U.S. Department of Labor
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REPORT TO THE BUREAU OF LABOR STATISTICS

BLS COULD DO MORE TO IDENTIFY DATA LIMITATIONS AND INCREASE TRANSPARENCY

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U.S. Department of Labor
Office of Inspector General
Audit

BRIEFLY...

BLS COULD DO MORE TO IDENTIFY DATA LIMITATIONS AND INCREASE TRANSPARENCY

October 26, 2023

WHY OIG CONDUCTED THE AUDIT

The Bureau of Labor Statistics (BLS) is one of the principal federal statistical agencies responsible for measuring labor market activity, working conditions, and price changes in the nation's economy. Federal policymakers, public institutions, and private citizens use this essential economic information to guide and support decision-making.

BLS collects data from both households and establishments using voluntary surveys; however, response rates for these surveys have steadily declined over the past 10 years.

WHAT OIG DID

We conducted this audit to answer the following question:

> How has BLS addressed challenges posed by declining statistical survey response rates, and what was the impact of the declining response rates on the reliability and costs of economic information developed by BLS?

To answer this question, we examined three BLS surveys: the Current Population Survey, the Consumer Price Index, and the Import and Export Price Indexes. We interviewed BLS program officials and representatives from other federal statistical agencies; analyzed BLS survey data, guidance, methodologies, and publication criteria; and reviewed public laws and Office of Management and Budget policies.

We focused on improvements needed in ensuring the transparency of potential survey data limitations to users of BLS data. However, we do not make determinations or provide conclusions on the reliability of the three indexes that we reviewed.

WHAT OIG FOUND

BLS has taken actions to address challenges posed by declining survey response rates. However, BLS could do more to identify potential data limitations in its economic information and increase the transparency of those limitations. We were unable to identify a correlation between costs and declining survey response rates. To reduce the impact of missing data caused by declining survey response rates, BLS increased the use of imputations in its survey data, which are essentially replacement data inferred from relevant information available. Although imputations are a standard practice among federal statistical agencies, BLS could be more transparent regarding its increased use of imputations to facilitate accurate interpretation of its survey data.

During the COVID-19 pandemic, BLS bypassed controls in place to ensure the reliability of its economic information in 10 percent of published indexes for Import and Export Price Indexes. Further, BLS did not ensure transparency regarding exceptions to survey publication criteria.

Increased transparency with regard to potential data limitations is needed to ensure BLS survey users draw correct conclusions from the data when making critical decisions, such as policy changes that affect the American people.

WHAT OIG RECOMMENDED

We made four recommendations to BLS to improve the transparency and clarity surrounding the use of imputations and published survey data. BLS agreed to take corrective actions for all four recommendations.

READ THE FULL REPORT

https://www.oig.dol.gov/public/reports/oa/2023/17-24-001-11-001.pdf

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Office of Inspector General
Washington, DC 20210

INSPECTOR GENERAL'S REPORT

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This report presents the results of the U.S. Department of Labor (DOL) Office of Inspector General's (OIG) audit of the Bureau of Labor Statistics' (BLS) declining survey response rates and the impact this decline has had on its economic information and survey costs. In this report, we focus on improvements needed in ensuring transparency of potential data limitations to users of BLS data. However, we do not make determinations or provide conclusions on the reliability of the three indexes that we reviewed.

BLS is the principal federal statistical agency responsible for measuring labor market activity, working conditions, and price changes in the nation's economy. BLS collects survey data, analyzes it, and reports essential economic information. Federal policymakers, public institutions, and private citizens use this information to guide and support decision-making. National data regarding employment, unemployment, and productivity are used by policymakers to track the state of the economy and drive changes in economic policy. For example, one BLS survey—the Consumer Price Index—is used to measure inflation and adjust Social Security payments and federal income tax brackets.

According to federal and industry studies, response rates are generally declining in all federal surveys.[1] Respondents are either unwilling to participate in surveys or are hesitant or unable to provide all the information requested. A decline in survey response rates could affect data quality. Because of the decrease in response rates and the importance of BLS's economic information, we conducted a performance audit to determine the following:

> How has BLS addressed challenges posed by declining statistical survey response rates, and what was the impact of the declining response rates on the reliability and costs of economic information developed by BLS?

BLS has taken actions to address challenges posed by declining survey response rates by researching and implementing new ways to educate respondents, train staff, and collect survey data; however, BLS could do more to identify potential data limitations in its economic information and increase the transparency of those limitations. Increased transparency with regard to potential data limitations is needed to ensure BLS survey users draw correct conclusions from the data when making critical decisions, such as policy changes that affect the American people.

This audit was scheduled in the OIG's Office of Audit Workplan for Fiscal Year (FY) 2020; however, due to resource constraints and the priority of pandemic audits, the OIG initiated the audit in FY 2021. We conducted the following work to complete our audit:

- interviewed BLS program officials for the Current Population Survey (CPS), Consumer Price Index (CPI), and Import and Export Price Index (MXPI);
- interviewed representatives from four other federal statistical agencies: the U.S. Department of Commerce's Census Bureau and Bureau of Economic Analysis and the U.S. Department of Agriculture's National Agricultural Statistics Service and Economic Research Service;
- reviewed public laws and Office of Management and Budget (OMB) policies for federal statistical agencies;
- reviewed BLS's quality guidance, survey methodologies, and publication criteria for CPS, CPI, and MXPI; and

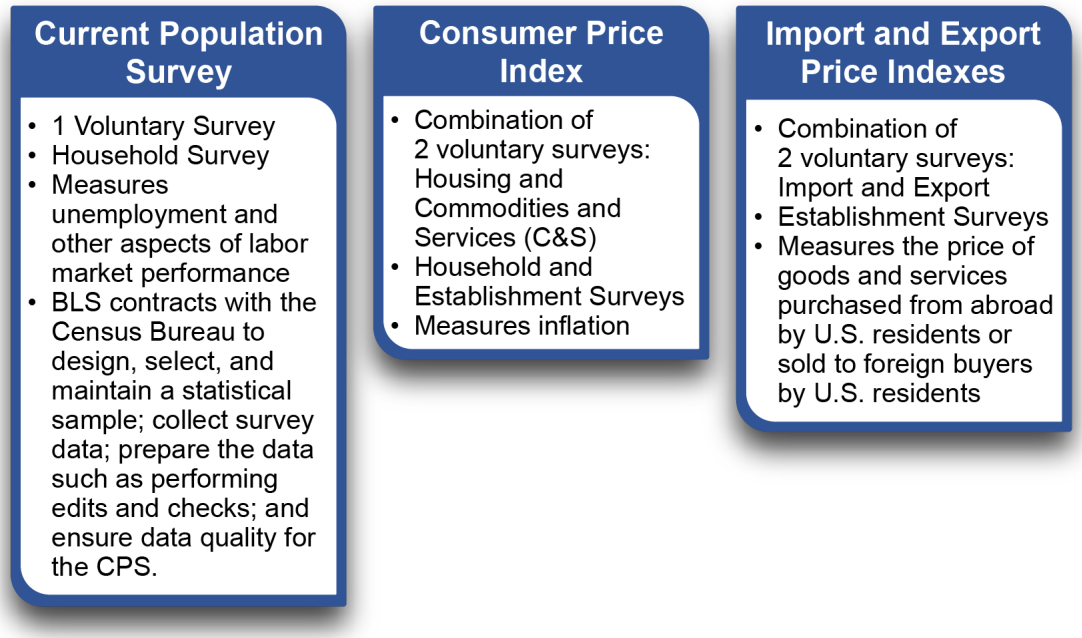
[1] See Appendix A for our complete list of referenced federal and industry studies.

- analyzed survey data for CPS, CPI, and MXPI concerning nonresponse and publication criteria for the period of October 2011 through September 2021.

BLS FACED CHALLENGES TO COLLECT SURVEY DATA

BLS collects data from both households and establishments using survey instruments, analyzes responses, and disseminates essential economic information to support public and private decision-making. For the purpose of this audit, we examined 3 of BLS's 15 surveys: CPS, CPI, and MXPI (see Figure 1).

