

Appendix C.

Composition of Aggregate Data Series in Terms of M3 Industry Series by Market Categories

AUTOMOTIVE EQUIPMENT

- 30A Tires and tubes (pt)
- 36I Miscellaneous electrical equipment and supplies (pt)
- 37A Motor vehicle parts, accessories, and bodies, except car bodies (pt)
- 37B Motor vehicles and car bodies (pt)
- 37J Boats, motorcycles, bicycles, travel trailers, and campers

HOME GOODS AND APPAREL

- 22B Knitting mill products
- 22C Carpets and rugs
- 23A Apparel and other finished textile products
- 25A Household furniture
- 30B Rubber and plastics footwear, hose, belting, gaskets, and other rubber products, n.e.c. (pt)
- 31B Leather products, except tanning, finishing, and footwear cut stock
- 32B Kitchen articles and pottery
- 32C Stone, clay, and glass products, except glass containers, kitchen articles, and pottery (pt)
- 34B Cutlery and handtools (pt)
- 35I Refrigeration, heating, and service industry machinery (pt)
- 36C Household appliances
- 36E Household audio and video equipment
- 38E Ophthalmic goods, watches and clocks
- 39A Miscellaneous personal goods, such as jewelry, silverware, toys and games, sporting goods, musical instruments, and burial caskets

CONSUMER STAPLES

- 20A Meat products
- 20B Dairy products
- 20C Fats and oils (pt)
- 20D Beverages (pt)
- 20E Food and kindred products, except meat and dairy products, beverages, fats, and oils (pt)
- 21A Cigarettes, cigars, and chewing and smoking tobacco and snuff
- 26C Miscellaneous converted paper products (pt)
- 27A Newspapers, periodicals, and books (pt)

- 27B Publishing and printing products, except newspapers, periodicals, and books (pt)
- 28C Drugs, soaps, and toiletries
- 29B Petroleum refining, except paving and roofing materials (pt)

MACHINERY AND EQUIPMENT

- 24B Wood buildings and mobile homes
- 25B Furniture, except household (pt)
- 34C Building materials and wire products (pt)
- 35A Steam engines and turbines (including nuclear)
- 35C Farm and garden machinery
- 35D Construction, mining, and material handling equipment
- 35E Metalworking machinery
- 35F Special industry machinery
- 35G General industrial machinery (pt)
- 35H Computer and office equipment (pt)
- 35I Refrigeration, heating, and service industry machinery (pt)
- 36A Electrical transmission and distribution equipment
- 36F Communication equipment, except for the Department of Defense
- 37A Motor vehicle parts, accessories, and bodies, except car bodies (pt)
- 37B Motor vehicles and car bodies (pt)
- 37C Complete aircraft, missiles, and space vehicles, except for the Department of Defense
- 37E Aircraft, missile, and space vehicle engines and parts, except for the Department of Defense (pt)
- 37G Ships and tank components, except for the Department of Defense
- 37I Railroad equipment
- 38A Search and navigation equipment, except for the Department of Defense
- 38D Medical instruments and supplies
- 38F Photographic goods

BUSINESS SUPPLIES

- 20E Food and kindred products, except meat and dairy products, beverages, and fats and oils (pt)
- 26C Miscellaneous converted paper products (pt)

- 27A Newspapers, periodicals, and books (pt)
- 27B Publishing and printing products, except newspapers, periodicals, and books (pt)
- 28A Chemical products, except paints, drugs, soaps, toiletries, and agricultural chemicals (pt)
- 28D Agricultural chemicals (pt)
- 29B Petroleum refining, except paving and roofing materials (pt)
- 30A Tires and tubes (pt)
- 34C Building materials and wire products (pt)
- 34F Miscellaneous fabricated metal products, except containers, cutlery, building materials, ordnance, and ammunition (pt)
- 39B Miscellaneous manufactures, except personal goods

CONSTRUCTION MATERIALS AND SUPPLIES

- 24C Wood products, except containers, buildings, and mobile homes (pt)
- 25B Furniture, except household (pt)
- 26A Pulp, paper, and paperboard mill products (pt)
- 28B Paints and related products
- 29A Asphalt paving and roofing materials
- 30C Miscellaneous plastics products, n.e.c. (pt)
- 32C Stone, clay, and glass products, except glass containers, kitchen articles, and pottery (pt)
- 33A Blast furnaces and steel mill products (pt)
- 33C Nonferrous metal products, primary and secondary (pt)
- 34C Building materials and wire products (pt)
- 36D Electric lighting and wiring equipment

DEFENSE PRODUCTS

- 28A Chemical products, except paints, drugs, soaps, toiletries, and agricultural chemicals (pt)
- 34X Ordnance and accessories
- 36G Communication equipment for the Department of Defense
- 37D Complete aircraft, missiles, and space vehicles for the Department of Defense
- 37F Aircraft, missiles, and space vehicle engines and parts for the Department of Defense (pt)
- 37H Ships, tanks, and tank components for the Department of Defense
- 38B Search and navigation equipment for the Department of Defense

OTHER MATERIALS AND INTERMEDIATE PRODUCTS

- 20C Fats and oils (pt)
- 20D Beverages (pt)

- 20E Food and kindred products, except meat and dairy products, beverages, and fats and oils (pt)
- 22A Broadwoven fabrics and textiles, except those from knitting and floor covering mills
- 24A Wood containers, pallets, and skids
- 24C Wood products, except containers, buildings, and mobile homes (pt)
- 26A Pulp, paper, and paperboard mill products (pt)
- 26B Paperboard containers and boxes
- 26C Miscellaneous converted paper products (pt)
- 28A Chemical products, except paints, drugs, soaps, toiletries, and agricultural chemicals (pt)
- 28B Paints and related products (pt)
- 28D Agricultural chemicals (pt)
- 29B Petroleum refining, except paving and roofing materials (pt)
- 30A Tires and tubes (pt)
- 30B Rubber and plastics footwear, hose, belting, gaskets, and other rubber products, n.e.c. (pt)
- 30C Miscellaneous plastics products, n.e.c. (pt)
- 31A Leather tanning and finishing and footwear cut stock
- 32A Glass containers
- 32C Stone, clay, and glass products, except glass containers, kitchen articles, and pottery (pt)
- 33A Blast furnaces and steel mill products (pt)
- 33B Iron and steel foundry products
- 33C Nonferrous metal products, primary and secondary (pt)
- 34A Metal cans and shipping containers
- 34B Cutlery and handtools (pt)
- 34C Building materials and wire products (pt)
- 34F Miscellaneous fabricated metal products, except containers, cutlery, building materials, ordnance, and ammunition (pt)
- 35B Internal combustion engines including diesel, except automotive and aircraft
- 35G General industrial machinery (pt)
- 35H Computer and office equipment (pt)
- 35J Industrial machinery, n.e.c.
- 36B Electrical industrial apparatus
- 36H Electronic components and accessories
- 36I Miscellaneous electrical equipment and supplies (pt)
- 37A Motor vehicle parts, accessories, and bodies, except car bodies (pt)
- 37X Aircraft, missile, and space vehicle engines and parts (pt)
- 38C Measuring and controlling devices

DURABLE GOODS INDUSTRIES

Nondefense Capital Goods

- 34D Ordnance and accessories, except for the Department of Defense

- 35A Steam engines and turbines (including nuclear)
- 35B Internal combustion engines including diesel, except automotive and aircraft
- 35D Construction, mining, and material handling equipment
- 35E Metalworking machinery
- 35F Special industry machinery
- 35G General industrial machinery
- 35H Computer and office equipment
- 35I Refrigeration, heating, and service industry machinery
- 36A Electrical transmission and distribution equipment
- 36B Electrical industrial apparatus
- 36F Communication equipment, except for the Department of Defense
- 37C Complete aircraft, missiles, and space vehicles, except for the Department of Defense
- 37E Aircraft, missiles, and space vehicle engines and parts, except for the Department of Defense
- 37G Ships and tank components, except for the Department of Defense
- 37I Railroad equipment
- 38A Search and navigation equipment, except for the Department of Defense

Nondefense Capital Goods, Excluding Aircraft and Parts

- 34D Ordnance and accessories, except for the Department of Defense
- 35A Steam engines and turbines (including nuclear)
- 35B Internal combustion engines including diesel, except automotive and aircraft
- 35D Construction, mining, and material handling equipment
- 35E Metalworking machinery
- 35F Special industry machinery
- 35G General industrial machinery
- 35H Computer and office equipment
- 35I Refrigeration, heating, and service industry machinery
- 36A Electrical transmission and distribution equipment
- 36B Electrical industrial apparatus
- 36F Communication equipment, except for the Department of Defense
- 37G Ships and tank components, except for the Department of Defense
- 37I Railroad equipment
- 38A Search and navigation equipment, except for the Department of Defense

Defense Capital Goods

- 34E Ordnance and accessories for the Department of Defense, except tanks and missiles
- 36G Communication equipment for the Department of Defense
- 37D Complete aircraft, missiles, and space vehicles for the Department of Defense
- 37F Aircraft, missile, and space vehicle engines and parts for the Department of Defense
- 37H Ships, tanks, and tank components for the Department of Defense
- 38B Search and navigation equipment for the Department of Defense

Durables, Excluding Capital Goods

- 24A Wood containers, pallets, and skids
- 24B Wood buildings and mobile homes
- 24C Wood products, except containers, buildings, and mobile homes
- 25A Household furniture
- 25B Furniture, except household
- 32A Glass containers
- 32B Kitchen articles and pottery
- 32C Stone, clay, and glass products, except glass containers, kitchen articles, and pottery (pt)
- 33A Blast furnaces and steel mill products
- 33B Iron and steel foundry products
- 33C Nonferrous metal products, primary and secondary
- 34A Metal cans and shipping containers
- 34B Cutlery and handtools
- 34C Building materials and wire products
- 34F Miscellaneous fabricated metal products, except containers, cutlery, building materials, ordnance, and ammunition
- 35C Farm and garden machinery
- 35J Industrial machinery, n.e.c.
- 36C Household appliances
- 36D Electric lighting and wiring equipment
- 36E Household audio and video equipment
- 36H Electronic components and accessories
- 36I Miscellaneous electrical equipment and supplies
- 37A Motor vehicle parts, accessories, and bodies, except car bodies
- 37B Motor vehicles and car bodies
- 37J Boats, motorcycles, bicycles, travel trailers, and campers
- 38C Measuring and controlling devices
- 38D Medical instruments and supplies
- 38E Ophthalmic goods, watches and clocks
- 38F Photographic goods

- 39A Miscellaneous personal goods, such as jewelry, silverware, toys and games, sporting goods, musical instruments, and burial caskets
- 39B Miscellaneous manufactures, except personal goods

- 37C Complete aircraft, missiles, and space vehicles, except for the Department of Defense
- 37G Ships and tank components, except for the Department of Defense
- 37I Railroad equipment

MISCELLANEOUS AGGREGATES

Producers' Durable Equipment

Information Technology Industries

- 35H Computer and office equipment
- 36F Communication equipment, except for the Department of Defense
- 38A Search and navigation equipment, except for the Department of Defense
- 38C Measuring and controlling devices
- 38F Photographic goods

Industrial Equipment

- 34C Building materials and wire products
- 34F Miscellaneous fabricated metal products, except containers, cutlery, building materials, ordnance, and ammunition
- 35A Steam engines and turbines (including nuclear)
- 35B Internal combustion engines including diesel, except automotive and aircraft
- 35E Metalworking machinery
- 35F Special industry machinery
- 35G General industrial machinery
- 36A Electrical transmission and distribution equipment
- 36B Electrical industrial apparatus

Transportation Equipment

- 37A Motor vehicle parts, accessories, and bodies, except car bodies
- 37B Motor vehicles and car bodies

Other Equipment

- 25A Household furniture
- 25B Furniture, except household
- 35C Farm and garden machinery
- 35D Construction, mining, and material handling equipment
- 35I Refrigeration, heating, and service industry machinery
- 36C Household appliances
- 36I Miscellaneous electrical equipment and supplies
- 38D Medical instruments and supplies
- 39A Miscellaneous personal goods, such as jewelry, silverware, toys and games, sporting goods, musical instruments, and burial caskets
- 39B Miscellaneous manufactures, except personal goods

Household Durable Goods

- 25A Household furniture
- 32B Kitchen articles and pottery
- 34B Cutlery and handtools
- 36C Household appliances
- 36E Household audio and video equipment
- 38E Ophthalmic goods, watches, and clocks
- 39A Miscellaneous personal goods, such as jewelry, silverware, toys and games, sporting goods, musical instruments, and burial caskets

Health Care Equipment and Products

- 25B Furniture, except household (pt)
- 28C Drugs, soaps, and toiletries (pt)
- 30B Rubber and plastics footwear, hose, belting, gaskets, and other rubber products, n.e.c. (pt)
- 30C Miscellaneous plastics products, n.e.c. (pt)
- 38D Medical instruments and supplies

Appendix D.

