

Metal Industry Indicators

Composite Indexes of Leading and Coincident Indicators of Selected Metal Industries for August and September—Summary Report

October 21, 2016

The **primary metals leading index** decreased to 158.6 in September from a revised 160.1 in August, and its 6-month smoothed growth rate decreased to 2.4% in September from a revised 4.5% in August (table 2). The 6-month smoothed growth rate is a compound annual rate that measures the near-term trend. Usually, a growth rate above +1.0% signals an increase in metals activity, and a growth rate below -1.0% indicates a downturn in activity. The primary metals leading index growth rate posted growth rates above +1.0% in May, June, July, August, and September which would normally signal strength. In contrast, however, the primary metals coincident index growth rates have been below -1.0% all of 2016. Of the five indicators that were available to calculate the September leading index, the USGS metals price index provided zero contribution, and the negative contributions of average weekly hours [-0.8], S&P stock price index [-0.1], and ratio of price to unit labor cost [-0.4] together offset the modest positive contribution made by the Purchasing Managers' Index [0.4] (table 3). Metals are key inputs in durable goods manufacturing and construction, the primary metals leading index provides early signs of change in activity for the overall U.S. economy (chart 8). The September leading index should be considered preliminary because only five of its eight indicators were available, and the leading index will be subject to revision when the other components are added next month.

The **steel leading index** decreased to 113.4 in August from a revised 113.8 in July, and its 6-month smoothed growth rate decreased to 3.3% in August from a revised 4.2% in July (table 4). The steel leading index growth rate posted growth rates above +1.0% in April, May, June, July, and August which would normally signal strength. In contrast, however, the steel coincident index growth rates have been below -1.0% since March. The largest contribution to the steel leading index in August was negative: the Purchasing Managers' Index [-0.4] (table 5).

The **copper leading index** decreased to 125.7 in August from a revised 126.0 in July, and its 6-month smoothed growth rate decreased to -1.4% in August from -1.0% in July (table 6). The copper leading index growth rate, after turning positive in April for the first time in 2016, turned negative again in May and June, and in July the leading index growth rate went below the -1.0% that would normally signal weakness in copper industry activity. The only positive contribution to the copper leading index in August was the S&P stock price index [0.3] (table 7), this was offset by the negative contributions in average weekly hours [-0.2], new orders [-0.1] and the LME spot price of primary copper [-0.3] (table 7).

The **leading index of metal prices** increased to 106.3 in August from a revised 105.9 in July, and its 6-month smoothed growth rate increased to 2.0% in August from a revised 1.7% in July (table 1). This is the ninth consecutive month with a positive 6-month smoothed growth rate, and the seventh consecutive month with a growth rate greater than +1.0%. A growth rate above +1.0% usually signals near term strength in metal prices.

The percent changes from July to August for the **metal industry coincident indexes**, which measure current economic activity, are shown below. August is the latest month for which these indexes are available.

| | |
|----------------|-------|
| Primary Metals | -0.6% |
| Steel | 0.3% |
| Copper | -0.1% |

Tables 1, 3, 5, and 7 identify the indicators and, for the industry indexes, show the contributions of each indicator to its respective index.

The *Metal Industry Indicators* report is produced at the U.S. Geological Survey. For more information about these indexes and the *Metal Industry Indicators* monthly report, contact Jeff Busse (703-648-4914), (email, jbusse@usgs.gov). Data provided by Jacob Fuhr and Annie Hwang.

The *Metal Industry Indicators* summary report with indexes for July and August is scheduled for release on the World Wide Web at 10:00 a.m. EDT, Friday, November 18, 2016.

Table 1.
Leading Index of Metal Prices and Growth Rates of the Nonferrous Metals Price Index, Inventories of Nonferrous Metal Products, and Selected Metal Prices

| | Six-Month Smoothed Growth Rates | | | | | | |
|-------------|--|---|--|--|---------------------|-------------------|----------------|
| | Leading Index of Metal Prices (1967=100) | Leading Index of Metal Prices Growth Rates | MII Nonferrous Metals Price Index | U.S. Nonferrous Metal Products Inventories (1982\$) | Primary Aluminum | Primary Copper | Steel Scrap |
| 2015 | | | | | | | |
| August | 104.1r | -0.7r | -29.3r | 11.2 | -28.1 | -29.9 | -42.1 |
| September | 104.4r | 0.2r | -26.6r | 9.5 | -23.7 | -26.5 | -43.5 |
| October | 104.6 | 0.8r | -23.0r | 6.7 | -31.4 | -22.1 | -62.1 |
| November | 103.1r | -1.8 | -32.0r | 8.1 | -28.4 | -33.7 | -64.1 |
| December | 104.6 | 1.2 | -23.2r | 10.8 | -17.8 | -27.1 | -58.1 |
| 2016 | | | | | | | |
| January | 104.4r | 0.8 | -24.6r | 14.4 | -12.9 | -28.4 | -43.3 |
| February | 104.9r | 1.6 | -16.3r | 8.7 | -0.2 | -21.5 | -35.9 |
| March | 105.9 | 3.3 | -13.2r | 3.1 | -13.0 | -13.9 | -21.3 |
| April | 106.5r | 3.9r | -1.7r | -4.2 | 10.7 | -4.3 | 29.6 |
| May | 106.3r | 2.9r | -9.9r | -6.3r | -1.9 | -13.0 | 63.9 |
| June | 106.7r | 3.4 | 0.5r | -4.2r | 10.3 | -4.6 | 28.9 |
| July | 105.9r | 1.7r | 4.0r | -7.7r | 8.0 | -0.9 | 19.1 |
| August | 106.3 | 2.0 | 0.9r | -8.0 | 5.9 | -9.1 | 25.9 |
| September | NA | NA | 12.3 | NA | 12.5 | 1.1 | 8.1 |