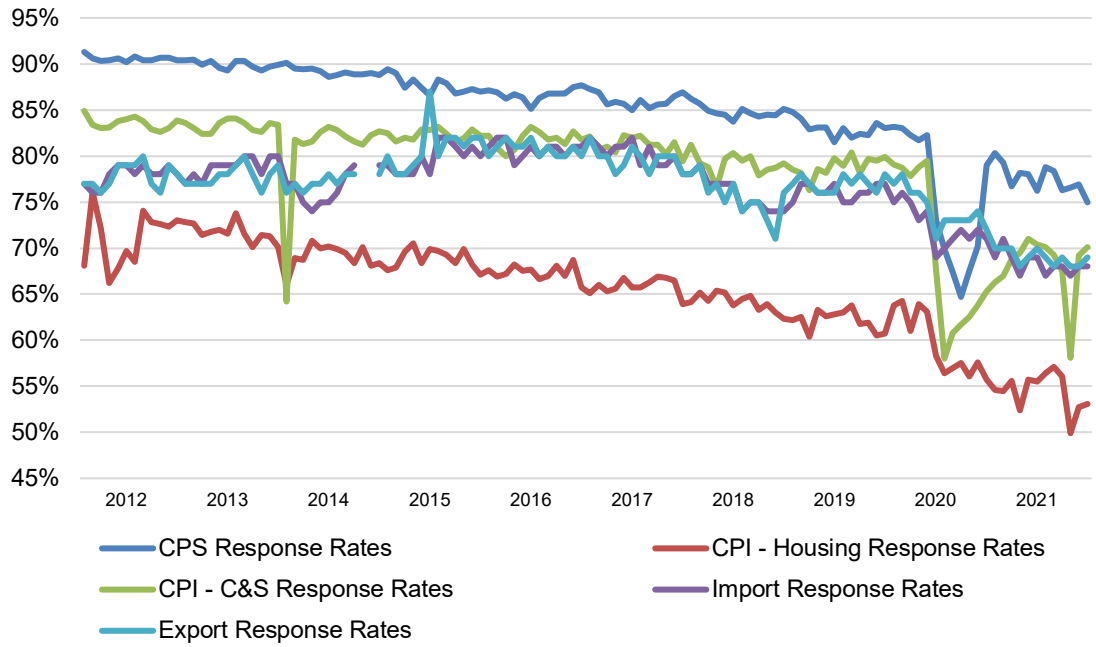
Figure 1: Three BLS Surveys Examined by the OIG



Source: OIG analysis of CPS, CPI, and MXPI survey methodologies

Overall, we found that response rates for the three surveys have declined over the past 10 years. From October 2011 to February 2020, response rates gradually decreased (see Figure 2). However, during the COVID-19 pandemic, response rates drastically dropped by as much as 21.5 percentage points, as in-person visits were suspended.

Figure 2: CPS, CPI, and MXPI Response Rates by Fiscal Year[2]



Source: OIG analysis of BLS survey response rates

BLS identified challenges associated with collecting CPS, CPI, and MXPI survey data. This included global events, such as the COVID-19 pandemic, which caused BLS to suspend in-person interviews. BLS also faced other issues, such as gatekeepers,[3] finding knowledgeable respondents, and respondents being unwilling to participate in surveys. The unwillingness of respondents to participate could be due to a variety of factors, such as the voluntary nature of the surveys, respondents' views that surveys are a burden, respondents having a general distrust of the government, or respondents having privacy/confidentiality concerns.

BLS depends on its ability to contact and persuade households and establishments to participate in its surveys. However, overall participation and response rates continue to decline. When a respondent cannot be contacted or refuses to participate in a survey, a nonresponse occurs for that sampled respondent. This nonresponse is called a unit nonresponse.

[2] The decline in CPI Commodities and Services (C&S) response rates in October 2013 was due to the Federal Government Shutdown. Data was not available for MXPI Import and Export in June and July of 2014.

[3] Gatekeepers are individuals or things that restrict access to the respondent or reporter for the establishment. Examples of gatekeepers include secretaries, administrative assistants, voicemail, email, smart doorbells, security cameras, locked gates, and locked buildings.

BLS also faces challenges with item nonresponse. This occurs when a respondent participates in a survey but does not know the answer to a particular question; refuses to answer a question, such as one that might be sensitive; or submits a late response. For example, BLS staff stated some households are uneasy about providing income information while some establishments are hesitant to provide the sales price of new vehicles.

To address these challenges, BLS utilized alternative source data to fill the data gap left by nonresponses. For example, BLS used J.D. Power Market Report[4] data for new vehicle prices, the U.S. Energy Information Administration's public data for the prices of all imports of crude petroleum products, and the U.S. Department of Agriculture's Farm Service Agency data for the price of most grain exports. Additionally, BLS trained data collectors in techniques to increase respondent participation and to collect responses for multiple surveys. BLS also continuously researched and implemented new ways to collect survey data, such as web, email, and video calls, and educated respondents on the importance responding to the surveys.

Despite BLS's efforts, response rates continued to decline, and nonresponse increased. Therefore, BLS used imputations[5] to mitigate item nonresponse when analyzing labor market activity and distributing essential economic information to the public.

RESULTS

BLS has taken actions to address the challenges posed by declining survey response rates by researching and implementing new ways to educate respondents, train staff, and collect survey data; however, response rates continued to decline. As rates declined, BLS increased the use of imputations, which could have introduced estimates that deviated from actual results. In addition, BLS published MXPI economic data that did not adhere to the criteria it developed to ensure the published data was representative of the population. BLS did not make either of these potential data limitations apparent to its survey users. As a result, end users who make critical decisions based on BLS economic data, including decisions on policy changes that affect the American people, could draw incorrect conclusions. We were unable to determine if declining survey response rates had an impact on BLS's survey costs.

[4] J.D. Power is an American data analytics, software, and consumer intelligence company.
[5] Imputation is the procedure for entering a value for a specific data item where the response is missing or unusable.

BLS COULD IMPROVE TRANSPARENCY REGARDING POTENTIAL DATA LIMITATIONS

As households and establishments responded less to surveys, BLS increased its use of imputations. BLS depends on its ability to contact and obtain households' and establishments' participation. However, overall participation and response rates continued to decline for both unit nonresponse and item nonresponse. Nonresponse of any kind results in missing values in BLS's data. Missing data can also be attributed to invalid data, seasonal items,[6] out-of-stock items,[7] substitutions,[8] quality adjustments,[9] and off-cycle collection.[10] If information remains missing from non-respondents, the economic information BLS disseminates may not represent the true values of what the survey was set out to measure.

What is...?

Imputation

Imputation is the procedure for entering a value for a specific data item where the response is missing or unusable.

*

Imputed values are derived from statistical analysis and reasoning and make use of the most relevant data available.

BLS used imputations to reduce the impact of missing data from item nonresponse,[11] which is a standard statistical practice among federal statistical agencies.[12] BLS also used several methods when determining imputed values for missing data. In some cases, BLS utilized the prior month's data to determine the entry for the missing data or utilized information from a record with similar characteristics. For CPS, CPI, and MXPI imputation methods, see Exhibit 1.

[6] Seasonal items are items available only at certain times of the year rather than year-round, such as snow skis and fresh tangelos. BLS uses special procedures when selecting and pricing items generally available only part of the year to ensure they are appropriately represented in the sample, and price changes are correctly included in the calculation.
[7] For items that are out of stock at the time responses are due, BLS imputes responses until the item becomes available again and respondents can provide actual prices.
[8] Substitution is when the selected item is no longer available for the good or service since the last time prices were collected, and the data collector selects a new item similar to the old item.
[9] Quality adjustment is when the selected item has changes in the quality or quantity (for example, a container of orange juice containing 59 ounces instead of 64 ounces) of the good or service since the last time prices were collected, and the data collector selects a new item similar to the old item.
[10] Off-cycle collection is any schedule less frequent than monthly and can be bimonthly, quarterly, biannual, or annual. Off-cycle collection is offered in limited cases to reduce respondent burden or when items are traded seasonally.
[11] BLS did not use imputations for unit nonresponses.
[12] We verified all 13 principal federal statistical agencies used imputation methods in at least one of their surveys.