Benchmarking Procedures Used in Revising Historical M3 Shipments and Inventory Estimates: 1986-1994

The mathematical technique used in benchmarking historical data in the M3 survey generally follows a trend revision minimization approach with constraints determined by annual benchmarks. The objective function F

$$F = \sum_{i=0}^{n-1} [(Y_{i+1}/Y_i) - (X_{i+1}/X_i)]^2$$

defines the sum of squared differences in the month-to-month trend between the original and revised data.

where $i = 0 =$ December 1985
 $i = n =$ December 1994

$Y_{i+1}/Y_i =$ revised ratio of change from month_i to month_{i+1}

$X_{i+1}/X_i =$ original ratio of change from month_i to month_{i+1}

For shipments and inventories, monthly data for the 80 M3 industry categories are benchmarked using the trend minimization function F.

Constraints for shipments are:

- $\sum Y_i =$ 1986 Benchmark; $i \in$ 1986
- $\sum Y_i =$ 1987 Benchmark; $i \in$ 1987
- $\sum Y_i =$ 1988 Benchmark; $i \in$ 1988
- $\sum Y_i =$ 1989 Benchmark; $i \in$ 1989
- $\sum Y_i =$ 1990 Benchmark; $i \in$ 1990
- $\sum Y_i =$ 1991 Benchmark; $i \in$ 1991
- $\sum Y_i =$ 1992 Benchmark; $i \in$ 1992
- $\sum Y_i =$ 1993 Benchmark; $i \in$ 1993
- $\sum Y_i =$ 1994 Benchmark; $i \in$ 1994

Constraints for inventories are:

- $Y_0 =$ December 1985 Benchmark
- $Y_{12} =$ December 1986 Benchmark
- $Y_{24} =$ December 1987 Benchmark
- $Y_{36} =$ December 1988 Benchmark
- $Y_{48} =$ December 1989 Benchmark
- $Y_{60} =$ December 1990 Benchmark
- $Y_{72} =$ December 1991 Benchmark
- $Y_{84} =$ December 1992 Benchmark
- $Y_{96} =$ December 1993 Benchmark
- $Y_{108} =$ December 1994 Benchmark

Stage of fabrication inventories are tabulated and benchmarked at the two-digit SIC major group level using the procedure described for total inventories.

Any imbalances between the sum of the three stages of fabrication and the total inventory data at the two-digit SIC major group level are corrected by the following raking procedure:

$$MI_J^A = MI_J^O [TI_J / (MI_J^O + WI_J^O + FI_J^O)]$$

$$WI_J^A = WI_J^O [TI_J / (MI_J^O + WI_J^O + FI_J^O)]$$

$$FI_J^A = FI_J^O [TI_J / (MI_J^O + WI_J^O + FI_J^O)]$$

for $J = 0$ through n
 where $0 =$ January 1986
 $n =$ December 1994

MI_J^O and MI_J^A are materials and supplies original and as raked.

WI_J^O and WI_J^A are work in process original and as raked
 FI_J^O and FI_J^A are finished goods original and as raked
 $TI_J =$ Benchmarked total inventories

Table D-1. **Benchmark Data for Shipments and Total Inventories for M3 Industry Categories: 1988 to 1994**

[Millions of dollars]

Industry category	1994	1993	1992	1991	1990	1989	1988
SHIPMENTS							
All manufacturing industries	3,343,824	3,127,621	3,004,723	2,878,165	2,912,229	2,840,376	2,695,432
Durable goods industries	1,786,993	1,630,633	1,541,864	1,451,999	1,485,313	1,477,901	1,421,500
Lumber and wood products	103,642	94,272	81,565	70,491	74,229	74,410	72,046
Wood containers, pallets and skids	3,708	3,256	2,942	2,861	2,848	2,620	2,294
Wood buildings and mobile homes	9,787	8,114	6,645	5,945	6,466	6,432	6,625
All other wood products	90,147	82,903	71,978	61,685	64,915	65,358	63,127
Furniture and fixtures	50,039	46,817	43,826	39,815	41,523	41,317	39,173
Household furniture	23,663	21,906	20,507	19,396	19,837	20,035	19,105
All other furniture	26,376	24,911	23,318	20,419	21,686	21,282	20,068
Stone, clay, and glass products	71,227	65,609	62,521	59,957	63,727	63,729	63,146
Glass containers	4,681	4,825	4,860	4,863	4,928	4,800	4,698
Kitchen articles and pottery	1,139	1,127	1,030	1,033	984	978	894
Other stone, clay, and glass products	65,407	59,658	56,631	54,061	57,816	57,951	57,553
Primary metal industries	160,771	142,685	138,287	136,378	148,787	155,717	149,837
Blast furnaces, steel mill products	69,729	62,466	58,449	57,267	62,826	64,783	64,294
Iron and steel foundry products	14,032	12,846	11,860	11,714	12,461	12,592	12,198
Nonferrous and other primary metal products	77,011	67,373	67,978	67,397	73,500	78,343	73,345
Fabricated metal products	190,173	175,118	166,532	159,759	165,065	164,073	159,504
Metal cans and shipping containers	13,025	12,626	13,263	13,792	13,665	12,705	12,591
Cutlery and handtools	7,759	7,227	6,641	6,198	6,254	6,205	5,722
Building materials and wire products	74,969	67,995	64,777	64,301	66,299	65,146	62,909
Ordinance and accessories	5,555	6,292	6,855	6,747	6,780	7,386	8,044
Other fabricated metal products	88,864	80,978	74,996	68,722	72,066	72,631	70,239
Industrial machinery and equipment	314,424	278,063	258,661	247,509	259,366	256,214	244,365
Steam engines and turbines	6,802	6,234	5,843	5,276	4,474	4,200	3,825
Internal combustion engines	14,953	12,600	11,707	11,929	12,554	13,029	12,547
Farm and garden machinery	20,037	17,018	14,784	15,424	16,649	15,125	13,624
Construction, mining, and material handling equipment	33,989	30,625	27,193	27,928	30,848	29,649	27,800
Metalworking machinery	31,313	28,598	26,474	24,554	26,359	26,232	24,140
Special industry machinery	26,786	23,685	21,522	21,432	21,817	21,326	19,350
General industrial machinery	36,036	33,656	31,443	30,918	30,421	28,873	27,226
Computer and office equipment	79,573	69,249	66,709	60,403	65,309	66,249	68,056
Refrigeration, heating, and service industry machinery	33,537	29,853	27,544	25,328	26,417	27,746	25,645
Industrial machinery, n.e.c.	31,398	26,545	25,443	24,316	24,519	23,783	22,152
Electronic and other electrical equipment	257,800	233,621	216,764	199,280	195,898	194,599	187,301
Electrical transmission and distribution equipment	10,813	9,789	9,797	9,175	9,648	9,415	9,072
Electrical industrial apparatus	22,784	21,639	19,266	17,561	18,009	17,983	16,772
Household appliances	22,794	20,435	18,633	17,175	17,681	18,230	17,203
Electric lighting and wiring equipment	22,204	20,618	19,844	18,235	19,401	19,637	19,262
Household audio and video equipment	12,628	11,126	10,614	9,716	9,299	9,110	8,337
Communication equipment	51,653	45,539	42,955	38,083	38,555	35,524	36,127
Electronic components and accessories	93,635	81,236	73,642	67,547	62,580	61,686	57,578
Miscellaneous electrical equipment and supplies	24,891	23,240	22,013	21,786	20,725	23,013	22,950
Transportation equipment	452,363	414,694	399,269	367,236	370,329	369,675	354,849
Motor vehicle parts	116,886	99,539	86,702	73,329	75,355	78,883	79,795
Motor vehicle assembly operations	197,554	167,826	151,682	135,881	141,940	154,349	142,558
Complete aircraft, missile and space vehicles	66,341	70,919	82,363	81,998	76,822	65,605	64,125
Aircraft, missile and space vehicle parts	38,661	45,426	49,003	50,184	49,000	44,998	43,830
Shipbuilding and tanks	11,633	12,007	12,830	12,382	12,509	11,106	10,851
Railroad equipment	6,569	5,310	4,714	4,909	5,038	4,644	3,401
Other transportation equipment	14,719	13,667	11,976	8,552	9,664	10,090	10,289

See footnotes at end of table.

Table D-1. **Benchmark Data for Shipments and Total Inventories for M3 Industry Categories: 1988 to 1994—Con.**

[Millions of dollars]

Industry category	1994	1993	1992	1991	1990	1989	1988
SHIPMENTS—Con.							
Durable goods industries—Con.							
Instruments and related products	138,798	137,387	134,941	132,836	127,977	121,523	116,009
Search and navigation equipment	30,103	33,546	35,039	38,612	38,615	36,898	37,278
Measuring and controlling devices	38,800	35,409	34,730	33,312	32,243	29,938	29,078
Medical instruments and supplies	42,776	42,237	39,535	35,821	32,518	28,417	25,801
Ophthalmic goods, watches and clocks	3,751	3,827	3,518	3,671	3,567	3,527	3,301
Photographic goods	23,368	22,368	22,119	21,420	21,035	22,743	20,551
Other durable goods	44,156	42,366	39,499	38,739	38,411	36,646	35,272
Miscellaneous personal goods	23,401	22,874	21,333	20,933	20,834	20,053	19,105
Other durable goods	20,755	19,492	18,166	17,807	17,577	16,592	16,166
Nondurable goods industries	1,556,830	1,496,989	1,462,859	1,426,165	1,426,916	1,362,475	1,273,932
Food and kindred products	430,994	422,220	406,963	397,892	391,728	380,161	354,085
Meat products	98,116	99,442	94,072	92,175	92,902	88,521	81,876
Dairy products	53,761	53,527	52,720	51,405	52,155	50,426	47,341
Fats and oils	20,775	20,068	18,725	19,319	19,956	21,195	20,690
Beverages	61,347	58,562	57,957	56,311	53,420	52,618	50,143
Other food and kindred products	196,995	190,621	183,490	178,683	173,295	167,400	154,034
Tobacco products	30,021	28,383	35,198	31,943	29,856	25,875	23,809
Textile mill products	78,267	73,955	70,753	65,439	65,532	67,264	64,627
Broadwoven fabrics and other textiles	48,178	45,577	43,940	41,248	41,076	41,973	41,202
Knitting mill products	19,128	18,144	16,985	15,147	14,376	14,889	13,155
Carpets and rugs	10,961	10,234	9,828	9,045	10,081	10,403	10,270
Apparel and other finished textile products	76,898	74,010	71,658	68,309	66,637	64,880	65,771
Paper and allied products	143,762	133,262	133,201	130,131	132,424	131,895	122,883
Pulp, paper and paperboard mill products	58,244	52,550	54,392	53,791	57,561	58,266	54,928
Paperboard containers and boxes	36,125	33,523	32,655	30,749	30,636	30,667	28,234
Miscellaneous converted paper products	49,393	47,190	46,154	45,591	44,227	42,963	39,720
Printing, publishing and allied industries	176,382	172,634	166,153	160,271	159,749	151,854	144,803
Newspapers, periodicals, and books	81,678	80,730	77,264	76,495	75,764	72,777	69,103
Other publishing and printing	94,704	91,904	88,889	83,776	83,985	79,077	75,700
Chemicals and allied products	333,259	314,907	305,420	298,544	292,803	283,196	261,238
Industrial chemicals	168,943	158,771	157,619	155,420	158,365	158,184	145,848
Paints and related products	20,865	19,306	18,293	17,355	17,563	16,946	16,337
Drugs, soaps, and toiletries	122,551	117,888	110,667	107,075	98,440	90,631	82,936
Agricultural chemicals	20,899	18,942	18,841	18,695	18,434	17,435	16,117
Petroleum and coal products	143,150	144,833	150,227	159,144	173,389	146,487	131,681
Asphalt paving and roofing materials	8,668	8,536	7,749	7,291	7,844	7,547	7,946
Petroleum refining products	134,481	136,298	142,478	151,853	165,545	138,940	123,736
Rubber and miscellaneous plastics products	134,553	122,777	113,593	105,804	105,250	101,236	95,484
Tires and tubes	12,883	12,601	11,814	11,822	11,815	11,690	11,225
Rubber and plastics footwear, hose, belting, gaskets and other rubber products	21,132	19,707	18,292	16,855	17,145	16,536	15,840
Miscellaneous plastics products, n.e.c.	100,538	90,469	83,487	77,127	76,290	73,010	68,420
Leather and leather products	9,545	10,007	9,694	8,689	9,548	9,626	9,550
Leather tanning and finishing and footwear cut stock	3,357	3,502	3,222	2,438	2,727	2,795	2,777
Other leather products	6,188	6,505	6,472	6,251	6,820	6,831	6,773

See footnotes at end of table.

