

# Metal Industry Indicators

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

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December 2003

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**The primary metals leading index advanced in November, its seventh increase in the past 8 months. The leading index of metal prices increased in October, the latest month for which it is available, and its growth rate reached a 15-month high.**

The **primary metals leading index** advanced 3.5% in November to 139.8 from a revised 135.1 in October, and the index's 6-month smoothed growth rate climbed to 14.1% from a revised 8.0% in October. The 6-month smoothed growth rate is a compound annual rate that measures the near-term trend. Normally, a growth rate above +1.0% signals an upward trend for future growth in metals activity, while a growth rate below -1.0% indicates a downward trend. For an explanation of these indexes and a definition of the primary metals industry, [see page 14](#).

Because only four of the index's eight components were available in time to compute the November index value, it should be considered preliminary. The Institute for Supply Management's PMI, a measure of U.S. manufacturing activity, recorded its highest reading since December 1983 and produced the biggest contribution to the increase in the leading index. The largest increase in the length of the average workweek in primary metals establishments in 20 months also made a sizable contribution. In addition, the other two available components, the JOC-ECRI metals price index growth rate and the stock price component, both posted solid gains.

Even though the size of the November increase in the leading index may be revised lower when the four remaining components are added next month, the index has been quite strong in recent months. Its growth rate is signaling an upward trend in growth in domestic primary metals activity in the near term.

The **steel leading index** dipped 0.2% in October, the latest month for which it is available, down to 111.4 from a revised 111.6 in September. The index's 6-month smoothed growth rate slowed to 1.9% from a revised 2.4% in September. Another large drop in the growth rate of the inflation-adjusted U.S. M2 money supply was the biggest factor in the net decline in the leading index. The steel leading index is 3.7% above its recent low of last March, and its growth rate continues to indicate increased growth in U.S. steel industry activity in the coming months.

In October, the **aluminum mill products leading index** rose 0.3% to 164.4 from a revised 163.9 in September. The index's 6-month smoothed growth rate moved up to -0.9% from a revised -1.5% in September. The positive contributors to the net increase in the index were commercial and industrial construction contracts, the PMI, and the index of new private housing units authorized by permits. The growth rate of the inflation-adjusted U.S. M2 money supply and retail sales of U.S. passenger cars and light trucks registered negative contributions. The recent performance of the aluminum mill products leading index is not providing a clear signal of future industry activity.

The **primary aluminum leading index** advanced 1.9% in October to 82.5 from a revised 81.0 in September, and its 6-month smoothed growth rate rose to 8.6% in October, a 9-year high. Five of the index's six components were available for the October index calculation. The index measuring the trade-weighted average exchange value of other major currencies against the U.S. dollar accounted for about half of the net increase in the leading index. The growth rate of the leading index continues to suggest a near-term increase in domestic primary aluminum industry activity.

The **copper leading index** grew 1.7% in October, moving up to 122.2 from a revised 120.2 in September. The index's 6-month smoothed growth rate surged to 7.8% from a revised 4.9% in September, marking the index's highest growth rate since February 1992. All but one of the leading index's six components increased in October, with the price of copper on the London Metal Exchange supplying the largest positive contribution. The growth rate of the copper leading index continues to point to increased growth in U.S. copper industry activity.

### Metals Price Leading Index Moves Up Again in October

The **metals price leading index** grew 1.7% in October, climbing to 115.1 from a revised 113.2 in September. The index has

increased 6 of the past 7 months. Its 6-month smoothed growth rate climbed to 6.5%, a 15-month high, up from a revised 3.5% in September.

Three of the leading index's four components were available in time to compute the October index value, and all three increased. However, an increase in the growth rate of the index measuring the trade-weighted average exchange value of other major currencies against the U.S. dollar accounted for most of the gain in the leading index. The growth rate of the inflation-adjusted value of new orders for U.S. nonferrous metal products moved up moderately, while the yield spread between the U.S. 10-year Treasury Note and the federal funds rate recorded a slight increase.

The fourth index component, the growth rate of the Economic Cycle Research Institute's (ECRI) 18-Country Long Leading

Index, was available only through September, when it was unchanged from August.

The growth rate of the inflation-adjusted value of inventories of U.S. nonferrous metal products, which usually moves inversely with metal prices, fell to -4.4% in October from a revised -3.2% in September. That marks the lowest growth rate for this indicator since March 1995.

The growth rate of the metals price leading index is pointing to increases in overall primary metal prices in the months ahead. The business cycle and inventories are only two factors in metals price determination. Other factors that affect prices include changes in metals production, speculation, strategic stockpiling, foreign exchange rates, geopolitical instability, and production costs.

