United States Government Accountability Office

Report to Congressional Requesters

June 2020

RETIREMENT SECURITY

BLS Should Explore Ways to Improve the Accuracy, Timeliness, and Relevance of Its Cost-of-Living Measurements

GAO-20-422

GAO Highlights

Highlights of GAO-20-422, a report to congressional requesters

June 2020

RETIREMENT SECURITY

BLS Should Explore Ways to Improve the Accuracy, Timeliness, and Relevance of Its Cost-of-Living Measurements

Why GAO Did This Study

In the United States, federal retirement programs typically include cost-of-living adjustments based on a CPI that measures inflation for a subpopulation of workers. This includes Social Security, which provides benefits for more than 60 million older Americans, workers with disabilities, and their families. As the life expectancy of Americans continues to increase, more Americans will be subject to these adjustments, so it is critical for them to be accurate.

GAO was asked to review U.S. and international efforts to measure the cost of living for older populations. This report examines (1) key issues that BLS faces in measuring the cost of living for older Americans; and (2) the experiences of other countries that developed alternate methods of adjusting retirement benefits. GAO reviewed pertinent literature; assessed BLS efforts to measure inflation; conducted case studies in three countries—Australia, New Zealand, and the U.K.—with a variety of CPIs, which GAO selected based on expert referral and document review; and interviewed agency officials and experts.

What GAO Recommends

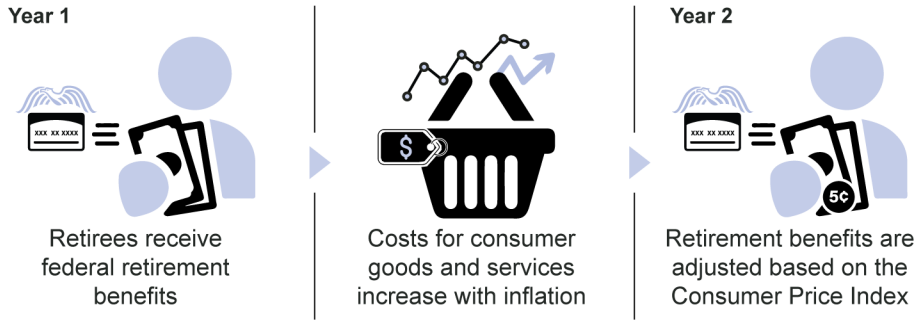
GAO recommends that BLS explore cost-efficient ways to evaluate the data currently used to produce subpopulation indexes, and explore the use of National Accounts data to produce more accurate, timely, and relevant CPIs. BLS agreed with the first recommendation but disagreed with the other. GAO continues to believe both recommendations are warranted, as discussed in the report.

View GAO-20-422. For more information, contact Charles A. Jeszeck at (202) 512-7215 or jeszeckc@gao.gov.

What GAO Found

The U.S. Bureau of Labor Statistics (BLS) faces accuracy, timeliness, and relevancy challenges developing consumer price indexes (CPI) for subpopulations of blue-collar workers and older Americans. For example, the CPI for these workers is used to adjust federal retirement benefits for inflation, including Social Security. BLS has not evaluated the extent to which its existing data are adequate to produce CPIs that reflect what these subpopulations pay, where they shop, and what they purchase. Officials cite budgetary reasons for not having done this, but there may be cost-efficient methods for evaluating the adequacy of these data. Without an evaluation, federal retirement benefits could be subject to adjustment based on potentially inaccurate information. Additionally, BLS has made limited use of certain data already collected by the federal government—such as National Accounts data on U.S. production and consumption—that could be used to increase the accuracy, timeliness, and relevancy of CPI calculations that reflect the mix of goods and services consumers purchase. Without adequately exploring the potential of using these data, BLS may be missing an opportunity to improve its CPIs.

Benefits Adjusted to Maintain Purchasing Power for the Goods and Services Consumers Buy



Source: GAO analysis of documents from the Social Security Administration and the Bureau of Labor Statistics. | GAO-20-422

Reports about the retirement systems in the 36 Organisation for Economic Co-operation and Development countries indicate that most use their primary measures of inflation to adjust government retirement benefits. In addition, all three of GAO's case study countries (Australia, New Zealand, and the United Kingdom, or U.K.) have a variety of CPIs, including for subpopulations, and they filled information gaps in their CPIs with National Accounts and other data. For example, Australia and the U.K. use National Accounts data annually to update their calculations of the mix of goods and services consumers buy, thereby making the CPIs more relevant and accurate. All three countries also collaborated with stakeholders—such as other agencies—to implement changes, for example by gathering input on the design of subpopulation CPIs.

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Abbreviations

BLS	Bureau of Labor Statistics
BEA	Bureau of Economic Analysis
COLA	cost-of-living adjustment
CPI	consumer price index
CPI-E	CPI for the Elderly
CPI-U	CPI for All Urban Consumers
CPI-W	CPI for Urban Wage Earners and Clerical Workers
OECD	Organisation for Economic Co-operation and Development
RPI	Retail Price Index
SSA	Social Security Administration

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U.S. GOVERNMENT ACCOUNTABILITY OFFICE
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June 16, 2020

The Honorable Virginia Foxx
Republican Leader
Committee on Education and Labor
House of Representatives

The Honorable Tim Walberg
Republican Leader
Subcommittee on Health, Employment, Labor, and Pensions
Committee on Education and Labor
House of Representatives

In the United States, federal retirement programs often use consumer price indexes (CPI) to calculate cost-of-living adjustments (COLA) for retirement benefits to ensure these benefits keep pace with inflation. These programs include the Federal Employee Retirement System, as well as Social Security, one of the largest federal programs that paid benefits to more than 60 million older Americans, workers with disabilities, and their families as of the end of 2019.[1] Federal retirement programs in the United States generally use the CPI-W, an index that measures inflation for a subpopulation of working Americans. CPI-W is one of several price indexes produced by the Department of Labor's Bureau of Labor Statistics (BLS). Although one of BLS's goals is to create accurate inflation measurements, some economists have argued that the CPI-W may overestimate the cost of living in general, while other economists have argued that it may underestimate the cost of living for older Americans. A number of legislative proposals have sought to change the index used for Social Security and other federal retirement benefits. We previously reported how even a fraction of a percent difference in the

[1]While retirement benefits are not the only type of benefit administered by the Social Security Administration, this report focuses on retirement programs. For more information about other Social Security benefits, including disabled worker benefits or survivor benefits, see GAO, *Social Security's Future: Answers to Key Questions*, GAO-16-75SP (Washington, D.C.: Oct. 27, 2015).

index used to adjust retirement benefits can accumulate over time, resulting in tangible monthly differences for individual beneficiaries.[2]

As Americans' life expectancy continues to increase, more retirees are exposed to the effects of COLAs over longer periods. Similar to the United States, a number of other countries with aging populations use CPIs to adjust benefits from their national pension systems.[3] Some countries have changed to an alternate index to reduce benefits and improve the financial sustainability of their pension systems, while others have changed to increase the purchasing power of pension benefits. We recognize that each country has a unique set of circumstances, including varying national pension programs and methods for producing national statistics. Still, the experiences of other countries that have created alternate indexes to increase understanding about how inflation may vary by age or income level, or that switched the index to adjust retirement benefits to ensure these benefits take into account the costs faced by retirees, may be relevant to the United States.

Given the central role of CPIs in determining the level of federal retirement payments that may be paid over multiple decades, you asked us to review the experiences of the United States and other countries in measuring the cost of living for older populations. This report (1) examines the challenges BLS faces in measuring the cost of living for older Americans and actions BLS is taking to address the challenges; and (2) describes the experiences of other countries that developed alternate methods of adjusting retirement benefits.

[2]In 2019 we reported that if COLAs were based on an alternate index, after 30 years the difference in Social Security benefits relative to using the CPI-W would be $100 or more per month for a hypothetical beneficiary with earnings equal to the national average wage index. We also reported the resulting changes in benefit levels would have a larger effect on the total retirement incomes of lower income households. For example, we estimated the decrease in benefits after 30 years of COLAs based on the Chained CPI-U—an alternate index produced by BLS whose annual inflation estimates have been on average about 0.25 percentage points lower than those of the CPI-U—would represent about a 6 percent decrease in the retirement income of a low-income household compared to about a 1 percent decrease for a high-income household. The analysis was based on hypothetical calculations of COLAs using historical and assumed CPI data from 2003-2033 for a beneficiary who retired in 2003 at age 65, and data on income from the Survey of Consumer Finances. GAO, *Retirement Security: Alternate Price Indexes for Cost-of-Living Adjustments Present Tradeoffs*, GAO-19-218R (Washington, D.C.: Jan. 28, 2019).

[3]We use the term national pension systems to refer to Social Security retirement-type programs in other countries.

To examine the challenges BLS faces in measuring the cost of living for older populations and steps BLS has taken to address the challenges, we interviewed a range of agency officials and other stakeholders and reviewed pertinent literature:

- We interviewed officials from BLS and reviewed agency policies and federal laws and regulations related to the production of CPIs and their use in adjusting federal retirement benefits. We also interviewed a nongeneralizable selection of nine subject-matter experts, including academic researchers and members of committees that advise BLS on technical matters. We identified subject-matter experts in pertinent literature or by referral from other interviewees. Finally, we interviewed officials from two agencies that use CPIs: the Social Security Administration (SSA), which uses them to calculate COLAs for retirement benefits; and the Bureau of Economic Analysis (BEA) within in the Department of Commerce, which uses CPIs to produce other national statistics and which also produces a similar measure of consumer inflation called the Personal Consumption Expenditures price index.
- We also conducted a literature review of research and policy studies using two data collection methods. First, we conducted a formal search of multiple databases for studies on the measurement of inflation for older Americans published from January 2009 to June 2019. From 88 studies, we identified 13 that described or analyzed issues in producing CPIs for measuring the inflation faced by older Americans. Second, we identified two additional studies that were authored or recommended by the subject-matter experts we interviewed, for a total of 15 studies.

We assessed BLS efforts to measure inflation for older Americans against (1) standards for internal control that call for federal agencies to develop statistics using relevant data obtained in a timely manner that faithfully represent what they purport to represent; and (2) BLS operational and performance goals to produce accurate products and improve the timeliness and relevance of its information on price changes in the economy.

To describe the experiences of other countries that developed alternate methods of adjusting retirement benefits, we conducted case studies of

Australia, New Zealand, and the United Kingdom.[4] To select these countries, we interviewed BLS and SSA officials and representatives of five international organizations that play varying roles with respect to CPIs and retirement benefits. We reviewed publications by the Organisation for Economic Co-operation and Development (OECD) and SSA describing the national pension systems of various countries. We also reviewed documents from the agencies responsible for producing CPIs and administering retirement benefits in some of these countries.[5] Based on our review, we selected countries with a variety of CPIs that all adjusted national pension benefits based, at least in part, on a CPI, similar to Social Security retirement benefits in the United States.[6]

We also selected these countries, in part, because they are similar to the United States with respect to retirement. For example, we selected countries with similar proportions of people age 65 or older and with a similar eligibility age for full national pension benefits. Because older Americans generally devote a substantially larger share of their total budgets to medical care than the broader population, we also selected one country with comparable out-of-pocket expenditures on medical care.[7] We recognize that each country has its own methods for producing national statistics such as CPIs, as well as retirement systems designed to reflect that country's unique historical and political experience. As a result, information from the case studies is not generalizable. However, the case studies provide examples of approaches countries took to

[4]We did not conduct an independent legal analysis to verify the information provided about the laws, regulations, or policies of the countries selected for this study. Instead, we relied on appropriate secondary sources, interviews, and other sources to support our work. We submitted key report excerpts to agency officials in each country for their review and verification, and we incorporated their technical corrections as necessary. We note also that the fact that a legal feature was successful in one or more of the countries we visited, which may have significantly different cultures, histories, and legal systems than the United States, does not necessarily indicate that it would be successful in the United States.

[5]While we reviewed information from other countries, we focused our review on OECD countries for which information on CPIs and national pension systems was readily available. See appendix I for more information on CPIs and national pensions in 36 OECD countries.

