U.S. Department of the Interior U.S. Geological Survey

METAL INDUSTRY INDICATORS

October 1996

Indicators of Domestic Primary Metals, Steel, Aluminum, and Copper Activity

Correction: In last month's report, we published incorrect growth rates for nonferrous metal products inventories in Table 1 and Chart 1 for the period 1993 to the present. Corrected data show that recent swings in inventory growth were not as strong as originally shown. The trend of inventory growth, however, remains the same.

Leading Index of Metal Prices Drifts Lower

The leading index of metal prices edged down to 95.6 in August, the latest month for which it is available, from a revised 95.7 in July. Its 6-month smoothed growth rate, a compound annual rate measuring near-term trend, also fell, from -1.8 to -2.0%. A growth rate below -1.0% implies decreasing growth for metal prices in the months ahead.

The metals price leading index is constructed with the 6-month smoothed growth rates of four different economic activities that signal changes in the business cycle. These activities have also been shown to signal future trends in demand for metals, which can affect price growth.

The growth rates of two index components, the deflated values of new orders for nonferrous metals and U.S. M2 money supply, each contributed 0.1 percentage point to the August leading index. However, a sharp drop in August permits authorized for new private housing offset those gains with a -0.3 percentage point contribution. The fourth indicator, deflated nonfinancial debt in the United States, was not available for the August index calculation.

The leading index of metal prices increased steadily between March and December 1995, indicating the possibility of higher prices in 1996 for metals, such as aluminum and copper. Instead, slower economic growth throughout the industrialized world and turmoil following the Sumitomo copper trading scandal have pushed metal prices lower.

The falloff in demand for metals can be seen, to some extent, in the increased inventory growth of U.S. manufactured nonferrous products[1] that has occurred since September 1995. The slow pace of world economic growth and the weak performance of the metals price leading index continue to point to poor growth prospects for most metal prices in the near future.

The leading index of metal prices signals significant changes in prices an average of 8 months in advance. Besides the business cycle and inventory levels, other factors that affect metal prices include changes in metals production, speculation, strategic stockpiling, and production costs.

(continued on page 2)

Leading Indicators (6 months ago and latest month)	Outlook
Leading Index of Metal Prices	
Feb '96 96.9 Aug '96 95.6	The leading index is signalling little or no growth for most metal prices in the short term.
Primary Metals Leading Index	
Mar '96 119.1 Sep '96 120.2	The trend of the leading index points to slow growth for primary metals activity in the near term.
Steel Leading Index	
Feb '96 103.7 Aug '96 102.8	The steel leading index is signalling no growth in steel activity in the months ahead.
Aluminum Mill Products Leading Index Feb '96 137.9 Aug '96 140.4	The aluminum leading indexes are indicating modest growth in aluminum activity over the next few months.
Copper Leading Index	
Feb '96 118.0 Aug '96 118.3	The copper industry should remain on a slow growth track for the near term.

The Metal Industry Indicators (MII) is now on the World Wide Web. The URL for the MII is: http://minerals.er.usgs.gov/minerals/pubs/mii/

[1]We estimate that aluminum producers account for 40 to 50% of the manufacturers' value of shipments of nonferrous metals. Copper producers may account for 20 to 25% of shipments.

(continued from page 1)

New Leading Indexes for Metal Industries

We have revised the metal industry leading indexes. The new indicators for each leading index are shown in Tables 3, 5, 7, and 9 of this report. We plan to put historical data for the metal industry leading and coincident indexes on the World Wide Web by the middle of November.

The metal industry leading indexes are composite indexes constructed from diverse economic indicators. These indicators tend to give early signals of major cyclical changes in metals activity measured by a coincident index. The coincident index, a composite index of production, shipments, and total employee hours worked, describes current conditions in the industry.

A major goal of this revision was to increase the average number of months in advance that each leading index signals major peaks (highs) and troughs (lows) in the corresponding coincident index. This was done by finding the best recipe of leading indicators, both old and new, that could be combined into new indexes with longer lead times. The old leading indexes lead each metal industry coincident index an average of 6 months. We have succeeded in constructing new leading indexes with lead times over their coincident indexes of 9 months for primary metals, 8 months for steel, and 7 months for copper. The average lead times for the aluminum mill products and primary and secondary aluminum leading indexes remain at 6 months.