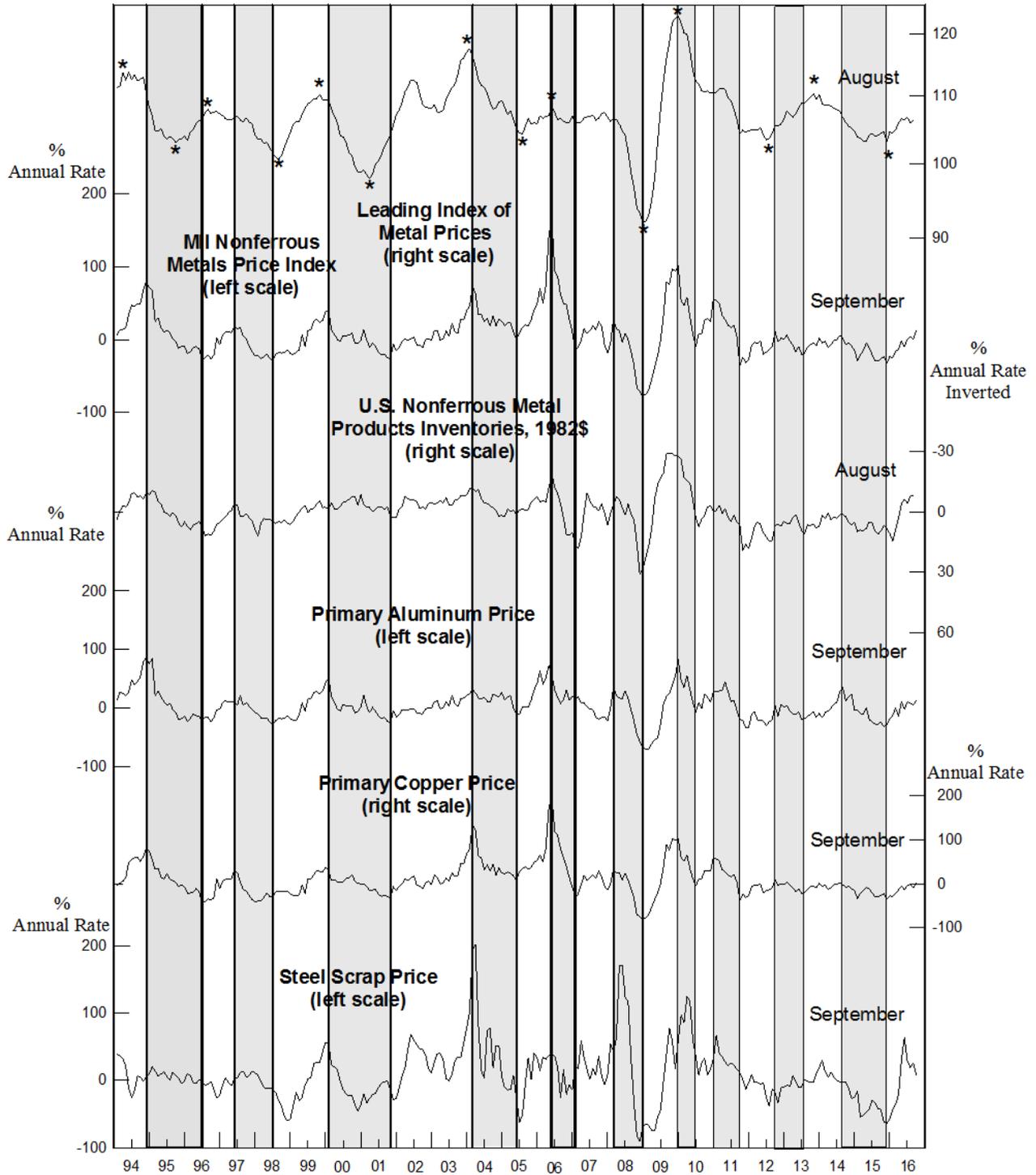
NA: Not available **r:** Revised

Sources: U.S. Geological Survey (USGS), American Metal Market (AMM), the London Metal Exchange (LME), U.S. Census Bureau, the Organisation for Economic Cooperation and Development (OECD), and Federal Reserve Board.

Note: The components of the Leading Index of Metal Prices are the spread between the U.S. 10-year Treasury Note and the federal funds rate, and the 6-month smoothed growth rates of the deflated value of new orders for nonferrous metal products, the Organisation for Economic Cooperation and Development (OECD) Total Leading Index, and the reciprocal of the trade-weighted average exchange value of the U.S. dollar against other major currencies. The Metal Industry Indicators (MII) Nonferrous Metals Price Index measures changes in end-of-the-month prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange (LME). The steel scrap price used is the price of No. 1 heavy melting. Inventories consist of the deflated value of finished goods, work in progress, and raw materials for U.S.-produced nonferrous metal products (NAICS 3313, 3314, & 335929). Six-month smoothed growth rates are based on the ratio of the current month's index or price to its average over the preceding 12 months, expressed at a compound annual rate.