**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**

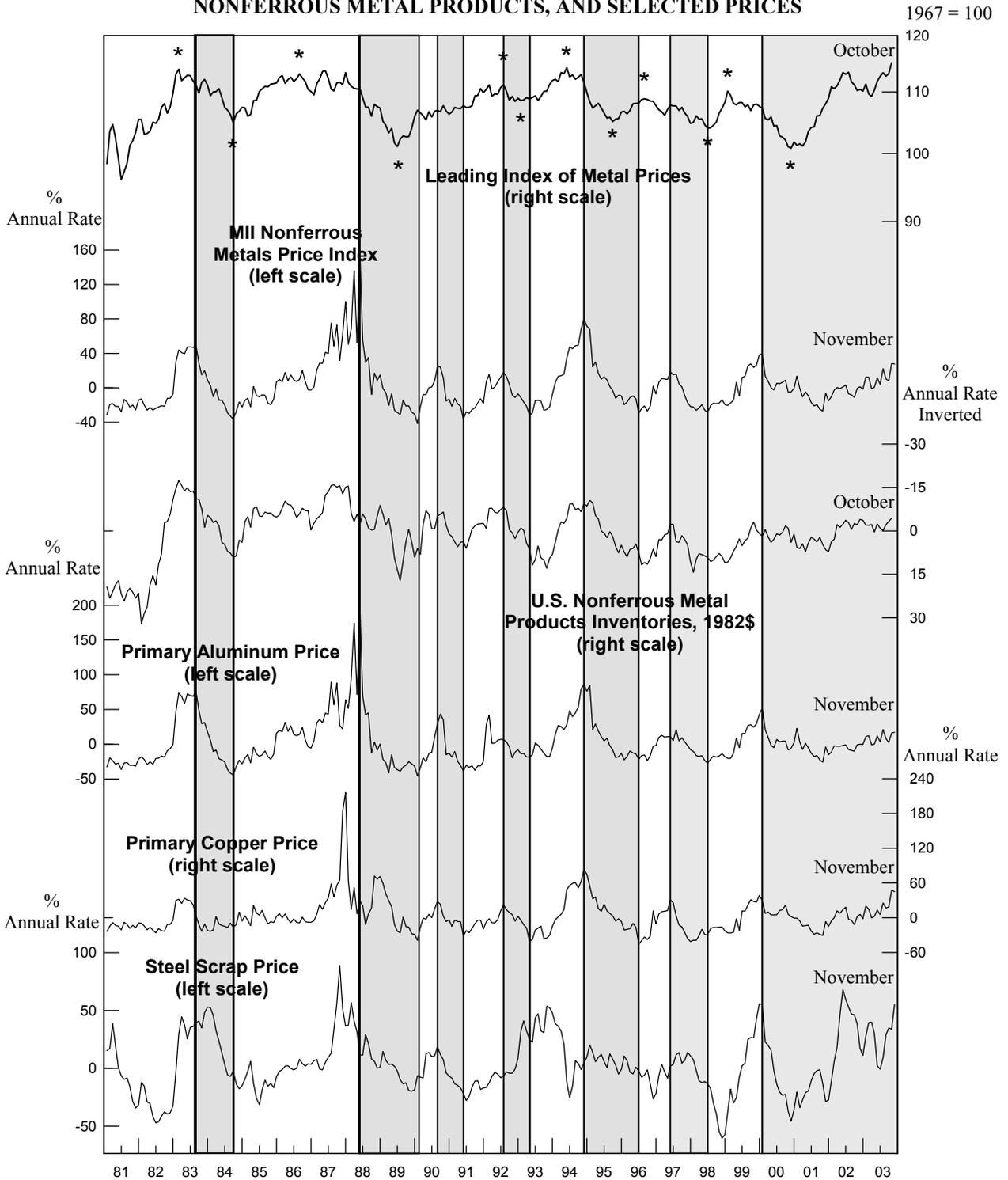
	Leading Index of Metal Prices (1967=100)	Six-Month Smoothed Growth Rates				
		MII Nonferrous Metals Price Index	U.S. Nonferrous Metal Products Inventories (1982\$)	Primary Aluminum	Primary Copper	Steel Scrap
<b>2002</b>						
October	110.2r	-0.5	-2.1	-0.8	2.3	38.2
November	110.4r	1.3	-4.0	0.0	5.7	17.4
December	110.1r	-1.6	-3.7	-0.4	-1.8	11.2
<b>2003</b>						
January	111.3r	12.7	-2.0	10.8	20.2	27.8
February	109.7r	12.4	-1.9	12.4	14.9	39.5
March	109.2r	-1.1	-2.2	-1.0	-0.3	40.0
April	110.3r	0.7	0.4	0.1	2.3	30.1
May	111.8	11.5	-2.4	11.6	13.4	2.3
June	112.7r	4.2	-0.9r	3.3	5.6	-0.8
July	113.3r	22.4	-0.1r	21.2	25.2	9.1
August	112.7r	10.4	-2.2	7.9	16.8	29.1
September	113.2r	8.2	-3.2r	2.5	18.4	34.7
October	115.1	28.2	-4.4	15.9	47.5	33.8
November	NA	27.7	NA	17.2	44.8	55.2

NA: Not available r: Revised

**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 Economic Cycle Research Institute's 18-Country Long 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.

**Sources:** U.S. Geological Survey (USGS); American Metal Market (AMM); the London Metal Exchange (LME); U.S. Census Bureau; the Economic Cycle Research Institute, Inc. (ECRI); and Federal Reserve Board.

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



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.**  
**The Primary Metals 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>
<b>2002</b>				
December	129.2	0.9r	98.0r	-2.1r
<b>2003</b>				
January	129.5r	1.0t	99.3r	0.4r
February	128.8r	-0.2r	98.2r	-1.8r
March	126.5r	-3.5r	97.7r	-2.8r
April	126.7r	-2.7r	96.8r	-4.1r
May	129.4r	1.4r	96.1r	-5.0r
June	130.3r	2.9r	95.5r	-5.6r
July	131.3r	4.3r	95.5r	-4.9r
August	133.9r	7.6r	95.0r	-5.2r
September	132.8r	5.4r	95.7	-3.3r
October	135.1r	8.0r	96.7	-0.9
November	139.8	14.1	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.**  
**The Contribution of Each Primary Metals Index Component to the Percent Change in the Index from the Previous Month**

<b>Leading Index</b>	<b>October</b>	<b>November</b>
1. Average weekly hours, primary metals (NAICS 331)	0.2r	1.1
2. Weighted S&P stock price index, machinery, construction and farm and industrial (December 30, 1994 = 100)	0.2r	0.4
3. Ratio of price to unit labor cost (NAICS 331)	0.7	NA
4. JOC-ECRI metals price index growth rate	0.4r	0.6
5. New orders, primary metal products, (NAICS 331 & 335929) 1982\$	0.3	NA
6. Index of new private housing units authorized by permit	0.3	NA
7. Growth rate of U.S. M2 money supply, 1996\$	-0.8	NA
8. PMI	0.4r	1.3
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	1.7r	3.4
<b>Coincident Index</b>	<b>September</b>	<b>October</b>
1. Industrial production index, primary metals (NAICS 331)	0.3r	0.8
2. Total employee hours, primary metals (NAICS 331)	0.0r	0.0
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)	0.7r	1.1