[6]See Appendix II for more information on selected countries' CPIs and national pension systems and how they compare with the U.S.

[7]According to World Health Organization data, the United States generally has higher out-of-pocket medical expenditures than all but a few OECD countries.

address issues similar to those facing the United States in measuring the cost of living for their retired populations.

We conducted this performance audit from February 2019 to June 2020 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.

Background

BLS Consumer Price Indexes

BLS currently produces a number of different price indexes to estimate price inflation (see table 1). In line with its strategic plan, BLS aims to make these estimates as accurate as possible, meaning that they reflect the average level of price inflation for a selected group of consumers. The accuracy of a price index can be assessed in multiple ways, such as the extent to which the index applies appropriate formulas to data that are complete and drawn from sufficiently large samples covering the relevant group of people. BLS bases its collection of these data on the population covered by the Consumer Price Index for All Urban Consumers (CPI-U). BLS then uses data collected for the CPI-U to produce three other price indexes. After introducing the CPI-U as its primary, or headline, index, BLS maintained a separate data collection for the CPI-W from 1978 through 1980 but found little difference between data for CPI-W and CPI-U. According to BLS, as a result of this and budgetary issues, BLS stopped collecting separate data for the CPI-W in 1981 and began using CPI-U data to derive the CPI-W.[8]

[8]Specifically, BLS economists track spending and prices for the CPI-W by using the CPI-U sample of geographic areas, outlets, items, and prices.

Table 1: Bureau of Labor Statistics (BLS) Produces the CPI-U Then Uses It to Create Additional Price Indexes

Index	Subpopulation index (yes/no)	Background	Coverage	Uses
CPI-U The Consumer Price Index (CPI) for All Urban Consumers	No	First published in 1978, BLS considers it the primary, or headline, price index and bases its data collection on this population's consumption patterns.	The broadest index constructed, it represents inflation for the goods and services purchased by about 93 percent of the U.S. population, including retired individuals.[a]	Economic indicator to guide government's economic decisions and aid in formulating fiscal and monetary policies. Measure of inflation to adjust some federal benefits, such as Medicare prescription drug benefits.
CPI-W The CPI for Urban Wage Earners and Clerical Workers	Yes	Precursor to the CPI-U first published in 1921 using data collected for a subpopulation of workers. First published using data from the CPI-U in 1981.[b] Has historically tracked closely to the CPI-U.	Constructed from data collected for the CPI-U for a subpopulation of workers in urban areas, it represents inflation for the goods and services purchased by about 29 percent of the U.S. population.	Measure of inflation to calculate cost-of-living adjustments (COLA) for federal retirement programs.[c]
CPI-E The CPI for the Elderly	Yes	Created in 1988 in response to legislation requiring BLS to develop an index that reflected the spending patterns of those 62 and older and not regularly published but available on request.[d] Historically has yielded annual inflation estimates about 0.2 percentage points higher than the CPI-U.	Constructed from data collected for the CPI-U for a subpopulation of those age 62 and older, it represents inflation for the goods and services purchased by about 21 percent of the U.S. population.	Considered by BLS to be experimental and not used by the federal government to adjust retirement benefits.
Chained CPI-U The Chained CPI for All Urban Consumers	No[e]	First published in 2002 to incorporate data on how consumers allocate their budget among various goods and services from one month to the next. Historically has yielded inflation estimates about 0.25 percentage points lower than the CPI-U.	Constructed from data for the same population as the CPI-U but using a different formula to combine inflation estimates for all goods and services. Results are subject to revision and are not final until 10-12 months after first published.	Measure of inflation used to adjust federal income tax brackets and other tax provisions.

Source: Documents from the Bureau of Labor Statistics, Office of Personnel Management, Social Security Administration, Centers for Medicare and Medicaid Services, Department of Defense, and Department of Veterans Affairs. | GAO-20-422

[a]The CPI-U does not include the spending patterns of people living in rural nonmetropolitan areas, those in farm households, people in the Armed Forces, and those in institutions, such as prisons and mental hospitals.

[b]The CPI-W was the only national price index BLS published until 1978.

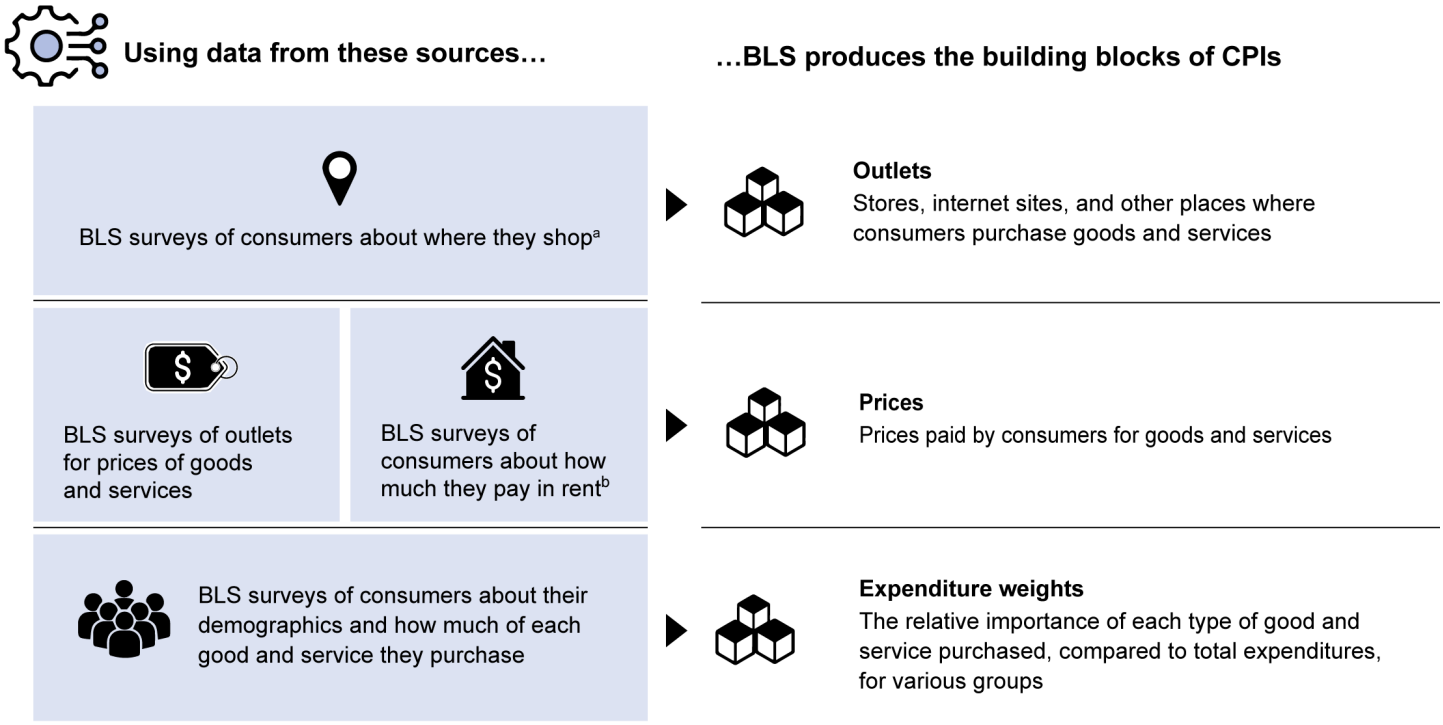
[c]Federal retirement programs that generally base COLAs on increases in the CPI-W from the third quarter of one year to another include the Civil Service Retirement System, the Federal Employees Retirement System, Military Pensions, Railroad Retirement Board pensions, Social Security, and Veterans Affairs pensions.

[d]BLS created the CPI-E pursuant to a provision in the Older Americans Act Amendments of 1987. See Pub. L. No. 100-175, § 191, 101 Stat. 926, 967.

[e]BLS officials told us that, although possible in theory, BLS could not at present produce an accurate chained CPI-E or chained CPI-W due to the small sample sizes involved with these subpopulations.

To create the CPI-U, BLS chooses a sample of outlets (e.g., stores or internet sites) at which the CPI-U population shops (see fig. 1 for more information on how BLS creates price indexes). BLS then collects price data at these outlets for goods and services the CPI-U population buys and uses the data to develop basic, or elementary, indexes for each good and service.

Figure 1: Sources of Data Used to Produce Consumer Price Indexes (CPI) in the United States



Source: GAO analysis of BLS documents. | GAO-20-422

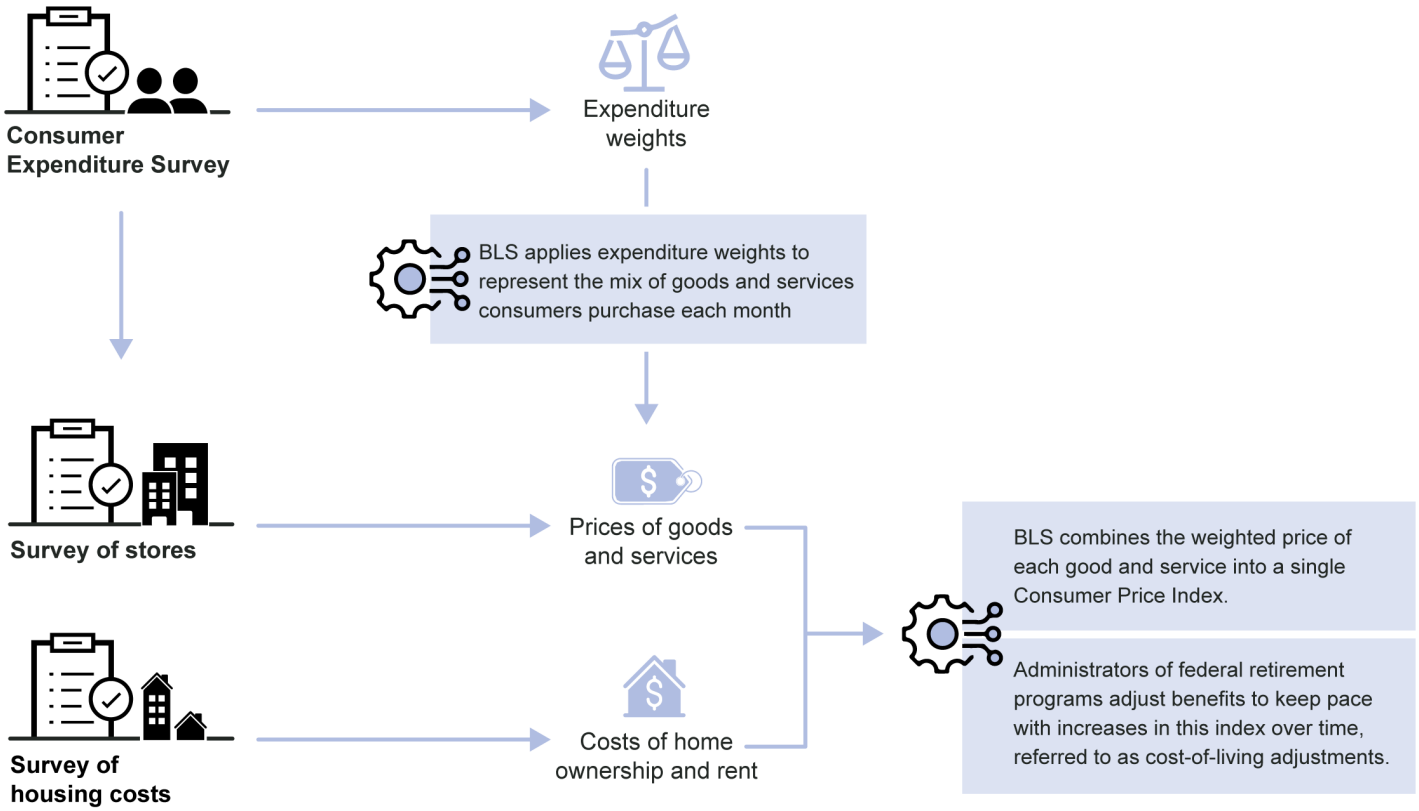
[a]Beginning in October 2019, the Bureau of Labor Statistics (BLS) discontinued its surveys of consumers to find out where they shop. Instead, BLS added questions about where consumers shop to its surveys of consumers about their demographics and how much they purchase.