Table D-1. **Benchmark Data for Shipments and Total Inventories for M3 Industry Categories: 1988 to 1994—Con.**

[Millions of dollars]

Industry category	1994	1993	1992 ¹	1991 ²	1990	1989	1988
INVENTORIES							
All manufacturing industries	397,378	382,545	374,902	383,509	397,852	384,542	363,299
Durable goods industries	248,400	237,399	232,317	244,121	257,365	252,060	237,509
Lumber and wood products	10,122	9,789	8,008	7,543	8,024	7,702	7,586
Wooden containers, pallets and skids	348	295	260	262	287	249	210
Wood buildings and mobile homes	535	483	428	400	461	479	476
All other wood products	9,239	9,012	7,321	6,881	7,277	6,974	6,901
Furniture and fixtures	6,452	5,995	5,678	5,571	5,847	5,804	5,713
Household furniture	3,537	3,233	3,021	2,907	2,971	2,984	3,010
All other furniture	2,915	2,762	2,657	2,664	2,876	2,821	2,704
Stone, clay, and glass products	7,695	7,554	7,846	7,787	8,071	7,669	7,378
Glass containers	774	770	999	895	942	876	841
Kitchen articles and pottery	216	203	202	196	198	193	182
Other stone, clay, and glass products	6,705	6,581	6,645	6,696	6,931	6,600	6,354
Primary metal industries	22,467	19,998	19,967	20,725	22,592	22,831	22,376
Blast furnaces, steel mill products	10,910	10,168	10,038	10,504	11,322	11,157	10,636
Iron and steel foundry products	1,324	1,382	1,405	1,397	1,457	1,439	1,395
Nonferrous and other primary metal products	10,234	8,448	8,524	8,824	9,812	10,235	10,346
Fabricated metal products	25,096	23,523	23,372	23,477	24,585	24,988	24,532
Metal cans and shipping containers	1,419	1,519	1,646	1,576	1,520	1,575	1,575
Cutlery and handtools	1,305	1,174	1,131	1,134	1,161	1,145	1,112
Building materials and wire products	9,850	9,144	9,038	9,096	9,741	9,911	9,935
Ordnance and accessories	939	953	1,108	1,181	1,407	1,398	1,439
Other fabricated metal products	11,583	10,733	10,449	10,490	10,756	10,959	10,471
Industrial machinery and equipment	51,347	47,317	45,689	46,514	48,427	49,199	46,687
Steam engines and turbines	2,015	1,818	1,696	1,949	1,705	1,331	1,454
Internal combustion engines	1,683	1,397	1,303	1,343	1,611	1,681	1,668
Farm and garden machinery	3,098	2,641	2,399	2,321	2,628	2,576	2,612
Construction, mining, and material handling equipment	6,596	6,271	6,141	6,417	6,865	6,645	6,639
Metalworking machinery	5,837	5,469	5,140	5,130	5,622	5,608	5,048
Special industry machinery	5,740	5,091	4,779	4,793	4,890	4,801	4,640
General industrial machinery	6,987	6,609	6,526	6,548	6,577	6,489	6,158
Computer and office equipment	10,637	10,594	10,352	10,684	10,682	11,833	11,275
Refrigeration, heating, and service industry machinery	4,343	3,859	3,814	3,764	4,107	4,571	4,041
Industrial machinery, n.e.c.	4,410	3,568	3,538	3,565	3,738	3,662	3,151
Electronic and other electrical equipment	34,099	31,573	29,709	30,011	31,940	32,688	30,813
Electrical transmission and distribution equipment	1,396	1,250	1,252	1,275	1,343	1,396	1,456
Electrical industrial apparatus	3,495	3,278	3,238	3,197	3,347	3,316	3,217
Household appliances	2,530	2,285	2,085	2,265	2,814	2,988	2,711
Electric lighting and wiring equipment	3,084	2,987	2,843	2,832	3,038	3,121	3,091
Household audio and video equipment	1,105	958	983	1,078	1,081	1,140	956
Communication equipment	8,192	7,303	6,731	6,534	6,953	7,034	6,552
Electronic components and accessories	11,175	10,578	9,759	9,839	9,815	10,002	9,130
Miscellaneous electrical equipment and supplies	3,121	2,934	2,818	2,991	3,548	3,692	3,699
Transportation equipment	61,491	61,188	61,533	71,072	75,649	69,187	61,628
Motor vehicle parts	10,754	9,291	8,675	8,890	8,742	8,106	7,963
Motor vehicle assembly operations	4,508	4,253	4,245	4,159	4,658	4,325	4,300
Complete aircraft, missile and space vehicles	32,626	33,304	32,366	38,656	40,998	36,919	31,358
Aircraft, missile and space vehicle parts	9,110	9,892	11,868	14,862	16,909	15,816	14,117
Shipbuilding and tanks	1,563	1,605	1,752	2,123	1,941	1,678	1,698
Railroad equipment	1,158	1,090	1,006	882	947	987	815
Other transportation equipment	1,773	1,752	1,621	1,500	1,455	1,355	1,377

See footnotes at end of table.

Table D-1. **Benchmark Data for Shipments and Total Inventories for M3 Industry Categories: 1988 to 1994—Con.**

[Millions of dollars]

Industry category	1994	1993	1992 ¹	1991 ²	1990	1989	1988
INVENTORIES—Con.							
Durable goods industries—Con.							
Instruments and related products	22,191	23,303	23,924	24,963	25,698	25,699	24,574
Search and navigation equipment	6,034	6,236	7,384	8,262	9,105	9,667	9,338
Measuring and controlling devices	6,739	6,647	6,835	6,960	7,186	7,043	6,710
Medical instruments and supplies	6,651	7,039	6,771	6,552	5,988	5,562	4,989
Ophthalmic goods, watches and clocks	640	744	689	700	747	698	671
Photographic goods	2,127	2,636	2,246	2,489	2,673	2,729	2,866
Other durable goods	7,439	7,158	6,591	6,458	6,531	6,292	6,223
Miscellaneous personal goods	4,375	4,214	3,897	3,884	3,931	3,860	3,824
Other durable goods	3,064	2,944	2,694	2,574	2,600	2,432	2,399
Nondurable goods industries	148,978	145,146	142,585	139,388	140,487	132,482	125,790
Food and kindred products	32,653	32,243	31,375	30,532	30,185	28,927	27,622
Meat products	3,209	3,207	2,942	2,882	2,850	2,753	2,546
Dairy products	2,605	2,487	2,498	2,428	2,552	2,415	2,170
Fats and oils	1,692	1,748	1,551	1,581	1,579	1,462	2,096
Beverages	5,902	5,786	5,708	5,428	5,257	5,187	4,939
Other food and kindred products	19,246	19,016	18,677	18,213	17,947	17,111	15,871
Tobacco products	6,063	6,598	6,871	6,504	6,121	5,734	5,475
Textile mill products	9,307	8,816	8,297	8,085	8,339	8,349	8,049
Broadwoven fabrics and other textiles	5,593	5,315	5,113	5,004	5,091	5,129	4,914
Knitting mill products	2,348	2,249	2,024	1,925	1,967	1,888	1,824
Carpets and rugs	1,365	1,253	1,160	1,156	1,281	1,332	1,311
Apparel and other finished textile products	11,367	10,776	9,899	9,474	9,176	9,203	9,354
Paper and allied products	14,171	13,951	13,843	13,651	13,527	13,321	12,431
Pulp, paper and paperboard mill products	5,409	5,683	5,650	5,471	5,247	4,947	4,449
Paperboard containers and boxes	3,680	3,397	3,451	3,427	3,379	3,549	3,273
Miscellaneous converted paper products	5,082	4,871	4,742	4,753	4,900	4,824	4,709
Printing, publishing and allied industries	12,199	11,976	11,771	11,843	12,179	11,627	11,213
Newspapers, periodicals, and books	5,293	5,190	5,190	5,120	5,394	5,073	4,738
Other publishing and printing	6,906	6,787	6,581	6,723	6,786	6,553	6,475
Chemicals and allied products	36,781	36,114	35,475	34,322	33,817	31,534	29,580
Industrial chemicals	17,676	17,644	17,548	17,395	17,780	16,388	15,320
Paints and related products	2,480	2,323	2,285	2,281	2,378	2,276	2,178
Drugs, soaps, and toiletries	14,503	13,882	13,473	12,467	11,390	10,705	10,039
Agricultural chemicals	2,122	2,264	2,170	2,179	2,269	2,165	2,043
Petroleum and coal products	10,750	9,936	10,975	11,383	13,184	10,559	9,039
Asphalt paving and roofing materials	556	597	569	554	535	510	485
Petroleum refining products	10,194	9,340	10,406	10,829	12,649	10,049	8,554
Rubber and miscellaneous plastics products	14,151	13,052	12,516	12,119	12,285	11,512	11,314
Tires and tubes	907	971	1,059	995	1,194	1,083	1,112
Rubber and plastics footwear, hose, belting, gaskets and other rubber products, n.e.c.	2,462	2,353	2,219	2,222	2,212	2,110	2,119
Miscellaneous plastics products, n.e.c.	10,781	9,728	9,239	8,902	8,879	8,319	8,083
Leather and leather products	1,538	1,684	1,563	1,475	1,673	1,716	1,713
Leather tanning and finishing and footwear cut stock	451	535	505	484	432	464	461
Other leather products	1,087	1,149	1,058	991	1,242	1,252	1,252

¹Source: 1992 Census of Manufactures ending inventories.²Source: 1992 Census of Manufactures beginning inventories.

Note: Detail may not add to total because of independent rounding.

Table D-2. Benchmark Data for Inventories by Stage of Fabrication for Major Industry Groups: 1991-1994

Major industry group	1994	1993	1992 ¹	1991 ²
ALL MANUFACTURING INDUSTRIES				
Materials and supplies	136,606	128,890	124,029	124,540
Work-in-process	128,770	125,425	124,004	133,515
Finished goods	132,002	128,231	126,873	125,454
Durable Goods Industries				
Materials and supplies	78,407	73,013	69,523	70,946
Work-in-process	104,748	102,182	101,093	111,287
Finished goods	65,244	62,202	61,702	61,888
Lumber and wood products				
Materials and supplies	4,576	4,455	3,478	3,171
Work-in-process	2,027	2,006	1,641	1,596
Finished goods	3,519	3,329	2,890	2,776
Furniture and fixtures				
Materials and supplies	2,918	2,725	2,544	2,483
Work-in-process	1,252	1,247	1,175	1,171
Finished goods	2,282	2,023	1,959	1,917
Stone, clay, and glass products				
Materials and supplies	2,608	2,513	2,527	2,529
Work-in-process	1,017	1,021	1,065	1,100
Finished goods	4,070	4,020	4,254	4,158
Primary metals industries				
Materials and supplies	7,503	6,789	6,568	6,711
Work-in-process	8,151	6,908	7,162	7,667
Finished goods	6,814	6,301	6,237	6,347
Fabricated metal products				
Materials and supplies	9,597	8,736	8,359	8,319
Work-in-process	7,463	7,022	7,291	7,494
Finished goods	8,036	7,765	7,722	7,664
Industrial machinery and equipment				
Materials and supplies	16,206	14,465	13,531	13,394
Work-in-process	19,868	18,776	17,972	18,793
Finished goods	15,272	14,076	14,185	14,327
Electronic and other electrical equipment				
Materials and supplies	12,244	11,060	10,464	10,430
Work-in-process	12,996	12,288	11,502	11,705
Finished goods	8,858	8,225	7,743	7,876
Transportation equipment				
Materials and supplies	13,105	12,933	12,818	14,551
Work-in-process	40,963	41,131	40,854	48,191
Finished goods	7,424	7,123	7,861	8,330
Instruments and related products				
Materials and supplies	6,939	6,780	6,849	7,014
Work-in-process	9,609	10,402	11,209	12,352
Finished goods	5,643	6,120	5,867	5,597
Other durable goods				
Materials and supplies	2,711	2,557	2,385	2,344
Work-in-process	1,402	1,381	1,222	1,218
Finished goods	3,326	3,220	2,984	2,896

See footnotes at end of table.

Table D-2. Benchmark Data for Inventories by Stage of Fabrication for Major Industry Groups: 1991-1994

Major industry group	1994	1993	1992 ¹	1991 ²
Nondurable Goods Industries				
Materials and supplies	58,199	55,877	54,506	53,594
Work-in-process	24,022	23,243	22,911	22,228
Finished goods	66,758	66,029	65,171	63,566
Food and kindred products				
Materials and supplies	11,262	11,031	10,653	10,428
Work-in-process	4,531	4,258	4,096	3,987
Finished goods	16,861	16,955	16,627	16,117
Tobacco products				
Materials and supplies	4,919	5,473	5,569	5,343
Work-in-process	227	175	121	97
Finished goods	917	950	1,181	1,064
Textile mill products				
Materials and supplies	2,864	2,557	2,509	2,526
Work-in-process	2,490	2,412	2,295	2,235
Finished goods	3,952	3,848	3,493	3,324
Apparel and other finished textile products				
Materials and supplies	4,499	4,275	3,535	3,462
Work-in-process	2,159	2,120	2,067	1,991
Finished goods	4,709	4,381	4,297	4,021
Paper and allied products				
Materials and supplies	7,463	6,982	7,030	7,000
Work-in-process	1,342	1,333	1,301	1,282
Finished goods	5,366	5,636	5,512	5,369
Printing, publishing, and allied industries				
Materials and supplies	4,625	4,474	4,403	4,541
Work-in-process	2,528	2,509	2,542	2,549
Finished goods	5,046	4,994	4,826	4,753
Chemicals and allied products				
Materials and supplies	12,710	12,004	11,937	11,623
Work-in-process	6,130	6,145	5,792	5,363
Finished goods	17,941	17,964	17,747	17,336
Petroleum and coal products				
Materials and supplies	3,496	3,354	3,447	3,445
Work-in-process	2,364	2,081	2,531	2,579
Finished goods	4,890	4,502	4,997	5,359
Rubber and miscellaneous plastics products				
Materials and supplies	5,845	5,211	4,929	4,760
Work-in-process	1,915	1,827	1,801	1,792
Finished goods	6,390	6,014	5,787	5,567
Leather and leather products				
Materials and supplies	516	516	494	466
Work-in-process	336	383	365	353
Finished goods	686	785	704	656

¹Source 1992 Census of Manufactures ending inventories.