The most significant change from this revision is the elimination of the CIBCR short- and long-leading indexes of the U.S. economy as indicators in the leading indexes for primary metals, steel, aluminum mill products, and copper. The CIBCR indexes are produced by the Center for International Business Cycle Research (CIBCR) at Columbia University, which along with the former U.S. Bureau of Mines, developed the original leading indexes.

We tested several economy-wide indicators and found that the Purchasing Managers' Index and deflated M2 money supply are good substitutes for the CIBCR indicators in the leading indexes for primary metals, steel, and aluminum mill products. *(continued on page 12)*

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)	MII Nonferrous Metals Price Index	Nonferrous Metal Products Inventories (1982$)	Primary Aluminum	Primary Copper	Steel Scrap
1995						
August	96.8r	1.7	-0.1	-2.3	7.3	12.6
September	97.3r	-3.0	1.6	-8.1	3.0	7.9
October	96.6r	-12.0	4.6	-19.3	-6.1	2.9
November	97.5r	-8.5	6.0	-18.0	-1.7	-5.0
December	97.7	-9.2	4.0	-13.4	-6.9	-0.7
1996						
January	96.3r	-19.4	6.1	-22.8	-21.2	10.6
February	96.9r	-16.4	7.9	-17.5	-20.4	6.6
March	97.1r	-11.4	5.6	-9.6	-18.8	-3.3
April	96.7r	-9.1	4.8	-12.5	-9.9	-4.8
May	95.4r	-12.8r	3.5	-14.1	-16.6	1.1
June	95.6r	-29.3	5.7	-21.6	-45.4	-2.2
July	95.7r	-24.1	8.4	-16.6	-39.9	-7.6
August	95.6	-21.0	10.9	-15.6	-33.3	-5.8
September	NA	-26.9	NA	-23.5	-37.6	-1.3

r *- Revised*

Note: The components of the Leading Index of Metal Prices are the 6-month smoothed growth rates of the following: 1, the deflated value of new orders for nonferrous metals; 2, the deflated value of total debt of U.S. nonfinancial sectors; 3, the index of new private housing units authorized; and 4, the deflated value of U.S. M2 money supply. 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 nonferrous metals and nonferrous metal products. 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.

Sources: U.S. Geological Survey (USGS); American Metal Market (AMM); the London Metal Exchange (LME); and the Bureau of the Census

Link To:

Chart 1.

Table 2.
The Primary Metals Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1995				
October	117.0	-0.5	105.3	-0.6
November	118.3	1.6	106.3	1.0
December	118.6	2.0	106.1	0.6
1996				
January	117.3	-0.2	106.1	0.7
February	118.5	1.8	106.3	1.0
March	119.1	2.5	106.3	1.0
April	119.6	3.0	106.7	1.9
May	119.5	2.5	107.0	2.2
June	120.1	2.8	107.3	2.6
July	119.0	0.7	107.6	2.7
August	119.7	1.7	108.3	3.5
September	120.2	2.2	NA	NA

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.
The 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 (SIC 33)	0.4	0.2
*2. S&P stock price index, machinery, diversified	0.3	0.3
3. Ratio of price to unit labor cost (SIC 33)	-0.2	NA
4. JOC metals price index growth rate	0.0	0.1
5. New orders, primary metals, 1982$	-0.1	NA
*6. Index of new private housing units authorized by permit	-0.1	NA
*7. Growth rate of U.S. M2 money supply, 1987$	0.0	NA
*8. Purchasing Managers' Index	0.3	-0.2
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	0.6	0.4

Coincident Index	**July**	**August**
1. Industrial production index, primary metals (SIC 33)	-0.1	0.0
2. Total employee hours, primary metals (SIC 33)	-0.5	0.7
3. Value of shipments, primary metals, 1982$	0.7	-0.1
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.2	0.7

*** New leading indicators**

Sources: Leading: 1, Bureau of Labor Statistics; 2, Standard & Poor's; 3, Center for International Business Cycle Research, Bureau of Labor Statistics, and Federal Reserve Board; 4, Journal of Commerce; 5, Bureau of the Census and U.S. Geological Survey; 6, Bureau of the Census and U.S. Geological Survey; 7, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 8, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, Bureau of the Census 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.

Links To:

Chart 2.

Chart 3.

