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Economic News Release



Consumer Price Index Summary

Transmission of material in this release is embargoed until
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CONSUMER PRICE INDEX - SEPTEMBER 2018

The Consumer Price Index for All Urban Consumers (CPI-U) increased 0.1 percent in September on a seasonally adjusted basis after rising 0.2 percent in August, the U.S. Bureau of Labor Statistics reported today. Over the last 12 months, the all items index rose 2.3 percent before seasonal adjustment.

The shelter index continued to rise and accounted for over half of the seasonally adjusted monthly increase in the all items index. The energy index declined 0.5 percent in September after rising in August. The food index was unchanged in September, as an increase in the index for food away from home offset a decline in the food at home index.

The index for all items less food and energy rose 0.1 percent in September, the same increase as in August. The shelter index increased 0.2 percent, and the indexes for apparel, motor vehicle insurance, recreation, and airline fares also rose. The medical care index increased as well, though its components were mixed. The index for used cars and trucks, which fell sharply, and the new vehicles index were among the indexes that declined in September.

The all items index rose 2.3 percent for the 12 months ending September, a smaller increase than the 2.7-percent increase for the 12 months ending August. The energy index rose 4.8 percent over the last year, a notably smaller increase than the 10.2-percent increase for the 12 month period ending August. The index for all items less food and energy rose 2.2 percent for the 12 months ending September and the food index increased 1.4 percent; these were both the same rate of increase as for the 12 months ending August.

Table A. Percent changes in CPI for All Urban Consumers (CPI-U): U.S. city average

	Seasonally adjusted changes from preceding month							Un- adjusted 12-mos. ended Sep. 2018
	Mar. 2018	Apr. 2018	May 2018	June 2018	July 2018	Aug. 2018	Sep. 2018	
All items.....	-.1	.2	.2	.1	.2	.2	.1	2.3
Food.....	.1	.3	.0	.2	.1	.1	.0	1.4
Food at home.....	.1	.3	-.2	.2	.2	.0	-.1	.4
Food away from home (1)..	.1	.2	.3	.2	.1	.2	.2	2.6
Energy.....	-2.8	1.4	.9	-.3	-.5	1.9	-.5	4.8
Energy commodities.....	-4.7	3.0	1.6	.6	-.6	3.0	-.2	9.6
Gasoline (all types)....	-4.9	3.0	1.7	.5	-.6	3.0	-.2	9.1

Fuel oil.....	-7	2.7	-7	2.9	1.2	2.2	.3	23.4
Energy services.....	-.2	-.5	-.1	-1.5	-.4	.4	-.8	-1.2
Electricity.....	.0	-.6	.1	-1.4	-.4	.3	-.5	-1.2
Utility (piped) gas service.....	-1.2	-.4	-.6	-1.7	-.5	.9	-1.7	-1.2
All items less food and energy.....	.2	.1	.2	.2	.2	.1	.1	2.2
Commodities less food and energy commodities....	-.1	-.1	-.1	.0	.1	-.3	-.3	-.3
New vehicles.....	.0	-.5	.3	.4	.3	.0	-.1	.5
Used cars and trucks....	-.3	-1.6	-.9	.7	1.3	.4	-3.0	-1.5
Apparel.....	-.6	.3	.0	-.9	-.3	-1.6	.9	-.6
Medical care commodities	.1	-.2	1.3	.2	-1.1	-.3	-.1	.7
Services less energy services.....	.3	.2	.3	.2	.3	.2	.2	3.0
Shelter.....	.4	.3	.3	.1	.3	.3	.2	3.3
Transportation services	.2	-.4	.0	.2	.5	.3	.5	4.0
Medical care services...	.5	.2	-.1	.5	.1	-.2	.2	2.0

1 Not seasonally adjusted.

Food

The food index was unchanged in September. The index for food at home, which was unchanged in August, fell 0.1 percent in September with major grocery store food group indexes mixed. The index for meats, poultry, fish, and eggs fell 1.0 percent in September, with all its major component indexes falling. The fruits and vegetables index also fell, declining 0.5 percent. The index for dairy and related products declined 0.3 percent.

The index for cereals and bakery products increased 0.6 percent, as did the index for nonalcoholic beverages. The index for other food at home rose 0.2 percent. The index for food away from home rose 0.2 percent in September, the same increase as in August.