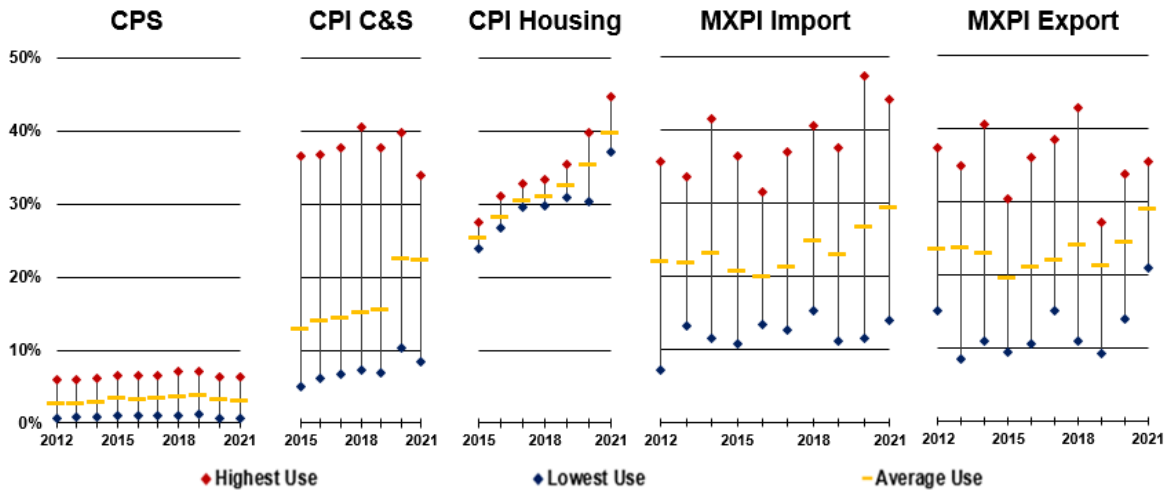
We reviewed the average use of imputations in CPS, CPI, and MXPI key data[13] and compared it to survey response rates over a 10-year period (FY 2012 to FY 2021).[14] Our analysis generally showed that, as households and establishments responded less, BLS increased its use of imputations (see Exhibit 2). For example, from FY 2015 to FY 2021, CPI Housing responses decreased from 69 percent to 55 percent while imputations increased from 25 percent to 40 percent.

We examined key data from the three surveys to determine how often BLS used imputations to fill in for missing data in each survey from FY 2012 to FY 2021. Our analysis[15] showed the CPS program used fewer imputations compared to CPI and MXPI. CPI used imputations up to 50 percent of the time while MXPI used imputations up to 63 percent of the time to fill in for missing data due to nonresponse, seasonal items, out-of-stock items, substitutions, quality adjustments, and off-cycle collection.

We also examined key data from the three surveys to determine how often BLS used imputations to fill in for missing data solely due to nonresponse. Figure 3 shows the lowest and highest imputation rates for the 10 CPS estimates, 9 CPI C&S indexes, 1 CPI Housing index, 28 MXPI Import Indexes, and 25 MXPI Export Indexes we reviewed for each year, as well as the average of these estimates/indexes for each year. To address nonresponse, CPI used imputations between 5 and 45 percent of the time, while MXPI used imputations between 7 and 47 percent of the time.

[13] Key data are survey-specific estimates or indexes that are commonly published within BLS's news releases. For a detailed explanation on the data the OIG analyzed, see Appendix A.
[14] Prior to 2015, CPI archived its data. Therefore, we were only able to analyze FY 2015 to FY 2021.
[15] We calculated a monthly imputation rate for each index by dividing the number of times BLS used an imputed price by the number of quotes eligible (which included responses and imputed prices). Then we averaged the monthly imputation rate for each index over the course of a fiscal year and identified the lowest and highest points (identified by blue and red dots in Figure 3). To determine the average imputation rate for each survey (identified by the yellow dash in Figure 3), we averaged the monthly imputation rates for each index over the course of a fiscal year.

Figure 3: Use of Imputation by Survey Due to Nonresponse



Source: OIG's analysis of BLS's imputations

Missing data can impact the quality of the survey data, potentially producing bias within estimates and reducing the representativeness of the population. Imputations preserve the survey data by replacing missing data with an estimated value based on other available information. Although imputations are used to reduce bias from missing data, imputation methods are imperfect and can introduce nonresponse bias. According to a 2001 MXPI study[16] on the consequences of using different imputation methods, some imputation is better than no imputation; however, certain methods introduce some inconsistencies into the data. Imputations are only advantageous if the imputed values are close to the true values.

What is...?

Nonresponse Bias

It is the idea that people not responding to the survey are systematically different from those who do, which skews the results.

*

It is when characteristics or prices of non-respondents differ from the characteristics or prices of respondents.

[16] Feenstra, Robert and Erwin Diewert. 2001. Imputation and Price Indexes: Theory and Evidence from the International Price Program. Bureau of Labor Statistics. https://www.bls.gov/osmr/research-papers/2001/pdf/ec010030.pdf.

BLS DID NOT ANALYZE THE IMPACT INCREASED IMPUTATIONS HAD ON ITS ECONOMIC INFORMATION

When explaining BLS's procedures for evaluating data quality, BLS officials did not emphasize evaluating nonresponse errors and the impact increased imputations had on its data. BLS officials stated the agency focused on measuring standard errors[17] by publishing variance results. However, according to BLS, nonresponse errors cannot be identified from just evaluating the variance, as an index could only have a small variation but still include bias.

Although OMB does not have specific criteria requiring agencies to evaluate imputations, OMB Standard 1.3 states nonresponse bias analyses must be conducted when unit or item response rates, or other factors, suggest the potential for bias to occur. Further, OMB provided federal agencies additional guidance concerning nonresponse bias and evaluating imputations.

For example, OMB's Guidance on Agency Survey and Statistical Information Collections states agencies need to consider the risk of nonresponse bias at the item level. At a minimum, agencies should plan to conduct nonresponse bias analyses if an item missing rate exceeds 30 percent, but agencies should also consider lower thresholds for key variables. According to OMB Statistical Working Paper 31, it is important for agencies to research the effects of imputation methods because imputation for item nonresponse can affect the quality of the estimates from a survey.

When researching how other principal federal statistical agencies determine the impact of imputations, we found federal studies that assessed imputations by conducting simulation testing to determine if imputed values were similar to true values. For example, a 2017 imputation study[18] performed on CPS found that, for respondents who were employed, responses could be imputed from 10 to 20 percent without appreciable bias, while responses for respondents who were not employed could be imputed up to 10 percent with little bias. However, BLS has not conducted a nonresponse bias analysis or imputation assessment to determine the impact its increased use of imputed data had on the CPI and MXPI key indexes.

[17] The standard error measures the confidence interval for percent changes in the indexes. Confidence intervals determine if an index change is significantly different from zero.
[18] This study used CPS data from 2010 to 2013. For more information, see BLS, "Using imputation to reduce the cost of survey collection in the Current Population Survey" (November 2017), available at: https://www.bls.gov/osmr/research-papers/2017/pdf/st170180.pdf.

BLS DID NOT INFORM USERS OF THE EXTENT IT USED IMPUTATIONS IN THE CPI AND MXPI INDEXES

Although BLS published resources that describe the various methods used for imputations, BLS did not inform users of the extent to which it used imputations. For example, BLS described its methods for imputations for public awareness in its Handbook of Methods for CPI and MXPI and within its Technical Paper for CPS.[19] In addition, the CPS program's publicly available data dictionary cautioned users when the family income variable had imputed values of approximately 20 percent. Further, during the COVID-19 pandemic, BLS's CPI and MXPI programs did increase transparency by reporting the impact the pandemic had on response rates.[20] However, the agency did not make users aware of how much BLS used imputed data in the CPI and MXPI indexes. According to BLS officials, the imputation rate is roughly the inverse of the response rate; even so, survey users would have to infer this relationship. Furthermore, BLS stopped reporting this information after January 2022.