²Source 1992 Census of Manufactures beginning inventories.

Note Detail may not add to total because of independent rounding.

Table D-3. Value of Shipments to the Department of Defense for Selected Industries

[Millions of dollars]

Category	1992	1987
Defense capital goods industries	91,808	109,407
Ordnance and accessories	(D)	5,098
Small arms ammunition	(D)	376
Ammunition (except for small arms), n.e.c.	2,580	3,713
Small arms	353	441
Ordnance and accessories, n.e.c.	553	568
Communication equipment	4,699	(D)
Telephone and telegraph apparatus	342	(D)
Radio and television communication equipment ..	4,258	3,629
Communications equipment, n.e.c.	99	9
Complete aircraft, missiles, and space vehicles ..	35,100	39,142
Aircraft	22,609	22,128
Guided missiles and space vehicles	12,491	17,014
Aircraft, missiles, and space vehicles, engines and parts ..	(D)	23,200
Aircraft engines and engine parts	6,270	9,708
Aircraft parts and equipment, n.e.c.	5,724	10,743
Missile and space vehicle propulsion units and parts ..	2,173	2,216
Missile and space vehicle equipment, n.e.c.	(D)	533
Ships and tank components	9,349	9,096
Shipbuilding and repairing	7,742	6,722
Tanks and tank components	1,607	2,374
Search and navigation equipment	23,352	28,936

Source: Survey of Shipments to Federal Government Agencies (MC-9675).

Table D-4. Annual Shipments as Originally Published and as Revised: 1992 to 1995

[Millions of dollars]

Industry category	1995	1994	1993	1992
ALL MANUFACTURING INDUSTRIES				
As published	3,599,038	3,370,020	3,102,239	2,934,126
As revised.....	3,566,930	3,343,824	3,127,625	3,004,727
Durable Goods Industries				
As published	1,944,636	1,812,716	1,631,768	1,506,632
As revised.....	1,910,585	1,786,995	1,630,635	1,541,866
Stone, clay, and glass products				
As published	85,863	80,277	70,577	66,623
As revised.....	75,545	71,227	65,610	62,521
Primary metals industries				
As published	179,335	156,527	138,196	135,945
As revised.....	184,508	160,772	142,685	138,287
Fabricated metal products				
As published	190,182	181,980	170,308	160,490
As revised.....	198,727	190,172	175,118	166,532
Industrial machinery and equipment				
As published	371,862	329,576	287,739	253,445
As revised.....	353,551	314,424	278,063	258,662
Electronic and other electrical equipment				
As published	316,284	273,982	232,907	209,422
As revised.....	300,624	261,402	233,622	216,764
Transportation equipment				
As published	463,782	463,027	424,564	391,292
As revised.....	451,254	452,363	414,694	399,270
Instruments and related products				
As published	138,514	132,332	128,970	127,289
As revised.....	145,088	138,798	137,387	134,941
All other durable goods				
As published	198,814	195,015	178,507	162,126
As revised.....	201,288	197,837	183,456	164,889
Nondurable Goods Industries				
As published	1,654,402	1,557,304	1,470,471	1,427,494
As revised.....	1,656,345	1,556,829	1,496,990	1,462,861
Food and kindred products				
As published	440,120	429,631	413,988	395,028
As revised.....	440,939	430,994	422,220	406,964
Tobacco products				
As published	34,694	32,612	31,301	33,054
As revised.....	31,908	30,021	28,383	35,198
Textile mill products				
As published	74,767	74,241	70,172	69,850
As revised.....	78,810	78,267	73,955	70,753
Paper and allied products				
As published	165,647	137,969	129,445	131,307
As revised.....	171,832	143,762	133,263	133,201
Chemicals and allied products				
As published	366,952	341,522	313,752	301,522
As revised.....	358,523	333,258	314,907	305,420

Table D-4. Annual Shipments as Originally Published and as Revised: 1992 to 1995

[Millions of dollars]

Industry category	1995	1994	1993	1992
Nondurable Goods Industries—Con.				
Petroleum and coal products				
As published	155,416	144,380	147,301	154,673
As revised.....	154,137	143,149	144,834	150,227
Rubber and miscellaneous plastics products				
As published	120,103	113,738	104,076	103,329
As revised.....	143,259	134,553	122,777	113,593
All other nondurable goods				
As published	296,703	283,211	260,436	238,731
As revised.....	276,937	262,825	256,651	247,505

Appendix E.

Benchmarking Procedures Used in Revising Historical M3 Unfilled Orders and New Orders Estimates: 1986-1994

The estimation procedure followed in calculating new and unfilled orders consistent with the benchmarked shipments and inventory data discussed in appendix D is described below. Revisions to the unfilled orders estimates are based on a trend revision minimization approach defined by objective function F with constraints determined by the equations given below.

$$F = \sum_{i=0}^{n-1} [(Y_{i+1}/Y_i) - (X_{i+1}/X_i)]^2$$

where $i = 0 =$ December 1985
 $i = n =$ December 1994

$Y_{i+1}/Y_i =$ revised ratio of change from month _{i} to month _{$i+1$}

$X_{i+1}/X_i =$ original ratio of change from month _{i} to month _{$i+1$}

Monthly unfilled orders data for 1986 and later are adjusted to be consistent with 1988-1991 ASM, 1992 Census of Manufactures, and 1993-1994 ASM shipments estimates using the trend minimization function F with constraints for end-of-year unfilled orders (Y_i) determined as follows:

for $i = 0$, $Y_0 =$ the current M3 end-of-year unfilled orders (UFO) estimates for 1985

for $i = 12 =$ December 1986

for $i = 24 =$ December 1987

for $i = 36 =$ December 1988

for $i = 48 =$ December 1989

for $i = 64 =$ December 1990

for $i = 72 =$ December 1991

for $i = 84 =$ December 1992

for $i = 96 =$ December 1993

for $i = 108 =$ December 1994

$$Y_i^A = Y_i^O (S_i^A / S_i^O)$$

where $Y_{12}^A =$ adjusted end-of-year 1986 UFO

$Y_{12}^O =$ original M3 end-of-year 1986 UFO

$S_{12}^A =$ ASM annual shipments estimates for 1986

$S_{12}^O =$ M3 annual shipments estimate for 1986

$Y_{24}^A =$ adjusted end-of-year 1987 UFO

$Y_{24}^O =$ original M3 end-of-year 1987 UFO

$S_{24}^A =$ ASM annual shipments estimates for 1987

$S_{24}^O =$ M3 annual shipments estimate for 1987

$Y_{36}^A =$ adjusted end-of-year 1988 UFO

$Y_{36}^O =$ original M3 end-of-year 1988 UFO

$S_{36}^A =$ ASM annual shipments estimates for 1988

$S_{36}^O =$ M3 annual shipments estimate for 1988

$Y_{48}^A =$ adjusted end-of-year 1989 UFO

$Y_{48}^O =$ original M3 end-of-year 1989 UFO

$S_{48}^A =$ ASM annual shipments estimates for 1989

$S_{48}^O =$ M3 annual shipments estimate for 1989

$Y_{60}^A =$ adjusted end-of-year 1990 UFO

$Y_{60}^O =$ original M3 end-of-year 1990 UFO

$S_{60}^A =$ ASM annual shipments estimates for 1990

$S_{60}^O =$ M3 annual shipments estimate for 1990

$Y_{72}^A =$ adjusted end-of-year 1991 UFO

$Y_{72}^O =$ original M3 end-of-year 1991 UFO

$S_{72}^A =$ ASM annual shipments estimates for 1991

$S_{72}^O =$ M3 annual shipments estimate for 1991

$Y_{84}^A =$ adjusted end-of-year 1992 UFO

$Y_{84}^O =$ original M3 end-of-year 1992 UFO

$S_{84}^A =$ ASM annual shipments estimates for 1992

$S_{84}^O =$ M3 annual shipments estimate for 1992

Y_{96}^A = adjusted end-of-year 1993 UFO
 Y_{96}^O = original M3 end-of-year 1993 UFO
 S_{96}^A = ASM annual shipments estimates for 1993
 S_{96}^O = M3 annual shipments estimate for 1993

Y_{108}^A = adjusted end-of-year 1994 UFO
 Y_{108}^O = original M3 end-of-year 1994 UFO
 S_{108}^A = ASM annual shipments estimates for 1994
 S_{108}^O = M3 annual shipments estimate for 1994

Monthly new orders estimates are derived consistent with the benchmarked shipments and unfilled orders monthly data using the following relation.

$$X_J = S_J + (Y_J - Y_{J-1})$$

for J = 1 through n

J = 1 = January 1986

J = n = December 1994

X_J = Benchmarked new orders

S_J = Benchmarked shipments

Y_J = Benchmarked unfilled orders

Table E-1. End-of-Year Unfilled Orders As Originally Published and Revised: 1992 to 1995

[Millions of dollars]

Industry category	1995	1994	1993	1992
ALL MANUFACTURING INDUSTRIES				
As published	461,357	451,768	438,358	472,186
As revised.....	474,475	464,307	453,412	488,656
Durable Goods Industries				
As published	439,459	427,448	417,627	450,125
As revised.....	451,715	439,731	432,667	466,323
Stone, clay, and glass products				
As published	7,640	7,514	6,819	6,392
As revised.....	6,762	6,649	6,319	5,984
Primary metals industries				
As published	27,482	27,859	21,548	20,676
As revised.....	28,275	28,727	22,317	20,984
Fabricated metal products				
As published	20,691	20,492	20,046	22,761
As revised.....	21,321	21,082	20,560	23,557
Industrial machinery and equipment				
As published	72,402	67,196	52,978	50,119
As revised.....	70,564	65,613	52,803	53,450
Electronic and other electrical equipment				
As published	52,760	46,132	44,438	42,087
As revised.....	48,985	42,635	43,594	43,225
Transportation equipment				
As published	205,469	203,174	213,476	245,846
As revised.....	221,161	218,145	225,044	253,095
Instruments and related products				
As published	46,368	48,018	51,394	55,587
As revised.....	48,149	49,920	55,042	59,180
All other durable goods				
As published	6,647	7,063	6,928	6,657
As revised.....	6,498	6,960	6,988	6,853
Nondurable Goods Industries				
As published	21,898	24,320	20,731	22,061
As revised.....	22,760	24,576	20,745	22,328

Table E-2. Annual New Orders As Originally Published and Revised: 1992 to 1995

[Millions of dollars]

Industry category	1995	1994	1993	1992
ALL MANUFACTURING INDUSTRIES				
As published	3,608,627	3,383,430	3,068,411	2,898,545
As revised.....	3,577,098	3,354,719	3,092,381	2,978,548
Durable Goods Industries				
As published	1,956,647	1,822,537	1,599,270	1,471,367
As revised.....	1,922,569	1,794,059	1,596,974	1,515,694
Stone, clay, and glass products				
As published	85,989	80,972	71,004	66,475
As revised.....	75,658	71,557	65,945	61,921
Primary metals industries				
As published	178,958	162,838	139,068	134,807
As revised.....	184,056	167,182	144,018	136,849
Fabricated metal products				
As published	190,381	182,426	167,593	159,321
As revised.....	198,966	190,694	172,121	165,793
Industrial machinery and equipment				
As published	377,068	343,794	290,598	250,805
As revised.....	358,502	327,234	277,416	258,608
Electronic and other electrical equipment				
As published	322,912	275,676	235,258	209,941
As revised.....	306,974	260,443	233,991	217,966
Transportation equipment				
As published	466,077	452,725	392,194	363,255
As revised.....	454,270	445,464	386,643	377,147
Instruments and related products				
As published	136,864	128,956	124,777	124,556
As revised.....	143,317	133,676	133,249	132,314
All other durable goods				
As published	198,398	195,150	178,778	162,207
As revised.....	200,826	197,809	183,591	165,096
Nondurable Goods Industries				
As published	1,651,980	1,560,893	1,469,141	1,427,178
As revised.....	1,654,529	1,560,660	1,495,407	1,462,854

Appendix F.

Notes on Trading Day Adjustment Methodology and Weight Patterns

The shipments data in the M3 survey are adjusted for calendar month variations, both length of month and number of trading days per month. The selection of these adjustment factors is based primarily on recognition of patterns contained in the data using the regression and spectral analysis capabilities of the X-11 seasonal adjustment software.