The food index rose 1.4 percent over the last 12 months, with the index for food away from home rising 2.6 percent and the food at home index increasing 0.4 percent. All the major grocery store food group indexes rose modestly over the period, except for the index for dairy and related products, which was unchanged.

Energy

The energy index declined 0.5 percent in September after rising 1.9 percent in August. After rising 3.0 percent in August, the gasoline index declined slightly in September, falling 0.2 percent. (Before seasonal adjustment, gasoline prices increased 0.3 percent in September.) The electricity index fell 0.5 percent in September after rising in August, and the index for natural gas, which also increased in August, fell 1.7 percent in September.

The energy index increased 4.8 percent over the past year. The index for fuel oil rose sharply, increasing 23.4 percent. The gasoline index rose 9.1 percent over the last 12 months, while the electricity and natural gas indexes both declined, falling 1.2 percent.

All items less food and energy

The index for all items less food and energy increased 0.1 percent in September. The shelter index rose 0.2 percent in September following a 0.3-percent increase in August. The indexes for rent and owners' equivalent rent both increased 0.2 percent in September, smaller increases than in August.

The index for apparel rose 0.9 percent in September following declines in each of the prior 3 months. The motor vehicle insurance index rose 0.8 percent. The recreation index advanced 0.3 percent in September as the index for recreation services increased 0.7 percent. The medical care index rose 0.2 percent in September after declining in July and August. The index for physicians' services rose 0.3 percent, but the indexes for hospital services and for prescription

drugs both declined. The index for airline fares continued to increase, advancing 1.0 percent. The indexes for household furnishings and operations, communication, education, alcoholic beverages, personal care, and tobacco all also rose in September.

The index for used cars and trucks fell sharply in September, declining 3.0 percent following increases in each of the last 3 months. The new vehicles index declined slightly in September, falling 0.1 percent.

The index for all items less food and energy rose 2.2 percent over the past 12 months, the same increase as for the 12 months ending August. The shelter index increased 3.3 percent over the last 12 months, and the medical care index rose 1.7 percent. The indexes for used cars and trucks, apparel, and airline fares all declined over the past year.

Not seasonally adjusted CPI measures

The Consumer Price Index for All Urban Consumers (CPI-U) increased 2.3 percent over the last 12 months to an index level of 252.439 (1982-84=100). For the month, the index increased 0.1 percent prior to seasonal adjustment.

The Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) increased 2.3 percent over the last 12 months to an index level of 246.565 (1982-84=100). For the month, the index increased 0.1 percent prior to seasonal adjustment.

The Chained Consumer Price Index for All Urban Consumers (C-CPI-U) increased 2.0 percent over the last 12 months. For the month, the index rose 0.1 percent on a not seasonally adjusted basis. Please note that the indexes for the past 10 to 12 months are subject to revision.

The Consumer Price Index for October 2018 is scheduled to be released on Wednesday, November 14, 2018, at 8:30 a.m. (EST).

Technical Note

Brief Explanation of the CPI

The Consumer Price Index (CPI) measures the change in prices paid by consumers for goods and services. The CPI reflects spending patterns for each of two population groups: all urban consumers and urban wage earners and clerical workers. The all urban consumer group represents about 93 percent of the total U.S. population. It is based on the expenditures of almost all residents of urban or metropolitan areas, including professionals, the self-employed, the poor, the unemployed, and retired people, as well as urban wage earners and clerical workers. Not included in the CPI are the spending patterns of people living in rural nonmetropolitan areas, farming families, people in the Armed Forces, and those in institutions, such as prisons and mental hospitals. Consumer inflation for all urban consumers is measured by two indexes, namely, the Consumer Price Index for All Urban Consumers (CPI-U) and the Chained Consumer Price Index for All Urban Consumers (C-CPI-U).

The Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) is based on the expenditures of households included in the CPI-U definition that meet two requirements: more than one-half of the household's income must come from clerical or wage occupations, and at least one of the household's earners must have been employed for at least 37 weeks during the previous 12 months. The CPI-W population represents about 29 percent of the total U.S. population and is a subset of the CPI-U population.