[b]BLS collects data on how much people pay in rent. To determine changes in the cost of homeownership, BLS also uses these rental data to estimate how much a homeowner would have to pay to rent a home similar to the one they own, referred to as "rental equivalence."

BLS combines the elementary indexes into a single, aggregated index by applying a set of expenditure weights—factors that determine, for example, whether a change in the price of apples or mobile phone service has a larger effect on total inflation (see fig. 2). These expenditure weights reflect the proportion of spending consumers direct to each good or service. To develop expenditure weights, BLS directs the Census Bureau to gather data about the relative importance of each purchase within the target population's "market basket" of consumer goods and services. The Census Bureau collects these data in the Consumer Expenditure Survey, a nationwide household survey conducted by BLS to determine how consumers spend their money that also contains demographic data about the households surveyed.[9] BLS uses 2 years of Consumer Expenditure Survey data to calculate the expenditure weights, in part so the sample sizes are large enough to produce accurate weights.

[9]Specifically, the Census Bureau collects data on behalf of BLS through two surveys that together are referred to as the Consumer Expenditure Survey. One is a Quarterly Interview Survey designed to collect data on large and recurring expenditures, such as a washing machine or electricity bills. The other is a Diary Survey designed to collect data on smaller, frequently purchased goods and services, like food and clothing. According to BLS, the two surveys cover the complete range of consumers' expenditures.

Figure 2: Expenditure Weights from the Consumer Expenditure Survey Are a Key Determinant of Cost-of-Living Adjustments to Federal Retirement Benefits



Source: GAO analysis of documents from the Bureau of Labor Statistics, Social Security Administration, and Office of Personnel Management. | GAO-20-422

From data collected to produce the CPI-U, BLS derives two subpopulation indexes—indexes that focus on the spending patterns of a portion of the population of all urban consumers: the CPI-W and the CPI-E.[10] To produce these subpopulation indexes, BLS adjusts the relative importance of price changes in each good and service through a process sometimes referred to as "reweighting," meaning BLS develops alternate sets of expenditure weights that reflect the spending patterns of the subpopulation. For example, since medical care comprises more of the CPI-E subpopulation's total expenditures (about 12 percent) than of the

[10]The CPI-W focuses on a subpopulation of workers in urban areas. The CPI-E focuses on a subpopulation of households headed by someone 62 or older.

CPI-U population's total expenditures (about 9 percent), the CPI-E gives more weight to medical care than the CPI-U.

BLS also creates a "chained" index using the same data for the entire CPI-U population but changing the formula used to combine indexes for each good and service, known as elementary or basic indexes, into a single aggregated index. This formula captures how consumers shift spending among different types of goods and services as prices change (see text box). In contrast, the other indexes assume that consumers keep purchasing various categories of goods and services in the same proportions over a 2-year period regardless of price changes.

What is a chained price index?

A chained price index uses a formula that is believed by some economists to better approximate a cost-of-living index by more accurately accounting for changes in consumption patterns in response to relative price changes. They contend that such a formula reduces the potential for overstating inflation relative to the other indexes BLS produces, which assume consumers keep buying goods and services in the same proportions no matter their price. Like the other three indexes BLS produces, the Chained CPI-U reflects consumers' ability to adapt to changing prices by choosing among closely related goods and services as prices change, for example purchasing a different type of apple because it is on sale. However, unlike the other three indexes, the Chained CPI-U further reflects consumers' ability to choose among all available goods and services as prices change, such as taking a train to work instead of driving when the price of gasoline rises, and purchasing headphones to listen to music during the commute.

We previously reported that, were federal retirement benefits to be indexed to the Chained CPI-U, SSA and other agencies would need to determine whether to base retirement COLAs on final data that may be outdated or preliminary data that may be inaccurate.[a] This is because the data needed to use a superlative index formula only become available after a significant time lag. This lag delays issuance of final monthly estimates for the Chained CPI-U by up to 1 year. Additionally, the chair of a panel convened at the request of BLS to examine issues in measuring the cost of living cautioned that chained indexes may not accurately reflect the way people with varying incomes substitute goods and services.[b] For example, retirees with lower incomes might not have the same ability as retirees with higher incomes to substitute other goods and services when the prices of needed medical care or prescription drugs rise.

Source: GAO analysis of documents from the Bureau of Labor Statistics (BLS) and policy research associations. | GAO-20-422

[a]GAO-19-218R.

[b]C.L. Schultze, "The Consumer Price Index: Conceptual Issues and Practical Suggestions," *Journal of Economic Perspectives*, Volume 17, No. 1 (2003): pp. 3-22.

BLS receives input on its processes from several sources. For example, BLS receives advice and recommendations from several advisory committees that variously focus on technical issues and the needs of users of BLS statistics. BLS also periodically receives input on its price indexes through external commissions and panels. For example, in May 1995, the U.S. Senate created the Advisory Commission to Study the

Consumer Price Index, commonly referred to as the "Boskin Commission," after its chairman, Michael J. Boskin. In December 1996, the Boskin Commission released its final report identifying sources of bias in the production of CPIs that the commission concluded were causing the indexes to overstate inflation.[11] BLS also receives input on its price indexes through public comment. For example, in May 2019, the Office of Management and Budget issued a request for public comments on the various price indexes produced by BLS and BEA.[12]

Social Security Retirement Benefits

While there are a number of federal retirement benefit programs, Social Security is by far the largest provider of indexed retirement and disability benefits in the United States, paying out over $1,047 billion in retirement and disability benefits in 2019. Social Security was established in 1935 to provide for the general welfare of older Americans by, among other things, establishing a system of federal old-age benefits, including a retirement program.[13] To determine a worker's initial retirement benefit, Social Security indexes the worker's earnings to an average wage index.[14] According to SSA, this ensures that a worker's future benefit reflects the general rise in the standard of living that occurred during his

[11]For example, the commission concluded that BLS formulas for producing CPIs did not adequately reflect how consumers respond to changing prices by shifting purchases among closely related goods and services. In response, in 1999, BLS changed the formula used to create elementary indexes for most categories of goods and services to better reflect consumers' ability to shift purchases within a category—for example, by substituting a different brand of toothpaste in place of one that goes up in price.

[12]Specifically, the agency said it will use the comments received and internal discussions with experts to consider whether to update the specific inflation measure used to adjust the Official Poverty Measure, as well as whether to provide guidance to Federal agencies on how to select and use different price indexes. See *Request for Comment on the Consumer Inflation Measures Produced by Federal Statistical Agencies*, 84 Fed. Reg. 19,961 (May 7, 2019).

[13]Officially titled Old-Age and Survivors Insurance, the Social Security retirement program provides benefits to retired workers, their families, and survivors of deceased workers. For more about Social Security, see GAO-16-75SP.

[14]See 42 U.S.C. § 415(a) and 20 C.F.R § 404.210(b). Not all federal programs use wage indexing to set initial benefits. For example, initial benefits provided through the Supplemental Security Income program are calculated by subtracting an individual's countable income for the current month from the Federal benefit rate, which is indexed to the CPI-W. See 20 C.F.R. §§ 416.405 and 416.420(b).

or her working lifetime.[15] Since 1975, Social Security has also indexed retirement benefits after the initial benefit level has been set to a CPI.[16] According to SSA, this ensures that benefits are not eroded by inflation over time. When SSA began indexing benefits, CPI-W was the only national CPI available, and SSA continues to use the CPI-W to determine COLAs.

As we have previously reported, the Social Security program faces financial difficulties that, if not addressed, will affect its long-term stability.[17] In April 2020, SSA projected that Social Security's retirement program trust fund will be unable to pay full benefits in 2034.[18] We have also reported that, according to projections by SSA and the

[15]According to SSA, most financial advisers say that individuals need about 70 percent of their pre-retirement earnings to comfortably maintain their pre-retirement standard of living, but not all agree. We previously reported that despite broad agreement among economists that retirement benefits and savings should in total allow a household to maintain its pre-retirement standard of living, there is no consensus about how much income this standard requires. See GAO, *Retirement Security: Most Households Approaching Retirement Have Low Savings*, GAO-15-419 (Washington, D.C.: May 12, 2015) and GAO, *Retirement Security: Better Information on Income Replacement Rates Needed to Help Workers Plan for Retirement*, GAO-16-242 (Washington, D.C.: Mar. 1, 2016).

[16]The Social Security Act specifies a formula for determining COLAs. This formula generally sets COLAs equal to the percentage increase, if any, in the average CPI-W from July through September over the average in the corresponding months of a prior year in which COLAs were paid. COLAs become effective in December and are paid starting in January of the following year. See 42 U.S.C. § 415(i). The same formula is used to determine COLAs for benefit programs not specifically focused on older populations. Specifically, the same formula is used to determine COLAs for Social Security Disability Insurance, which provides benefits to people no longer able to work as a result of their disabilities and to their dependents, and for the Supplemental Security Income program, which provides benefits to certain low-income aged, blind, and disabled individuals—both adults and children—who meet the financial eligibility requirements.

[17]See, for example, GAO, *The Nation's Retirement System: a Comprehensive Re-evaluation Is Needed to Better Promote Future Retirement Security*, GAO-18-111SP (Washington, D.C.: Oct. 18, 2017).

[18]The Board of Trustees, *The 2020 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds* (Washington, D.C.: Apr. 22, 2020). SSA based this projection of Old-Age and Survivors Insurance Trust Fund asset reserves on an intermediate set of assumptions that represent the Trustees' best estimate of key demographic and economic factors affecting the future status of the Trust Fund. For further discussion, see GAO, *The Nation's Fiscal Health: Action Is Needed to Address the Federal Government's Fiscal Future*, GAO-17-237SP (Washington, D.C.: Jan. 17, 2017); GAO-16-75SP; and GAO, *Social Security and Medicare: Improved Schedule Management Needed for More Timely Trust Fund Reports*, GAO-19-596 (Washington, D.C.: July 30, 2019).

Congressional Budget Office, use of an alternate index to determine COLAs would have less effect on Social Security's long-range finances than some other options for addressing the program's finances, such as changing the taxation of earnings or raising the retirement age.[19] That said, we found that, according to SSA projections, using an alternate CPI to calculate COLAs would affect Social Security's finances in different ways. Specifically, using the CPI-E would increase expected COLAs and thus program costs and using the Chained CPI-U would decrease expected COLAs and thus program costs, while using the CPI-U would result in little change to either.

National Income and Product Accounts (National Accounts)

Produced by BEA, the National Accounts are a set of statistics on U.S. production, income, consumption, investment, and saving.[20] Among these are Gross Domestic Product, a measure of the goods, services, and structures produced across the economy, and the Personal Consumption Expenditures index, a measure of consumer inflation similar to CPIs, but constructed using different methods and data sources and covering different populations and transactions. Data collected by BEA to produce the National Accounts differ in a number of ways from those collected by BLS to produce CPIs. For example, while CPIs focus on the expenditures of households in urban areas, the National Accounts also include expenditures on institutional populations, such as individuals living in nursing homes. Further, while CPI expenditure data are based on the recollection of consumers, National Accounts expenditure data primarily reflect the records of the businesses that serve consumers. In other words, to collect data on the quantity of goods and services consumed,

[19]GAO-19-218R.

[20]In this report we use the term "National Accounts" to refer to the national income and product accounts. The national income and product accounts are one of three major elements of the U.S. national economic accounts. The other two major elements of the U.S. national economic accounts are the industry accounts produced by BEA and the U.S. financial accounts produced by the Board of Governors of the Federal Reserve System. The industry accounts trace the flow of goods and services among industries and show, among other things, the value added by each industry in the production process. The financial accounts record the acquisition of assets and assumption of liabilities, the sources of funds used to acquire those assets, and the value of assets held and liabilities owed.