According to BLS officials, OMB does not have specific criteria requiring agencies to inform users of the amount of imputations used. Although OMB does not have specific criteria, OMB issued guidelines[21] as required in response to the Information Quality Act of 2001[22] for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies. These guidelines direct agencies to ensure information is presented in an accurate, clear, complete, and unbiased manner. In addition, for agencies responsible for disseminating influential scientific, financial, or statistical information, OMB requires agencies to develop guidelines that include a high

[19] CPI Handbook of Methods, available at: https://www.bls.gov/opub/hom/cpi/home.htm; MXPI Handbook of Methods, available at: https://www.bls.gov/opub/hom/ipp/; and "Design and Methodology: Current Population Survey—America's Source for Labor Force Data," Technical Paper 77 (October 2019), available at: https://www2.census.gov/programs-surveys/cps/methodology/CPS-Tech-Paper-77.pdf

[20] BLS, "Effects of COVID-19 Pandemic and Response on the Consumer Price Index" (March 2020 to January 2022), available at: https://www.bls.gov/covid19/effects-of-covid-19-pandemic-on-consumer-price-index.htm; BLS, "Effects of COVID-19 Pandemic and Response on the U.S. Import and Export Price Indexes" (April 2020 to December 2021), available at: https://www.bls.gov/covid19/effects-of-covid-19-pandemic-on-import-export-price-indexes.htm

[21] OMB, Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies (February 22, 2002), available at: https://www.federalregister.gov/documents/2002/02/22/R2-59/guidelines-for-ensuring-and-maximizing-the-quality-objectivity-utility-and-integrity-of-information

[22] Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554), known as the Information Quality Act, available at: https://www.nrc.gov/public-involve/info-quality/pl106-554.pdf

degree of transparency about data and methods to facilitate the reproducibility of such information by qualified third parties.

Further, OMB Standard 7.3 states agencies must produce survey documentation that includes those materials necessary to understand how to properly analyze data from each survey, as well as the information necessary to replicate and evaluate each survey's results. In addition, this standard recommends survey documentation include nonresponse bias and imputation[23] analyses.

We also identified best practices implemented by principal federal statistical agencies regarding transparency of the amount of imputations used. We found the Census Bureau[24] cautioned users when imputed values made up 20 percent of the CPS program's estimates and informed users of how many imputations were used for all items in the American Community Survey. In addition, the National Center for Education Statistics has a policy[25] for its surveys to report the range of the amount of imputations used for items, as well as the amount of imputations for items with a response rate less than 70 percent.

According to the September 2020 report by the Federal Committee on Statistical Methodology,[26] effective understanding of data quality is essential for public officials, private businesses, and the public to make data-driven decisions. Without making transparent the amount of imputations used in the disseminated data, BLS did not provide users of the CPI and MXPI survey information with complete information necessary to make informed decisions.

There are a variety of errors[27] that could be introduced in survey data. Because this report focused on imputations and nonresponse bias, we did not determine the reliability of the economic information published by BLS for CPS, CPI, and

[23] OMB Guideline 7.3.1 states "survey system documentation includes all information necessary to analyze the data properly" including a "description of all editing and imputation methods applied to the data (including evaluations of the methods) and how to remove imputed values from the data."
[24] The CPS program is sponsored jointly by the Department of Commerce's Census Bureau and BLS. The Census Bureau made the CPS data and data dictionary available on its website.
[25] National Center for Education Statistics, "2012 Revision of NCES Statistical Standards: Final," available at: http://nces.ed.gov/statprog/2012
[26] Federal Committee on Statistical Methodology, "A Framework for Data Quality," FCSM-20-04 (September 2020), available at: https://nces.ed.gov/fcsm/pdf/FCSM.20.04_A_Framework_for_Data_Quality.pdf
[27] There are two types of total survey errors—sampling error and nonsampling error—that could impact economic information published. The sampling error occurs when all members of the frame population are not measured and is commonly measured by its standard error (square root of its variance). Nonsampling errors can arise at any stage of a survey, and they can affect both bias and variance, but the principal concern is usually with introducing bias into a survey. Nonsampling errors include response error, nonresponse error, coverage error, processing error, and estimation error.

MXPI. However, users should be made aware of potential data limitations. Without a nonresponse bias analysis or imputation assessment, BLS may not know the impact increased imputations had on its economic information.

IN CALENDAR YEAR 2021, BLS BYPASSED MXPI PROGRAM CONTROLS MEANT TO ENSURE INFORMATION RELIABILITY

BLS management has developed criteria with the intent to ensure the reliability of its economic information prior to publication. Each BLS program has different publication criteria.

We found that, during the COVID-19 pandemic, BLS bypassed MXPI's controls meant to ensure the reliability of its economic information in 10 percent of its published indexes. Generally, during the 10-year period reviewed, the number of instances where published indexes did not meet MXPI's publication criteria was minimal. However, in Calendar Year (CY) 2021, we determined BLS published 18 of 189 MXPI indexes (10 percent) that did not meet the coverage ratio requirement of its publication criteria. Although only 10 percent of MXPI indexes published in 2021 did not meet the publication criteria, the overall reliability of the data may still be impacted. Therefore, it is imperative for BLS to disclose to the public the instances when exceptions are taken.

We reviewed publication criteria and survey data for the CPS, CPI, and MXPI programs. We compared the data to the information BLS published in its news releases from FY 2012 to FY 2021[28] to determine if the agency adhered to its criteria when publishing key economic information. We found the CPS and CPI programs published information that met the criteria; however, the MXPI program published information that did not meet publication criteria.

According to MXPI publication criteria, in order to be publishable, the trade dollar value for the index has to be at least $4.754 billion, the average coverage ratio for an index published the prior year could not fall below 20 percent, and the average coverage ratio for an unpublished index from the prior year had to be at least 25 percent.[29] These criteria ensure the published data accurately reflects

[28] Our original scope period was from FY 2012 to FY 2021; however, CPI archived its data and only had data from January 2015 to present day available, and MXPI used calendar year information as part of MXPI's standard annual publication review process.
[29] Although MXPI had six factors in its publication criteria, only two factors (trade dollar value and coverage ratio) related to being representative of the population. These are the two factors we used for our analysis.

what the population would say. If the data is not representative of the population, results could be distorted, leading users to draw incorrect conclusions.

BLS WAS NOT TRANSPARENT WITH EXCEPTIONS TO MXPI PUBLICATION CRITERIA

While BLS made its CPS and CPI publication criteria available to its users, the agency only made one of the two applicable MXPI publication criteria available to survey users. In addition, BLS only discussed one exception to the MXPI publication criteria, and this exception only applied to 2 of the 18 instances (11 percent) in which BLS did not adhere to its publication criteria.

OMB Standard 3.5 states agencies must evaluate the quality of the data and make the evaluation public (through technical notes and documentation included in reports of results or through a separate report) to allow users to interpret results of analyses. Publication criteria assure the public of the reliability of BLS's economic information.

BLS is the only agency to produce MXPI information. Therefore, when BLS evaluated its data, the agency focused on the importance of the data to its users. According to BLS officials, BLS decided to continue publication for some indexes that had sufficient prices, despite not meeting the coverage ratio. It was BLS's expectation that the coverage ratio would improve when the pandemic was over. Regardless of whether the coverage ratio improved once the pandemic was over, users should be informed of the data limitation so they are able to better interpret the economic information and make sound judgments.

Because BLS's publication criteria process is only one part of its evaluation of the quality of its data, we did not make a determination on the reliability of MXPI economic information from CY 2012 to CY 2021. By not adhering to MXPI publication criteria, BLS published 10 percent of CY 2021 data that was not representative of the population. Because users were generally unaware of exceptions made to MXPI's publication criteria, users could have drawn incorrect conclusions.

OIG'S RECOMMENDATIONS

We recommend the Acting Commissioner for the Bureau of Labor Statistics:

1. Perform a nonresponse bias study or imputation assessment to determine if bias exists in the Consumer Price Index and Import and Export Price Index economic information due to the increased use of imputations.

2. Based on the nonresponse bias study or imputation assessment, establish, as applicable, a threshold at which the Consumer Price Index and Import and Export Price Index must publicly disclose the amount of imputations used. Update program policies and procedures to include the established threshold and document how to publicly disclose when the threshold is met.

3. Determine if the Calendar Year 2021 Import and Export Price Index coverage ratio improved and, if not, determine the appropriate course of action.

4. Update the Import and Export Price Index Handbook of Methods to include the publication criteria that ensure the index is representative of the population as well as what exceptions can be made.

OIG ANALYSIS OF MANAGEMENT'S COMMENTS

On September 29, 2023, BLS provided its formal response to our draft performance audit report and recommendations. The agency agreed to take appropriate action on all four recommendations; however, BLS raised concerns with our conclusions and recommendations. We find the tone of BLS's response discouraging, as BLS repeatedly chose, in part, to question the objective used by the OIG. We believe BLS's focus should be on improving the transparency and clarity surrounding the use of imputations and published survey data. BLS's response did not change the report's conclusions.