Table 4.
The Steel Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1995				
September	103.4	0.2	94.5	0.4
October	102.6	-0.9	93.5	-1.6
November	103.0	0.1	95.0	1.3
December	103.4	1.0	94.2	-0.2
1996				
January	102.8	0.1	95.0	1.5
February	103.7	1.9	94.5	0.5
March	103.1	0.8	94.3	0.2
April	104.0	2.2	94.9	1.4
May	103.8	1.7	95.0	1.5
June	104.1	1.9	95.6	2.8
July	103.3	-0.1	95.7	2.5
August	102.8	-1.0	95.4	1.4

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.
The 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, blast furnaces and basic steel products (SIC 331)	-0.1	-0.1
2. New orders, steel works, blast furnaces, and rolling and finishing mills, 1982$, (SIC 331)	0.1	-0.2
*3. Shipments of household appliances, 1982$	-0.2	0.0
4. S&P stock price index, steel companies	-0.4	0.0
5. Industrial production index for automotive products	0.3	-0.4
*6. Growth rate of the price of steel scrap (#1 heavy melting, $/ton)	-0.1	0.0
*7. Index of new private housing units authorized by permit	0.1	-0.1
*8. Growth rate of U.S. M2 money supply, 1987$	-0.2	0.0
*9. Purchasing Managers' Index	-0.4	0.3
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	-0.9	-0.5
Coincident Index		
1. Industrial production index, basic steel and mill products (SIC 331)	0.1	-0.1
2. Value of shipments, steel works, blast furnaces, and rolling and finishing mills (SIC 331), 1982$	0.1	-0.2
3. Total employee hours, blast furnaces and basic steel products (SIC 331)	-0.2	-0.1
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.1	-0.3

***New leading indicators**

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

NA: *Not available* ***r*** *- Revised*

Links To:

Chart 4.

Chart 5.

Table 6.
The Aluminum Mill Products Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1995				
September	138.9	3.9	142.0	-2.5
October	137.6	1.8	144.0	0.3
November	140.6	5.8	141.0	-3.5
December	139.1	3.3	142.9	-0.6
1996				
January	135.9	-1.3	139.5	-4.8
February	137.9	1.3	140.9	-2.6
March	137.9	1.3	142.6	0.1
April	139.8	3.5	141.6	-1.1
May	140.3	3.5	143.1	1.1
June	140.9	3.6	142.4	0.2
July	140.5	2.5	141.6	-0.6
August	140.4	1.8	141.3	-0.8

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.
The Contribution of Each Aluminum Mill Products Index Component to the Percent Change in the Index from the Previous Month

Leading Index	**July**	**August**
1. Average weekly hours, aluminum sheet, plate, and foil (SIC 3353)	-0.1	-0.7
2. Index of new private housing units authorized by permit	0.2	-0.1
3. Industrial production index for automotive products	0.4	-0.4
4. Construction contracts, commercial and industrial (mil. sq. ft.)	-0.7	0.7
5. Net new orders for aluminum mill products (mil. lbs.)	0.7	-0.1
*6. Growth rate of U.S. M2 money supply, 1987$	-0.2	0.0
*7. Purchasing Managers' Index	-0.5	0.3
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	-0.1	-0.2
Coincident Index		
1. Industrial production index, aluminum sheet, plate, and foil (SIC 3353)	-1.2	0.0
2. Total employee hours, aluminum sheet, plate, and foil (SIC 3353)	-0.2	0.1
3. Shipments of aluminum mill products (mil. lbs.)	0.7	-0.5
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	-0.6	-0.3

***New leading indicators**

Sources: Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, Federal Reserve Board; 4, F.W. Dodge, Division of McGraw-Hill Information Systems Company; 5, The Aluminum Association, Inc. and U.S. Geological Survey; 6, Federal Reserve Board, Conference Board, and U.S. Geological Survey; 7, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey. All series are seasonally adjusted.

NA*: Not Available* ***r*** *- Revised*

Links To:

Chart 6.

Chart 7.