BLS surveys consumers about how much they bought, whereas BEA surveys companies about how much they sold.[21]

The National Accounts are produced primarily from data collected by federal government agencies. These data include both "statistical" data collected from federal statistical agencies, such as the Census Bureau, as well as "administrative" data collected by federal agencies as a byproduct of administering their programs. For example, BEA uses sample data generated by the Internal Revenue Service in processing tax returns to estimate corporate profits. BEA supplements these statistical and administrative data collected by federal agencies with data obtained from trade associations, businesses, international organizations, and other sources.

BLS Faces Challenges Developing Consumer Price Indexes, but Has Made Limited Use of Data Collected by the Federal Government That May Help It Improve the Indexes' Accuracy and Timeliness

[21]Specifically, the primary source for CPI expenditure data is the Consumer Expenditure Survey, a survey of households conducted by BLS. By comparison, National Accounts expenditure data primarily come from two sample surveys of companies conducted by the Census Bureau: the Monthly Retail Trade Survey of companies that sell merchandise and related services, and the Quarterly Services Survey of additional companies in the service industries such as health care and professional services.

BLS Faces Challenges Related to the Accuracy and Timeliness of CPIs, Among Others

BLS faces a number of challenges related to the accuracy and timeliness of CPIs, as well as challenges related to measuring inflation for older Americans. Some of these challenges may have implications for federal retirement benefit adjustments.

Accuracy

According to BLS officials and documentation, BLS is unsure if the data sources it uses to produce the CPI-U are adequate to produce accurate subpopulation estimates—specifically, the CPI-E and CPI-W.[22] For the CPI-E, BLS has not evaluated the adequacy of the CPI-U data it uses to measure inflation for the 62-and-older subpopulation. Specifically, BLS has not evaluated the extent to which CPI-U data represent the outlets where members of this older subpopulation shop, the prices they pay, or the mix of goods and services they purchase. BLS considers the CPI-E an experimental index, in part, because of the relatively small sample size within the Consumer Expenditure Survey used to create the expenditure weights for this subpopulation, which account for the mix of goods and services the subpopulation purchases. According to BLS documentation, the expenditure weights for the CPI-U rely on about 65,000 household interviews, which are collected quarterly over 2 years. In contrast, the expenditure weights for subpopulation indexes use about one-third or less of that: 21,000 interviews for the CPI-E and 16,000 for the CPI-W.[23] For the CPI-W, BLS has not evaluated the adequacy of using CPI-U data since 1980, but the relative sample size used to calculate the expenditure weights for the CPI-W subpopulation has been shrinking in part because of declining response rates and demographic shifts away from the occupations included in the CPI-W. For example, occupations in the CPI-W include blue-collar jobs such as clerical, sales, laborer, and construction jobs. BLS officials and documentation indicate that as a result of these demographic shifts and the subsequent shrinking sample

[22]For more on the data in the CPI-E and CPI-W, see Bureau of Labor Statistics, "The Experimental Consumer Price Index for Older Americans," *Focus on Prices and Spending: Consumer Price Index*, vol. 2, no. 15 (February 2012) and Bureau of Labor Statistics, "Why Does BLS Provide Both the CPI-W and CPI-U?," *Beyond the Numbers: Prices and Spending*, vol. 3, no. 5 (February 2014).

[23]The interview numbers are for the weights based on 2017-2018 data. A smaller sample size increases the risk of sampling error. As discussed below, BLS began a project in 2009 to redesign the Consumer Expenditure Survey. As a result of this project, the sample size for the Consumer Expenditure Survey will increase, but officials said that this was done to maintain data quality and not to improve subpopulation estimates.

size within the Consumer Expenditure Survey, the accuracy of the CPI-W expenditure weights may be deteriorating.

A core element of BLS's mission is to provide accurate products. Moreover, standards of internal control call for agencies to obtain relevant data from reliable internal and external sources to meet information requirements for meeting their objectives. For BLS, this could include obtaining relevant data from reliable sources for producing CPIs.[24] BLS officials said they have not evaluated the adequacy of the existing data because it is costly to undertake a full evaluation, but there may be cost-efficient ways to do so.[25] BLS also has not evaluated different methods to conduct a cost-efficient analysis. Without taking actions to understand available options for a cost-efficient solution, BLS lacks reasonable assurance that adjustments to Social Security and other retirement benefits are based on indexes that reflect what they are intended to reflect. Specifically, benefits could be subject to adjustment based on potentially inaccurate information.

Most experts we interviewed identified potentially cost-efficient methods to evaluate the adequacy of existing data for subpopulation indexes.[26] For example, five experts we interviewed, including some on BLS advisory groups, suggested that BLS may be able to use existing data to examine the adequacy of using Consumer Expenditure Survey data for the CPI-E. Specifically, one expert suggested that BLS could compare expenditure patterns for the older subpopulation in the Consumer Expenditure Survey to those in third-party data.[27] Another expert added that the overall prices older Americans pay may not be significantly different than the prices the general population pays. For example, gas stations generally charge the same price to each customer regardless of age, so this expert said that it may not be worthwhile for BLS to collect separate price data for older Americans. Another expert indicated that, while it might not be possible to

[24]GAO, *Standards for Internal Control in the Federal Government*, GAO-14-704G (Washington, D.C.: Sept. 10, 2014).

[25]As we reported in 2019, BLS estimates it would cost about $5 million annually over several years to research these issues for the CPI-E, and potentially another $110 million per year thereafter if the CPI-E required additional surveys. This, they said, would make the accuracy of the CPI-E comparable to the accuracy of the CPI-U. GAO-19-218R.

[26]For more information about evaluating the adequacy of existing data and similar issues in other countries, see our discussion later in this report.

[27]Third-party data are secondary source data that are often purchased but that can also be provided free of charge.

link expenditures and demographics (such as age) for all CPI categories using third-party data, it may be possible for certain categories such as groceries, which are a sizeable portion of the older population's expenditures. Another suggested that to improve subpopulation indexes, BLS could shift resources from cost savings realized from other ongoing projects.

BLS officials acknowledged some potentially cost-efficient methods could exist to evaluate the adequacy of existing data for subpopulation indexes. For example, they said that a recent change in survey methodology will enable them to connect demographic information with information on where people shop beginning in 2019. The ability to make this connection should allow them to determine whether certain subpopulations shop at the same or different outlets and could help them determine the adequacy of their outlet sample selection. According to agency officials, BLS advisory groups could weigh in on such issues, but BLS has not asked the advisory groups to do so nor do the advisory groups have any recent or ongoing research on indexes for subpopulations such as older Americans. BLS officials added that obtaining transaction and demographic data from credit card companies could help, but cautioned that companies may be unwilling to share these data.

BLS is currently undertaking a project to improve how it estimates its subpopulation indexes, CPI-E and CPI-W, in part by examining changes to the formulas used to apply expenditure weights. As part of its justification for the project, BLS expressed concerns about the decrease in the relative sample size for the CPI-W population in the Consumer Expenditure Survey and reiterated the importance of the CPI-W in adjusting federal retirement benefits. This project is a step in the right direction but does not fully address the question of whether the CPI-U data are adequate to produce CPI-W and CPI-E.

In 2009, BLS began another project to address measurement error in and households' willingness to respond to the Consumer Expenditure Survey, which is primarily conducted to create expenditure weights for CPIs. According to agency documents, the survey faces increasing costs and declining response rates. One particular goal of the project is to reduce error due to underreporting. For example, BLS is currently testing replacing a paper record of household expenditures with an online form with the goal of more accurately capturing expenditures and maintaining response rates. The project is ongoing and BLS expects to implement changes in stages through and beyond 2022. According to agency officials, the project was not designed to address subpopulation indexes,

but instead was designed to address broader issues with the accuracy of the Consumer Expenditure Survey.

Timeliness and Relevance

BLS also faces challenges regarding the timeliness and relevance of CPIs. In particular, most CPIs are published using expenditure data that can be up to 4 years old, and, in this dynamic economy, as expenditure data age, they become less relevant to present-day expenditure patterns.[28] Most of BLS's price indexes, including the CPI-U, CPI-E, and CPI-W, rely on 2 years of expenditure data and the data require additional time to be collected and processed for use, referred to as a lag. For example, the CPIs produced from January 2014 to December 2015 used expenditure data from 2011 through 2012. BLS officials said reducing the lag could enable more timely use of expenditure data for CPIs but would not be possible without a significant change to the use or design of the Consumer Expenditure Survey.[29]

Another of BLS's indexes, the Chained CPI-U, aims to incorporate current-period expenditure data, which may be most relevant for current-period price changes, but as we reported in 2019, the data are subject to revision and BLS produces the final, revised Chained CPI-U with a 10 to 12 month delay.[30] BLS officials told us they do not currently have timely enough expenditure data to produce the Chained CPI-U without this delay. We found in our 2019 report that if the Chained CPI-U were to be used to calculate Social Security or other federal retirement benefit COLAs, it could result in permanent differentials stemming from measurement error that would have a larger effect on people who receive benefits longest or have lower incomes.[31]

[28]Relevant data have a logical connection with, or bearing upon, the identified information requirements. For example, the mix of goods and services people bought before the introduction of the smart phone may be less relevant to measuring inflation 4 years after the introduction of the smart phone.

[29]For further discussion of opportunities to address the timeliness and relevance challenges, see our discussion later in this report.

[30]GAO-19-218R. As described previously, the Chained CPI-U incorporates a formula that is designed to account for a consumer's ability to adapt to changing prices by choosing among all available goods and services.

[31]GAO-19-218R. For example, since the Chained CPI-U is subject to revision until up to a year after it is initially produced, the errors stemming from using the unrevised estimate could lead to permanent differentials in annual benefit levels, as benefit adjustments compound over time and are based on the prior year's benefit level.

Other Challenges

BLS also faces several other challenges measuring inflation for older Americans, several of which BLS is examining in the subpopulation project discussed above.

Large purchases. BLS is examining how to treat large purchases that are acquired in one time period but used throughout many time periods, such as owner-occupied housing and durable goods. BLS's current approach to owner-occupied housing is to calculate what it would cost to rent a similar home. In part, because many seniors own their homes, BLS is considering instead calculating how much it costs to own and occupy the home (e.g., by including mortgage interest payments but not the purchase price of the home).[32]

Definition of average. BLS is also examining whether a subpopulation index should represent the average expenditures of all households (as its CPIs currently do) or the expenditures of an average household.[33] The current approach of representing the average expenditures of all households is simpler because the index can be constructed from information on average expenditures. The alternate approach of representing expenditures of an average household is more complicated because it gives each household equal weight, and requires first constructing a price index for each household, then an averaging of those indexes. According to BLS, the current approach tends to give more relative weight to the purchasing behavior of higher-income households, whereas the alternate approach may be more appropriate for a subpopulation index, such as the one used to adjust Social Security benefits. For example, taking the average of all expenditures tends to reflect the more expensive purchases typically made by higher-income households. In contrast, measuring the average household's expenditures may better represent expenditures made by a particular subpopulation, such as recipients of federal benefits programs like Social Security.

User needs. BLS is also examining how to define the subpopulation of interest to meet the needs of its users, such as the Social Security Administration. Specifically, CPI-E is based on households headed by someone age 62 or older and the CPI-W is based on households with

[32]For more about owner-occupied housing and similar issues in other countries, see our discussion later in this report.