BLS expressed concerns that the OIG strayed from the objective provided in its 2021 Audit Workplan. The OIG's Audit Workplan is developed at the beginning of each fiscal year and includes a focus area rather than a specific audit objective for each planned project. Prior to project initiation, the audit team develops a specific project objective that generally aligns with the intended focus area but is further clarified based on additional research, including current events impacting the program that may have transpired since the time of the Audit Workplan's

publication. When we initiated this project, we clearly communicated our objective in our notification letter to BLS, and we further relayed this objective during our entrance conference with BLS officials. Our notification letter stated this performance audit's objective was to determine the following:

> How has BLS addressed challenges posed by declining statistical survey response rates, and what was the impact on the reliability and costs of economic information developed by BLS?[30]

Our audit work and analyses were consistent with the objective communicated to BLS in the notification letter and during the entrance conference.

BLS disagreed with the OIG's statement that the agency had not conducted a nonresponse bias analysis or imputation assessment for MXPI, stating a nonresponse bias study was conducted on MXPI in 2009. We acknowledge BLS did conduct a nonresponse bias study on MXPI in 2009; however, that study was conducted 14 years ago on data from 2003 to 2008. Therefore, both the study and data were outside of our 10-year audit scope and not included in our report. Further, the 2009 study did not conclude on the impact the increased use of imputations had on MXPI's economic information as we recommended in this report. BLS agreed a more recent study may prove useful and agreed to the OIG's recommendation to conduct an assessment.

BLS also disagreed with the OIG's statement that data users were not made aware of how much BLS used imputed data. BLS highlighted its increased transparency during the COVID-19 pandemic by stating it reported monthly updates regarding the impact of the pandemic on response rates. BLS noted response rates are used as a common measure of quality, and an imputation rate is roughly equivalent to the inverse of the response rates, meaning, for example, as the response rate decreases the imputation rate would increase. We acknowledged BLS's increased transparency during the COVID-19 pandemic in our report; however, BLS's monthly updates did not include all MXPI key indexes. Additionally, those updates were only published from April 2020 to December 2021. Further, the additional information provided by BLS, such as the Handbook of Methods, discussed imputation methodology but did not include information regarding the amount of imputations used. Therefore, we maintain our conclusion that users were not aware of how much BLS used imputed data in the CPI and MXPI key indexes.

[30] Audit notification letter on the Audit of Bureau of Labor Statistics Survey Response Rates, Project No. 17-P21-002-11-001 (March 11, 2021), available at: https://www.oig.dol.gov/public/oaprojects/BLS%20Survey%20Response%20Rates%20-%20Engagement%20Ltr_031121.pdf

BLS also stated that the report's recommendation did not align with OMB's statistical policy directives. We acknowledge OMB does not have a standard specifically requiring agencies to report how much imputed data an agency uses. However, OMB requires agencies to develop guidelines that include a high degree of transparency. Each OMB standard includes accompanying guidelines that present recommended best practices to fulfill the goals of the standards, including evaluating potential sources of error such as imputation error. Additionally, as part of our audit, we performed benchmarking with other federal statistical programs to identify best practices for evaluating and reporting imputations. BLS agreed to take steps to address the OIG's recommendation by engaging with experts and OMB on the use of imputation thresholds and being transparent with the public.

Finally, BLS stated the OIG implied that BLS knowingly and intentionally published data that were unreliable or below the high standard of quality required for publication or both. However, the OIG acknowledged in our report that BLS's publication criteria process is only part of its evaluation of the quality of its data, and specifically did not question the reliability of MXPI's published data. Instead, we focused our conclusions and recommendations on increased transparency. BLS ultimately agreed to take action on recommendations associated with our conclusions and has already implemented efforts to address low coverage rates.

We will work with BLS to ensure corrective actions taken meet the intent of these four open recommendations.

BLS's response to the draft report is included in its entirety in Appendix B.

We appreciate the cooperation and courtesies BLS extended us during this audit. OIG personnel who made major contributions to this report are listed in Appendix C.

Carolyn R. Hantz
Assistant Inspector General for Audit

EXHIBIT 1: IMPUTATION METHODS

For the CPS survey, there are three different imputation methods: (1) relational imputation, (2) longitudinal edits, and (3) hot deck imputation. Relational imputation infers the missing value from other characteristics on the person's record or within the household. Longitudinal edits utilize the prior month's data to determine the entry for the missing data, which is used in most of the labor force edits. Hot deck imputation utilizes information from a record with similar characteristics.

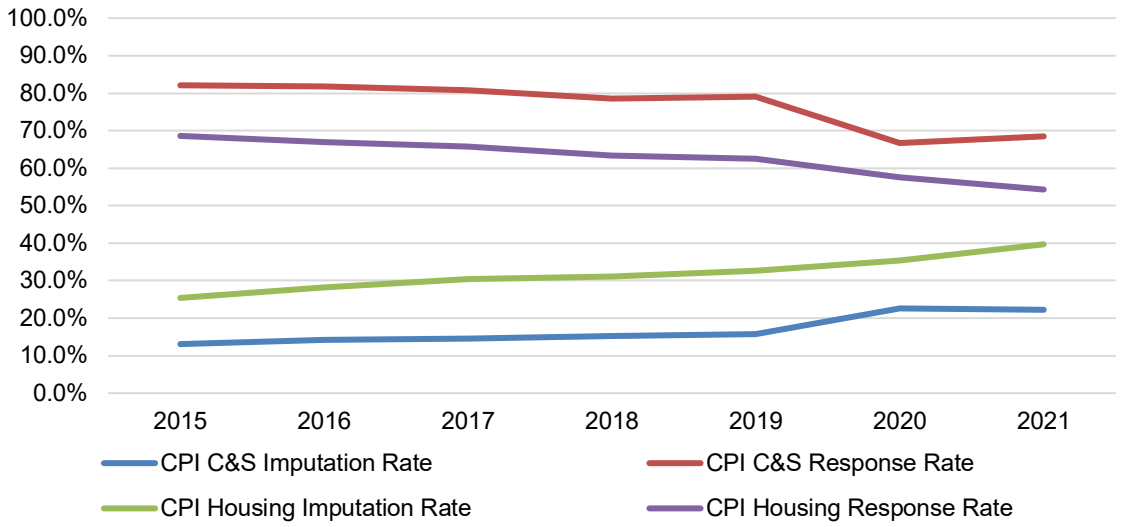
For the CPI Housing survey, there are two imputation methods: (1) vacancy imputation and (2) non-interview imputation. The vacancy imputation method assumes that, after an initial lease period, expected rents change at a steady rate until the old tenant moves out of the unit. When there is a change in occupants or a unit becomes vacant, the rent is assumed to jump at some rate. In markets with generally rising rents, this jump rate is usually greater than the average rate of change for occupied units. The non-interview imputation method imputes a price by using the average rent change of other housing units in their respective category.

For the CPI C&S survey, there are three imputation methods: (1) cell-relative imputation, (2) class-mean imputation, and (3) carry-forward. Cell-relative imputation utilizes the average price of all similar items in 1 month for the same geographic area if there is no reason to believe the price change is different than similar items. Class-mean imputation is employed in replacement situations and utilizes the price change closely associated with the annual or periodic introduction of new lines or models for many items. Carry-forward utilizes the same price in the previous month.

For the MXPI survey, there are two imputation methods: (1) cell mean imputation and (2) linear interpolation. Cell mean imputation utilizes the average monthly price change of items that have usable prices at the most detailed level. For example, there may be five items at one level, but prices for only two of the five are received. An average percent change would then be created based on the two prices received, and the other three items would take the change of the two. Linear interpolation utilizes the price for the item in periods before and after the periods where the price is not reported to linearly interpolate the middle value or values.

