Rent and OER, seasonally adjusted 1-month change, February 2020-March 2021

Rent of primary residence

Owners' equivalent rent
Interpreting the CPI during COVID-19

- Reduced response rates mean more imputation, additional noise in short term index movements
- Some indexes have substantially reduced data quality
Interpreting the CPI during COVID-19: seasonal adjustment

- Seasonal adjustment
  - Disruption of normal seasonal patterns mean seasonally adjusted movements should be interpreted cautiously
    - During pandemic
    - Going forward
Interpreting the CPI during COVID-19: weights

- **Weights**

  - CPI-U and CPI-W weights do not adjust in real time
    - Airline fares
    - Food away from home
    - Lodging away from home
Indexes with interpretation issues

- Food at home
- Food away from home
- Airline fares
- Lodging away from home
- Motor vehicle insurance
- Admissions
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