[33]These are known as "plutocratic" and "democratic" weighting, respectively.

particular occupations, and BLS is examining whether other definitions could meet user needs. For example, BLS said it plans to contact stakeholders to ask about whether expanding the CPI-W to include all labor force participants (thereby increasing sample size) would meet user needs.[34]

Quality change vs. inflation. A further challenge for all price indexes is determining what portion of the price change is due to changes in quality as opposed to inflation, according to eight of the nine experts we interviewed. BLS has several methods to adjust for quality changes. For example, if an older television is replaced with a new model with an increased price, BLS analysts collect information on the characteristics of those televisions and conduct an analysis to determine how much of the price change is due to a change in quality (e.g., the new television has additional features). The remainder of the price change is attributed to inflation. While accounting for quality change is a challenge for all price indexes, four of the nine experts we interviewed said it may be particularly difficult when measuring inflation for older populations. According to these experts, this is because older populations tend to consume more medical care goods and services, for which quality changes are particularly difficult to measure.[35]

BLS Has Taken Steps to Incorporate Alternative Data Sources into CPIs, but Has Made Limited Use of Other Data Currently Collected by the Federal Government

Alternative data. To improve its price indexes, BLS is exploring the use of alternative data sources, such as "big data" obtained directly from companies, from third parties, or from the internet (see text box below). For example, BLS recently purchased a large private dataset to use in an experimental index for new vehicles. According to BLS, big data may lead to methodological improvements and cost savings in the CPIs. Notably, some big data may provide "real-time" expenditure data that could potentially be used to capture consumer behavior in response to relative price changes, thereby addressing substitution bias. According to agency officials and most experts we spoke with, big data may be promising but incorporating them in the CPIs requires additional considerations and

[34]As described earlier, the CPI-W was the only national CPI available when SSA began indexing benefits, and SSA continues to use the CPI-W to determine COLAs.

[35]In part to find a better way to estimate health care inflation, BLS has developed experimental disease-based price indexes. One of the criteria for developing these indexes was that the indexes could be used as an input for the CPI. According to BLS, health care quality adjustment is challenging and measuring the health outcomes necessary to do so may require changes in the way BLS surveys medical care. Bureau of Labor Statistics, *Price and Index Number Research: PINR Experimental Disease-Based Price Indexes*, accessed May 28, 2020, http://www.bls.gov/pir/diseasehome.htm.

adjustments to the processes BLS currently has in place. For example, the data may not be consistently available with the information needed to produce CPIs. Additionally, big data are not always free and some companies may be reluctant to share these data.

What is "big data?" Big data encompass a number of very large data sets that can be structured or unstructured and have the potential to be mined for information. Web-scraped data and scanner data are two prominent types of big data relevant for consumer price indexes. Web-scraped data are price data collected on goods sold online. Scanner data include price and quantity data on sales of goods obtained by scanning bar codes for goods, such as at electronic points of sale in retail outlets. Advances in technology have allowed large amounts of data to be collected and stored easily and could be used in consumer price index construction.

Source: GAO analysis of Bureau of Labor Statistics documents. | GAO-20-422.

In addition to big data, BLS currently uses some administrative data collected by the federal government to improve inflation estimates for certain goods and services. For example, BLS obtains information from the Department of Energy on household consumption averages for electricity and piped gas service. It also uses administrative data from the Centers for Medicare & Medicaid Services about which facilities provide adult home care. According to BLS officials, they are unable to use some administrative data (e.g., certain federal tax data) because of current law.[36]

Other data collected by the federal government (National Accounts data). While BLS is exploring numerous alternative data sources, BLS has not fully explored the potential to update expenditure weights on a more frequent basis using supplementary data from the National Accounts in years when the most current biennial weights using Consumer Expenditure Survey data are not available. As discussed earlier, BLS typically requires 2 years of data from the Consumer Expenditure Survey to produce expenditure weights, which have a lag. In contrast, National Accounts data comprise administrative and statistical data representing the whole economy, many of which have a large

[36]For example, federal law prohibits unauthorized disclosure of federal tax information. See 26 U.S.C. § 6103.

sample size and are available on an annual basis.[37] Standards of internal control call for agencies to obtain relevant data from reliable internal and external sources in a timely manner to meet information requirements for meeting their objectives. For BLS, this could include obtaining relevant data from reliable sources for producing CPIs. As part of its strategic plan, BLS maintains goals to improve the accuracy and timeliness of BLS data and to ensure relevance in an ever-changing economy. Without adequately exploring the potential of using National Accounts data to supplement Consumer Expenditure Survey data, BLS may be missing an opportunity to move closer towards those goals. Over time, expenditure survey data lose their accuracy and relevance to the present-day expenditure patterns of consumers, which can introduce bias in measures of inflation used to adjust federal retirement benefits.[38] For example, the longer the time period between expenditure weight updates, the longer the delay to include new products in the expenditure patterns reflected in the CPIs. This delay could become increasingly important because of the rapid development in new technology, such as smart phones.

Of the 15 publications we reviewed, six discussed ways to improve the CPI and four of these suggested more timely expenditure weight updates could make the CPIs more accurate and relevant. For example, a 2009 working paper by BLS staff found that more frequent weighting may offer better representation of current price change, as well as a closer approximation to a cost-of-living index.[39] In particular, the authors simulated updating expenditure weights annually, which resulted in slower inflation increases that the authors posited are a closer approximation to a cost-of-living index. While these improvements may not be currently possible given the lag in Consumer Expenditure Survey data, the authors conclude that further examination of the weighting issue is a potentially fruitful avenue of research. The three other studies similarly indicated that more timely weight updates would result in more

[37]For more on the differences between expenditure data in the National Accounts and Consumer Expenditure Survey data, see Noah Johnson, *A Comparison of PCE and CPI: Methodological Differences in U.S. Inflation Calculation and Their Implications* (Bureau of Labor Statistics, Washington, D.C.: November 2017).

[38]As described above, relevant data have a logical connection with, or bearing upon, the identified information requirements. For example, current-period expenditure data may be most relevant for current-period price changes.

[39]John Greenlees and Elliot Williams, *Reconsideration of Weighting and Updating Procedures in the U.S. CPI* (Bureau of Labor Statistics, October 2009).

relevant CPIs, for example by better reflecting changes in consumer spending patterns.

BLS officials acknowledged that updating the weights more frequently would make the index more relevant, though they did not believe using the Consumer Expenditure Survey to do so was practical in part because they said it would require additional costs to increase the sample size.[40] In 2002, BLS increased the frequency of its weight updates from every 10 years to every 2 years, which they said was an improvement but required a sample size increase in Consumer Expenditure Survey. As previously described, the Consumer Expenditure Survey faces increasing costs and declining response rates and, according to agency officials, obtaining a large enough sample to update weights annually would require a 50 to 100 percent increase in sample size, for example, to avoid an increase in sampling error. Indeed, three studies we reviewed suggested that it can be challenging to obtain enough responses for household surveys such as the Consumer Expenditure Survey, indicating that alternate data sources may become more important.

In contrast, BLS officials acknowledged that National Accounts data could provide useful supplementary information if the expenditure survey is not providing timely enough data. However, BLS officials said they have not explored using National Accounts data, in part because they have not examined the effects of altering the expenditure weights in about 10 years. BLS officials expressed concern that National Accounts data can be subject to revision. According to the Bureau of Economic Analysis (BEA), the revisions do not reflect errors but are driven by the incorporation of more complete source data.[41] BLS officials also noted that some National Accounts data are adjusted by the CPI, so BLS would

[40]While BLS officials and others we spoke with expressed concern that updating the weights too frequently (e.g., on a weekly basis) might lead to "chain drift" or volatility in the CPIs, there is a precedent for annually reweighting price indexes in BLS, as a portion of the import and export price indexes is reweighted annually. Moreover, the 2009 Greenlees and Williams study demonstrated that an annual update to expenditure weights did not lead to additional volatility.

[41]For example, some monthly data are revised annually to include additional data provided by retailers. Also, BLS productivity measurements use National Accounts data.

have to remove the CPI's effect in order to use National Accounts data in the CPI.[42]

Moreover, the supplementary use of National Accounts data could also help address some of the concerns with measurement error in household surveys, according to some literature we reviewed. Specifically, National Accounts data could be used to address underreporting due to recall bias, the difficulty some survey respondents have recalling infrequent purchases, or underreporting of certain goods that may be seen as socially undesirable, such as tobacco and alcohol. For example, according to a recent Brookings Institution report, the National Accounts data used for the BEA's Personal Consumption Expenditure index weights are mostly based on business surveys and administrative data and thereby avoid the reporting biases inherent in the Consumer Expenditure Survey.[43] BLS's Technical Advisory Committee recommended using administrative data to address such underreporting in fiscal year 2016, as did a National Academy of Sciences report in 2013.[44] While BLS has taken steps toward increased use of administrative data, BLS has not fully implemented the Technical Advisory Committee recommendation as of March 2020.

[42]Not all data in the National Accounts are adjusted using the CPI. BLS periodically examines the differences in CPI expenditure weights and National Accounts expenditure weights used in the Personal Consumption Expenditures index. According to agency officials, the purpose of this is to evaluate the soundness of Consumer Expenditure Survey data, not to explore supplementary use of alternative data.

[43]Brent R. Moulton, *The Measurement of Output, Prices, and Productivity: What's Changed Since the Boskin Commission?* (Washington D.C.: The Brookings Institution, July 2018). For more about the potential use of National Accounts data to address underreporting in household surveys, see our discussion later in this report.

[44]National Research Council, Committee on National Statistics, Division of Behavioral and Social Sciences and Education, *Measuring What We Spend: Toward a New Consumer Expenditure Survey*, Panel on Redesigning the BLS Consumer Expenditure Surveys, eds. Don A. Dillman and Carol C. House (Washington, D.C.: The National Academies Press, 2013).

Selected Countries Use Various Strategies, Such As Obtaining Data from Alternative Sources and Bolstering Collaboration with Stakeholders, to Update Their Indexes for Retirement Benefits

Use of Retiree-Specific and Chained Price Indexes for Adjusting National Pension Benefits Is Relatively Uncommon

Our review of Organisation for Economic Co-operation and Development (OECD) countries' national pension systems revealed that it is relatively uncommon to use a retiree-specific index (i.e., a CPI for the older subpopulation) for the purpose of adjusting national pension benefits. Of the 36 OECD countries, 27 have national pension programs in which indexation is based, at least in part, on prices after initial benefits have been set, similar to Social Security in the United States (see app. I).[45] Most OECD countries use their primary measures of inflation to adjust national pension benefits, according to reports and documents about the retirement systems in these countries. Of the 27 countries using prices to adjust national pension benefits, we found evidence in 10 that the national statistical agency produces an index for the older subpopulation. Each of these 10 countries generally uses the same price information for the older subpopulation index as the main CPI but reweights the price information based on the expenditures for that subpopulation, rather than gathering new information that is unique to that group (see text box). A similar approach is used for the CPI-E in the United States. However, of these 10 countries, only four countries use the index for the older subpopulation to adjust their national pension benefits (Australia, Czech Republic, Hungary, and the Slovak Republic). The others produce the

[45]The remaining nine countries use other factors, such as average wages or other discretionary processes. Of those 27 that are using price indexation, 11 are based entirely on prices and 16 are based on prices plus other factors, such as average wages.

subpopulation index for research or other purposes, but do not use it for pension benefit adjustments.

Agency officials in all three of our case study countries (Australia, New Zealand, and the United Kingdom) said they generally saw a value in having a primary index for macroeconomic purposes, such as inflation targeting, and a subpopulation index that could be used for other purposes, such as indexation of benefits.[46]

[46]We did not conduct an independent legal analysis to verify the information provided about the laws, regulations, or policies of the countries selected for this study. Instead, we relied on appropriate secondary sources, interviews, and other sources to support our work. We note also that the fact that a legal feature was successful in one or more of the countries we visited, which may have significantly different cultures, histories, and legal systems than the United States, does not necessarily indicate that it would be successful in the United States.

Methods for Validating Use of Existing CPI Data in Subpopulation CPIs

In the three case study countries we selected for review, each national statistical agency relied upon different approaches to validate the use of existing data from the primary (main) CPI in the subpopulation CPI. Agency officials indicated that some of the methods for validating the use of existing CPI data for the subpopulation CPIs were cost efficient.