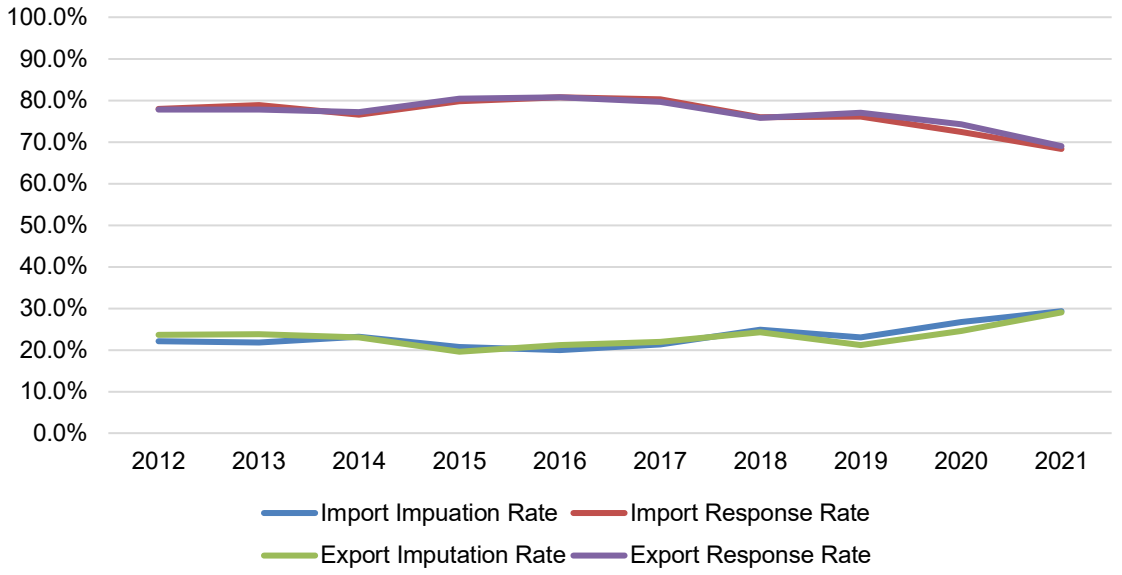
EXHIBIT 2: CORRELATION BETWEEN RESPONSE RATES AND THE USE OF IMPUTATIONS

Figure 4: Correlation between Response Rate and Imputation Use for CPI



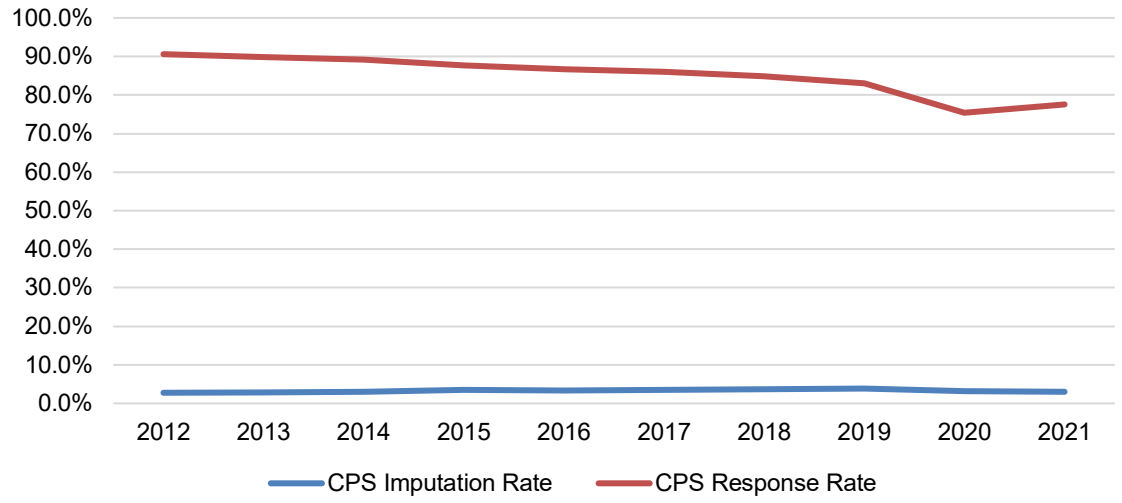
Source: The OIG's analysis of CPI response rates and imputations.

Figure 5: Correlation between Response Rate and Imputation Use for MXPI



Source: The OIG's analysis of MXPI response rates and imputations.

Figure 6: Correlation between Response Rate and Imputation Use for CPS



Source: The OIG's analysis of CPS response rates and imputations.

APPENDIX A: SCOPE AND METHODOLOGY

SCOPE

This audit covered BLS's CPS, CPI, and MXPI survey methodologies, specifically focusing on data collection, nonresponse adjustment, and the evaluation of data quality as well as the costs to collect its survey data. Our analyses generally covered the period of October 2011 to September 2021. However, CPI archived its data from before 2015; therefore, we only analyzed CPI data from January 2015 to September 2021. Additionally, MXPI used calendar year information when evaluating the publication criteria; therefore, we analyzed MXPI published data from January 2012 to September 2021. Our work was generally conducted remotely, with CPI and MXPI data analyses performed at BLS headquarters in Washington, DC.

METHODOLOGY

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

To answer our audit objective, we did the following:

- interviewed BLS senior leadership; CPS, CPI, and MXPI program officials; Office of Field Operations officials; and Office of Survey Methods Research officials;
- reviewed public laws and OMB policies for federal statistical agencies;
- reviewed BLS's quality guidelines, survey methodologies, and publication criteria for CPS, CPI, and MXPI;
- surveyed CPI and MXPI data collectors and CPS, CPI, and MXPI supervisors to identify challenges associated with declining survey response rates;
- analyzed survey response rate data for CPS and MXPI from FY 2012 to FY 2021 and CPI from August 2016 to September 2021;

- analyzed imputation data for CPS and MXPI from FY 2012 to FY 2021 and CPI from January 2015 to September 2021;

- analyzed publication data for CPS from FY 2012 to FY 2021, MXPI from CY 2012 to CY 2021, and CPI from January 2015 to September 2021;

- interviewed four federal statistical agencies: the U.S. Department of Commerce's Census Bureau and Bureau of Economic Analysis and the U.S. Department of Agriculture's National Agricultural Statistics Service and Economic Research Service; and

- reviewed studies and working papers on imputation methods and nonresponse.

To perform our audit, we selected a non-statistical, judgmental sample of 3 of 15 BLS surveys for more in-depth analysis. To determine which surveys would be selected, we performed a risk assessment using several risk factors. Specifically, we assessed survey costs, users of the survey data, the Principal Federal Economic Indicators each survey contributed to, agency responsibilities, the various collection methods, and the overall response rate. Based on this analysis, we selected the Current Population Survey, Consumer Price Index, and Import and Export Price Indexes.

Because there are multiple estimates and indexes within these three surveys, we reviewed key estimates and indexes. For CPS, we considered the key data the bold topics discussed in the Household survey data in the Employment Situation news release. For CPI, we considered the key indexes: the eight major indexes and one all items index within the C&S survey, and the 1 major index within the Housing survey. For MXPI, we considered the key data for the parent indexes within Table 1 through Table 6, which had 28 import indexes and 25 export indexes, totaling 53 key data.

To determine the impact declining survey response rates had on BLS's survey costs, we first reviewed the operating costs by line item, including personnel compensation, personnel benefits, other contractual services, travel, rent and utilities, supplies and materials, equipment, etc. for each of the three sampled surveys from FY 2012 to FY 2021. We also reviewed costs by cost center. Finally, we reviewed BLS staff time utilization reports for CPI from FY 2018 to FY 2021 and MXPI from FY 2012 to FY 2021 to determine if the staff hours spent collecting survey data had increased. Ultimately, with the information provided, we were unable to identify a correlation between costs and declining survey response rates.

RELIABILITY ASSESSMENT

We assessed the reliability of CPS, CPI, and MXPI response rates and CPS and CPI imputations by: (1) performing electronic testing, (2) reviewing existing information about the data and the system that produced them, and (3) interviewing agency officials knowledgeable about the data. The audit team also corroborated response rates against public reports. We conducted an analysis to determine if BLS's information was sufficiently reliable to utilize for this audit; however, we did not opine on the overall reliability of economic information published by BLS. We determined that the CPS, CPI, and MXPI response rate data and CPS and CPI imputation data were sufficiently reliable for the purposes of this report.

For MXPI imputation data, there was no information reported to the public. Therefore, we obtained the methodology to calculate the number of imputations. For FY 2012 to FY 2021, we calculated the number of imputations for each index and verified these totals to BLS internally run reports. We determined MXPI imputation data was sufficiently reliable for the purposes of this report.