CHART 1.
LEADING INDEX OF METAL PRICES AND GROWTH RATES
OF NONFERROUS METALS PRICE INDEX, INVENTORIES OF
NONFERROUS METAL PRODUCTS, AND SELECTED PRICES

1967 = 100



Shaded areas are downturns in the nonferrous metals price index growth rate. Asterisks (*) are peaks and troughs in the economic activity reflected by the leading index of metal prices. Scale for nonferrous metal products inventories is inverted.

Table 2.
Primary Metals Industry Indexes and Growth Rates

| | Leading Index | | Coincident Index | |
|-------------|---------------|-------------|------------------|-------------|
| | (1977 = 100) | Growth Rate | (1977 = 100) | Growth Rate |
| 2015 | | | | |
| September | 154.9r | -6.4r | 109.0 | -3.3 |
| October | 155.3r | -5.2r | 108.9 | -3.0 |
| November | 154.9r | -5.0r | 109.3 | -1.9 |
| December | 153.7r | -5.6r | 108.6 | -2.7 |
| 2016 | | | | |
| January | 154.1r | -4.4r | 109.0 | -1.5 |
| February | 154.7r | -3.0r | 108.3 | -2.2 |
| March | 156.7r | -0.2r | 108.5r | -1.7 |
| April | 157.3r | 0.7r | 108.2 | -1.9 |
| May | 158.5r | 2.2r | 108.4r | -1.4r |
| June | 158.8r | 2.8r | 108.2r | -1.6 |
| July | 159.8r | 4.3r | 107.9r | -1.8r |
| August | 160.1r | 4.5r | 107.2 | -2.6 |
| September | 158.6 | 2.4 | NA | NA |

NA: Not available **r:** Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 3.
Contribution of Each Primary Metals Index Component to the Percent Change in the Index from the Previous Month

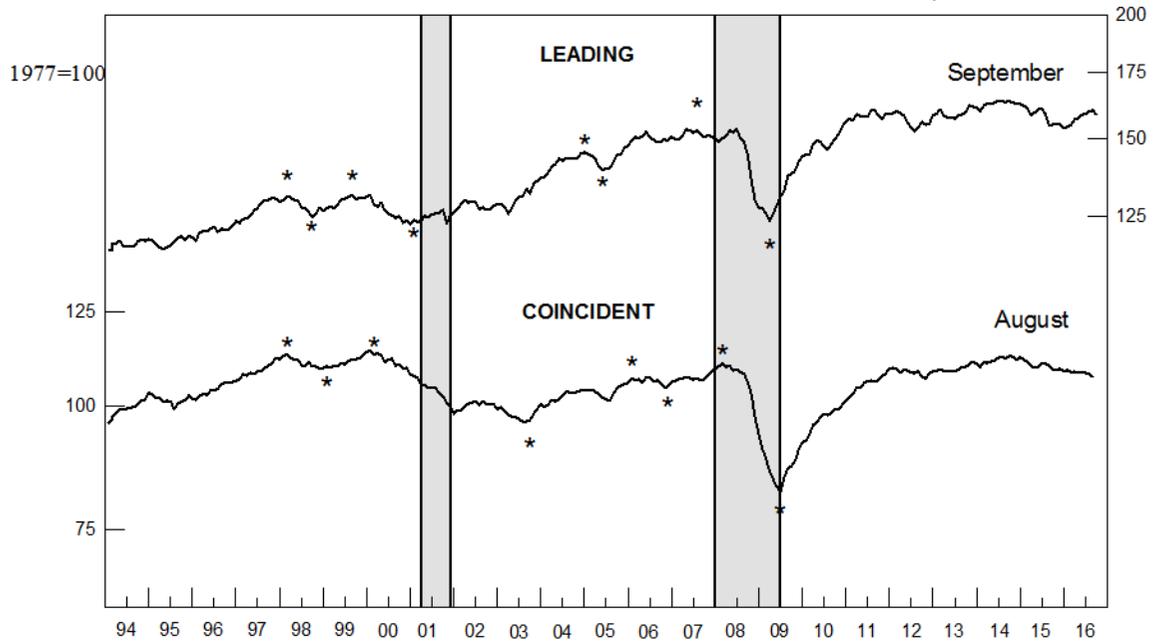
| | | |
|--|---------------|------------------|
| Leading Index | August | September |
| 1. Average weekly hours, primary metals (NAICS 331) | -0.2r | -0.8 |
| 2. Weighted S&P stock price index, machinery, construction and farm and industrial (December 30, 1994=100) | 0.4r | -0.1 |
| 3. Ratio of price to unit labor cost (NAICS 331) | 0.1 | -0.4 |
| 4. USGS metals price index growth rate | 0.0 | 0.0 |
| 5. New orders, primary metal products, (NAICS 331 & 335929) 1982\$ | 0.0 | NA |
| 6. Index of new private housing units authorized by permit | 0.0 | NA |
| 7. Growth rate of U.S. M2 money supply, 2009\$ | 0.2 | NA |
| 8. PMI | -0.4r | 0.4 |
| Trend adjustment | 0.0 | 0.0 |
| Percent change (except for rounding differences) | 0.2r | -0.9 |
| Coincident Index | July | August |
| 1. Industrial production index, primary metals (NAICS 331) | -0.4r | -0.1 |
| 2. Total employee hours, primary metals (NAICS 331) | 0.3 | -0.5 |
| 3. Value of shipments, primary metals products, (NAICS 331 & 335929) 1982\$ | -0.3r | -0.2 |
| Trend adjustment | 0.1 | 0.1 |
| Percent change (except for rounding differences) | -0.3r | -0.6 |