- Australia agency officials said they validated the use of existing data in the index for the older subpopulation in part by both researching whether pensioners pay different prices or shop at different outlets and cross-checking some data from industry sources. Officials said they expected that pensioners and the general population generally pay the same prices for most items and included different prices in the index for the older subpopulation for those items known to be discounted for pensioners.
    - To get a better sense of the older population's expenditures, they also increased the sample size of the expenditure survey from about 7,000 households to about 10,000 households to include more pensioners.
- New Zealand agency officials said they validated the use of existing data in part by using existing expenditure data to confirm that goods and services most important to the older subpopulation were adequately represented in the data. They also said they consider the coverage of the subpopulation group when determining the make-up of the CPI basket. Since older people may shop at different stores than the general population, New Zealand's statistical agency also developed separate outlet weights for the older subpopulation, which more accurately reflect the different mix of outlets, or stores, frequented by this group, according to agency officials. Overall, officials said they found that using subpopulation-specific outlet data instead of general CPI outlet data had very little impact on the index for the older subpopulation.
- United Kingdom agency officials said they validated the use of existing data by organizing expenditure data from the household survey into categories that align with national expenditure data, which allowed them to generate bigger samples than exist in the household survey data. As a result of the larger sample, their statistical agency said they were able to achieve more precise estimates for the index for the older subpopulation.

Source: National statistical agencies in Australia, New Zealand, and the United Kingdom. | GAO-20-422

It is also relatively uncommon for a country to produce a chained index for the purpose of adjusting national pension benefits.[47] Of those 27 OECD countries that are using price indexation, five of them produce a chained index (Australia, Canada, the United States, the United Kingdom, and New Zealand). However, none of the OECD countries use the chained index to adjust their national pension benefits. In our three case study countries, the statistical agencies used the chained index as an analytical tool to measure bias in the CPI or for comparative purposes. Officials we spoke with said that the delay required to produce a chained index made it impractical to use the index to adjust benefits. While some of the stakeholders in selected case study countries indicated it could be theoretically possible to create a chained CPI for the older subpopulation, we did not identify any countries with such an index during this review.[48]

Selected Countries Are Supplementing CPI Data with Other Government-Collected Data to Help Bolster Gaps in Information

While government-collected data are often collected for reasons other than the production of the CPIs, the three selected case study countries are using government-collected data to help fill the gaps in data they collect expressly for the CPI (see table 2).

Table 2: Examples of Other Government-Collected Data Used to Measure CPI from Selected Countries

Australia	New Zealand	United Kingdom
National Accounts data enabled annual updates to expenditure weights, reducing substitution bias by about 0.2 percentage points per year.	Administrative data, such as tenancy bond (rental price) data, as well as National Accounts data on health and life insurance.	National Accounts data used, in part, to address underreporting in the expenditure survey.

Source: Interviews and documentation from national statistical agencies in Australia, New Zealand, and the United Kingdom. | GAO-20-422

According to agency officials in the three selected countries, use of this government-collected data improves accuracy of the CPIs and can be a relatively affordable way to supplement data collected for the CPI.

[47]As described above, the Chained CPI-U in the U.S. uses a superlative formula. In other countries this type of index is commonly referred to as a "superlative" index, but in the United States this type of index is referred to as "chained."

[48]As described later, Australia uses elements of a chained index in its CPI and index for older populations, for goods for which high frequency scanner data are available, according to agency officials. However, Australia does not have an overall chained CPI for the older subpopulation.

National Accounts, key sources of government-collected data, are typically used for national summary measures like the Gross Domestic Product.[49] However, all three of the selected countries are also using relevant consumption data from National Accounts to supplement their CPI data, which agency officials in Australia said is in-line with recommendations from the International Labour Organization (see text box). Australia, New Zealand, and the United Kingdom are all using their National Accounts data to supplement expenditure survey data in their CPIs, while New Zealand is also using another form of government-collected administrative data to improve its CPIs.

International Guidance for Calculating CPIs and Subpopulation Indexes

The International Labour Organization produces a manual that provides an overview of issues that national statistical offices can consider when making decisions on how to deal with the various problems in the compilation of Consumer Price Indexes. Researchers from many countries' national statistical agencies, universities, and international organizations (such as the World Bank, International Monetary Fund, and Organisation for Economic Co-operation and Development) are involved in creating the manual. The manual also establishes international conventions, such as a suggestion that countries regularly evaluate the use of average wages as opposed to price indexes (and vice versa). Last published in 2004, an update to the manual is scheduled to be released in 2020. The upcoming revised manual is expected to elaborate on the use of National Accounts data and alternative data sources to develop expenditure weights.

Source: International Labour Organization. | GAO-20-422

- **Australia.** Australia's statistical agency uses consumption data from their National Accounts to update the CPI expenditure weights more frequently than officials said was previously possible. Using this data has helped reduce substitution bias, meaning that the data better reflect changes in consumer purchases in response to price

[49]As defined above, National Accounts data provide a comprehensive view of economic activity, including consumption data, investment, exports and imports, and income and saving.

changes.[50] Previously, Australia updated its expenditure weights every 6 years, when its household expenditure survey was released. In other words, the CPI was previously calculated assuming that consumers' expenditure patterns did not change for 6 years. As a result, the CPI did not account for substitution patterns to different goods and services over significant periods of time, leading to bias in the CPI. In 2018, the Australian statistical agency incorporated National Accounts data in the CPI in those years when the expenditure survey was not conducted, allowing the expenditure weights to be updated annually to reflect what statistical agency officials described as more timely and relevant consumption patterns and to improve the accuracy of the data. According to Australian statistical agency officials, they did not have the budget to increase the frequency of their household expenditure survey, which they said is very costly. Instead, officials said they researched alternative ways that would allow for more frequent reweighting and settled on using the National Accounts data in between survey years to update the weights annually. This approach does not require a budget increase because the National Accounts data are already produced. Australian officials said more frequent weighting helped reduce substitution bias in their CPIs by about 0.2 percentage points per year, which can have a large impact on benefits over time.

By incorporating consumption data from the National Accounts, Australian statistical agency officials said they can generate more timely and relevant CPI measures, including the subpopulation indexes. Australia's index for the older subpopulation, called the Pensioner and Beneficiary Living Cost Index, also benefits from more frequent updates of the expenditure weights and subsequent reduction in substitution bias in the CPI, according to agency officials. Agency officials said that despite not having demographic information in the National Accounts, their methods have made use of this consumption data fit for purpose for the subpopulation indexes, and the subpopulation indexes are as methodologically sound as the primary CPI.

- **New Zealand.** New Zealand's statistical agency also uses National Accounts data to estimate expenditure weights for insurance services, which are relatively difficult to measure in survey data, according to

[50]Expenditure weights are meant to reflect the relative importance of the goods and services as measured by their shares in the total consumption of households for various demographic groups, including the older population.

agency officials. Specifically, the expenditure weights for health and life insurance are based on data from the National Accounts.

- **United Kingdom.** In the United Kingdom, annual spending data from the National Accounts are the main source for CPI expenditure weights, as stakeholders noted that the National Accounts spending data are more precise and timely than their household expenditure survey. According to statistical agency officials, household expenditure data are ultimately obtained by organizing the United Kingdom's expenditure survey data into categories that align with the National Accounts and scaling up these data to the National Accounts data. Officials said this method allows the United Kingdom's statistical agency to achieve larger sample sizes, and thus smaller variances and more precision in estimates for subgroup indexes. United Kingdom officials said that their National Accounts estimates are more accurate and comprehensive than their household expenditure survey, which has a smaller sample size of nearly 6,000 households. Having more accurate expenditure data and weights leads to a more accurate and relevant primary index for pension benefits, as well as a more accurate subpopulation index, according to agency officials. The National Accounts data also help the United Kingdom adjust for any potential underreporting of particular goods in the household expenditure survey, such as alcohol, further increasing the accuracy and relevance of the dataset, according to officials.[51] Collecting prices directly from the source is more accurate than relying on someone to recall how much they spent on items, according to one stakeholder.

Government agencies from selected countries also produce other administrative data that can be useful in measuring the CPI. For example, New Zealand's statistical agency partnered with the Ministry for Business, Innovation, and Employment to use its tenancy bond database, which covers approximately 85 percent of all rental housing units in the country. These data facilitated a new way to measure rent in their CPI. Moreover, this partnership enabled New Zealand's statistical agency to create an index of rent prices monthly, instead of quarterly, which resulted in a more accurate and timely depiction of what people are spending on rent and a more accurate indexation of benefits overall. According to agency officials, the transition to these administrative data replaced the CPI

[51]During household surveys, such as the United Kingdom's Living Costs and Food survey, respondents' reports on what they spent money on may not be completely accurate. This can be due to recall bias, which is when there is a discrepancy in the accuracy or completeness of the recollections retrieved ("recalled") by households. It can also be due to specific items being either deliberately or unconsciously underreported, such as gambling, alcohol, or tobacco.

survey of landlords, and in doing so it lowered respondent burden, increased the timeliness of the rental component of New Zealand's CPI, and improved population coverage. In all of our case study countries, various data are used to measure housing prices (see text box).

Housing and the Consumer Price Index

Measuring the change in housing prices for CPI is widely acknowledged by experts to pose methodological and data challenges. In response, national statistical agencies have developed a variety of approaches to address the measurement of owner-occupied housing costs, both in the primary CPI and subpopulation indexes. Officials in the national statistical offices of the case study countries said that one of the factors underlying the approach to housing is whether the measure should reflect inflation in the economy overall or inflation as experienced by households.

- In Australia and New Zealand, the primary CPI includes price changes stemming from the purchase of a new home but not via mortgage interest payments (known as the acquisitions approach), while the subpopulation index excludes the purchase of a new home but includes mortgage interest (referred to as outlays or payment approach).
- In the United Kingdom, there are two versions of the primary CPI: one that uses "rental equivalence" (a calculation of what the owner would pay in rent for an equivalent house) and one that excludes owner-occupied housing costs. In addition, the United Kingdom's subpopulation index uses a payments approach.

Source: National statistical agencies in Australia, New Zealand, and the United Kingdom. | GAO-20-422

Selected Countries Are Using Alternative Big Data Sources to Get More Data in a More Timely Way

Officials in our selected case study countries said they are using alternative big data sources, such as web-scraping data and transactional (scanner) data to help them more accurately index their national pension benefits (see table 3).[52]

[52]As described earlier, web-scraped data are price data collected on goods sold online. Scanner data include price and quantity data on sales of goods obtained by scanning bar codes for goods at electronic points of sale in retail outlets.

Table 3: Examples of Big Data Explored to Measure CPI from Selected Countries

Australia	New Zealand	United Kingdom
Transactional (scanner) data from grocery stores are currently used in the Consumer Price Index (CPI). These data account for nearly one-sixth of the goods and services in the CPI. Scanner data enabled a chained formula for that portion of the CPI.	Currently has scanner data from grocery stores and is working on incorporating these data in the Consumer Price Index.	Exploring the use of scanner and online price data in the Consumer Price Index.

Source: Interviews and documents from national statistical agencies in Australia, New Zealand, and the United Kingdom. | GAO-20-422

These officials said that these alternative data sources allow countries to obtain a higher volume of data and more accurate data to incorporate into their CPIs, subsequently making the indexation of benefits more accurate. Electronic price data obtained from a retailer, whether through the retailer's website or through scanner data the retailer shares with the national statistical agency, reflects accurate and timely data on the price and quantity of goods and services sold. Electronic price data can be an improvement over data collected in household expenditure surveys, for example, as several experts and agency officials in one case study country noted that household expenditure surveys suffer from recall bias, resulting in less accurate spending data. The three selected countries are at different stages of incorporating scanner data into their CPI. Officials at the national statistical agencies in all three of our case-study countries stated that they are primarily focused on incorporating scanner data from grocery stores into their CPI. Using grocery store data is possible, in part, because these countries contain a relatively small number of stores that dominate grocery sales, according to agency officials, which is a difference from the United States.

- **Australia.** According to stakeholders, the Australian statistical agency developed a formula that incorporates a chained formula into a portion of the CPI using high- frequency scanner data from the country's dominant grocery stores, which provides timely price and expenditure data on food items for their indexes. Integrating this type of high-frequency data is not easy, they said, since the traditional CPI formulas are not built to handle the volume of data that scanner data produce. However, in consultation with academics and statistical agencies from around the world, Australia was able to develop a chained formula that uses an innovative statistical method, known as

a multilateral approach, to incorporate the scanner data.[53] As a result, the portion of the CPI for which Australia has scanner data (about one-sixth of the CPI, comprised mostly of food and other grocery data) is based on a chained formula. Incorporating these data allows the country to include all of the products available in the datasets, rather than a small sample of products, leading to a more accurate calculation of food prices and a more accurate index overall, for both the general population and the older subpopulation, according to agency officials. Stakeholders in Australia noted that the international price statistics community has since reached a consensus that multilateral methods are the most effective way to capitalize the full amount of information provided in scanner data, and they said that the forthcoming update of the International Labour Organization's CPI Manual is expected to recommend this method as well.