In addition, BLS provided publication working files for CPS from FY 2012 to FY 2021, CPI from January 2015 to September 2021, and MXPI from CY 2012 to CY 2021. Because this information was not public, we obtained methodologies to calculate each publication criteria for CPI and MXPI. We calculated each publication criteria and verified these totals to the publication working papers provided to us.

For CPI, we found no differences; therefore, we determined that the publication working files were reliable and complete. For MXPI, we found differences due to the snapshots of data showing the final repricing instead of a snapshot at the time BLS reviewed the data. Since MXPI's working files are the best data to ensure the agency's publication criteria process works as intended, we used BLS's working files to report our finding. Because CPS working files only showed the series and the number of times suppressed for FY 2012 to FY 2021, we could not recalculate and verify with the publication working papers. Since CPS's working files are the best data to ensure the agency's publication criteria process works as intended, we used BLS's working files to report our finding.

INTERNAL CONTROLS

In planning and performing our audit, we considered BLS's internal controls relevant to our audit objective by obtaining an understanding of those controls through interviews and reviews of policies and procedures. We assessed the following internal control areas relevant to the audit objective: Control

Environment, Control Activities, Agency Risk Assessment, Information and Communication, and Monitoring. Our consideration of internal controls for administering CPS, CPI, and MXPI survey methodologies would not necessarily disclose all matters that might be reportable conditions. Because of inherent limitations in internal controls, or misstatements, noncompliance may occur and not be detected.

CRITERIA

- United States Code Title 29 - Labor, Chapter 1 Labor Statistics
- OMB Standards and Guidelines for Statistical Surveys, September 2006
- OMB Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies, February 2002

THIRD PARTY STUDIES REVIEWED FOR THIS AUDIT

The following is a complete list of studies and articles reviewed for this audit:

1. Dixon, John. 2017. *Using imputation to reduce the cost of survey collection in the Current Population Survey*. Bureau of Labor Statistics. https://www.bls.gov/osmr/research-papers/2017/pdf/st170180.pdf.

2. Feenstra, Robert and Erwin Diewert. 2001. *Imputation and Price Indexes: Theory and Evidence from the International Price Program*. Bureau of Labor Statistics. https://www.bls.gov/osmr/research-papers/2001/pdf/ec010030.pdf.

3. Fetter, Matt. 2001. *Mass Imputation of Agricultural Economic Data Missing by Design – A Simulation Study of Two Regression Based Techniques*. U.S. Department of Agriculture. https://nces.ed.gov/FCSM/pdf/2001FCSM_Fetter.pdf.

4. Habiger, Joshua, Michael Robbins, and Sujit Ghosh. 2010. *An Assessment of Imputation Methods for the USDA's Agricultural Resource Management Survey*. http://www.asasrms.org/Proceedings/y2010/Files/306412_56428.pdf.

5. Izsak, Yoel and Monica Moleres. 2022. *A Simulation Study of Multiple Imputation Methods for the Producer Price Index*. Bureau of Labor Statistics. https://www.bls.gov/osmr/research-papers/2022/pdf/st220020.pdf.

6. Terrie, Larkin. 2018. *Assessing the Automated Imputation of Missing and Erroneous Survey Data: A Simulation-Based Approach*. Bureau of Economic Analysis. https://www.bea.gov/system/files/papers/WP2018-5.pdf.

APPENDIX B: AGENCY'S RESPONSE TO THE REPORT

U.S. Department of Labor

Bureau of Labor Statistics
2 Massachusetts Ave. N.E.
Washington, D.C. 20212

MEMORANDUM FOR: CAROLYN R. HANTZ
Assistant Inspector General for Audit
Office of Inspector General

FROM : WILLIAM J. WIATROWSKI
Acting Commissioner

William Wiatrowski
Digitally signed by William Wiatrowski
Date: 2023.09.29 16:16:28 -04'00'

SUBJECT : Management Response to Office of Inspector General Draft Report No. 17-001-23-11-001, *BLS Could Do More to Identify Data Limitation and Increase Transparency*

This response addresses the Office of Inspector General (OIG) Report Number 17-001-23-11-001, "*BLS Could Do More to Identify Data Limitation and Increase Transparency.*" The Bureau of Labor Statistics (BLS) appreciates the opportunity to review and provide comments.

In 2021, the OIG issued its Audit Workplan that stated the following objective for this audit:

> *This audit will focus on how efficiently and effectively BLS is able to obtain data necessary to produce the economic information it is required to produce, and if there are other sources to obtain the necessary data.*

The BLS believes that the work and analyses conducted during this audit, as well as the Report, strayed from the overall objective stated above. The report acknowledges but does not consider BLS' efforts to obtain data in an era of declining survey response. Instead, the report focuses on the impact declining response had on the reliability of economic information developed by BLS. It suggests a lack of transparency regarding data limitations and makes recommendations that do not align with the Office of Management and Budget (OMB) Statistical Policy Directives.

OIG states in its report that they found response rates for the three surveys have declined over the past 10 years. This information is a known fact that was communicated to the OIG at the beginning of the audit and is now confirmed by the audit. Additionally, BLS publishes response rate information on our public website. We appreciate OIG's recognition that the decline in response to government surveys is not unique to BLS. As a statistical agency, this matter is at the forefront of our risk management and planning. We make every effort to mitigate this risk and inform the public of the data limitations we may encounter as a result.

Concerns about the audit and report

We have three primary concerns with the information included in the report: (1) some statements are not consistent with the evidence that BLS provided the OIG during audit fieldwork, (2) OIG implies that BLS misrepresented facts and analyses, and (3) the focus of and recommendations in the report are not aligned with the OMB statistical policy directives that guide BLS statistical programs.

(1) Some statements in the report are not consistent with the information that BLS provided the OIG during audit fieldwork.

- On page 9, OIG states that BLS has not conducted a nonresponse bias analysis or imputation assessment for the U.S. Import and Export Price Indexes (MXPI). According to BLS quality review information that was provided to the OIG during fieldwork, a nonresponse bias study was completed in 2009 for MXPI. While a more recent study may prove useful, OIG's statement that BLS has not conducted a nonresponse study is not accurate for MXPI.
- On page 10, OIG states that BLS did not inform users of the extent that imputations were used in the Consumer Price Index (CPI) and MPXI. The BLS worked diligently to inform the public about the effect of the pandemic on data collection and data quality. The BLS respectfully disagrees with the OIG's statement that data users were not made aware of how much BLS used imputed data. The BLS shared these outreach efforts with the OIG during the audit fieldwork.
    - During the COVID-19 pandemic, BLS provided monthly updates on the impact of response rates on published indexes. These updates are archived and accessible from the BLS Website. From this webpage, the public can access the special monthly reports prepared by all BLS survey programs during each month that data collection and data quality were impacted by the pandemic. Specifically, regarding the CPI and the MXPI programs, monthly reports were published from March 2020 to January 2022 for CPI and April 2020 to December 2021 for MXPI. Furthermore, notices were included in each news release directing the public to these reports. These reports present information on response rates for major price indexes, comparing them to previous periods before and during the pandemic. The additional outreach and analyses were provided to inform the public on the impact that lower response rates have on the quality of the price indexes.
    - Detailed explanations on how CPI and MXPI impute missing price data due to nonresponse is described in the BLS Handbook of Methods. During the pandemic, response rates were used as the common measure of quality, and the average knowledgeable data user who accessed this information understood that the imputation rate is roughly equivalent to the inverse of response rates.
    - BLS published, and continues to publish, information on imputation for the CPI. The OIG was made aware of this information during the audit fieldwork.

(2) OIG implies that BLS misrepresented facts and analyses.