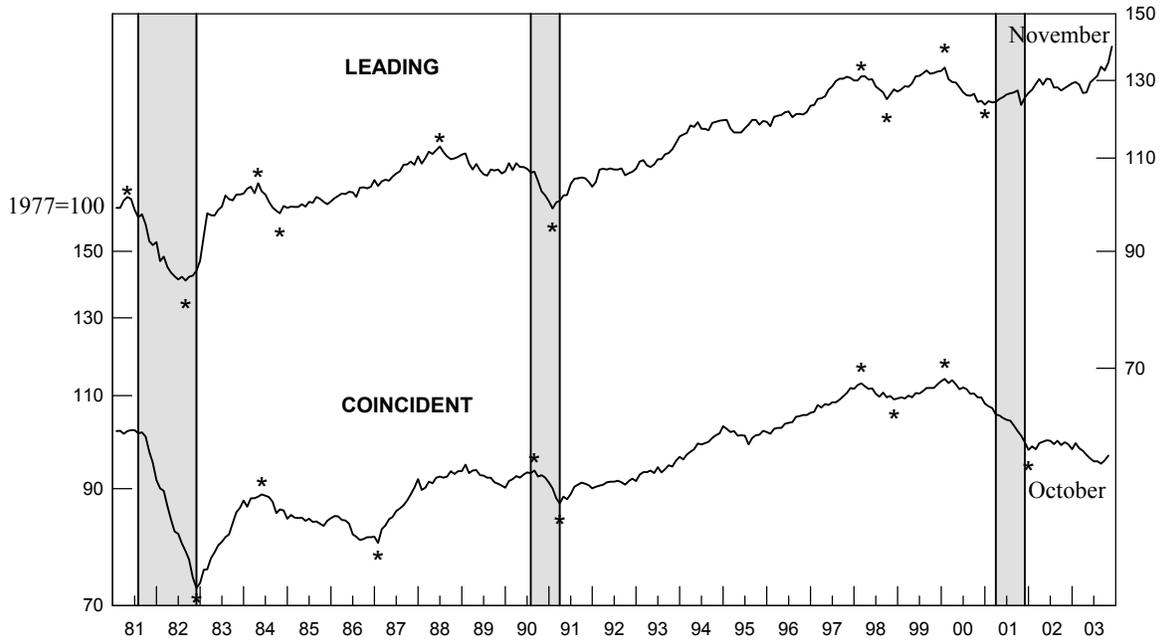
**Sources:** Leading: 1, Bureau of Labor Statistics; 2, Standard & Poor's and U.S. Geological Survey; 3, U.S. Geological Survey; 4, Journal of Commerce and Economic Cycle Research Institute, Inc.; 5, U.S. Census Bureau and U.S. Geological Survey; 6, U.S. Census Bureau and U.S. Geological Survey; 7, Federal Reserve Board, 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; 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.**

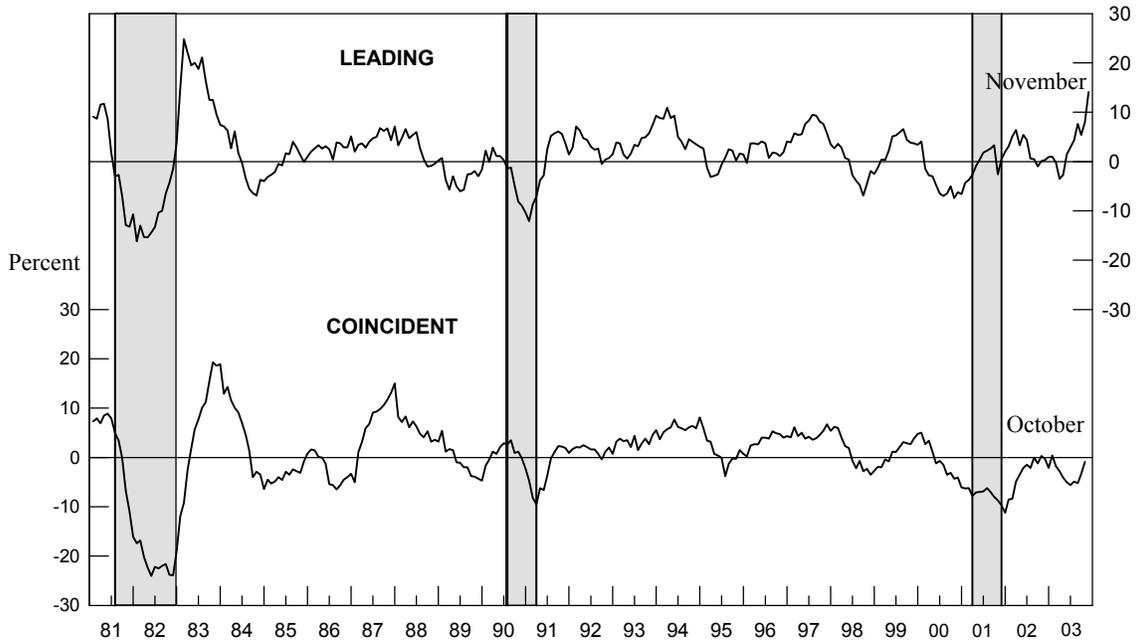
**PRIMARY METALS: LEADING AND COINCIDENT INDEXES, 1981-2003** 1977=100



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, 1981-2003** 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.  
The Steel Industry Indexes and Growth Rates**

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
<b>2002</b>				
November	110.2	-0.7	95.3r	2.2r
December	112.5	2.9	94.4r	0.2r
<b>2003</b>				
January	109.9	-1.8	95.2r	1.4r
February	108.6	-3.9	93.3r	-2.6r
March	107.4	-5.5	93.0r	-3.2r
April	108.1	-3.9	93.4r	-2.3r
May	110.9	1.1	92.1r	-4.7r
June	110.8	1.1	90.8r	-6.8r
July	111.3	2.1	90.5	-6.7r
August	113.0r	5.0r	89.7	-7.6r
September	111.6r	2.4r	90.7r	-4.9r
October	111.4	1.9	91.1	-3.4

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.

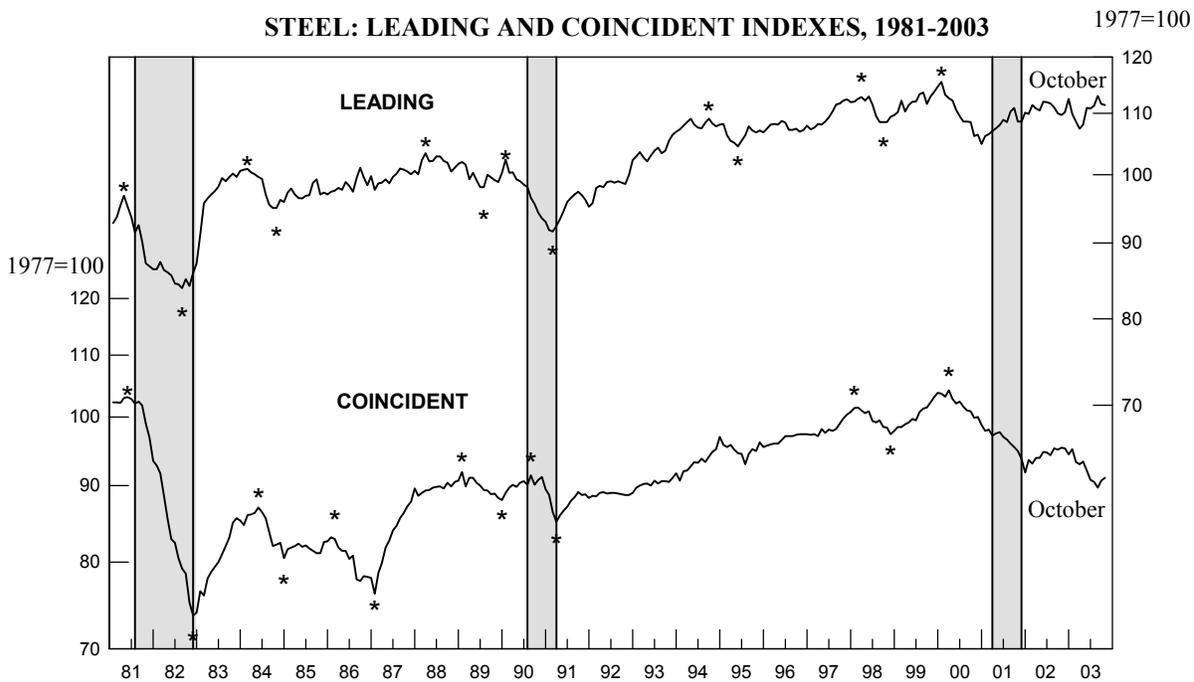
**Table 5.  
The Contribution of Each Steel Index Component to the Percent Change  
in the Index from the Previous Month**