Table 8.
The Copper Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1995				
September	117.5	-0.2	117.7	-1.0
October	116.2	-1.9	119.2	1.3
November	117.7	1.0	119.8	2.3
December	118.2	2.0	119.0	0.9
1996				
January	116.2	-1.0	119.5	1.5
February	118.0	2.1	119.4	1.2
March	118.7	3.0	118.8	0.2
April	119.5	4.0	119.8	1.7
May	119.4	3.2	120.0	1.6
June	118.4	0.9	119.5	0.6
July	118.2	0.5	120.5	2.2
August	118.3	0.5	120.6	2.0

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 9.
The Contribution of Each Copper Index Component to the Percent Change in the Index from the Previous Month

Leading Index	**July**	**August**
1. Average weekly overtime hours, rolling, drawing, and extruding of copper (SIC 3351)	-0.1	0.0
2. New orders, nonferrous and other primary metals, 1982$	0.3	0.1
3. MII stock price index, copper companies	-0.5	0.1
*4. Ratio of shipments to inventories, electronic and other electrical equipment (SIC 36)	-0.2	-0.1
*5. Growth rate of the LME spot price of primary copper	0.1	0.1
6. Index of new private housing units authorized by permit	0.2	-0.1
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	-0.2	0.1
Coincident Index		
1. Industrial production index, primary smelting and refining of copper (SIC 3331)	0.6	0.1
2. Total employee hours, rolling, drawing, and extruding of copper (SIC 3351)	-0.3	0.1
3. Copper refiners' shipments (short tons)	0.4	-0.2
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.8	0.1

***New leading indicators**

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

NA: *Not available* ***r*** *- Revised*

Links To:

Chart 8.

Chart 9.

(continued from page 2)
The Purchasing Managers' Index and M2 money supply did not work well as leading indicators for copper, but the lead of the copper leading index was increased by adding a shipments-to-inventories ratio for electronic and other electrical equipment.

In addition to the CIBCR short- and long-leading indexes, we deleted or replaced the following indicators for the industry shown:

Primary Metals
S&P stock price index, metals firms

Steel
Contracts and orders for plant and equipment
Net new orders for machine tools

Copper
Construction contracts, commercial and industrial
Copper scrap price (N.Y. #2 cents/lb)

For the primary and secondary aluminum leading index, the only change is the substitution of the ratio of shipments to inventories for motor vehicles and parts in place of a similar ratio for transportation equipment. (Tables and charts for the primary and secondary aluminum indexes are in a separate file.)

Although levels and growth rates of the new leading indexes are not exactly the same as those of the old indexes, the trends of both the old and new indexes are fairly close. As such, signals of future metals activity from the new leading indexes are similar to those from the old indexes.

The new primary metals leading index advanced 0.4% in September to 120.2 from 119.7 in August. Its 6-month smoothed growth rates for August and September are 1.7% and 2.2%, respectively. Since only four of the eight primary metals leading indicators were available for September, the September growth rate could be revised downward when the other indicators become available. Still, the August and September growth rates point to slow growth in the coming months for the broad primary metals industry, which consists of 26 metal processing and refining industries.

The new leading indexes for the steel, aluminum, and copper industries are computed through August. The steel leading index recorded the weakest performance of the new leading indexes in August, decreasing to 102.8 from 103.3 in July. With its August 6-month smoothed growth rate at -1.0%, the steel industry could see little or no growth over the next few months.

The new leading indexes for the aluminum industries moved in opposite directions in August. The leading index for aluminum mill products edged down to 140.4 from 140.5 in July, while the leading index for primary and secondary aluminum increased 1.2% to 225.7 from 223.0 in July. The 6-month smoothed growth rates of both leading indexes indicate slow growth for both industries in the months ahead.

The copper leading index edged higher in August to 118.3 from 118.2 in July. Although the leading index has been weak since June because of declining prices for copper company stocks and primary copper metal, the leading index has remained around 118.0 because of growth in new orders for nonferrous metals, steady shipments of electrical and electronic equipment, and stable construction activity as measured by permits for new housing. The copper industry should remain on a slow growth track for the near term.

The next release of the metal industry indicators summary on MINES FaxBack is scheduled for 10:00 A.M. ET, Wednesday, November 20. It can be accessed from a touch-tone telephone attached to a fax machine by dialing 703-648-4999.

The **Metal Industry Indicators** is produced at the U.S. Geological Survey by the Minerals Information Team. The report is prepared by George Swisko (703-648-4912), Gail James (703-648-4915), and Ken Beckman (703-648-4916), e-mail (kbeckman@usgs.gov). The metal industry leading and coincident indexes were developed by the Center for International Business Cycle Research at Columbia University. Correspondence can be addressed to:

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