- On page 2, OIG states, "Increased transparency with regard to potential data limitations is needed to ensure BLS survey users draw correct conclusions from the data when making critical decisions, such as policy changes that affect the American people." BLS agrees that transparency and limitations with data should be communicated to data users. However, BLS disagrees with the OIG's assumption that BLS is not communicating potential data limitations with the public. As described above, with evidence previously provided to OIG, and in the BLS Handbook of Methods, BLS provides ample communication regarding data limitations to data users.
- On page 12, OIG states that BLS "bypassed […] controls meant to ensure information reliability." BLS disagrees with this characterization and considers this statement misleading. The statement implies that BLS knowingly and intentionally published data that were unreliable and/or below the high standard of quality required for publication. In this report, the OIG maintains that these guidelines are precise cutoffs and that BLS 'bypassed controls' in the publication of some indexes. This statement is inconsistent with the evidence that BLS provided to the OIG, some of which is highlighted below.
- On page 12, OIG states that "the MXPI program published information that did not meet publication criteria." The report draws attention to 18 price indexes published in 2021 that did not meet what the OIG defines as criteria. However, the OIG application of the word criteria is a misrepresentation of the steps taken and guidelines used to evaluate publishability of MXPIs. The mischaracterization is based on the meaning of the word 'criteria,' which was used by BLS in response to an initial round of questions. BLS clarified on subsequent occasions that these criteria are guidelines that contribute to the publication decision, but they are not the only determinants of publishability. BLS directed OIG to the BLS website where the discussion of guidelines and publishability are described in the MXPI chapter of the Handbook of Methods.
- On page 12, OIG states "…in Calendar Year (CY) 2021, we determined BLS published 18 of 189 MXPI indexes (10 percent) that did not meet the coverage ratio requirement of its publication criteria." BLS stands by the quality of the indexes that were published during the period and for the indexes that the OIG considers as not having adhered to publication criteria. BLS agrees that 2021 was a year during which response rates were at historic lows because of the pandemic. These unprecedented times required thoughtful consideration of the need to provide data to the public while also explaining the limitations of the data. During 2021, the MXPI program prepared monthly reports regarding the quality of indexes. These reports were shared with the OIG. In 2021, the MXPI program closely scrutinized the publishability of each index due to a loss of prices data during the pandemic. A section regarding publishability was included in each monthly report listing which indexes were suppressed due to poor quality. An example of these reports that were prepared from April 2021 until December 2021 is below:

  https://www.bls.gov/covid19/import-export-price-indexes-covid19-impacts-january-2021.htm

  Index Suppression

  Publication quality is evaluated monthly and annually. Each month, the number of respondents contacted and prices requested varies. These changes occur as the market basket is updated

monthly to add new representative items and exclude items no longer traded and as respondents establish different schedules to report price changes. Information on the data collection process provides metrics to evaluate the number and representative share of prices that support index quality. Published indexes ensure confidentiality of respondents, sample representativeness, and robustness of coverage for items and companies.

The top-level price indexes continue to be representative of total trade. Detailed indexes face greater likelihood of suppression. If the number of prices collected is insufficient to support index publication, the index's publication is suppressed for the month(s) that insufficient price data are collected.

There were no indexes where the index value and percent changes needed to be suppressed in January 2021.

(3) Recommendations are not aligned with the OMB statistical policy directives that guide BLS statistical programs.

Throughout the report, the focus on publication quality is related to imputation rates. For example, on page 5, the relation between response rates and imputations is set out in the report by saying, "Despite BLS's efforts, response rates continued to decline and nonresponse increased." This sentence is followed by the conclusion, "Therefore, BLS used imputations to mitigate item nonresponse when analyzing labor market activity and distributing essential economic information to the public." This relation is repeated further down on the same page, "As rates declined, BLS increased the use of imputations, which could have introduced estimates that deviated from actual results."

Imputations and other forms of nonresponse adjustment are standard features of statistical programs to ensure data are representative of the population. BLS provided this information to OIG during fieldwork. OIG implies that BLS made the decision to increase the use of imputations due to nonresponse. BLS would like to clarify that, due to the nature of surveys, any time BLS cannot collect or does not receive data from respondents, survey response rates decrease, and the percentage of data imputed (implicitly or explicitly) will automatically increase.

The efforts in the report to give imputation rates equal billing with response rates have no precedent in OMB statistical guidelines. BLS provided a large amount of information regarding the inverse relationship between response rates and imputation rates, described the well-founded methodological approach to use imputation in index estimation, and questioned the focus of the analysis on imputation rates instead of response rates. Despite BLS input, the OIG has maintained its focus on imputation rates. To a data user, the transparency with which BLS provides response rate information is sufficient to address any concern about imputation. However, the OIG report appears to prioritize

imputation rates over response rates, when the response rate is the preferred measure of quality as defined in the OMB statistical policy guidelines.

Response to the OIG's recommendations

With regard to the four recommendations issued by the OIG, BLS management provides the following response:

Recommendation 1: Perform a nonresponse bias study or imputation assessment to determine if bias exists in the Consumer Price Index and Import and Export Price Index economic information due to the increased use of imputations.

Management Response: BLS concurs with this recommendation given the continued decline in survey response, although we note that the CPI's Commodities and Services response rates for cumulative FY23 are 70.1%, with the latest two quarters averaging over 71% and trending upward post-pandemic, while the CPI's Housing survey is still below 70% but trending upward. In FY24, BLS will develop a plan to address this recommendation for the CPI. In FY22, BLS began planning to conduct a new nonresponse bias study for the MXPI, which we expect to be complete by FY25.

Recommendation 2: Based on the nonresponse bias study or imputation assessment, establish, as applicable, a threshold at which Consumer Price Index and Import and Export Price Index must publicly disclose the amount of imputations used. Update program policies and procedures to include the established threshold and document how to publicly disclose when the threshold is met.

Management Response: The recommendation to establish a threshold for disclosure of the amount of imputation has no known standard in survey literature. However, to comply with the recommendation, BLS will carry out a nonresponse bias study or imputation assessment as requested for the two programs. Based on the results, BLS will engage with experts and the Office of Management and Budget to evaluate the use of thresholds for imputation and establish a transparent approach to communicate with the public regarding how imputations affect the quality of published data. BLS will update policies and procedures as necessary and in accordance with OMB guidance to address the approach.

Recommendation 3: Determine if the Calendar Year 2021 Import and Export Price Index coverage ratio improved and, if not, determine the appropriate course of action.

Management Response: BLS will evaluate the coverage ratio for 2021 data and determine what course of action is appropriate. Given the long-standing concern of coverage for published price indexes, MXPI had already begun major efforts before the OIG audit to address low coverage rates by using an administrative data source to replace a third of the sample. This project will greatly increase the coverage ratio of homogeneous product areas, and it will also allow for a reallocation of resources to strengthen data collection activities for heterogeneous product areas.

Recommendation 4: Update the Import and Export Price Index Handbook of Methods to include the publication criteria that ensures the index is representative of the population as well as what exceptions can be made.

Management Response: BLS will update the MXPI Handbook of Methods chapter to describe the publication quality and limitations of the indexes, while also assuring that any statement or description does not jeopardize the exposure of respondent identifiable information.

Conclusion

The BLS welcomes review of the quality of our official statistics. Our mission to collect, calculate, and publish official statistics on prices, productivity, working conditions, and the labor market is guided by the Office of Management and Budget Statistical Policy Directives. BLS strives to vet its economic and statistical concepts and results through many venues, including Federal Register Notices; by presenting to academic and business data users, such as the American Economic Association and the National Association for Business Economics; by participating on and presenting to the Federal Economic Statistical Advisory Committee; and by clearing methodology and results through the BLS Technical Advisory Committee and the BLS Data Users Advisory Committee.

The original intent of the OIG's report was focused on *how efficiently and effectively BLS is able to obtain data* and then devolved into a study of response rates, which are a well-known and understood standard of survey quality. However, the OIG report's findings focus on imputation rates, which are commonly known to be highly inversely correlated with response rates, but of which the OMB statistical policies say little. The OIG recommendations are incongruent with OMB statistical policies that guide BLS survey programs. While the BLS can comply with the recommendations put forth by the OIG, the focus of the findings on imputation rates is not consistent with traditional measures of survey and data quality, and BLS stands by the current use of response rates to evaluate data quality. Since the OIG strayed from the original focus of the audit, no recommendations were provided that could help BLS to improve the efficiency or effectiveness of obtaining data or to identify new data sources.

BLS will address the OIG recommendations in the continued interest of transparency and accountability to our data users. BLS understands and appreciates the oversight role the OIG has to assure good governance of the programs under its purview. However, BLS respectfully disagrees with the characterization in the report that BLS did not, and does not, provide transparent information and bypassed controls regarding published data. BLS exists to provide gold-standard statistical measures to the public, and we are committed to the accuracy, integrity, reliability, transparency, and accountability in all our data and programs.

If you have any questions, please contact Leslie Bennett, OIG Audit Liaison, at bennett.leslie@bls.gov.

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APPENDIX C: ACKNOWLEDGMENTS

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