- **New Zealand.** New Zealand's statistical agency is working towards incorporating more scanner data, primarily from its two large supermarket chains, in the production of the country's CPIs, which will help achieve a more accurate index for both the general population and the older subpopulation, according to agency officials. New Zealand started using retail scanner data to supplement its expenditure data in its CPI in 2006, and in 2014 New Zealand incorporated direct measurement from scanner data for consumer electronics products into its CPI. Officials from the national statistical agency said they hope to expand their use of this type of big data in the near future. They have already received the data from supermarkets, whose goods account for roughly 20 percent of the goods and services in the CPI, but they have not yet integrated the data into their CPIs. Agency officials said they expect to integrate this in the next year. New Zealand's statistical agency officials said they have a goal to obtain scanner data for other CPI components soon as well, such as fuel.
- **United Kingdom.** In the United Kingdom, agency officials said improvements in technologies have resulted in new alternative sources for price data that could be used in the compilation of their

[53]In the past, chained (superlative) formulas only worked with so-called bilateral index methods, which essentially compared prices in two periods, limiting the use of price data in the CPI. However, once the Australian statistical agency was able to implement a multilateral approach, it was able to incorporate all of the scanner data, which allowed high-frequency and more high-quality data in the estimation of the CPI. The multilateral index method works by shifting the window of comparison of prices over time as more data are added to the formula. Instead of comparing prices in two periods, as in the bilateral index method, the multilateral index method uses a rolling window to make comparisons over various time periods, and takes the average of these comparisons.

price indexes in the near future. The United Kingdom's statistical agency is currently exploring both scanner data and online price data. The agency currently has several streams of research looking into the expanded use of alternative data, including research studying the feasibility of moving away from collecting prices manually towards using electronic means wherever feasible and efficient. The agency is now receiving web-scraped data from an online source that captures prices from online sales of goods like clothing. The United Kingdom's statistical agency is also continuing to engage with retailers on receiving scanner data covering areas such as clothing and groceries, targeting some of the largest retailers from which the agency currently manually collects prices. These data sources may provide a more efficient way to capture the increase in online expenditures that has occurred over the last decade, and will likely continue to occur. These new data are initially being used for research work, but over time the web-scraped online prices and scanner data will be used when calculating primary inflation indexes, according to agency officials. The research done by the United Kingdom's statistical agency into grocery store items has also enabled officials there to explore different methods of collecting web scraped prices in-house. The officials said this has led to wider benefits for the agency in general, with an increase in knowledge and experience that has contributed to the success of other big data projects.

Selected Countries Collaborate and Consult with National Stakeholders and Experts When Implementing Changes to Their CPIs

Our selected case-study countries use committees with stakeholders and advisory panels, including academic researchers with subject matter expertise, to implement innovative changes to their CPIs (see table 4).

Table 4: Examples of Collaborative Approaches from Selected Countries

Australia	New Zealand	United Kingdom
The national statistical agency in Australia partnered with academics to develop a new formula to incorporate scanner data. It also holds regular reviews and seeks input with each release of the expenditure survey.	The advisory committee of the national statistical agency of New Zealand sought public input and published several reports and recommendations about subpopulation indexes.	The national statistical agency of the United Kingdom held numerous workshops with stakeholders, including technical experts and other agencies that use CPI. Officials said this was an important part of the process to develop subpopulation indexes.

Source: National statistical agencies in Australia, New Zealand, and the United Kingdom. | GAO-20-422

The statistical agencies in these three countries have shown a willingness to act on recommendations that came out of these collaborative efforts. These countries are also seeking input from the international statistical community, which country officials said has led to positive developments in their CPIs.

- **Australia.** Australia's statistical agency has taken a variety of approaches to collaborate with external stakeholders, which agency officials said has led to positive changes to their CPIs, and thus indexation of benefits over the years. According to agency officials, Australia's collaborative efforts include:
  - conducting regular reviews and seeking stakeholder input every 6 years with the release of the expenditure survey;
  - convening workshops with stakeholders including both academics and users (e.g., the agencies that distribute benefits);
  - participating in international conferences to receive feedback on changes to the country's CPI and subpopulation indexes;
  - partnering with methodology experts in other agencies such as the Treasury and central bank, occasionally by obtaining staff on detail; and
  - commissioning reports that research and review measures to strengthen the financial security of seniors.

These reviews and associated collaborative efforts have helped the agency learn more about the issues it faces and have helped trigger changes that will improve the accuracy of the nation's CPI, according to agency officials. For example, as discussed above, agency officials said that a 2011 CPI review revealed concern by the Reserve Bank of Australia and others that the infrequent reweighting was resulting in bias in the CPI that affected inflation targeting by the central bank, as well as benefit expenditures. This review helped spur innovations, such as including the incorporation of scanner data into the nation's CPI, which delivered positive results with respect to more timely and relevant data being used to estimate inflation. Australia's statistical agency officials said they sought extensive input from key governmental stakeholders, a number of academic experts, as well as international experts to research how to best incorporate scanner data into their CPI, which agency officials noted was necessary to facilitate the integration of high-frequency scanner data into the CPI. They also conducted numerous bilateral and multilateral consultations with key stakeholders in the government that use CPI data, including the Reserve Bank of Australia, the Treasury,

Department of Finance, Department of Social Services, and State Treasuries. Australian statistical agency officials suggested that consulting with users of the data frequently was an important part of implementing changes to the measurement of the CPI and subpopulation indexes.

- **New Zealand.** New Zealand's statistical agency has also used CPI advisory committees composed primarily of external stakeholders who make use of the agency's CPIs. For example, in 2013 New Zealand's statistical agency convened a committee to independently review the methods and practices used to compile the CPI and make recommendations, for example, about how additional indexes should be measured. The committee also incorporated public submissions on the scope and uses of the CPI, for example, from nongovernmental organizations and interest groups such as retiree advocacy groups. The committee then released a report recommending the creation of additional CPIs that are designed for microeconomic purposes, such as the indexation of retirement benefits, to better reflect changes in the purchasing power of the incomes of particular subgroups of the population, like the older subpopulation. The committee also recommended that New Zealand's statistical agency review the sample size and collection methods of their expenditure survey to improve the reliability of expenditure estimates of the required population subgroups so that the estimates could eventually be of high enough quality to be published, which they subsequently were. According to officials, the committee's report helped lead to the creation of New Zealand's subpopulation indexes. Moreover, the committee recommended that the statistical agency try to use retail scanner data to measure price change and stated that the method aligns with international best practices. New Zealand's statistical agency recognized these best practices and the international consensus that multilateral methods are the preferred way to incorporate big data. Indeed, it has started to use these methods in the rental prices data and it plans to continue to research implementing these methods further.
- **United Kingdom.** The United Kingdom has also developed advisory panels on consumer prices to provide independent advice to the National Statistician, which officials said has allowed the United Kingdom's statistical agency to learn more about challenges with the nation's CPIs and to find possible solutions. Similar to the United States, the United Kingdom has advisory groups on technical issues, as well as on the uses of price indexes. The reports published by various advisory groups have raised technical issues with the Retail

Price Index (RPI), which is the United Kingdom's longest running measure of inflation. These technical issues resulted in the RPI being higher than the CPI. Ultimately, agency officials said consultations and advisory panel input helped lead to the RPI being decertified as a national statistic (see text box). The United Kingdom's statistical agency also hosted numerous meetings and a collaborative workshop about the conceptual foundations of its subpopulation indexes, which are currently being developed. According to agency officials, obtaining input from internal and external stakeholders has been critical to developing solutions to indexation challenges.

The United Kingdom's Experience Changing Price Index Used for Pension Adjustments

Changing the index used for benefit adjustments can be difficult, as switching price indexes can involve tradeoffs. For example, public and private pension benefits in the United Kingdom have traditionally been indexed by the Retail Price Index (RPI), the oldest index in the United Kingdom. The United Kingdom recently switched indexation of certain government benefits, including pension benefits, from the RPI to the slower-growing CPI. This is expected to result in lower payouts from the government. In contrast, the government continued using the faster-growing RPI for some provisions, such as student loan interest rates, that resulted in higher payments to the government. Stakeholders suggested that having multiple measures of inflation can create incentives for the government to use different indexes for its own budgetary advantage, with pensioners receiving lower benefit adjustments and students facing relatively higher loan payment adjustments. The United Kingdom's experience highlights that changing the index for benefits may result in advantages and disadvantages for different groups and thus may be politically difficult, according to agency officials.

Source: Interviews with stakeholders and documentation from agencies in the United Kingdom. | GAO-20-422

Conclusions

Federal retirement programs like Social Security have relied upon a subpopulation price index to adjust benefits since automatic cost-of-living adjustments were first enacted almost 45 years ago. This index estimates changes in purchasing power for wage earners as opposed to changes in the standard of living or some other type of measurement. In recent years, numerous legislative proposals have been suggested to change this index from one that measures the purchasing power of wage earners to one that targets some different population, for example one solely

focused on the elderly. Much of the debate over using a different index has centered on the ability (i.e., the accuracy) of the indexes to capture changes in the cost of living for a particular group in society.

BLS is unsure whether the data sources it currently uses are adequate to produce accurate CPI-E and CPI-W subpopulation indexes on a timely basis, according to BLS officials and documentation. While the CPI-E is experimental and not used by federal programs, the CPI-W is used to adjust billions of dollars of Social Security and other federal retirement program benefits. It is therefore critical that the measurement be as accurate as possible. However, ensuring the measurement's accuracy may require a reexamination of the underlying data used to produce the subpopulation indexes. BLS has not evaluated the adequacy of existing data because it is costly to undertake a full evaluation, according to agency officials. But experts we interviewed, including some on BLS advisory groups, indicate there may be cost-efficient ways to conduct such a review. Although the experiences of other countries may not be directly applicable, other countries have found ways to evaluate the use of existing data for their subpopulation indexes, and officials in all three of our case study countries expressed the view that some of these methods were cost efficient. Absent BLS evaluating the adequacy of the existing data it uses to produce its subpopulation indexes, BLS will continue to be uncertain if its subpopulation indexes are accurate and it may not learn of potential areas for improvement.

In addition, BLS currently relies on the Consumer Expenditure Survey to produce expenditure weights that measure the mix of goods and services consumers purchase and, because of survey shortcomings and processing lags, the weights reflect spending patterns that can be up to 4 years out of date. Although BLS has taken other steps to improve the accuracy, timeliness, and relevance of data used in the CPIs, BLS has not fully explored the potential to update expenditure weights on a more frequent basis using annual data from the National Accounts, which are currently collected in part to measure Gross Domestic Product. While not specifically designed for use in CPIs, the National Accounts data may provide BLS an opportunity to supplement Consumer Expenditure Survey data in the intervening years. Moreover, some literature we reviewed indicated that the use of National Accounts data has the potential to mitigate measurement error in the Consumer Expenditure Survey, thereby increasing accuracy. Without adequately exploring the potential of such an option, BLS may be missing an opportunity to improve its CPIs.

Recommendations for Executive Action

We are making the following two recommendations to the Department of Labor:

- The Secretary of Labor should ensure that BLS explores cost-efficient ways to evaluate the data sources currently used to produce subpopulation indexes, such as by engaging more directly with other stakeholders or seeking input from its advisory groups and other knowledgeable entities about approaches to expand data collection in a cost-efficient manner. (Recommendation 1)
- The Secretary of Labor should ensure that BLS explores the use of already collected National Accounts data to produce more accurate, timely, and relevant CPIs. (Recommendation 2)

Agency Comments and Our Evaluation

We provided a draft of the report to the Department of Labor, the Social Security Administration, and the Department of State for their review and comment. We also sent an informational copy to the Bureau of Economic Analysis. The Department of Labor and the Social Security Administration provided technical comments, which we have incorporated where appropriate. In an email, the Department of State said it had no comments on the report. The Department of Labor also provided written comments, which are reproduced in appendix III and discussed below.