Sources: Leading: 1, Bureau of Labor Statistics; 2, Standard & Poor's and U.S. Geological Survey; 3, U.S. Geological Survey; 4, Journal of Commerce and U.S. Geological Survey; 5, U.S. Census Bureau and U.S. Geological Survey; 6, U.S. Census Bureau and U.S. Geological Survey; 7, Federal Reserve Board, The Conference Board, and U.S. Geological Survey; and 8, Institute for Supply Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; and 3, U.S. Census Bureau and U.S. Geological Survey. All series are seasonally adjusted, except 2, 3, and 4 of the leading index.

NA: Not available **r:** Revised

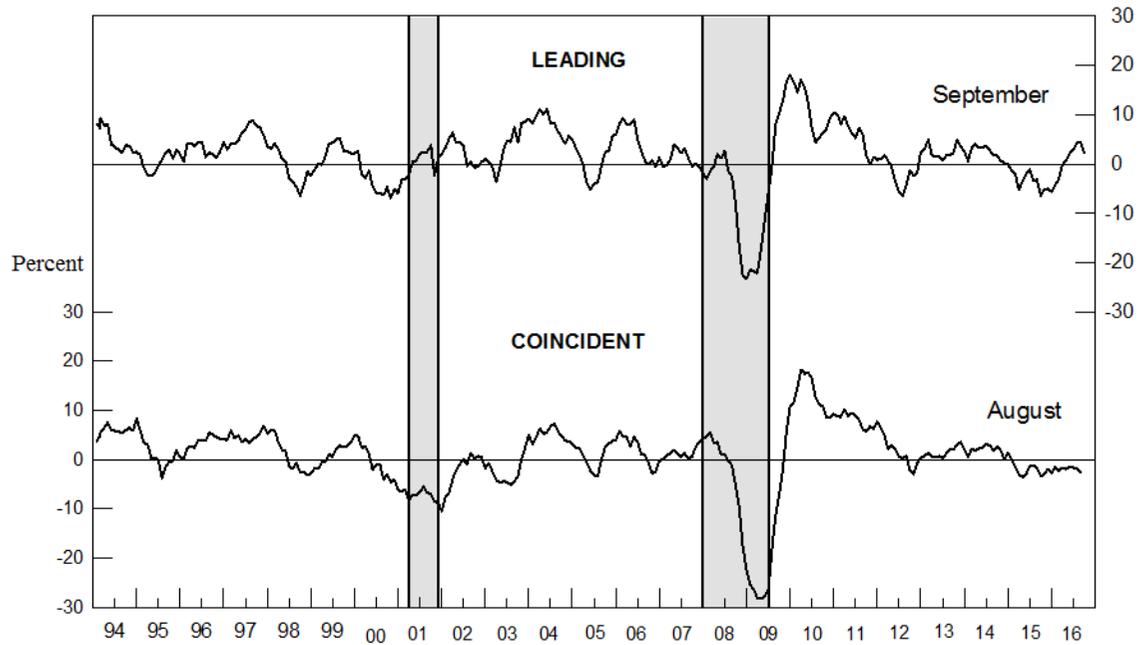
Note: A component's contribution, shown in Tables 3, 5, 7, and 9, measures its effect, in percentage points, on the percent change in the index. Each month, the sum of the contributions plus the trend adjustment equals (except for rounding differences) the index's percent change from the previous month.

CHART 2.
PRIMARY METALS: LEADING AND COINCIDENT INDEXES, 1994-2016 1977=100



Shaded areas are business cycle recessions. Asterisks (*) signify peaks (the end of an expansion) and troughs (the end of a downturn) in the economic activity reflected by the indexes.

CHART 3.
PRIMARY METALS: LEADING AND COINCIDENT GROWTH RATES, 1994-2016 Percent



Shaded areas are business cycle recessions.

The growth rates are expressed as compound annual rates based on the ratio of the current month's index to its average level during the preceding 12 months.

**Table 4.
Steel Industry Indexes and Growth Rates**

| | <u>Leading Index</u> | | <u>Coincident Index</u> | |
|-------------|----------------------|--------------------|-------------------------|--------------------|
| | <u>(1977 = 100)</u> | <u>Growth Rate</u> | <u>(1977 = 100)</u> | <u>Growth Rate</u> |
| 2015 | | | | |
| September | 110.1r | -5.2r | 115.1 | -3.6 |
| October | 110.5r | -3.9r | 115.3 | -2.9 |
| November | 110.4r | -3.7r | 114.5 | -3.6 |
| December | 109.8r | -4.2r | 114.3 | -3.4 |
| 2016 | | | | |
| January | 110.5r | -2.3r | 115.1 | -1.5 |
| February | 110.9r | -1.4r | 115.6 | -0.4 |
| March | 111.0r | -0.7r | 114.9 | -1.2 |
| April | 112.0r | 1.2r | 114.0 | -2.2 |
| May | 113.0r | 2.9r | 113.7 | -2.5 |
| June | 113.0r | 3.1r | 114.0 | -1.7 |
| July | 113.8r | 4.2r | 113.0r | -3.1r |
| August | 113.4 | 3.3 | 113.2 | -2.2 |