The CPIs are based on prices of food, clothing, shelter, fuels, transportation, doctors' and dentists' services, drugs, and other goods and services that people buy for day-to-day living. Prices are collected each month in 75 urban areas across the country from about 5,000 housing units and approximately 22,000 retail establishments (department stores, supermarkets, hospitals, filling stations, and other types of stores and service establishments). All

taxes directly associated with the purchase and use of items are included in the index. Prices of fuels and a few other items are obtained every month in all 75 locations. Prices of most other commodities and services are collected every month in the three largest geographic areas and every other month in other areas. Prices of most goods and services are obtained by personal visits or telephone calls by the Bureau's trained representatives.

In calculating the index, price changes for the various items in each location are aggregated using weights, which represent their importance in the spending of the appropriate population group. Local data are then combined to obtain a U.S. city average. For the CPI-U and CPI-W, separate indexes are also published by size of city, by region of the country, for cross-classifications of regions and population-size classes, and for 23 selected local areas. Area indexes do not measure differences in the level of prices among cities; they only measure the average change in prices for each area since the base period. For the C-CPI-U, data are issued only at the national level. The CPI-U and CPI-W are considered final when released, but the C-CPI-U is issued in preliminary form and subject to three subsequent quarterly revisions.

The index measures price change from a designed reference date. For most of the CPI-U and the CPI-W, the reference base is 1982-84 equals 100. The reference base for the C-CPI-U is December 1999 equals 100. An increase of 7 percent from the reference base, for example, is shown as 107.000. Alternatively, that relationship can also be expressed as the price of a base period market basket of goods and services rising from \$100 to \$107.

Sampling Error in the CPI

The CPI is a statistical estimate that is subject to sampling error because it is based upon a sample of retail prices and not the complete universe of all prices. BLS calculates and publishes estimates of the 1-month, 2-month, 6-month, and 12-month percent change standard errors annually for the CPI-U. These standard error estimates can be used to construct confidence intervals for hypothesis testing. For example, the estimated standard error of the 1-month percent change is 0.03 percent for the U.S. all items CPI. This means that if we repeatedly sample from the universe of all retail prices using the same methodology, and estimate a percentage change for each sample, then 95 percent of these estimates will be within 0.06 percent of the 1-month percentage change based on all retail prices. For example, for a 1-month change of 0.2 percent in the all items CPI-U, we are 95 percent confident that the actual percent change based on all retail prices would fall between 0.14 and 0.26 percent. For the latest data, including information on how to use the estimates of standard error, see <https://www.bls.gov/cpi/tables/variance-estimates/home.htm>.

Calculating Index Changes

Movements of the indexes from 1 month to another are usually expressed as percent changes rather than changes in index points, because index point changes are affected by the level of the index in relation to its base period, while percent changes are not. The following table shows an example of using index values to calculate percent changes:

	Item A	Item B	Item C
Year I	112.500	225.000	110.000
Year II	121.500	243.000	128.000
Change in index points	9.000	18.000	18.000
Percent change	$9.0/112.500 \times 100 = 8.0$	$18.0/225.000 \times 100 = 8.0$	$18.0/110.000 \times 100 = 16.4$

Use of Seasonally Adjusted and Unadjusted Data

The Consumer Price Index (CPI) produces both unadjusted and seasonally adjusted data. Seasonally adjusted data are computed using seasonal factors derived by the X-13ARIMA-SEATS seasonal adjustment method. These factors are updated each February, and the new factors are used to revise the previous 5 years of seasonally adjusted data. For more information on data revision scheduling, please see the Factsheet on Seasonal Adjustment at www.bls.gov/cpi/seasonal-adjustment/questions-and-answers.htm and the Timeline of Seasonal Adjustment Methodological Changes at www.bls.gov/cpi/seasonal-adjustment/timeline-seasonal-adjustment-methodology-changes.htm.

For analyzing short-term price trends in the economy, seasonally adjusted changes are usually

preferred since they eliminate the effect of changes that normally occur at the same time and in about the same magnitude every year—such as price movements resulting from weather events, production cycles, model changeovers, holidays, and sales. This allows data users to focus on changes that are not typical for the time of year. The unadjusted data are of primary interest to consumers concerned about the prices they actually pay. Unadjusted data are also used extensively for escalation purposes. Many collective bargaining contract agreements and pension plans, for example, tie compensation changes to the Consumer Price Index before adjustment for seasonal variation. BLS advises against the use of seasonally adjusted data in escalation agreements because seasonally adjusted series are revised annually.

