

EXPLANATION OF REVISIONS

The annual revisions for the Monthly Retail Trade and Food Services Survey (MRTS) include historical corrections, benchmarking to the 2024 Annual Integrated Economic Survey (AIES), and updates to seasonal adjustment models.

Not adjusted estimates of monthly sales were revised for January 2018 through July or August 2026¹ (if an advance sales estimate is computed), as well as end-of-month inventory estimates for January 2018 through July 2026. Not adjusted estimates of quarterly e-commerce sales were revised for first quarter 2018 through second quarter 2026.

Coefficients of variation (CVs) of totals and standard errors (SEs) of ratios for monthly sales and monthly end-of-month inventories were revised for March 2018 through July 2026. CVs of totals and SEs of ratios for quarterly e-commerce sales were revised for first quarter 2018 through second quarter 2026.

Revisions to not adjusted estimates are made in two parts:

First, revisions are made to prior Monthly Retail Trade and Food Services (MRTS) estimates to reflect historical corrections. Then, revisions were made when benchmarking the Monthly Retail Trade and Food Services estimates to the 2024 Annual Integrated Economic Survey (AIES) estimates.

Revisions to seasonally adjusted estimates were made based on the revised not adjusted estimates and revised seasonal adjustment factors. Adjusted estimates of monthly sales were revised for January 2015 through July or August 2026¹ (if an advance sales estimate is computed), as well as end-of-month inventory estimates for January 2015 through July 2026. Adjusted estimates of quarterly retail e-commerce sales are revised for first quarter 2015 through second quarter 2026.

Reasons for Revisions

We revised the not adjusted estimates to:

- Reflect corrections to data for the MRTS and AIES samples. Corrections are made to replace previously reported data with more accurate data received at a later date or to replace imputed data with reported data obtained from the company.
- Introduce the results from the 2024 AIES, which has been benchmarked using the final results of the 2022 Economic Census.
- Link the previously published estimates from the prior MRTS sample to estimates from the current MRTS sample.

We revise the seasonally adjusted estimates to:

- Reflect revisions to the not adjusted estimates.
- Incorporate changes to the seasonal adjustment factors based on the annual review of the seasonal adjustment models.

Benchmarking to 2024 AIES estimates

There are several reasons for benchmarking estimates from the Monthly Retail Trade Survey to the Annual Integrated Economic Survey:

- **Timing.** The respondents have more time to prepare their annual and census reports than they do for their monthly reports. The annual and census responses are requested at a time when many firms have already compiled audited book figures for their own use. The timing of the annual survey allows us to independently verify the reported data using sources such as a company's annual report. On the other hand, respondents to the monthly survey have just a few weeks to provide reports of their sales and end-of-month inventories. Sometimes these reports are based on incomplete or unaudited records and may include estimates made by respondents to represent their understanding of their business.
- **Sampling.** As described in more detail in the Technical Documentation, the estimates derived from the annual survey are based on a sample that is much larger than the samples used to produce the monthly sales and inventory estimates. MRTS estimates are benchmarked to the results from the 2024 AIES. See the AIES methodology page for more information: <https://www.census.gov/programs-surveys/aies/technical-documentation/methodology.html>.
- **Response.** The annual estimates are based on more reported data than the monthly estimates. The responses to the AIES are required by law, while the MRTS is voluntary. This results in a total quantity response rate (TQRR) of approximately 63.7 percent for sales and 64.9 percent for inventories for MRTS. See the AIES methodology page for the response rates in AIES: <https://www.census.gov/programs-surveys/aies/technical-documentation/methodology.html>. An imputation process accounts for the sales and inventories data that fail edits or are missing because of nonresponse. For MRTS, this process assumes that non-responding firms have similar month-to-month changes to the responding firms of a similar size in the same industry. However, the AIES imputation processes rely heavily on administrative data and relationships of these data for each individual firm, which could result in different data being tabulated for the MRTS and AIES for non-responding firms.

Estimates of Monthly Sales

For detailed NAICS codes, corrections are applied to the monthly retail and food service sales estimates for February 2018 through July 2026. Then, for each detailed NAICS code, the monthly retail and food service sales estimates are linked to the estimates derived from the prior sample. The linkage is performed at each detailed NAICS level by multiplying the sample-based estimates prior to March 2018 by a geometric mean. The geometric mean is computed as the square root of the product of two ratios. The numerators of the ratios are the Horvitz-Thompson sales estimates for February and March 2018 from the current sample. The denominators of the ratios are the Horvitz-Thompson estimates for February and March 2018 from the prior sample.