r: Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

**Table 5.
Contribution of Each Steel Index Component to the Percent Change
in the Index from the Previous Month**

| Leading Index | July | August |
|---|-------------|---------------|
| 1. Average weekly hours, iron and steel mills (NAICS 3311 & 3312) | 0.4 | 0.1 |
| 2. New orders, iron and steel mills (NAICS 3311 & 3312), 1982\$ | 0.1 | -0.1 |
| 3. Shipments of household appliances, 1982\$ | -0.1r | 0.1 |
| 4. S&P stock price index, steel companies | 0.4 | -0.3 |
| 5. Retail sales of U.S. passenger cars and light trucks (units) | 0.3r | -0.2 |
| 6. Growth rate of the price of steel scrap (#1 heavy melting, \$/ton) | -0.4r | 0.0 |
| 7. Index of new private housing units authorized by permit | 0.0 | 0.0 |
| 8. Growth rate of U.S. M2 money supply, 2009\$ | 0.1 | 0.2 |
| 9. PMI | -0.1 | -0.4 |
| Trend adjustment | 0.0 | 0.0 |
| Percent change (except for rounding differences) | 0.6r | -0.5 |
| Coincident Index | | |
| 1. Industrial production index, iron and steel products (NAICS 3311 & 3312) | -0.7r | 0.0 |
| 2. Value of shipments, iron and steel mills (NAICS 3311 & 3312), 1982\$ | -0.1r | -0.2 |
| 3. Total employee hours, iron and steel mills (NAICS 3311 & 3312) | -0.2 | 0.4 |
| Trend adjustment | 0.1 | 0.1 |
| Percent change (except for rounding differences) | -0.9r | 0.3 |

Sources: Leading: 1, Bureau of Labor Statistics; 2, U.S. Census Bureau and U.S. Geological Survey; 3, U.S. Census Bureau and U.S. Geological Survey; 4, Standard & Poor's; 5, U.S. Bureau of Economic Analysis and American Automobile Manufacturers Association; 6, Journal of Commerce and U.S. Geological Survey; 7, U.S. Census Bureau and U.S. Geological Survey; 8, Federal Reserve Board, The Conference Board, and U.S. Geological Survey; and 9, Institute for Supply Management. Coincident: 1, Federal Reserve Board; 2, U.S. Census Bureau and U.S. Geological Survey; and 3, Bureau of Labor Statistics and U.S. Geological Survey. All series are seasonally adjusted, except 4 and 6 of the leading index.

r: Revised

CHART 4.
STEEL: LEADING AND COINCIDENT INDEXES, 1994-2016

1977=100

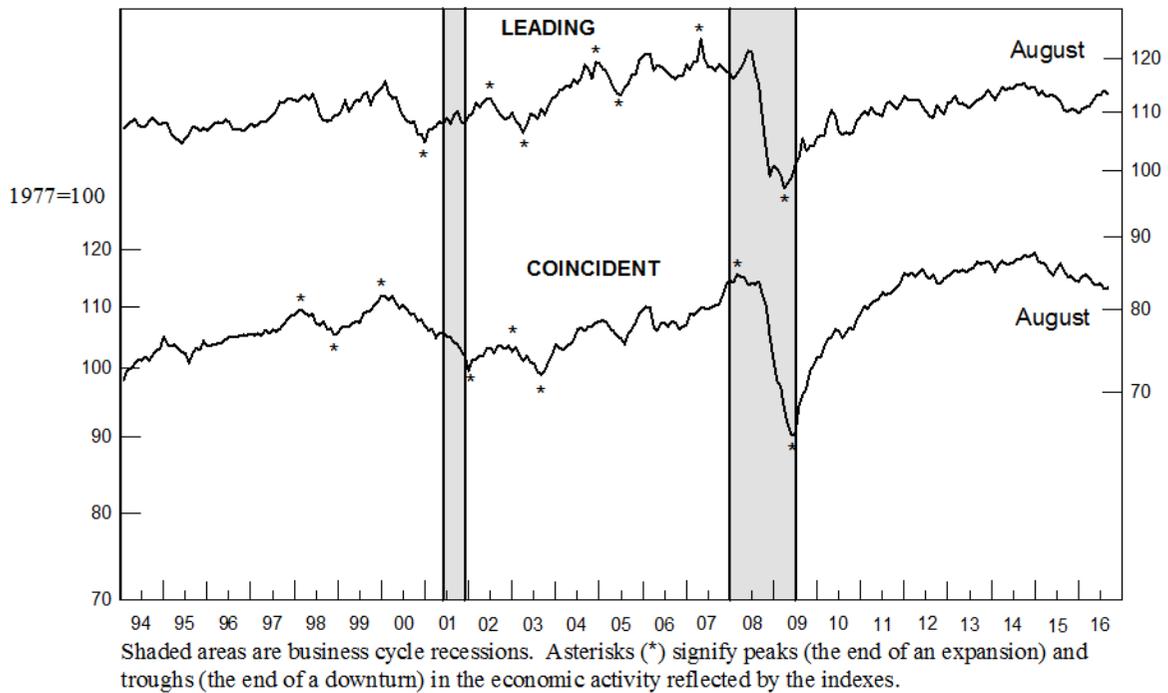
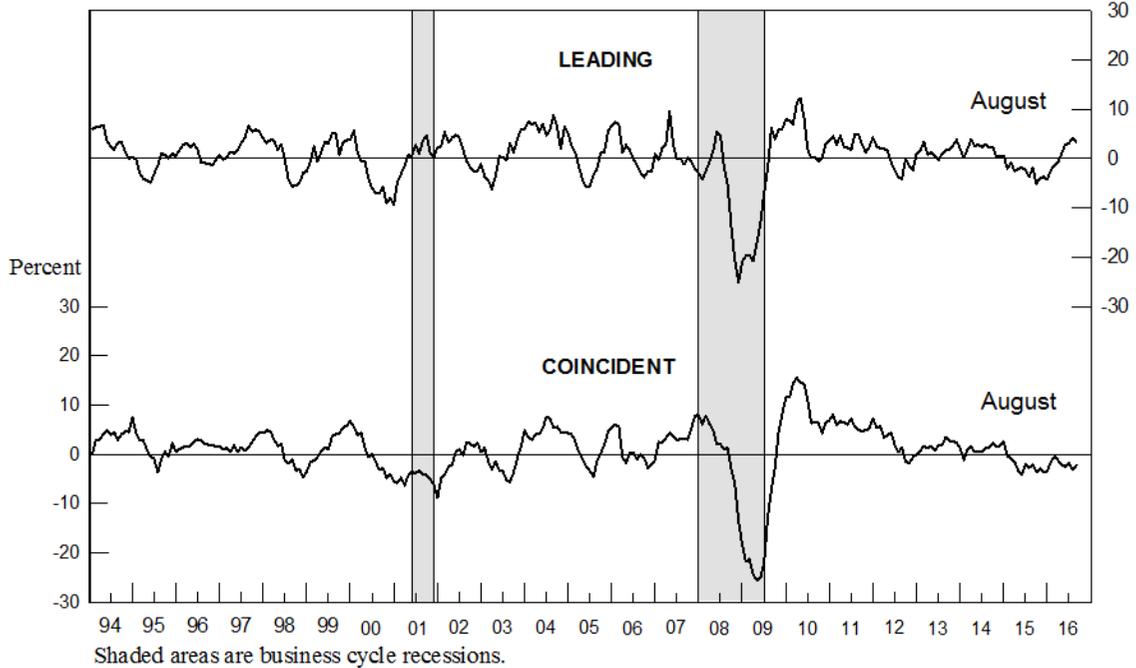