Leading Index	September	October
1. Average weekly hours, iron and steel mills (NAICS 3311 & 3312)	1.0r	-0.3
2. New orders, iron and steel mills (NAICS 3311 & 3312), 1982\$	-0.3r	0.4
3. Shipments of household appliances, 1982\$	0.1	-0.1
4. S&P stock price index, steel companies	0.0	0.2
5. Retail sales of U.S. passenger cars and light trucks (units)	-0.7	-0.3
6. Growth rate of the price of steel scrap (#1 heavy melting, \$/ton)	0.0	0.0
7. Index of new private housing units authorized by permit	-0.1	0.3
8. Growth rate of U.S. M2 money supply, 1996\$	-1.0	-0.8
9. PMI	-0.1	0.4
Trend adjustment	0.0	0.0
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Percent change (except for rounding differences)	-1.1r	-0.2
<b>Coincident Index</b>		
1. Industrial production index, iron and steel products (NAICS 3311 & 3312)	0.5r	1.0
2. Value of shipments, iron and steel mills (NAICS 3311 & 3312), 1982\$	0.1r	0.0
3. Total employee hours, iron and steel mills (NAICS 3311 & 3312)	0.4r	-0.7
Trend adjustment	0.1	0.1
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Percent change (except for rounding differences)	1.1r	0.4

**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, 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; 3, Bureau of Labor Statistics and U.S. Geological Survey. All series are seasonally adjusted, except 4 and 6 of the leading index.

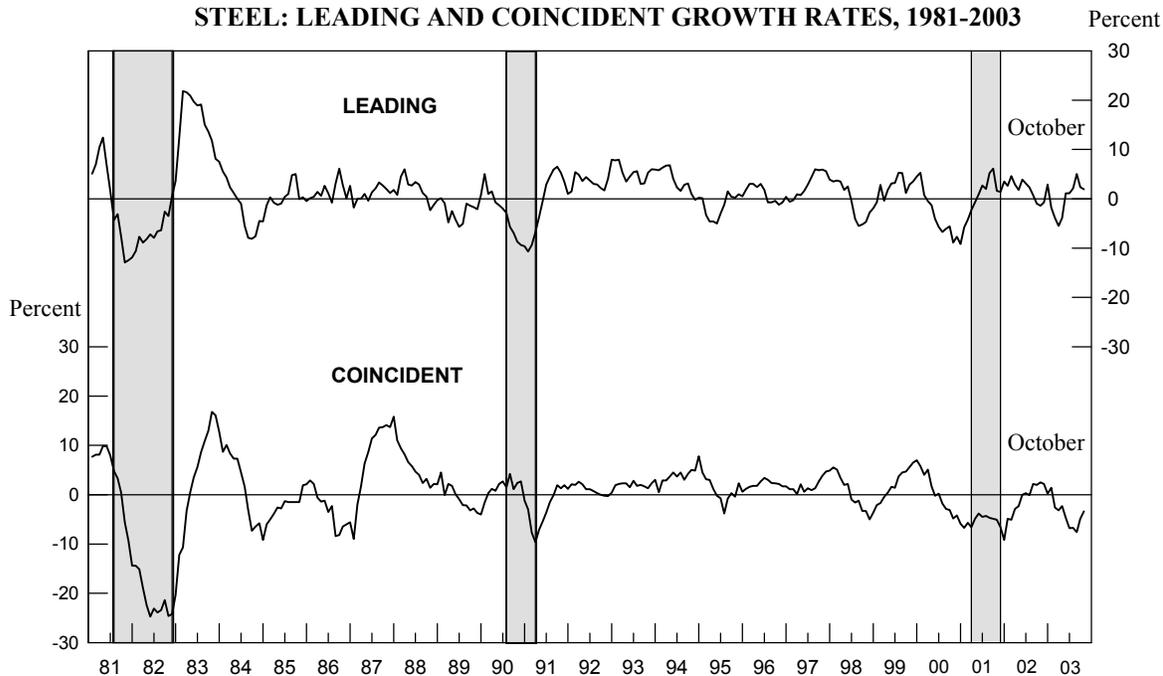
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**CHART 4.**  
**STEEL: LEADING AND COINCIDENT INDEXES, 1981-2003**



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 5.**  
**STEEL: LEADING AND COINCIDENT GROWTH RATES, 1981-2003**



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 6.**  
**The Aluminum Mill Products 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>
<b>2002</b>				
November	165.1	0.2	137.1r	1.7r
December	167.8	3.3	137.6r	2.3r
<b>2003</b>				
January	166.0	1.0	135.1r	-1.3r
February	165.9	0.7	136.9r	1.2r
March	161.7	-3.9	136.4	0.0r
April	162.9	-2.3	133.2r	-4.2r
May	167.2	2.8	136.3r	0.1r
June	164.5	-0.6	132.4r	-5.1r
July	164.7	-0.2	132.6r	-4.4r
August	168.4r	3.9r	134.6r	-1.4r
September	163.9r	-1.5r	133.7r	-2.4r
October	164.4	-0.9	134.1	-1.5

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.