After performing the above linkage, the resulting sales estimates for December 2017 through July 2026 are input to the benchmarking program. The estimates for a given detailed NAICS code are revised in a manner that—

- For 2018 through 2024, constrains the sum of the 12 monthly sales estimates to equal the corresponding annual sales estimate from the 2024 AIES (rounded to millions).
- Minimizes the sum of the squared differences between the month-to-month changes of the input and revised estimates for December 2017 through July 2026.
- Uses the previously published December 2017 sales estimate as a constraint, linking the revised estimates to the previously published sales estimates and resulting in no revision to the December 2017 estimate.

A mathematical result of the benchmarking methodology is that, for a given NAICS code, all published monthly sales estimates after December 2024 are derived by multiplying the Horvitz-Thompson estimates by the ratio of the benchmarked-to-input estimate for December 2024. This ratio, which is called a carry-forward factor, remains the same and is used to derive published monthly sales estimates until the next benchmarking operation.

Revised estimates for aggregate industry levels are computed by summing the revised estimates for the appropriate detailed industries comprising the aggregate. For aggregate industry estimates, annual totals calculated using MRTS estimates may differ slightly from AIES due to rounding.

Estimates of End-of-Month Inventories

For detailed NAICS codes, corrections are applied to the end-of-month inventory estimates for February 2018 through July 2026. Then, for each detailed NAICS code, the end-of-month inventory estimates are linked to the estimates derived from the prior sample. The linkage is performed using a procedure similar to the one used for sales, except the geometric mean is based on end-of-month inventory.

After performing the above linkage, the resulting end-of-month inventory estimates for December 2017 through July 2026 are input to the benchmarking program. The estimates for a given detailed NAICS code are revised in a manner that—

- For 2017 through 2024, constrains the December end-of-month inventory estimates to equal the corresponding end-of-year inventory estimate from the 2024 AIES (rounded to millions).
- Minimizes the sum of the squared differences between the month-to-month changes of the input and revised estimates for December 2017 through July 2026.
- Uses the previously published December 2017 end-of-month inventory estimate as a constraint, linking the revised estimates to the previously published end-of-month inventory estimates and resulting in no revision to the December 2017 estimate.

For a given detailed NAICS code, end-of-month inventory estimates subsequent to December 2024 are derived by multiplying the input estimates by the ratio of the benchmarked-to-input estimate for December 2024. This ratio is the carry-forward factor for inventory, and it remains the same until the next benchmarking operation.

Revised estimates for aggregate industry levels are computed by summing the revised estimates for the appropriate detailed industries comprising the aggregate. For aggregate industry estimates, annual totals calculated using MRTS estimates may differ slightly from AIES due to rounding.

Estimates of Quarterly E-commerce Sales

For detailed NAICS codes, corrections are applied to the quarterly e-commerce sales estimates for first quarter 2018 through second quarter 2026. Then, for select detailed NAICS codes (usually at the 3-digit NAICS level), these quarterly retail e-commerce sales estimates are linked to the estimates derived from the prior sample. The linkage is performed at these select detail levels by multiplying the sample-based estimates prior to first quarter 2018 by a ratio. The numerators of the ratios are the Horvitz-Thompson e-commerce sales estimates for first quarter 2018 from the current sample. The denominators of the ratios are the Horvitz-Thompson e-commerce sales estimates for first quarter 2018 from the prior sample. Monthly e-commerce estimates are also linked at these select detail levels using a procedure similar to the one used for sales, except the geometric mean is based on monthly e-commerce sales estimates.

After performing the above linkage, the resulting e-commerce sales estimates for fourth quarter 2017 through second quarter 2026 are input to the benchmarking program. The estimates for the select detailed NAICS code are

revised in a manner that—

- For 2018 through 2024, constrains the sum of the 4 quarterly e-commerce sales estimates to equal the corresponding annual e-commerce sales estimate from the 2024 AIES (rounded to millions).
- Minimizes the sum of squared differences between the quarter-to-quarter changes of the input and revised estimates for fourth quarter 2017 through second quarter 2026.
- Uses the previously published fourth quarter 2017 e-commerce estimate as a constraint, linking the revised estimates to the previously published e-commerce estimates and resulting in no revision to the fourth quarter 2017 estimate.