CHART 5.
STEEL: LEADING AND COINCIDENT GROWTH RATES, 1994-2016

Percent



The growth rates are expressed as compound annual rates based on the ratio of the current month's index to its average level during the preceding 12 months.

**Table 6.
Copper Industry Indexes and Growth Rates**

| | <u>Leading Index</u> | | <u>Coincident Index</u> | |
|-------------|----------------------|--------------------|-------------------------|--------------------|
| | <u>(1977 = 100)</u> | <u>Growth Rate</u> | <u>(1977 = 100)</u> | <u>Growth Rate</u> |
| 2015 | | | | |
| September | 125.5 | -3.5 | 108.0 | -3.4 |
| October | 126.3 | -2.1 | 109.5 | -0.8 |
| November | 126.5 | -1.7 | 110.4 | 0.4 |
| December | 127.6 | 0.1 | 111.6 | 1.7 |
| 2016 | | | | |
| January | 126.2 | -1.8 | 111.9 | 2.1 |
| February | 126.1 | -2.0 | 111.6 | 1.3 |
| March | 126.6 | -1.0 | 111.0 | 0.4 |
| April | 127.6 | 0.7 | 112.6 | 3.1r |
| May | 127.0 | -0.2 | 112.6r | 3.0r |
| June | 126.8 | -0.2 | 111.6r | 1.2r |
| July | 126.0 | -1.0 | 111.1r | 0.2r |
| August | 125.7 | -1.4 | 110.9 | -0.2 |

r: Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

**Table 7.
Contribution of Each Copper Index Component to the Percent Change
in the Index from the Previous Month**

| Leading Index | July | August |
|--|-------------|---------------|
| 1. Average weekly hours, nonferrous metals (except aluminum) (NAICS 3314) | -0.8 | -0.2 |
| 2. New orders, nonferrous metal products, (NAICS 3313, 3314, & 335929) 1982\$ | -0.1r | -0.1 |
| 3. S&P stock price index, building products companies | 0.5 | 0.3 |
| 4. LME spot price of primary copper | 0.0 | -0.3 |
| 5. Index of new private housing units authorized by permit | 0.0 | 0.0 |
| 6. Spread between the U.S. 10-year Treasury Note and the federal funds rate | -0.1 | 0.0 |
| Trend adjustment | 0.0 | 0.0 |
| Percent change (except for rounding differences) | -0.6 | -0.1 |
| Coincident Index | | |
| 1. Industrial production index, primary smelting and refining of copper (NAICS 331411) | -0.6 | 0.4 |
| 2. Total employee hours, nonferrous metals (except aluminum) (NAICS 3314) | 0.0 | -0.6 |
| 3. Copper refiners' shipments (short tons) | 0.0 | 0.0 |
| Trend adjustment | 0.1 | 0.1 |
| Percent change (except for rounding differences) | -0.5r | -0.1 |