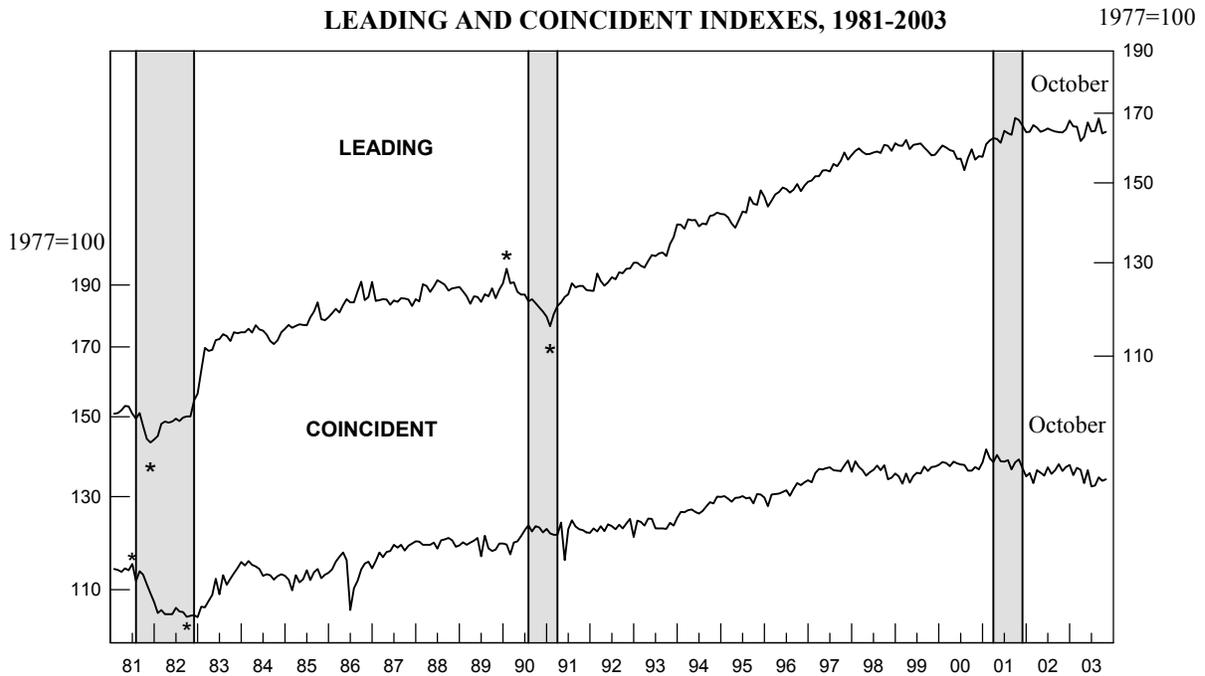
**Table 7.**  
**The Contribution of Each Aluminum Mill Products Index Component to the Percent Change in the Index from the Previous Month**

	<b>September</b>	<b>October</b>
<b>Leading Index</b>		
1. Average weekly hours, aluminum sheet, plate, and foil (NAICS 331315)	0.0	NA
2. Index of new private housing units authorized by permit	-0.1	0.4
3. Retail sales of U.S. passenger cars and light trucks (units)	-0.8r	-0.4
4. Construction contracts, commercial and industrial (square feet)	-0.4r	0.8
5. Net new orders for aluminum mill products (pounds)	-0.2r	0.0
6. Growth rate of U.S. M2 money supply, 1996\$	-1.2r	-1.1
7. PMI	-0.1r	0.5
Trend adjustment	0.2	0.2
Percent change (except for rounding differences)	-2.6r	0.4
<b>Coincident Index</b>		
1. Industrial production index, misc. aluminum materials (NAICS 331315,9)	-0.2r	0.1
2. Total employee hours, aluminum sheet, plate, and foil (NAICS 331315)	-0.6	NA
Trend adjustment	0.2	0.2
Percent change (except for rounding differences)	-0.6r	0.3

Sources: Leading: 1, Bureau of Labor Statistics; 2, U.S. Census Bureau and U.S. Geological Survey; 3, U.S. Bureau of Economic Analysis and American Automobile Manufacturers Association; 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, Institute for Supply Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey. All series are seasonally adjusted.

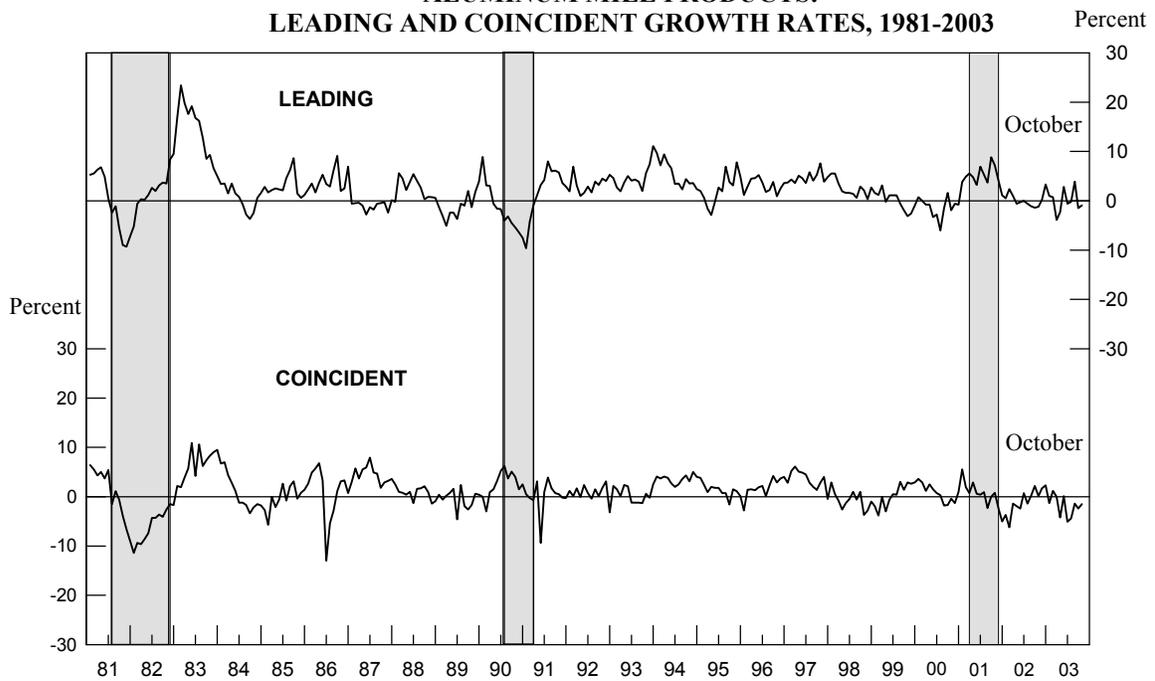
NA: Not available r: revised

**CHART 6.**  
**ALUMINUM MILL PRODUCTS:**  
**LEADING AND COINCIDENT INDEXES, 1981-2003**



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 7.**  
**ALUMINUM MILL PRODUCTS:**  
**LEADING AND COINCIDENT GROWTH RATES, 1981-2003**