In its written comments, the Department of Labor stated that BLS continually improves its measures according to a guiding principle to provide accurate, objective, relevant, timely, and accessible information. The Department of Labor agreed with the first recommendation to explore cost-efficient ways to evaluate the data sources currently used to produce subpopulation indexes and stated that it would continue to investigate improvements to subpopulation indexes.

The Department of Labor disagreed with the second recommendation to explore the use of National Accounts data in the construction of its indexes, stating that the National Accounts data are not a replacement for Consumer Expenditure Survey data. While we agree that the National Accounts data are not a wholesale replacement for the Consumer Expenditure Survey data, we believe that it would be useful to examine National Accounts data as an augmenting, alternative source of data that could supplement or enrich the Consumer Expenditure Survey. Such an effort could potentially lead to more accurate, timely, and relevant CPIs. Although the Department of Labor stated that the Consumer Expenditure Survey is a continuous survey and that data are received quarterly, most CPIs still rely on expenditure weights based on Consumer Expenditure

Survey data that are up to 4 years out-of-date. In addition, the Consumer Expenditure Survey faces increasing costs and declining response rates.

The Department of Labor stated in its comments that it is exploring ways to accelerate the data collection and processing time and that it periodically investigates the frequency of updating expenditure weights. We commend the Department of Labor for considering these efforts, and we maintain that they could take further action to explore additional opportunities for improvement. For example, the Department of Labor could research the extent to which there are instances or categories for which the National Accounts data could be used to produce more up-to-date expenditure weights than the Consumer Expenditure Survey. As we noted in our report, Department of Labor officials told us they periodically examine National Accounts expenditure data to explore differences with the Consumer Expenditure Survey data, not to explore supplementary use of alternative data. While it cannot be ensured that every expenditure data point in the National Accounts will be of use for producing CPIs, we maintain that further exploring the National Accounts expenditure data as a complement to the Consumer Expenditure Survey data may provide opportunities for BLS to improve the accuracy, timeliness, and relevance of its CPIs.

We are sending copies of this report to the Secretary of Labor, the Commissioner of Social Security, and the Secretary of State. In addition, the report will be available at no charge on the GAO website at http://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-7215 or jeszeckc@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IV.

Charles A. Jeszeck
Director, Education, Workforce, and Income Security Issues

Appendix I: National Pension Indexation Formulas in the 36 OECD Countries

Table 5: Indexation Formulas for National Pension Benefits in the 36 OECD Countries

Country	National pension indexation based at least in part on prices (after initial benefits set)?	If indexation based at least in part on prices…	
		evidence of a subpopulation index for the elderly? (Used in pension formula?)	evidence of a chained index? (Used in pension formula?)
Australia	Yes (in part)	Yes (Yes)	Yes[a] (No)
Austria	No	n/a	n/a
Belgium	Yes	No	No
Canada	Yes (in part)	Yes (No)	Yes (No)
Chile	Yes	No	No
Czech Republic	Yes (in part)	Yes (Yes)	No
Denmark	No	n/a	n/a
Estonia	Yes (in part)	No	No
Finland	Yes (in part)	No	No
France	Yes	Yes (No)	No
Germany	No	n/a	n/a
Greece	No	n/a	n/a
Hungary	Yes	Yes (Yes)	No
Iceland	Yes	No	No[a]
Ireland	No	n/a	n/a
Israel	Yes	No	No
Italy	Yes	No	No
Japan	Yes (in part)	Yes (No)	No
Korea	Yes	No	No
Latvia	Yes (in part)	No	No
Lithuania	No	n/a	n/a
Luxembourg	Yes (in part)	No	No
Mexico	Yes	No	No
Netherlands	Yes	No	No
New Zealand	Yes (in part)	Yes (No)	Yes (No)
Norway	No	n/a	n/a
Poland	Yes (in part)	No	No
Portugal	Yes (in part)	No	No
Slovak republic	Yes (in part)	Yes (Yes)	No
Slovenia	No	n/a	n/a
Spain	Yes (in part)	No	No
Sweden	No	n/a	n/a
Switzerland	Yes (in part)	No	No

Country	National pension indexation based at least in part on prices (after initial benefits set)?	If indexation based at least in part on prices… evidence of a subpopulation index for the elderly? (Used in pension formula?)	If indexation based at least in part on prices… evidence of a chained index? (Used in pension formula?)
Turkey	Yes	No	No
United Kingdom	Yes (in part)	Yes (No)	Yes (No)
United States	Yes	Yes (No)	Yes (No)
Total Yes	**27**	**10 (4)**	**5 (0)**

Source: GAO analysis of Organisation for Economic Co-operation and Development (OECD), Social Security Administration, and country-specific documents. | GAO-20-422.

[a]Some elements of Australia's and Iceland's CPIs are based on chained formulas, but the CPIs are primarily based on other formulas.

Appendix II: Additional Information about Selected Case Study Countries

Table 6: Overview of Selected Countries' Practices Regarding Subpopulation Indexes and Other Approaches to Improve Consumer Price Indexes

	Australia	New Zealand	United Kingdom
Population	25 million	5 million	66 million
Statistical agency	Australian Bureau of Statistics (ABS)	Statistics New Zealand (Stats NZ)	Office for National Statistics (ONS)
National pension	Age Pension	Superannuation	State Pension
Type of indexation used for national pension benefits	Higher of CPI or Pensioner and Beneficiary Living Cost Index, provided amount is within a given range of wage growth	CPI (excluding tobacco), provided amount is within a given range of wage growth	Higher of CPI, wage growth, or 2.5 percent
Older subpopulation index	Pensioner and Beneficiary Living Cost Index[a]	Household Living-Costs Price Indexes— Superannuitants	Household Cost Index—Retired Households[b]
Population	Recipients of all government payments, the largest one being the national pension[a]	Recipients of the national pension	Retired households
Weighting approach	Average expenditure for all households	Expenditure for average household	Expenditure for average household
Coverage	National; private households (excludes institutionalized individuals)	National; households living in permanent dwellings (excludes institutionalized individuals)	Domestic; all households (including institutionalized individuals)
Approach for durable goods and interest payments	Payments approach (includes interest payments)	Payments approach (includes interest payments)	Payments approach (includes interest payments)
Examples of other government-collected data used to measure CPI	National Accounts data enabled annual updates to expenditure weights, reducing substitution bias by about 0.2 percentage points per year.	Administrative data, such as tenancy bond (rental price) data, as well as National Accounts data on health and life insurance.	National Accounts data used, in part, to address underreporting in the expenditure survey.
Examples of big data explored to measure CPI	Transactional (scanner) data from grocery stores are currently used in the CPI. These data account for about one-sixth of the goods and services in the CPI. Scanner data enabled a chained formula for that portion of the CPI.	Currently has scanner data from grocery stores and is working on incorporating these data into the CPI.	Exploring the use of scanner and online price data in the CPI.
Examples of collaborative approaches	ABS partnered with academics to develop a new formula to incorporate scanner data. ABS holds regular reviews and seeks input with each release of the expenditure survey.	Stats NZ's advisory committee sought public input and published several reports and recommendations about subpopulation indexes.	ONS held numerous workshops with stakeholders, including technical experts and other agencies that use CPI. Officials said this was an important part of the process to develop subpopulation indexes.

Source: Agency officials and GAO review of documents from national statistical offices in selected countries. | GAO-20-422.

Note: We did not conduct an independent legal analysis to verify the information provided about the laws, regulations, or policies of the countries selected for this study. Instead, we relied on appropriate secondary sources, interviews, and other sources to support our work. We submitted key report excerpts to agency officials in each country for their review and verification, and we incorporated their

technical corrections as necessary. We note also that the fact that a legal feature was successful in one or more of the countries we visited, which may have significantly different cultures, histories, and legal systems than the United States, does not necessarily indicate that it would be successful in the United States.

[a]Australia also has a Living Cost Index specifically for pensioners, which follows the same methodologies as this index.

[b]The United Kingdom's Household Cost Indexes are under development and the methodologies are subject to change.

Appendix III: Comments from the Department of Labor

U.S. Department of Labor

Commissioner
Bureau of Labor Statistics
Washington, D.C. 20212

May 11, 2020

Dr. Charles A. Jeszeck
Director
Education, Workforce, and Income Security
U.S. Government Accountability Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Dr. Jeszeck:

Thank you for the opportunity to review and comment on the Government Accountability Office's (GAO) draft report titled, *Retirement Security: BLS Should Explore Ways to Improve the Accuracy, Timeliness, and Relevance of Its Cost-of-Living Measurements* (GAO-20-422, job code 103320).

The Department of Labor (DOL) appreciates GAO's work to highlight some of the challenges in creating a Cost-of-Living index. The Bureau of Labor Statistics (BLS) continuously improves its measures in accordance with a guiding principle to provide customers accurate, objective, relevant, timely, and accessible information. A list of recent improvements to the suite of Consumer Price Index products is available from the BLS website.[1]

DOL agrees with GAO's recommendation there may be limited cases of cost-efficient ways to evaluate the data currently used to produce subpopulation indexes. BLS considers the CPI-E an experimental index, because a full assessment to incorporate methodology improvements to reach gold standard quality is cost prohibitive given BLS' current funding level. BLS will continue to investigate improvements to subpopulation indexes, including recommendations made by a panel of experts formed by the Committee on National Statistics in 2020-2021.

DOL does not agree with the recommendation to use National Accounts data as a replacement for household survey data, because their use would not produce more accurate, timely, and relevant CPIs. The International Labor Organization manual on

[1] https://www.bls.gov/cpi/additional-resources/historical-changes.htm

Consumer Price Indexes recommends using national accounts data when the national household budget survey is not timely or continuous. On the contrary, the Consumer Expenditure Surveys (CE) are conducted continuously and received by the CPI on a quarterly basis. To improve the timeliness of weight information used in production of all CPI indexes, the BLS is exploring efficiencies to accelerate the CE data collection and processing time. The BLS also periodically investigates the weight update frequency of its headline consumer inflation products, and could adopt an annual update frequency if it were determined to improve the accuracy of those indexes.

As the report notes, using National Accounts data to address issues such as underreporting in the CE has been proposed in the past. BLS maintains a webpage dedicated to data quality monitoring of the CE, including comparisons to other data sources and the Personal Consumption Expenditure (PCE).[2] BLS has researched the multiple assumptions and indirect estimation procedures required to adjust for differences in population targets and definitions of consumption between CPI and PCE. We have made these adjustments for comparison purposes, but conclude their ongoing use would not clearly improve estimates of relative spending measures for the CPI without introducing other errors.

Finally, the use of National Accounts data would not improve estimation of subpopulation CPIs. To our knowledge, there is no consumer demographic information linked to national accounts data and would not address any of the reasons for which BLS considers the CPI-E to be experimental.

Thank you for the opportunity to respond.

Sincerely,

WILLIAM BEACH

Digitally signed by WILLIAM BEACH
Date: 2020.05.11 14:53:45 -04'00'

WILLIAM W. BEACH
Commissioner
Bureau of Labor Statistics

[2] https://www.bls.gov/cex/cecomparison.htm

Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

Charles A. Jeszeck, (202) 512-7215 or jeszeckc@gao.gov

Staff Acknowledgments

In addition to the contact named above, Michael Collins (Assistant Director), Laura Hoffrey (Analyst in Charge), Emilio Fonseca, Kathleen McQueeney, Tom Moscovitch, and Julie Miller made key contributions to this report. Also contributing to this report were Deborah Bland, Alicia Cackley, Charles Ford, Sarah Gilliland, Susan Irving, Kelsey Kreider, Sheila McCoy, Jessica Orr, Oliver Richard, Joseph Silvestri, Almeta Spencer, Curtia Taylor, Frank Todisco, Walter Vance, Adam Wendel, and Sirin Yaemsiri.

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