Factors are considered optimal when the daily weights assigned to the industry eliminate or diminish the peaks in the spectral plots, which are based on calendar frequencies, and lower the absolute value of the month-to-month change in the residual irregular component (I)

of the data series. Several variations of the calculation and application of these weights provided multiple versions of the irregular component values. The set of weights selected were those which realized the lowest I value. The following table contains the daily weights used for each industry. For trading day weights before 1987, see table F-1 of M3-1(90).

New orders data in this publication are implicitly trading day adjusted by using the trading day adjusted shipments as input to their derivation. The change in unfilled orders is not trading day adjusted.

Table F-1. Trading Day Weight Patterns and Diagnostics

Series	Daily weights							Trading day adjustment indicator	F ratio ¹
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
DURABLE GOODS INDUSTRIES									
Lumber and Wood Products									
Wood containers, pallets and skids	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	2.50
Wood buildings and mobile homes	1.294	0.957	1.270	1.106	0.910	1.000	0.464	(T)	10.42
Wood products (except containers, buildings, and mobile homes)	1.238	0.779	1.277	1.460	0.843	0.747	0.657	(T)	17.77
Furniture and Fixtures									
Household furniture	1.576	1.033	0.978	1.308	1.033	0.593	0.479	(T)	20.25
Furniture (except household)	1.020	1.166	1.172	1.171	1.378	0.400	0.694	(T)	35.13
Stone, Clay, and Glass Products									
Glass containers	0.747	1.606	1.052	0.990	1.459	0.457	0.690	(T)	19.01
Kitchen articles and pottery	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	2.43
Other stone, clay, and glass products	1.126	1.240	0.996	1.395	0.990	0.669	0.584	(T)	30.13
Primary Metal Industries									
Blast furnaces, steel mill products	1.039	1.243	1.077	1.295	1.172	0.583	0.591	(T)	37.80
Iron and steel foundry products	1.264	1.280	0.846	1.277	1.042	0.862	0.429	(T)	12.80
Nonferrous metal products, primary and secondary	1.210	1.173	1.010	1.403	1.114	0.606	0.484	(T)	22.55
Fabricated Metal Products									
Metal cans and shipping containers	1.191	0.996	1.122	1.082	1.219	0.684	0.706	(T)	8.82
Cutlery and handtools	1.188	1.131	1.091	1.004	1.198	0.956	0.432	(T)	4.77
Building materials and wire products	1.048	1.377	1.077	1.414	0.839	0.777	0.468	(T)	20.49
Ordnance and accessories:									
Nondefense	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	2.34
Defense	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	3.88
Other fabricated metal products	1.136	1.333	1.033	1.291	1.027	0.679	0.500	(T)	33.02
Industrial Machinery and Equipment									
Steam engines and turbines	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	3.20
Internal combustion engines	1.150	0.824	1.240	0.906	1.277	0.663	0.940	(T)	3.10
Farm and garden machinery	0.880	1.372	0.964	1.210	1.053	1.196	0.325	(T)	4.09
Construction, mining, and material handling equipment	0.819	1.514	0.755	1.425	0.966	0.859	0.663	(T)	12.46
Metalworking machinery	1.340	1.337	0.977	1.058	1.230	0.649	0.409	(T)	13.09
Special industry machinery	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	3.63
General industrial machinery	1.176	1.461	1.085	1.070	1.116	0.773	0.320	(T)	28.05
Computer and office equipment	1.203	0.900	1.356	0.791	1.204	1.065	0.481	(T)	7.42
Refrigeration, heating, and service industry machinery	1.272	0.893	1.186	1.166	1.281	0.620	0.582	(T)	12.65
Industrial machinery, n.e.c.	0.744	1.383	1.232	1.565	0.806	0.638	0.631	(T)	17.83
Electronic and Other Electrical Equipment									
Electrical transmission and distribution equipment	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	1.82
Electrical industrial apparatus	1.039	1.012	1.089	1.206	0.939	0.821	0.894	(T)	4.13
Household appliances	0.942	1.313	1.035	1.196	0.918	0.675	0.922	(T)	9.20
Electric lighting and wiring equipment	1.036	1.347	1.068	1.033	0.958	0.946	0.613	(T)	11.07
Household audio and video equipment	1.352	1.334	0.778	1.118	1.091	0.743	0.583	(T)	4.55
Communication equipment:									
Nondefense	0.698	1.449	1.099	1.190	1.398	0.461	0.705	(T)	20.48
Defense	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	1.28
Electronic components and accessories	1.068	1.118	1.008	1.060	1.260	0.761	0.726	(T)	11.27
Other electrical machinery	1.158	1.406	0.952	0.917	0.903	0.987	0.669	(T)	6.75

See footnotes at end of table.

Table F-1. Trading Day Weight Patterns and Diagnostics

Series	Daily weights							Trading day adjustment indicator	F ratio ¹
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
DURABLE GOODS INDUSTRIES—Con.									
Transportation Equipment									
Motor vehicle parts	1.148	1.367	1.422	1.174	0.803	0.807	0.280	(T)	17.36
Motor vehicle assembly operations ..	1.168	1.445	1.161	1.554	0.701	0.971	0.000	(T)	15.54
Complete aircraft, missile, and space vehicles:									
Nondefense	0.939	1.447	1.755	0.824	1.196	0.613	0.225	(T)	3.12
Defense	0.554	1.759	1.347	0.906	0.775	0.877	0.782	(T)	10.44
Aircraft, missile, and space vehicle parts:									
Nondefense	0.652	1.587	1.376	0.629	0.724	1.158	0.874	(T)	4.51
Defense	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	2.23
Shipbuilding, tanks, and tank components:									
Nondefense	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	1.34
Defense	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	1.41
Railroad equipment	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	2.24
Other transportation equipment	1.215	1.010	1.158	0.942	1.620	0.621	0.434	(T)	5.37
Instruments and Related Products									
Search and navigation equipment:									
Nondefense	0.375	1.435	0.747	1.285	1.265	1.181	0.713	(T)	3.39
Defense	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	2.00
Measuring and controlling devices ..	1.282	1.031	1.255	1.045	1.264	0.609	0.513	(T)	20.18
Medical instruments and supplies ..	0.966	1.170	1.177	1.039	1.410	0.437	0.802	(T)	18.45
Ophthalmic goods, watches and clocks	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	1.81
Photographic goods	1.061	1.342	1.018	0.901	1.368	0.525	0.785	(T)	12.63
Other Durable Goods									
Miscellaneous personal goods	1.208	1.079	1.202	0.915	1.362	1.106	0.128	(T)	7.12
Other durable goods	0.832	1.345	0.913	1.291	1.004	0.837	0.778	(T)	8.72
NONDURABLE GOODS INDUSTRIES									
Food and Kindred Products									
Meat products	1.021	0.834	1.373	0.919	1.052	0.837	0.965	(T)	11.90
Dairy products	1.159	1.076	1.113	1.244	1.104	0.759	0.546	(T)	35.95
Fats and oils	1.366	0.972	0.846	1.631	1.059	0.275	0.851	(T)	12.65
Beverages	1.073	1.195	1.155	1.041	1.277	0.654	0.606	(T)	17.78
Other food and kindred products (except meat and dairy products, beverages, fats, and oils)	1.097	1.186	1.030	1.037	1.323	0.576	0.751	(T)	25.06
Tobacco Products									
Cigarettes, cigars, chewing and smoking tobacco, and snuff	1.326	1.375	1.206	0.844	1.064	0.195	0.990	(T)	6.81
Textile Mill Products									
Broadwoven fabrics and other textiles (except those from knitting and floor covering mills)	1.179	1.057	1.162	1.085	1.204	0.607	0.705	(T)	24.94
Knitting mill products	1.044	1.214	1.026	1.304	1.094	0.513	0.804	(T)	12.77
Carpets and rugs	1.073	1.024	1.186	1.475	0.888	0.855	0.498	(T)	18.48
Apparel and other finished textile products	0.916	1.473	0.843	0.998	1.106	0.871	0.793	(T)	10.27
Paper and Allied Products									
Pulp, paper, and paperboard mill products	1.029	1.150	1.013	1.118	1.085	0.838	0.768	(T)	17.77
Paperboard containers and boxes ..	1.063	1.383	1.193	1.110	1.225	0.468	0.558	(T)	58.74
Miscellaneous converted paper products	0.962	1.251	0.886	1.197	1.180	0.633	0.892	(T)	12.73

See footnotes at end of table.

Table F-1. Trading Day Weight Patterns and Diagnostics

Series	Daily weights							Trading day adjustment indicator	F ratio ¹
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
NONDURABLE GOODS INDUSTRIES—Con.									
Printing, Publishing, and Allied Industries									
Newspapers, periodicals, and books	1.195	0.965	0.894	1.172	0.937	0.797	1.041	(T)	6.62
Other publishing and printing.....	1.147	1.009	1.285	1.129	1.078	0.626	0.725	(T)	25.11
Chemicals and Allied Products									
Chemicals products (except paints, drugs, soaps, toiletries, and agricultural chemicals)	1.082	1.244	1.042	1.189	1.030	0.626	0.788	(T)	37.02
Paints and related products.....	1.215	0.999	0.982	1.400	1.027	0.594	0.783	(T)	12.98
Drugs, soaps, and toiletries.....	1.175	1.217	1.163	0.982	1.196	0.827	0.440	(T)	17.28
Agricultural chemicals.....	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	2.18
Petroleum and Coal Products									
Asphalt paving and roofing materials	1.123	0.890	1.249	1.779	0.723	0.627	0.608	(T)	9.69
Petroleum refining products.....	1.162	1.136	0.952	0.900	1.285	0.926	0.639	(T)	4.71
Rubber and Miscellaneous Plastics Products									
Tires and tubes.....	0.982	1.413	0.760	1.520	1.099	0.503	0.724	(T)	17.84
Rubber and plastics footwear, hose, belting, gaskets, and other rubber products.....	1.109	1.139	1.080	1.173	1.096	0.727	0.676	(T)	12.52
Miscellaneous plastics products, n.e.c.	1.129	1.206	0.982	1.248	1.077	0.750	0.608	(T)	18.89
Leather and Leather Products									
Leather tanning and finishing, and footwear cut stock.....	0.865	1.219	1.542	0.462	1.561	0.297	1.055	(T)	4.11
Other leather products.....	1.000	1.000	1.000	1.000	1.000	1.000	1.000	(NT)	3.89

NA Not available. n.e.c. Not elsewhere classified.

Note: Detail may not add to total because of independent rounding.

Appendix G.

Summary Measures for Evaluating the Quality of the Seasonal Adjustment of M3 Series

The measures shown in the following table were used in evaluating the current seasonal adjustment procedure. Brief descriptions of the measures follow.

The average absolute percentage change without regard to sign is the average of the absolute percentage changes between all pairs of adjacent months; it is one measure of variability.

The "O" is the average month-to-month percentage change, without regard to sign, in the original series. The "C" is the same for the seasonally adjusted series. The "C" is the same for the cyclical component which is a smooth, flexible moving average of the seasonally adjusted series. The "I" is the same for the irregular component, which is obtained by dividing the cyclical component into the seasonally adjusted series.

The "IC" is the average relative month-to-month change, without regard to sign, of the irregular component divided by the average relative month-to-month change, without regard to sign, of the cyclical component. It serves as an indication of the series' relative irregularity.

The measures of relative contributions of the component series to the variation in the original series can be interpreted as measures of the absolute importance of each component. The percentages shown are actually the percentages of the total variance obtained by adding up the variances of the individual components and may differ from those using the variance computed directly from the original series. The I is the irregular component; C is the trend component; and S, the seasonal component. A value of I greater than 30 usually indicates that the erratic movements in the series will significantly diminish the ability of X-11 to identify the seasonal movements in the data. Values of S less than 50 suggest that the seasonal movements are difficult to quantify.

The F value presented here measures the presence of stable seasonality. It is the quotient of two variances: (1) the between months variance, which is mainly due to seasonal, and (2) the residual variance, which is mainly due to irregular. A value of 7.0 or greater is used as an indicator of the presence of stable seasonality.

The Q value is a weighted average of 11 different quality control statistics concerned variously with the irregular movements of the series and with seasonal patterns changing too rapidly to be identifiable, particularly in recent years. A value greater than 1.2 is unacceptable; whereas, values less than 0.8 often indicate an acceptable adjustment. With values between 0.8 and 1.2, other measures must be consulted to determine if the seasonal movement in the series can be adequately quantified by the X-11 program.

The SF_R and MM_R are diagnostics from the sliding spans tests. The SF_R measures the amount of revision in a seasonal factor for a specific observation which occurs as the specific years included in the seasonal adjustment analysis change. For example, for most series in this publication a 14-year series is examined as four 11-year spans: 1982-1992, 1983-1993, 1984-1994, and 1985-1995. For the SF_R , it is considered acceptable if no more than 25 percent of the seasonal factors are revised by more than 3 percent for Q values less than or equal to 0.8; for Q values between 0.8 and 1.2, the SF_R should be no more than 15 percent.