For a given detailed NAICS code, e-commerce estimates subsequent to fourth quarter 2024 are derived by multiplying the input estimates by the ratio of the benchmarked-to-input estimate for fourth quarter 2024. This ratio is the carry-forward factor for e-commerce, and it remains the same until the next benchmarking operation.

Similarly, the monthly e-commerce sales estimates at these select detail levels for December 2017 through June 2026 are input into the benchmarking program. These estimates for the select detail levels are revised in a manner that—

- For first quarter 2018 through second quarter 2026, constrains the sum of the 3 months in a given quarter to equal the corresponding quarterly e-commerce sales estimate which has been benchmarked to the 2024 AIES.
- Minimizes the sum of squared differences between the month-to-month changes of the input and revised estimates for December 2017 through June 2026.
- Uses the previous December 2017 e-commerce estimate as a constraint, linking the revised estimates to the previous e-commerce sales estimates and resulting in no revision to the December 2017 estimate.

For a given detailed NAICS code, e-commerce estimates subsequent to June 2026 are derived by multiplying the input estimates by the carry-forward factor for e-commerce described above, which remains the same until the next benchmarking operation.

The revised estimates for the total retail quarterly e-commerce sales are computed by summing the revised estimates for the appropriate detailed industries comprising the aggregate. For aggregate industry estimates, annual totals calculated using MRTS estimates may differ slightly from AIES due to rounding.

Note that AIES did not link the NAICS 4541 supplemental sales and e-commerce levels to the Annual Retail Trade Survey (ARTS). Therefore, MRTS has not used those levels for benchmarking. Instead MRTS is using the supplemental sales and e-commerce levels from ARTS, linked to sales benchmarked to the 2022 Economic Census, and raked to the AIES NAICS 4541 sales and e-commerce totals.

Seasonally Adjusted Estimates

New seasonal, trading-day, and holiday factors are computed and used to adjust sales for January 2015 through July or August 2026¹ (if an advance sales estimate is computed). For inventories, new seasonal factors are computed and used to adjust inventories for January 2015 through July 2026. For quarterly e-commerce sales, new seasonal factors are computed and used to adjust e-commerce sales for first quarter 2015 through second quarter 2026. For sales, inventories, and e-commerce sales, the new seasonal factors are computed using the revised not adjusted estimates as input to the Census Bureau's X-13ARIMA-SEATS software, version 1.1 build 62, and using the X-11 filter-based adjustment procedure.

A different seasonal adjustment model specification exists for select NAICS detail levels for sales, inventory, and quarterly e-commerce. Part of that specification defines a model span, which is the span of time used to calculate trading-day and holiday factors for the given time series. In general, the model span should not be too long since trading-day and holiday patterns can change over time. All model spans for sales, inventory, and e-commerce begin no earlier than January 2001 (or first quarter 2001). For end-of-month inventories series that exhibit significant trading day effects based on research, a trading day regressor is added to the model. The trading day regressor for end-of-month inventories estimates the day of the week effects based on the last day of the month. Sales series also use trading day regressors for MRTS. All model specifications are available upon request.

REVISIONS OF SALES AND INVENTORIES

The following table shows a comparison of the revised sales and inventories to the previously published estimates for 2025:

<<https://www.census.gov/retail/mrts/www/benchmark/2026/excel/introtable.xlsx>>

ADDITIONAL INFORMATION

Survey Questionnaires

The AIES content summary can be found on the Census Bureau Web site at <<https://www2.census.gov/programs-surveys/aies/information-respondents/2024/aies-content-summary.pdf>>. The MRTS questionnaires can be found on the Census Bureau's Web site at <http://www.census.gov/retail/mrts/get_forms.html>.

¹ Advance sales estimates are computed for selected kinds of business and are based on a small subsample selected from the larger MRTS sample.

Related Links:

<<https://www.census.gov/retail/>>

<<https://www.census.gov/programs-surveys/aies.html>>

Source: Retail Indicators Branch, U.S. Census Bureau

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