Intervention Analysis

The Bureau of Labor Statistics uses intervention analysis seasonal adjustment for some CPI series. Sometimes extreme values or sharp movements can distort the underlying seasonal pattern of price change. Intervention analysis seasonal adjustment is a process by which the distortions caused by such unusual events are estimated and removed from the data prior to calculation of seasonal factors. The resulting seasonal factors, which more accurately represent the seasonal pattern, are then applied to the unadjusted data.

For example, this procedure was used for the motor fuel series to offset the effects of the 2009 return to normal pricing after the worldwide economic downturn in 2008. Retaining this outlier data during seasonal factor calculation would distort the computation of the seasonal portion of the time series data for motor fuel, so it was estimated and removed from the data prior to seasonal adjustment. Following that, seasonal factors were calculated based on this "prior adjusted" data. These seasonal factors represent a clearer picture of the seasonal pattern in the data. The last step is for motor fuel seasonal factors to be applied to the unadjusted data.

For the seasonal factors introduced in January 2018, BLS adjusted 38 series using intervention analysis seasonal adjustment, including selected food and beverage items, motor fuels, and natural gas.

Revision of Seasonally Adjusted Indexes

Seasonally adjusted data, including the U.S. city average all items index levels, are subject to revision for up to 5 years after their original release. Every year, economists in the CPI calculate new seasonal factors for seasonally adjusted series and apply them to the last 5 years of data. Seasonally adjusted indexes beyond the last 5 years of data are considered to be final and not subject to revision. In January 2018, revised seasonal factors and seasonally adjusted indexes for 2013 to 2017 were calculated and published. For series which are directly adjusted using the Census X-13ARIMA-SEATS seasonal adjustment software, the seasonal factors for 2017 will be applied to data for 2018 to produce the seasonally adjusted 2018 indexes. Series which are indirectly seasonally adjusted by summing seasonally adjusted component series have seasonal factors which are derived and are therefore not available in advance.

Determining Seasonal Status

Each year the seasonal status of every series is reevaluated based upon certain statistical criteria. Using these criteria, BLS economists determine whether a series should change its status from "not seasonally adjusted" to "seasonally adjusted", or vice versa. If any of the 81 components of the U.S. city average all items index change their seasonal adjustment status from seasonally adjusted to not seasonally adjusted, not seasonally adjusted data will be used in the aggregation of the dependent series for the last 5 years, but the seasonally adjusted indexes before that period will not be changed. Twenty-nine of the 81 components of the U.S. city average all items index are not seasonally adjusted for 2018.

Contact Information

For additional information about the CPI visit www.bls.gov/cpi or contact the CPI Information and Analysis Section at 202-691-7000 or cpi_info@bls.gov.

For additional information on seasonal adjustment in the CPI visit <https://www.bls.gov/cpi/seasonal-adjustment/home.htm> or contact the CPI seasonal adjustment section at 202-691-6968 or cpiseas@bls.gov.

Information from this release will be made available to sensory impaired individuals upon request. Voice phone: 202-691-5200; Federal Relay Service: 1-800-877-8339.

- [Table 1. Consumer Price Index for All Urban Consumers \(CPI-U\): U. S. city average, by expenditure category](#)
- [Table 2. Consumer Price Index for All Urban Consumers \(CPI-U\): U. S. city average, by detailed expenditure category](#)
- [Table 3. Consumer Price Index for All Urban Consumers \(CPI-U\): U. S. city average, special aggregate indexes](#)

- [Table 4. Consumer Price Index for All Urban Consumers \(CPI-U\): Selected areas, all items index](#)
- [Table 5. Chained Consumer Price Index for All Urban Consumers \(C-CPI-U\) and the Consumer Price Index for All Urban Consumers \(CPI-U\): U.S. city average, all items index](#)
- [Table 6. Consumer Price Index for All Urban Consumers \(CPI-U\): U.S. city average, by expenditure category, 1-month analysis table](#)
- [Table 7. Consumer Price Index for All Urban Consumers \(CPI-U\): U.S. city average, by expenditure category, 12-month analysis table](#)
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