The MM_R is a measure of the revision in the month-to-month percent change for specific observations, as the years included in the span are changed. It is considered acceptable if no more than 40 percent of the observations are revised by more than 3 percent.

The ratio of maximum to minimum seasonal factor gives the ratio of the largest downward adjustment to the largest upward adjustment and, therefore, measures the extent of the seasonal movements estimated by the program. An NS in the last column indicates a series is not seasonally adjusted in this publication. The information in the other columns for these series is the measures produced in X-11 ARIMA and sliding spans runs to determine the presence of quantifiable seasonality. For series which are not seasonally adjusted in this publication, the original unadjusted values are included in both the seasonally adjusted and unadjusted totals.

Table G-1. Shipments (Seasonal Factors)

Industry	Average percent changes				Ratio of irregular to cyclical components (I/C)	Relative contribution to variance			F value	Q value	Percent revised		Ratio of seasonal factors	Seasonal adjustment indicator
	Original series (O)	Seasonally adjusted series (CI)	Irregular component (I)	Cyclical component (C)		I	C	S			SF _r	MM _c		
DURABLE GOODS INDUSTRIES														
Lumber and Wood Products														
Wood containers, pallets and skids	10.56	6.52	7.30	1.78	4.10	53.83	3.20	42.97	11.08	1.10	43.5	41.1	1.57	(NS)
Wood buildings and mobile homes	8.54	7.60	2.65	1.25	2.12	10.61	2.37	87.02	101.88	.36	5.6	13.1	1.44	(S)
All other wood products	6.25	5.16	2.89	2.63	2.72	20.10	2.72	77.18	50.80	.53	2.8	4.9	1.31	(S)
Furniture and Fixtures														
Household furniture	9.90	8.32	2.32	.63	3.70	7.18	.52	92.30	148.11	.39	-	-	1.39	(S)
All other furniture	5.25	4.37	2.12	.80	2.64	18.60	2.66	78.73	42.43	.48	-	.7	1.21	(S)
Stone, Clay, and Glass Products														
Glass containers	6.54	5.75	2.50	.55	4.53	15.74	.77	83.49	90.43	.48	-	1.4	1.34	(S)
Kitchen articles and pottery	10.33	9.64	4.01	.41	9.84	14.72	.15	85.13	56.65	.83	(NA)	(NA)	1.75	(S)
Other stone, clay, and glass products	6.74	6.31	1.89	.76	2.48	8.09	1.31	90.60	145.70	.28	-	-	1.34	(S)
Primary Metal Industries														
Blast furnaces, steel mills	5.40	4.77	1.81	1.24	1.45	11.86	5.61	82.53	50.68	.41	-	1.9	1.21	(S)
Iron and steel foundries	9.89	8.84	2.71	1.17	2.33	8.49	1.57	89.95	75.21	.48	4.9	7.0	1.44	(S)
Nonferrous and other primary metal products	5.39	4.61	2.47	1.14	2.17	21.27	4.52	74.20	37.88	.53	-	-	1.17	(S)
Fabricated Metal Products														
Metal cans and shipping containers	6.87	6.43	2.40	.73	3.29	12.07	1.12	86.82	93.09	.35	6.3	7.0	1.49	(S)
Cutlery and handtools	10.66	9.98	3.62	.58	6.24	11.61	.30	88.09	15.43	.97	4.9	11.2	1.38	(S)
Building materials and wire products	7.16	6.96	1.99	.66	3.03	7.48	.82	91.70	73.37	.46	-	-	1.28	(S)
Ordnance and accessories:														
Nondefense	12.34	9.27	5.99	1.90	3.14	28.57	2.89	68.55	30.70	.62	9.0	21.0	1.54	(S)
Defense	15.37	10.52	9.07	2.19	4.15	41.62	2.42	55.96	3.98	1.32	34.0	51.0	1.95	(S)
Other fabricated metal products	7.40	6.83	1.78	.80	2.24	6.30	1.26	92.44	122.48	.33	-	1.4	1.30	(S)
Industrial Machinery and Equipment														
Steam engines and turbines	59.44	54.51	13.43	3.54	3.79	5.70	.40	93.90	31.80	.70	60.4	64.3	8.03	(S)
Internal combustion engines	9.16	7.99	3.17	1.15	2.76	13.34	1.75	84.92	43.32	.49	2.8	2.8	1.59	(S)
Farm and garden machinery	14.10	12.33	5.27	1.39	3.78	15.30	1.07	83.63	83.22	.48	18.8	25.9	1.85	(S)
Construction, mining, and material handling equipment	7.01	5.80	2.75	1.37	2.00	17.58	4.38	78.03	19.34	.57	3.7	6.5	1.25	(S)
Metalworking machinery	10.23	9.43	2.97	1.11	2.67	8.92	1.25	89.83	25.79	.62	2.1	7.0	1.48	(S)
Special industrial machinery	12.85	10.58	5.96	1.40	4.27	23.78	1.30	74.91	5.30	1.09	11.1	28.0	1.54	(S)
General industrial machinery	5.54	4.59	2.23	.87	2.57	18.51	2.80	78.69	36.50	.63	.7	2.1	1.18	(S)
Computer and office equipment	30.28	29.82	2.85	1.01	2.82	.91	.11	98.98	61.89	.30	.9	9.3	1.93	(S)
Refrigeration, heating and service industry machinery	7.72	6.76	2.78	.82	3.40	14.30	1.24	84.46	100.17	.42	3.5	9.1	1.46	(S)
Industrial machinery, n.e.c.	8.40	7.50	3.08	.98	3.13	14.19	1.45	84.36	74.14	.49	2.1	5.6	1.44	(S)
Electronic and Other Electrical Equipment														
Electrical transmission and distribution equipment	12.44	11.76	3.41	.59	5.75	7.74	.23	92.03	27.92	.79	.7	8.4	1.42	(S)
Electrical industrial apparatus	8.88	8.11	2.35	.74	3.18	7.69	.76	91.55	46.34	.43	2.1	.7	1.30	(S)
Household appliances	7.54	6.94	2.60	.74	3.51	12.17	.99	86.84	34.06	.59	2.8	9.1	1.43	(S)
Electric lighting and wiring equipment	8.63	8.39	2.23	.66	3.39	6.53	.57	92.90	51.25	.50	-	.7	1.34	(S)
Household audio and video equipment	13.27	12.32	4.32	1.30	3.32	10.84	.99	88.17	50.50	.51	11.8	8.4	1.75	(S)
Communication equipment:														
Nondefense	14.63	14.09	3.66	1.10	3.33	6.28	.57	93.15	24.36	.60	2.8	6.3	1.68	(S)
Defense	19.20	18.02	8.26	1.10	7.55	17.32	.30	82.37	17.85	1.06	20.1	28.0	2.30	(S)
Electronic components	6.47	5.83	1.84	1.10	1.67	8.82	3.15	88.03	49.13	.44	-	2.1	1.23	(S)
Miscellaneous electrical equipment and supplies	9.82	9.29	3.68	1.01	3.65	13.42	1.01	85.57	43.52	.56	13.0	23.4	1.54	(S)
Transportation Equipment														
Motor vehicle parts	12.13	10.32	3.75	1.32	2.83	11.48	1.43	87.09	52.18	.45	3.5	4.9	1.67	(S)
Motor vehicle assembly operations	14.74	12.75	4.62	1.73	2.67	11.40	1.59	87.01	53.22	.47	9.0	10.5	2.16	(S)

See footnotes at end of table.

Table G-1. Shipments (Seasonal Factors)—Con.

Industry	Average percent changes				Ratio of irregular to cyclical components (I/C)	Relative contribution to variance			F value	Q value	Percent revised		Ratio of seasonal factors	Seasonal adjustment indicator
	Original series (O)	Seasonally adjusted series (CI)	Irregular component (I)	Cyclical component (C)		I	C	S			SF _r	MM _c		
DURABLE GOODS INDUSTRIES—Con.														
Transportation Equipment—Con.														
Complete aircraft, missile, and space vehicles:														
Nondefense.....	24.85	19.21	12.94	2.63	4.92	30.81	1.27	67.92	11.12	1.07	41.0	60.8	2.09	(S)
Defense.....	10.57	9.02	5.14	.85	6.03	24.37	.67	74.96	15.05	1.07	2.8	11.2	1.48	(S)
Aircraft, missile, and space vehicle parts:														
Nondefense.....	16.12	14.49	5.94	1.12	5.32	14.30	.51	85.20	15.45	1.01	10.4	23.1	1.83	(S)
Defense.....	21.35	18.27	9.97	1.01	9.86	22.89	.24	76.88	27.11	1.01	11.7	26.1	2.30	(S)
Shipbuilding and tanks:														
Nondefense.....	23.78	17.44	15.34	3.88	3.96	42.44	2.71	54.85	7.46	1.18	16.7	20.2	2.44	(S)
Defense.....	11.02	9.05	5.83	1.29	4.51	28.91	1.42	69.67	10.07	1.03	9.0	22.4	1.59	(S)
Railroad equipment.....	20.12	14.31	13.45	2.15	6.26	46.38	1.18	52.44	3.54	1.50	60.2	81.3	1.84	(NS)
Other transportation equipment.....	10.96	9.90	3.92	1.42	2.77	13.31	1.74	84.95	54.98	.43	(NA)	(NA)	1.51	(S)
Instruments and Related Products														
Search and navigation equipment:														
Nondefense.....	17.79	16.45	6.81	1.00	6.82	14.58	.31	85.11	6.98	.87	13.9	32.7	1.76	(S)
Defense.....	13.08	12.56	3.11	.94	3.31	5.73	.52	93.74	34.71	.51	6.3	8.4	1.63	(S)
Measuring and controlling devices.....	8.59	8.01	2.51	.64	3.91	8.89	.58	90.53	18.30	.67	—	2.8	1.29	(S)
Medical instruments and supplies.....	7.95	7.50	2.31	.65	3.54	8.64	.69	90.68	12.81	.75	—	2.1	1.21	(S)
Ophthalmic goods, watches and clocks.....	8.28	6.96	4.08	1.01	4.05	25.21	1.54	73.25	29.12	.73	4.9	12.6	1.46	(S)
Photographic goods.....	9.54	8.92	2.71	.66	4.08	8.41	.50	91.08	67.97	.47	2.8	6.3	1.44	(S)
Other Durable Goods														
Miscellaneous personal goods.....	15.67	14.94	3.66	.63	5.85	5.65	.16	94.18	157.02	.56	12.5	14.7	1.71	(S)
Other durable goods.....	9.51	8.75	2.82	.66	4.26	9.34	.52	90.15	36.42	.67	1.4	4.9	1.56	(S)
NONDURABLE GOODS INDUSTRIES														
Food and Kindred Products														
Meat products.....	3.36	2.84	1.39	.57	2.46	18.82	3.10	78.08	22.16	.51	—	—	1.14	(S)
Dairy products.....	3.37	3.05	1.14	.48	2.40	12.00	2.08	85.91	34.93	.49	—	—	1.16	(S)
Fats and oils.....	5.13	3.07	3.82	1.06	3.62	58.08	4.44	37.48	2.06	1.36	7.4	19.6	1.21	(NS)
Beverages.....	5.47	5.06	1.83	.39	4.65	11.48	.53	87.99	204.98	.45	1.4	2.1	1.39	(S)
All other foods.....	7.28	7.15	1.54	.38	4.09	4.40	.26	95.33	115.41	.42	—	—	1.26	(S)
Tobacco products.....	25.50	22.47	7.90	1.68	4.71	10.95	.49	88.56	14.24	1.02	(NA)	(NA)	2.49	(S)
Textile Mill Products														
Broadwoven fabrics and other textiles.....	9.95	9.98	1.63	.71	2.31	2.58	.49	96.93	104.24	.32	—	—	1.40	(S)
Knitting mills.....	10.79	10.26	2.71	.85	3.21	6.49	.63	92.88	87.60	.48	4.9	9.1	1.44	(S)
Carpets and rugs.....	9.32	8.55	2.57	.93	2.78	8.22	1.07	90.71	74.35	.39	2.1	4.2	1.45	(S)
Apparel and other finished textile products.....	9.75	9.08	2.00	.65	3.06	4.60	.49	94.91	272.89	.29	.7	2.8	1.52	(S)
Paper and Allied Products														
Pulp, paper, and paperboard mill products.....	3.28	2.47	1.41	.90	1.57	22.22	9.07	68.71	13.54	.63	.7	2.1	1.13	(S)
Paperboard containers and boxes.....	4.32	3.83	1.36	.70	1.95	10.93	2.88	86.19	76.67	.38	—	—	1.18	(S)
Miscellaneous converted paper products.....	4.60	4.00	1.79	.51	3.49	16.49	1.36	82.15	27.18	.71	—	1.4	1.15	(S)
Printing, Publishing, and Allied Industries														
Newspapers, books, and periodicals.....	4.51	3.66	1.63	.54	3.04	16.33	1.76	81.91	56.67	.53	—	.9	1.23	(S)
Other publishing and printing.....	4.81	4.40	1.62	.64	2.54	11.69	1.81	86.50	81.59	.41	.7	1.4	1.27	(S)
Chemicals and Allied Products														
Industrial chemicals.....	3.83	3.44	.99	.86	1.15	7.25	5.50	87.25	59.79	.30	—	—	1.17	(S)
Paints and related products.....	6.70	5.56	2.51	.81	3.12	16.63	1.71	81.65	64.34	.42	.7	1.4	1.37	(S)
Drugs, soaps, and toiletries.....	8.53	8.02	2.02	.60	3.36	5.96	.53	93.51	54.24	.47	1.4	2.1	1.32	(S)
Agricultural chemicals.....	17.53	15.34	5.85	1.83	3.20	12.52	1.22	86.26	106.98	.45	38.9	39.2	2.67	(S)

See footnotes at end of table.