Sources: Leading: 1, Bureau of Labor Statistics; 2, U.S. Census Bureau and U.S. Geological Survey; 3, Standard & Poor's; 4, London Metal Exchange; 5, U.S. Census Bureau and U.S. Geological Survey; and 6, Federal Reserve Board and U.S. Geological Survey. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics; and 3, American Bureau of Metal Statistics, Inc. and U.S. Geological Survey. All series are seasonally adjusted, except 3, 4, and 6 of the leading index.

r: Revised

CHART 6.
COPPER: LEADING AND COINCIDENT INDEXES, 1994-2016

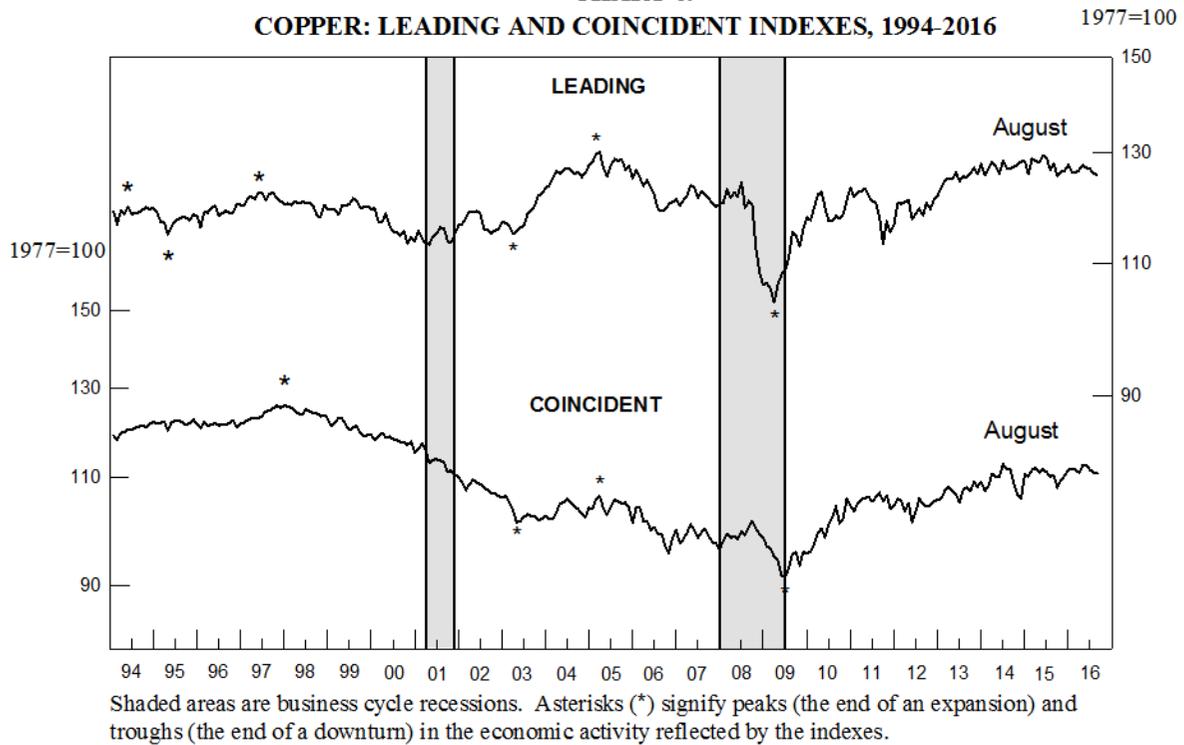


CHART 7.
COPPER: LEADING AND COINCIDENT GROWTH RATES, 1994-2016

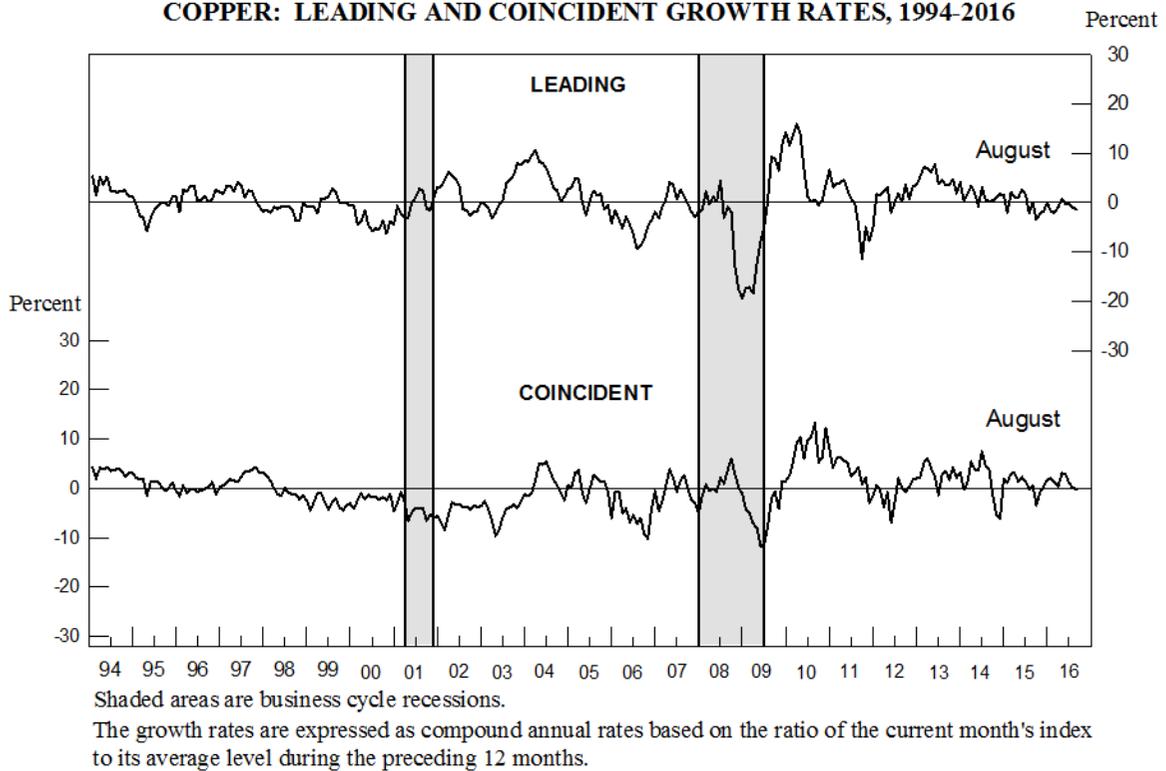
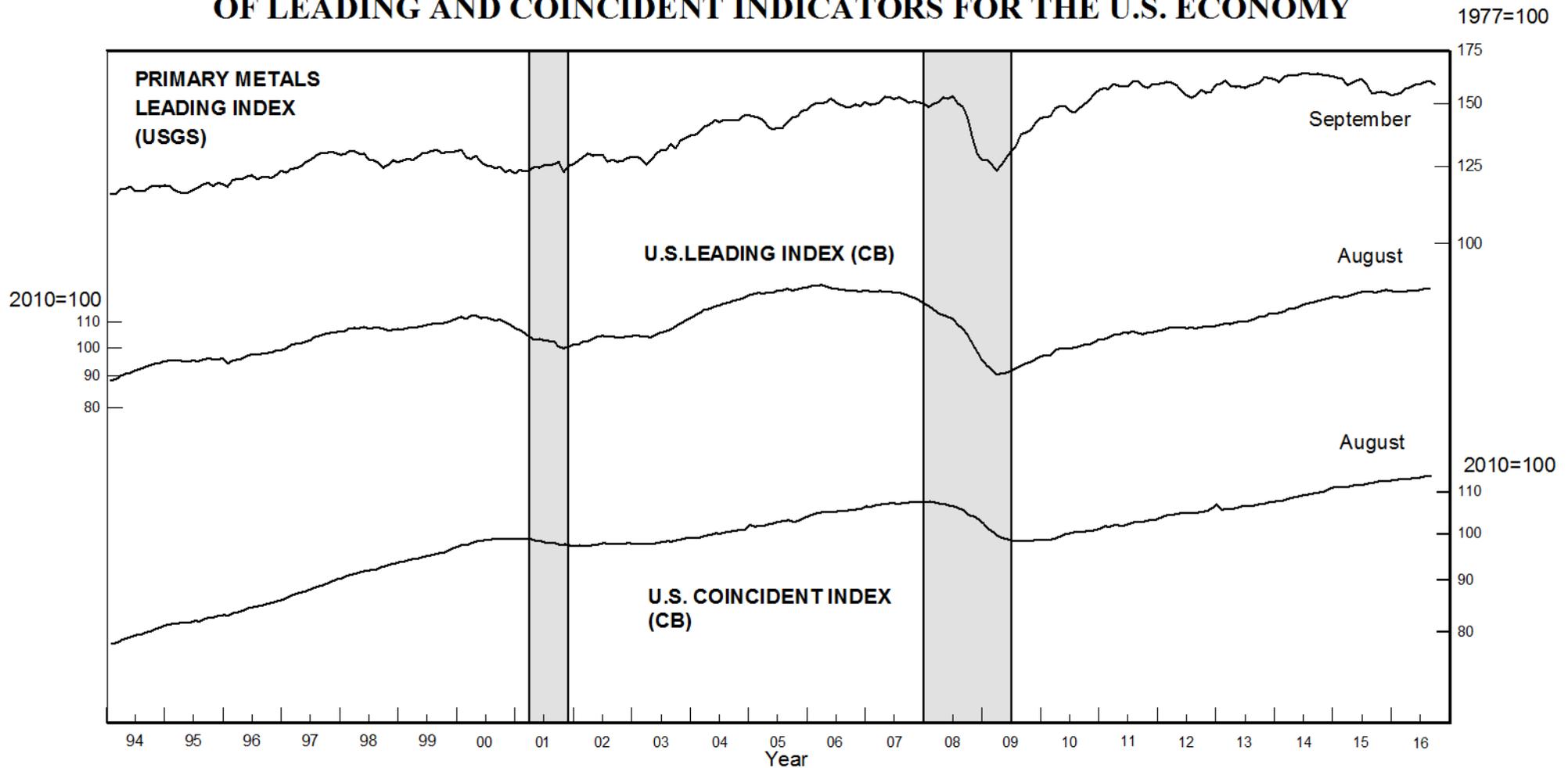


Chart 8.

**PRIMARY METALS LEADING INDEX AND COMPOSITE INDEXES
OF LEADING AND COINCIDENT INDICATORS FOR THE U.S. ECONOMY**



Shaded areas are business cycle recessions.

Sources: U.S. Geological Survey (USGS) and The Conference Board (CB).

October 2016