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 8.**  
**The Copper Industry Indexes and Growth Rates**

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
<b>2002</b>				
November	116.7	-3.2	108.8r	-3.0r
December	117.4	-2.1	109.9r	-0.8r
<b>2003</b>				
January	117.5	-1.9	110.0r	-0.4r
February	116.2	-3.8	109.4r	-1.2r
March	114.8	-5.5	107.8r	-3.9
April	115.6	-3.6	105.9r	-6.7r
May	117.0	-0.7	107.0r	-4.2r
June	117.7r	0.8	108.0r	-1.9r
July	119.3	3.9	109.8r	1.4r
August	119.7	4.4	108.0r	-1.5r
September	120.2r	4.9r	108.4r	-0.4r
October	122.2	7.8	107.7	-1.5

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.

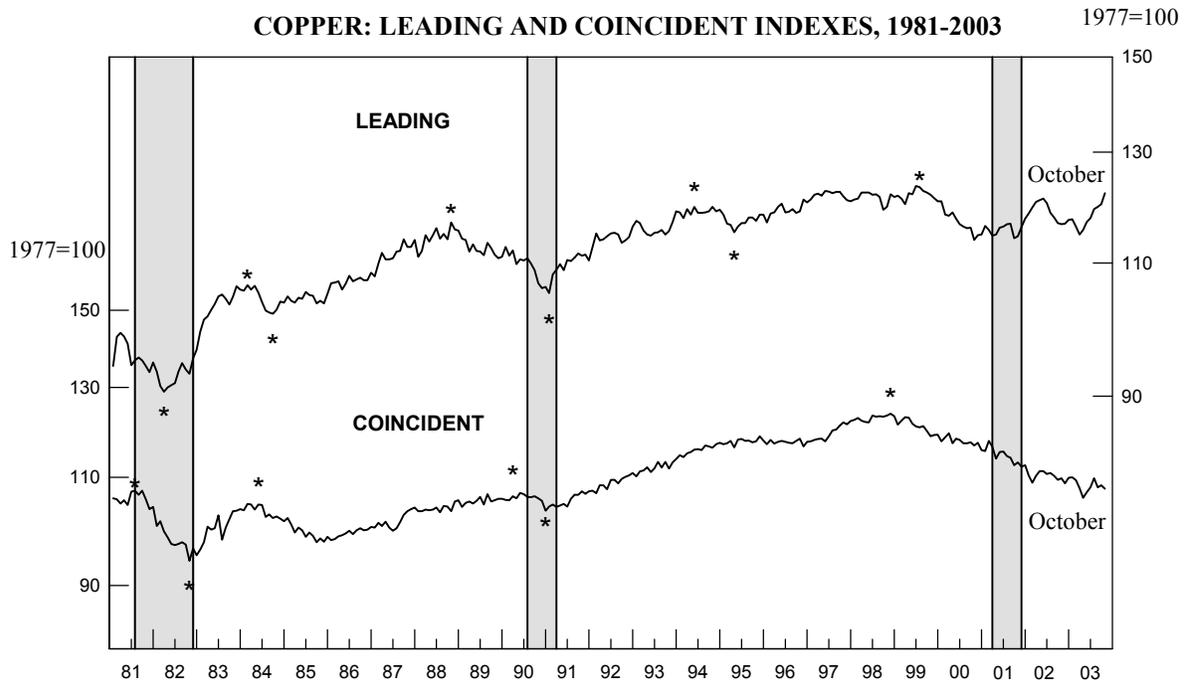
**Table 9.**  
**The Contribution of Each Copper Index Component to the Percent Change in the Index from the Previous Month**

Leading Index	September	October
1. Average weekly overtime hours, copper rolling, drawing, extruding, and alloying (NAICS 33142)	0.3	-0.1
2. New orders, nonferrous metal products, (NAICS 3313, 3314, & 335929) 1982\$	0.1r	0.1
3. S&P stock price index, building products companies	0.2	0.5
4. LME spot price of primary copper	0.1	0.8
5. Index of new private housing units authorized by permit	-0.1	0.4
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)	0.5r	1.7
<b>Coincident Index</b>		
1. Industrial production index, primary smelting and refining of copper (NAICS 331411)	0.1	-0.3
2. Total employee hours, copper rolling, drawing, extruding, and alloying (NAICS 33142)	0.4r	-0.5
3. Copper refiners' shipments (short tons)	-0.1	NA
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.5r	-0.7

**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; 6, Federal Reserve Board 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, 4, and 6 of the leading index.

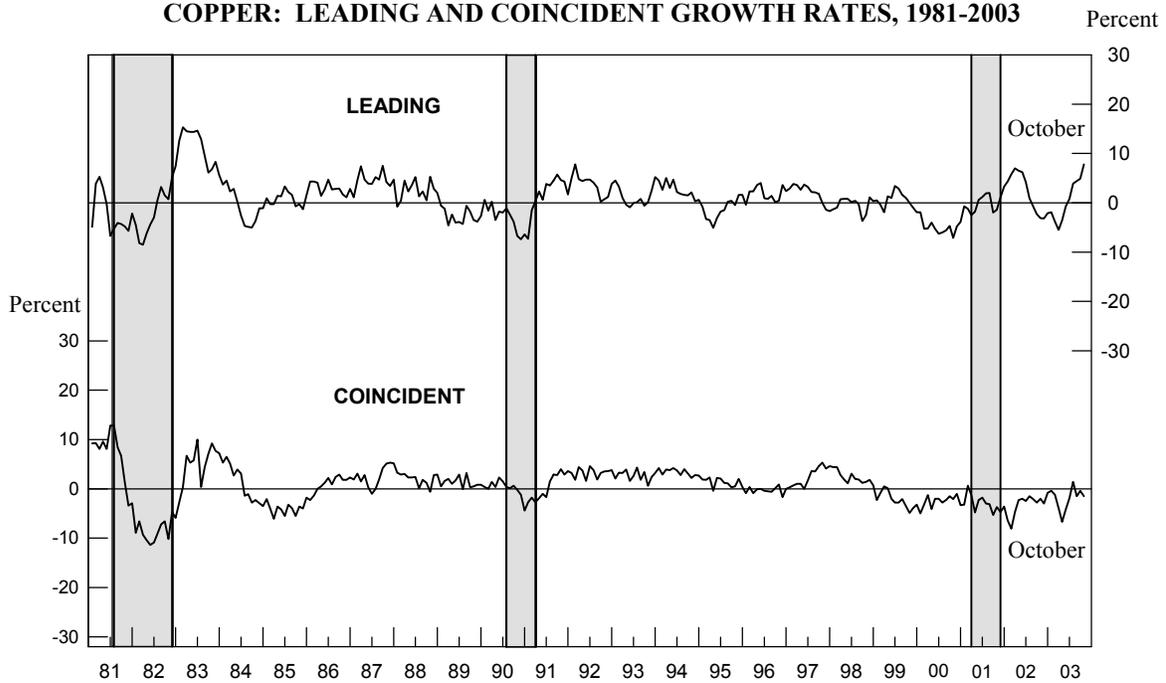
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**CHART 8.**  
**COPPER: LEADING AND COINCIDENT INDEXES, 1981-2003**