Table G-1. Shipments (Seasonal Factors)—Con.

Industry	Average percent changes				Ratio of irregular to cyclical components (I/C)	Relative contribution to variance			F value	Q value	Percent revised		Ratio of seasonal factors	Seasonal adjustment indicator
	Original series (O)	Seasonally adjusted series (CI)	Irregular component (I)	Cyclical component (C)		I	C	S			SF _r	MM _c		
NONDURABLE GOODS INDUSTRIES—Con.														
Petroleum and Coal Products														
Asphalt paving and roofing materials . . .	17.54	16.20	6.20	2.00	3.10	12.62	1.31	86.07	168.87	.29	18.1	18.2	2.75	(S)
Petroleum refining products	3.73	2.33	2.00	1.87	1.07	30.86	27.13	42.01	6.26	.71	1.4	.7	1.20	(S)
Rubber and Miscellaneous Plastics Products														
Tires and tubes.	6.57	5.75	2.48	.59	4.20	15.51	.88	83.61	82.81	.48	—	1.4	1.28	(S)
Rubber and plastics footwear, hose, belting, gaskets, and other rubber products	6.80	6.21	2.18	.87	2.50	10.77	1.73	87.50	66.51	.55	4.9	5.6	1.34	(S)
Miscellaneous plastics products, n.e.c..	5.51	5.09	1.58	.78	2.02	8.61	2.10	89.28	79.76	.41	—	1.4	1.24	(S)
Leather and Leather Products														
Leather tanning and finishing and footwear cut stock.	11.18	8.11	5.85	.94	6.21	33.98	.88	65.14	38.38	.87	2.8	8.4	1.56	(S)
Other leather products	11.76	11.22	3.89	1.28	3.04	10.60	1.15	88.25	31.04	.69	13.2	14.7	1.61	(S)

— Represents zero. NA Not available. N.e.c. Not elsewhere classified. NS Not seasonally adjusted. S Seasonally adjusted.

Table G-2. Unfilled Orders (Seasonal Factors)

Industry	Average percent changes				Ratio of irregular to cyclical components (I/C)	Relative contribution to variance			F value	Q value	Percent revised		Ratio of seasonal factors	Seasonal adjustment indicator
	Original series (O)	Seasonally adjusted series (CI)	Irregular component (I)	Cyclical component (C)		I	C	S			SF _r	MM _c		
DURABLE GOODS INDUSTRIES														
Furniture and Fixtures														
Household furniture	3.90	2.91	1.85	1.08	1.72	26.23	8.88	64.90	7.88	.83	2.8	6.5	1.17	(S)
All other furniture	3.04	2.12	1.73	1.05	1.65	35.02	12.80	52.18	22.08	.56	-	.7	1.19	(S)
Stone, Clay, and Glass Products														
Kitchen articles and pottery	9.77	6.67	5.06	3.25	1.56	33.90	14.00	52.10	7.84	.84	34.7	28.7	1.89	(S)
Other stone, clay, and glass products ..	2.48	1.76	1.15	1.11	1.03	26.20	24.70	49.10	10.52	.58	-	-	1.12	(S)
Primary Metal Industries														
Blast furnaces, steel mills	3.78	2.56	1.49	1.83	.81	17.57	26.71	55.72	19.44	.42	2.8	1.9	1.18	(S)
Iron and steel foundries	2.42	2.10	1.55	1.33	1.17	43.32	31.63	25.05	6.37	.78	(NA)	(NA)	1.07	(S)
Nonferrous and other primary metal products	2.90	2.08	1.36	1.48	.92	22.51	26.44	51.04	24.79	.33	-	-	1.16	(S)
Fabricated Metal Products														
Cutlery and handtools	8.09	6.07	5.26	2.29	2.30	50.35	9.54	40.12	5.44	.92	14.6	21.0	1.33	(S)
Building materials and wire products ..	1.84	1.46	1.17	.73	1.60	51.52	20.14	28.34	6.88	.88	(NA)	(NA)	1.06	(S)
Ordnance and accessories:														
Nondefense	8.35	6.83	5.36	3.31	1.62	41.41	15.78	42.81	8.52	.58	34.7	23.8	1.52	(S)
Defense	3.05	2.66	1.87	1.87	1.00	40.81	40.50	18.70	1.64	.96	(NA)	(NA)	1.07	(NS)
Other fabricated metal products	1.44	1.10	.69	.75	.92	25.32	29.86	44.82	14.60	.48	(NA)	(NA)	1.05	(S)
Industrial Machinery and Equipment														
Steam engines and turbines	2.64	2.44	1.71	1.69	1.01	37.58	36.58	25.83	3.72	.89	-	-	1.15	(NS)
Internal combustion engines	5.44	2.80	2.37	1.23	1.92	19.19	5.18	75.63	34.85	.59	16.7	3.7	1.58	(S)
Construction, mining, and material handling equipment	2.13	1.88	1.12	1.45	.78	30.51	50.64	18.85	11.25	.50	(NA)	(NA)	1.08	(S)
Metalworking machinery	2.09	1.88	.90	1.61	.56	19.55	61.71	18.74	4.55	.74	(NA)	(NA)	1.07	(NS)
Special industrial machinery	2.67	2.24	1.71	1.60	1.07	43.91	38.26	17.83	5.85	.69	NA	NA	1.09	(S)
General industrial machinery	1.56	1.42	.80	1.08	.74	30.01	54.63	15.36	4.90	.62	(NA)	(NA)	1.05	(NS)
Computer and office equipment	2.89	2.19	1.57	1.23	1.28	36.98	22.70	40.32	5.25	.71	(NA)	(NA)	1.10	(S)
Refrigeration, heating, and service industry machinery	3.74	2.34	1.75	1.25	1.39	24.28	12.49	63.22	39.41	.38	-	-	1.24	(S)
Industrial machinery, n.e.c.	2.16	1.87	1.57	1.01	1.55	53.67	22.28	24.05	5.60	.90	(NA)	(NA)	1.07	(S)
Electronic and Other Electrical Equipment														
Electrical transmission and distribution equipment	2.05	1.64	1.38	.85	1.62	45.19	17.16	37.65	5.96	.85	(NA)	(NA)	1.07	(S)
Electrical industrial apparatus	1.74	1.24	1.00	.63	1.57	34.70	14.01	51.29	10.60	.66	(NA)	(NA)	1.07	(S)
Household appliances	8.36	5.58	4.90	2.21	2.22	37.11	7.55	55.35	10.78	.92	42.6	38.3	1.55	(S)
Electric lighting and wiring equipment ..	2.03	1.81	1.32	1.14	1.16	45.08	33.23	21.69	2.27	.87	(NA)	(NA)	1.05	(NS)
Household audio and video equipment	14.93	9.24	7.86	4.02	1.95	33.29	8.72	57.99	8.35	.92	38.9	49.0	2.74	(S)
Communication equipment:														
Nondefense	1.90	1.64	1.10	.99	1.11	38.12	30.88	31.00	2.24	.79	(NA)	(NA)	1.07	(NS)
Defense	2.08	1.91	1.28	1.26	1.02	40.22	39.00	20.78	.93	1.04	(NA)	(NA)	1.05	(S)
Electronic components and accessories	2.70	1.98	1.23	1.42	.87	23.19	30.68	46.13	13.57	.51	1.9	1.9	1.16	(S)
Miscellaneous electrical equipment and supplies	2.67	2.30	1.79	1.27	1.41	47.90	24.00	28.10	8.10	.99	(NA)	(NA)	1.08	(S)
Transportation Equipment														
Motor vehicle parts	2.91	2.35	1.59	1.60	.99	32.73	33.26	34.01	9.36	.50	(NA)	(NA)	1.07	(S)
Complete aircraft, missile, and space vehicles:														
Nondefense	2.22	2.06	1.24	1.69	.73	30.22	56.16	13.62	3.39	.73	(NA)	(NA)	1.08	(NS)
Defense	1.99	1.51	1.29	.79	1.63	42.84	16.08	41.08	16.51	.66	(NA)	(NA)	1.09	(S)
Aircraft, missile, and space vehicle parts:														
Nondefense	1.70	1.61	1.01	1.26	.80	34.55	53.81	11.63	.81	1.22	(NA)	(NA)	1.06	(NS)
Defense	2.05	1.74	1.19	1.12	1.07	35.17	30.90	33.92	6.73	.51	(NA)	(NA)	1.09	(S)

See footnotes at end of table.

Table G-2. Unfilled Orders (Seasonal Factors)—Con.

Industry	Average percent changes				Ratio of irregular to cyclical components (I/C)	Relative contribution to variance			F value	Q value	Percent revised		Ratio of seasonal factors	Seasonal adjustment indicator
	Original series (O)	Seasonally adjusted series (CI)	Irregular component (I)	Cyclical component (C)		I	C	S			SF _r	MM _c		
DURABLE GOODS INDUSTRIES—Con.														
Transportation Equipment—Con.														
Shipbuilding and tanks:														
Nondefense.....	6.42	5.90	4.06	4.18	.97	40.86	43.24	15.90	4.63	.81	13.2	7.0	1.21	(S)
Defense.....	2.51	2.21	1.65	1.31	1.26	50.12	31.64	18.24	2.43	.82	(NA)	(NA)	1.07	(NS)
Railroad equipment.....	6.09	5.45	3.86	3.55	1.09	40.92	34.76	24.32	3.51	.81	25.0	16.8	1.24	(NS)
Instruments and Related Products														
Search and navigation equipment:														
Nondefense.....	2.42	2.13	1.73	1.13	1.53	53.94	23.16	22.90	1.73	1.33	7.4	2.8	1.11	(NS)
Defense.....	1.46	1.32	.69	1.06	.65	21.93	52.14	25.93	6.32	.59	(NA)	(NA)	1.05	(S)
Measuring and controlling devices.....	1.19	1.04	.73	.66	1.10	43.13	35.47	21.40	3.19	.92	(NA)	(NA)	1.05	(NS)
Medical instruments and supplies.....	1.69	1.30	.98	.94	.99	33.62	30.76	35.62	5.37	.51	(NA)	(NA)	1.08	(S)
Ophthalmic goods, watches and clocks.....	7.52	5.66	5.22	1.92	2.72	53.61	7.24	39.15	8.66	.96	25.9	26.2	1.34	(S)
Photographic goods.....	5.62	4.44	3.77	2.00	1.88	55.36	15.67	28.97	6.10	.96	19.4	23.4	1.20	(S)
Other Durable Goods:														
Miscellaneous personal goods.....	14.83	5.27	4.25	2.56	1.66	8.25	2.99	88.76	63.55	.39	31.9	24.5	2.85	(S)
Other durable goods.....	7.69	4.35	3.95	1.64	2.41	25.27	4.36	70.37	34.28	.56	18.5	15.0	1.66	(S)
NONDURABLE GOODS INDUSTRIES														
Textile Mill Products														
Broadwoven fabrics and other textiles.....	2.51	2.10	1.23	1.49	.82	26.57	39.43	34.00	7.49	.52	—	—	1.11	(S)
Carpets and rugs.....	7.20	5.11	4.35	2.28	1.91	37.40	10.24	52.36	11.70	.68	9.0	23.3	1.34	(S)
Paper and Allied Products														
Pulp, paper, and paperboard mill products.....	4.63	3.38	2.52	2.09	1.20	35.10	24.21	40.69	16.88	.45	3.7	2.8	1.18	(S)
Paperboard containers and boxes.....	3.13	1.90	1.46	1.11	1.32	22.45	12.94	64.61	45.08	.32	—	—	1.18	(S)
Miscellaneous converted paper products.....	3.75	2.98	2.70	.98	2.75	58.72	7.74	33.54	4.04	1.13	4.6	3.7	1.11	(S)
Printing and Publishing														
Newspapers, books, and periodicals.....	6.01	3.73	3.49	1.11	3.14	36.61	3.70	59.69	7.75	.97	30.6	15.0	1.40	(S)
Other publishing and printing.....	3.69	2.66	2.31	1.21	1.90	43.29	11.94	44.78	6.88	1.02	0.9	1.9	1.16	(S)
Leather and Leather Products														
Leather tanning and finishing and cut stock.....	6.52	5.64	5.16	1.57	3.29	59.96	5.54	34.49	5.99	1.09	(NA)	(NA)	1.26	(S)
Other leather products.....	7.23	4.71	3.71	2.29	1.62	34.28	13.03	52.69	17.58	.66	24.3	15.4	1.43	(S)

— Represents zero. NA Not available. N.e.c. Not elsewhere classified. NS Not seasonally adjusted. S Seasonally adjusted.