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 9.**  
**COPPER: LEADING AND COINCIDENT GROWTH RATES, 1981-2003**



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 10.**  
**The Primary Aluminum 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>
<b>2002</b>				
November	76.3	-2.5	69.8	8.2
December	77.5	0.9	70.5	9.4
<b>2003</b>				
January	78.1	2.5r	70.0	6.8
February	79.0	4.3r	70.7	7.3
March	79.3	4.8r	70.0	4.2
April	78.3r	2.0r	69.1	1.0
May	80.9	8.2r	68.9	-0.2
June	80.9r	7.0r	67.8	-3.7
July	80.0	3.9r	67.0	-6.4
August	80.5r	4.7r	66.9	-6.3
September	81.0r	5.6r	67.4r	-4.5r
October	82.5	8.6	67.1	-5.1

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 11.**  
**The Contribution of Each Primary Aluminum Index Component to the Percent Change in the Index from the Previous Month**

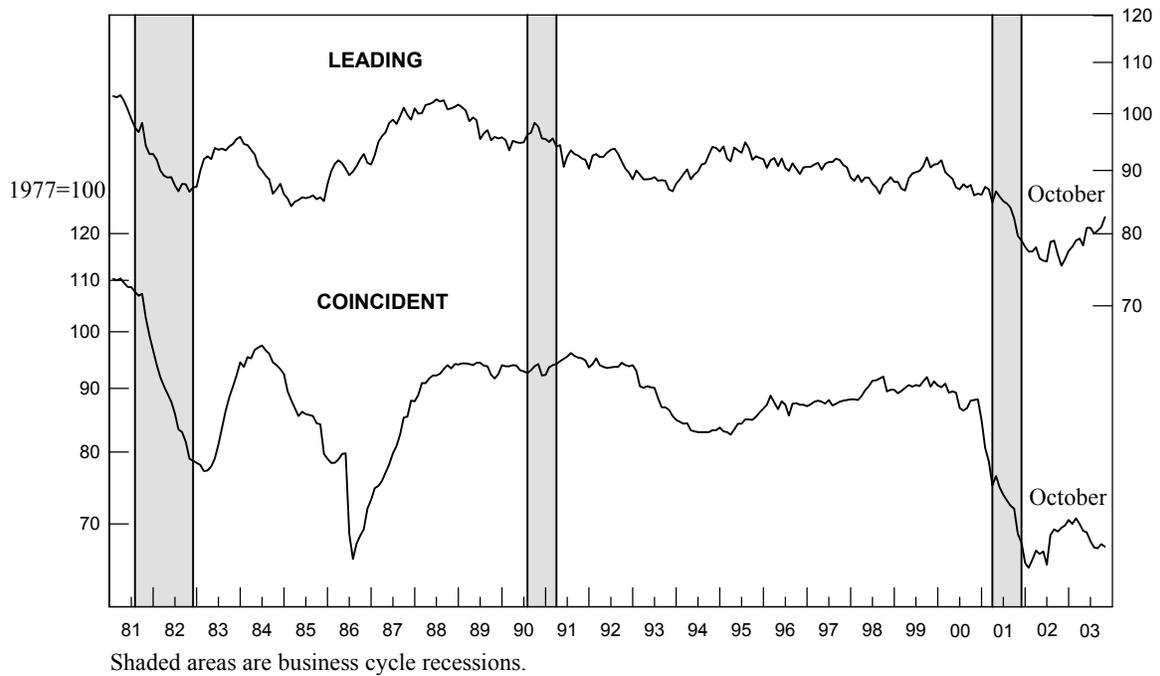
	<b>September</b>	<b>October</b>
<b>Leading Index</b>		
1. Average weekly hours, primary aluminum products (NAICS 331312)	0.2	NA
2. S&P stock price index, aluminum companies	0.1	0.5
3. LME cash closing price for primary aluminum (\$/ton)	-0.2r	0.4
4. Industrial production index, misc. aluminum materials (NAICS 331315,9)	-0.1r	0.0
5. New orders, nonferrous metal products (NAICS 3313, 3314, & 335929) 1982\$	0.1r	0.1
6. Reciprocal, index of the trade-weighted average exchange value of the U.S. dollar against other major currencies	0.5r	1.1
Trend adjustment	-0.1	-0.1
Percent change (except for rounding differences)	0.5r	2.0
<b>Coincident Index</b>		
1. Production of primary aluminum (metric tons)	-0.1r	-0.5
2. Total employee hours, primary aluminum products, (NAICS 331312)	0.8	NA
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	0.7r	-0.5

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

NA: Not available    r: Revised

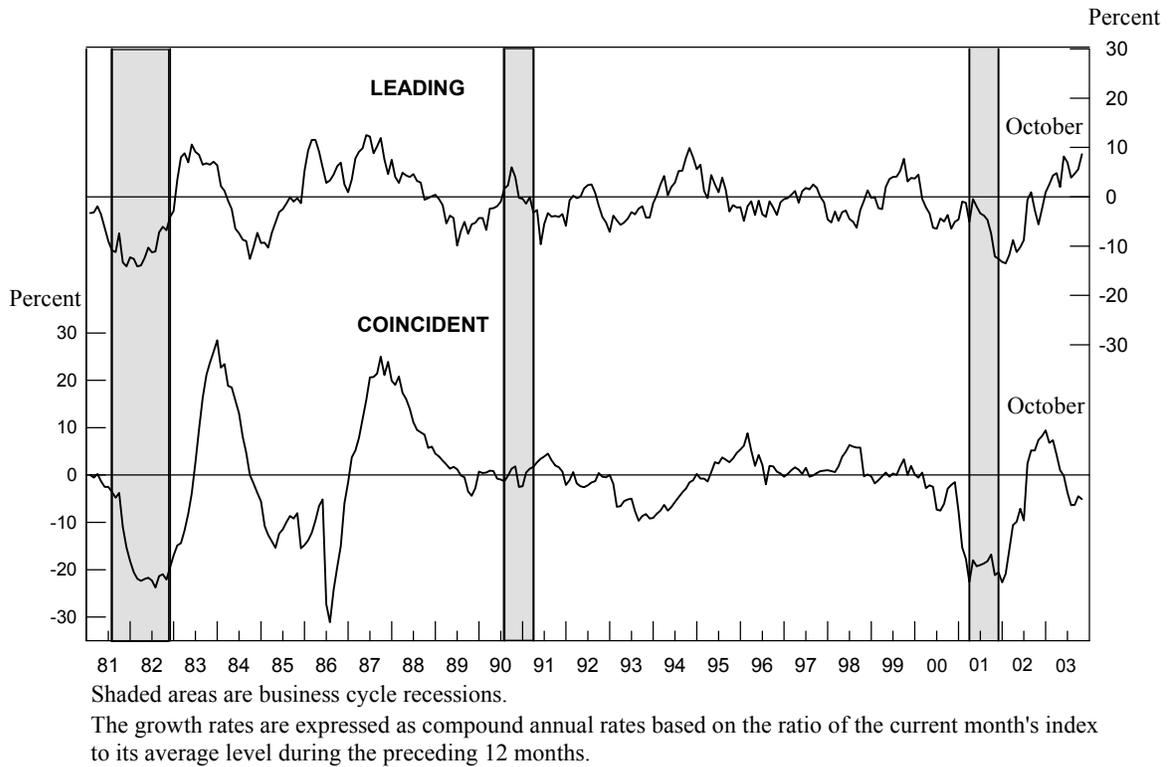
**CHART 10.**

**PRIMARY ALUMINUM LEADING AND COINCIDENT INDEXES, 1981-2003** 1977=100



**CHART 11.**

**PRIMARY ALUMINUM LEADING AND COINCIDENT GROWTH RATES, 1981-2003**



## Explanation

Each month, the U.S. Geological Survey tracks the effects of the business cycle on five U.S. metal industries by calculating and publishing composite indexes of leading and coincident indicators. Wesley Mitchell and Arthur Burns originated the cyclical-indicators approach for the economy as a whole at the National Bureau of Economic Research in the mid-1930s. Over subsequent decades this approach was developed and refined, mostly at the National Bureau, under the leadership of Geoffrey H. Moore.<sup>1</sup>

A business cycle can briefly be described as growth in the level of economic activity followed by a decline succeeded by further growth. These alternating periods of growth and decline do not occur at regular intervals. Composite indexes, however, can help determine when highs and lows in the cycle might occur. A composite index combines cyclical indicators of diverse economic activity into one index, giving decision makers and economists a single measure of how changes in the business cycle are affecting economic activity.

The indicators in the metal industry leading indexes historically give signals several months in advance of major changes in a coincident index, a measure of current metal industry activity. Indicators that make up the leading indexes are, for the most part, measures of anticipations or new commitments to various economic activities that can affect the metal industries in the months ahead.

Composite coincident indexes for the metal industries consist of indicators for production, shipments, and total employee hours worked. As such, the coincident indexes can be regarded as measures of the economic health of the metal industries.

The metal industry coincident indexes reflect industry activity classified by the U.S. Standard Industrial Classification (SIC) and the North American Industry Classification System (NAICS). Of the five metal industries, primary metals (NAICS 331) is the broadest, containing 25 different metal processing industries. Steel, aluminum, and copper are specific industries within the primary metals group.

The SIC was the main vehicle used by the U.S. Government and others in reporting industry economic statistics throughout most of the last century. Starting with the 1997 U.S. Economic Census, the U.S. Government began using the NAICS, which classifies economic data for industries in Canada, Mexico, and the United States. In general, metal industry indexes starting in 1997 begin to reflect the NAICS classification, while indexes for earlier years follow the SIC. Hence, composite indexes from 1997 forward are not entirely consistent with those of earlier years.

The largest change to primary metals because of the NAICS deals with other communication and energy wire manufacturing (NAICS 335929). Under NAICS, this manufacturing has been removed from primary metals and added to electrical equipment, appliance, and component manufacturing. Because monthly shipments and new orders for this wire are not available, the USGS is estimating their values from 1997 onward and adding them to the appropriate metal industry indicators and indexes to maintain consistency.

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<sup>1</sup>Business Cycle Indicators, A monthly report from The Conference Board (March 1996).

There are other small changes to the primary metals industry because of the switch to the NAICS. Coke oven activity not done by steel mills, for example, is removed and alumina refining, a part of industrial inorganic chemical manufacturing under the SIC, is added. Since the historic trends of the composite indexes are not affected by these small changes, the USGS is not making specific adjustments to the indexes for them for the periods before and after 1997.

The metal industry leading indexes turn before their respective coincident indexes an average of 8 months for primary metals and 7 months for steel and copper. The average lead time for the primary aluminum leading index is 6 to 8 months, and the average lead time for the aluminum mill products leading index is 6 months.

The leading index of metal prices, also published in the *Metal Industry Indicators*, is designed to signal changes in a composite index of prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange. On average, this leading index indicates significant changes in price growth about 8 months in advance.

The growth rate used in the *Metal Industry Indicators* is a 6-month smoothed growth rate at a compound annual rate, calculated from a moving average. Moving averages smooth fluctuations in data over time so that trends can be observed. The 6-month smoothed growth rate is based upon the ratio of the latest monthly value to the preceding 12-month moving average.

$$\left[ \left( \frac{\text{current value}}{\text{preceding 12-month moving average}} \right)^{\frac{12}{6.5}} - 1.0 \right] * 100$$

Because the interval between midpoints of the current month and the preceding 12 months is 6.5 months, the ratio is raised to the 12/6.5 power to derive a compound annual rate.

The growth rates measure the near-term industry trends. They, along with other information about the metal industries and the world economy, are the main tools used to determine the outlook of the industries. A 6-month smoothed growth rate above +1.0% usually means increasing growth; a rate below -1.0% usually means declining growth.

**The next summary is scheduled for release on the World Wide Web at 10:00 a.m. EST, Friday, January 23. The address for *Metal Industry Indicators* on the World Wide Web is: <http://minerals.usgs.gov/minerals/pubs/mii/>**

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