Table G-3. Total Inventories (Seasonal Factors)

Industry	Average percent changes				Ratio of irregular to cyclical components (I/C)	Relative contribution to variance			F value	Q value	Percent revised		Ratio of seasonal factors	Seasonal adjustment indicator
	Original series (O)	Seasonally adjusted series (CI)	Irregular component (I)	Cyclical component (C)		I	C	S			SF _r	MM _c		
DURABLE GOODS INDUSTRIES														
Lumber and Wood Products														
Wood containers, pallets and skids	4.18	2.01	3.28	1.80	1.83	59.79	17.89	22.32	.76	1.61	23.1	15.0	1.15	(NS)
Wood buildings and mobile homes	5.57	5.12	2.29	1.15	1.98	15.93	4.05	80.02	9.91	.56	.7	1.4	1.17	(S)
All other wood products	1.50	.88	.96	.68	1.41	42.54	21.44	36.03	8.64	.78	(NA)	(NA)	1.09	(S)
Furniture and Fixtures														
Household furniture	1.24	.85	.64	.52	1.24	29.42	18.98	51.60	19.80	.49	(NA)	(NA)	1.06	(S)
All other furniture	1.33	.61	.80	.67	1.18	43.61	31.10	25.29	6.85	.59	(NA)	(NA)	1.04	(S)
Stone, Clay, and Glass Products														
Glass containers	1.86	1.52	.78	.68	1.14	17.94	13.77	68.29	24.11	.41	(NA)	(NA)	1.09	(S)
Kitchen articles and pottery	2.59	1.71	1.54	.91	1.70	38.68	13.45	47.87	16.61	.64	-	-	1.17	(S)
Other stone, clay, and glass products	1.41	1.13	.59	.40	1.47	19.59	9.10	71.31	79.04	.26	(NA)	(NA)	1.07	(S)
Primary Metal Industries														
Blast furnaces, steel mills	1.42	.90	.54	.86	.63	15.85	40.25	43.90	9.30	.52	(NA)	(NA)	1.06	(S)
Iron and steel foundries	1.92	1.33	1.15	.58	2.00	38.75	9.65	51.60	22.54	.61	(NA)	(NA)	1.10	(S)
Nonferrous and other primary metal products	1.25	.68	.58	.72	.81	25.65	39.36	34.99	9.93	.49	(NA)	(NA)	1.05	(S)
Fabricated Metal Products														
Metal cans and shipping containers	4.75	3.87	2.42	1.30	1.87	26.05	7.47	66.48	33.26	.49	3.7	2.8	1.25	(S)
Cutlery and handtools	2.24	1.74	1.27	.64	1.97	31.99	8.21	59.80	16.56	.54	-	-	1.12	(S)
Building materials and wire products	1.23	.88	.72	.56	1.29	32.54	19.42	48.04	15.55	.46	(NA)	(NA)	1.07	(S)
Ordnance and accessories:														
Nondefense	3.39	2.73	1.65	.83	1.99	25.10	6.36	68.54	24.94	.52	.9	.9	1.20	(S)
Defense	3.46	1.97	1.93	1.56	1.24	37.18	24.13	38.69	4.78	.88	5.6	10.3	1.18	(S)
Other fabricated metal products	1.03	.53	.58	.56	1.02	35.95	34.28	29.77	3.27	.80	(NA)	(NA)	1.03	(NS)
Industrial Machinery and Equipment														
Steam engines and turbines	5.19	4.45	2.04	1.15	1.78	16.41	5.21	78.38	61.90	.27	.7	3.5	1.31	(S)
Internal combustion engines	1.66	1.02	.82	1.00	.82	24.82	37.18	37.99	6.16	.56	(NA)	(NA)	1.05	(S)
Farm and garden machinery	2.77	2.24	1.43	1.00	1.44	25.58	12.31	62.11	16.02	.72	.9	-	1.21	(S)
Construction, mining, and material handling equipment	1.30	.63	.56	.83	.67	22.47	49.53	28.00	13.55	.35	(NA)	(NA)	1.05	(S)
Metalworking machinery	1.37	1.03	.52	.62	.83	15.71	22.60	61.69	13.53	.57	(NA)	(NA)	1.08	(S)
Special industry machinery	1.73	1.23	.79	.81	.98	22.37	23.42	54.21	7.64	.58	(NA)	(NA)	1.04	(S)
General industrial machinery	.87	.48	.43	.48	.91	29.20	35.07	35.73	7.42	.67	(NA)	(NA)	1.02	(S)
Computer and office equipment	2.63	2.24	.87	.87	1.00	11.54	11.65	76.81	8.04	.56	-	-	1.11	(S)
Refrigeration, heating, and service industry machinery	2.06	1.61	.74	.87	.85	14.03	19.33	66.64	34.03	.33	-	-	1.11	(S)
Industrial machinery, n.e.c.	1.60	.76	.96	.84	1.15	41.83	31.84	26.33	6.93	.56	(NA)	(NA)	1.05	(S)
Electronic and Other Electrical Equipment														
Electrical transmission and distribution equipment	2.20	1.67	1.23	.65	1.89	31.98	8.96	59.06	12.29	.83	-	-	1.14	(S)
Electrical industrial apparatus	1.11	.58	.61	.58	1.04	35.10	32.53	32.37	5.30	.59	(NA)	(NA)	1.04	(S)
Household appliances	3.22	2.75	1.19	.97	1.23	14.25	9.41	76.34	52.71	.28	-	-	1.20	(S)
Electric lighting and wiring equipment	1.52	1.36	.52	.49	1.06	11.44	10.10	78.46	49.99	.23	(NA)	(NA)	1.09	(S)
Household audio and video equipment	3.30	2.39	1.43	1.61	.89	19.76	25.12	55.13	30.79	.33	.9	-	1.18	(S)
Communication equipment:														
Nondefense	1.83	1.03	.70	1.16	.60	16.70	46.46	36.85	8.91	.62	(NA)	(NA)	1.08	(S)
Defense	3.02	1.29	1.95	1.58	1.23	47.68	31.44	20.88	5.64	.72	-	.7	1.11	(S)
Electronic components	1.12	.56	.56	.72	.78	27.77	45.28	26.95	7.30	.58	(NA)	(NA)	1.04	(S)
Miscellaneous electrical equipment and supplies	1.49	1.14	.64	.76	.84	18.05	25.39	56.55	15.11	.44	(NA)	(NA)	1.08	(S)
Transportation Equipment														
Motor vehicle parts	1.67	1.11	.79	.80	1.00	25.15	25.35	49.50	12.36	.52	(NA)	(NA)	1.08	(S)
Motor vehicle assembly operations	3.46	2.87	1.60	.76	2.11	22.56	5.05	72.39	24.48	.52	-	.9	1.20	(S)
Complete aircraft, missile, and space vehicles:														
Nondefense	2.08	1.20	1.25	1.09	1.15	37.16	28.20	34.64	5.02	.72	(NA)	(NA)	1.06	(S)
Defense	2.02	1.03	1.30	1.26	1.03	38.78	36.71	24.52	6.77	.64	(NA)	(NA)	1.06	(S)

See footnotes at end of table.

Table G-3. Total Inventories (Seasonal Factors)—Con.

Industry	Average percent changes				Ratio of irregular to cyclical components (I/C)	Relative contribution to variance			F value	Q value	Percent revised		Ratio of seasonal factors	Seasonal adjustment indicator
	Original series (O)	Seasonally adjusted series (CI)	Irregular component (I)	Cyclical component (C)		I	C	S			SF _r	MM _c		
DURABLE GOODS INDUSTRIES—Con.														
Transportation Equipment—Con.														
Aircraft, missile, and space vehicle parts														
Nondefense.....	2.10	1.18	1.17	.90	1.30	38.44	22.74	38.82	7.51	.65	(NA)	(NA)	1.07	(S)
Defense.....	3.20	2.07	1.89	1.11	1.70	39.10	13.58	47.32	28.30	.57	—	—	1.18	(S)
Shipbuilding and tanks:														
Nondefense.....	10.14	6.49	7.05	3.31	2.13	48.29	10.67	41.04	8.83	1.02	61.1	54.2	1.56	(S)
Defense.....	2.84	1.48	2.05	.94	2.19	57.86	12.06	30.08	2.92	1.09	(NA)	(NA)	1.06	(S)
Railroad equipment.....	3.36	1.87	2.13	1.18	1.81	48.17	14.74	37.09	3.73	1.07	—	.9	1.11	(NS)
Other transportation equipment.....	3.78	2.88	1.84	1.10	1.67	26.21	9.44	64.35	7.77	.81	2.8	3.7	1.14	(S)
Instruments and Related Products														
Search and navigation equipment:														
Nondefense.....	2.21	1.49	1.22	1.06	1.16	30.99	23.19	45.81	8.89	.72	.9	.9	1.12	(S)
Defense.....	2.00	1.03	1.07	1.32	.82	29.21	43.96	26.84	6.43	.50	(NA)	(NA)	1.08	(S)
Measuring and controlling devices.....	1.01	.66	.56	.43	1.30	33.38	19.77	46.85	13.81	.54	(NA)	(NA)	1.04	(S)
Medical instruments and supplies.....	1.18	.79	.52	.57	.91	22.27	26.71	51.02	7.62	.70	(NA)	(NA)	1.06	(S)
Ophthalmic goods, watches and clocks.....	1.82	1.31	.94	.80	1.17	27.33	19.88	52.79	13.41	.55	(NA)	(NA)	1.09	(S)
Photographic goods.....	2.14	1.78	.75	.78	1.22	19.26	12.84	67.90	24.64	.41	—	1.9	1.13	(S)
Other Durable Goods														
Miscellaneous personal goods.....	1.91	1.55	.94	.60	1.58	24.39	9.83	65.79	34.18	.44	(NA)	(NA)	1.09	(S)
Other durable goods.....	1.73	1.25	.83	.58	1.44	26.77	12.86	60.37	22.32	.53	(NA)	(NA)	1.10	(S)
NONDURABLE GOODS INDUSTRIES														
Food and Kindred Products														
Meat products.....	2.58	2.05	1.22	.71	1.71	20.86	7.18	71.96	12.10	.78	(NA)	(NA)	1.10	(S)
Dairy products.....	2.00	1.51	1.14	.67	1.70	32.19	11.13	56.68	18.84	.54	—	—	1.12	(S)
Fats and oils.....	7.35	5.30	4.34	2.07	2.10	36.79	8.35	54.86	25.84	.55	6.5	13.1	1.37	(S)
Beverages.....	1.30	.88	.75	.33	2.26	38.81	7.57	53.62	8.24	.89	(NA)	(NA)	1.05	(S)
All other foods.....	2.89	2.82	.61	.32	1.90	4.43	1.23	94.33	461.24	.20	—	—	1.20	(S)
Tobacco products.....	2.83	2.45	1.11	.67	1.66	16.10	5.84	78.06	61.80	.29	—	—	1.17	(S)
Textile Mill Products														
Broadwoven fabrics and other textiles.....	1.60	1.21	.62	.58	1.06	17.56	15.68	66.75	22.95	.31	(NA)	(NA)	1.08	(S)
Knitting mills.....	2.32	2.04	.89	.75	1.19	14.40	10.20	75.40	48.82	.27	—	—	1.15	(S)
Carpets and rugs.....	2.02	1.53	1.08	.84	1.29	27.81	16.79	55.40	12.17	.45	—	—	1.10	(S)
Apparel and other finished textile products.....	2.20	2.10	.56	.71	.79	6.05	9.70	84.25	184.31	.13	—	—	1.14	(S)
Paper and Allied Products														
Pulp, paper and paperboard mills.....	1.21	.72	.57	.69	.82	24.48	36.25	39.28	20.45	.43	(NA)	(NA)	1.06	(S)
Paperboard containers and boxes.....	1.50	.84	.77	.90	.85	28.13	38.56	33.31	6.91	.49	(NA)	(NA)	1.05	(S)
Miscellaneous covered paper products.....	1.56	1.18	.79	.50	1.59	27.78	11.06	61.16	15.80	.58	(NA)	(NA)	1.07	(S)
Printing and Publishing														
Newspapers, books, and periodicals.....	1.62	1.15	.68	.78	.88	19.36	25.22	55.41	39.37	.31	(NA)	(NA)	1.07	(S)
Other publishing and printing.....	2.70	2.40	.88	.61	1.44	11.20	5.37	83.44	105.02	.32	—	—	1.21	(S)
Chemicals and Allied Products														
Industrial chemicals.....	1.12	.65	.61	.69	.89	29.50	37.19	33.31	6.47	.45	(NA)	(NA)	1.04	(S)
Paints and related products.....	1.71	1.11	1.08	.54	2.02	43.54	10.63	45.83	19.67	.59	(NA)	(NA)	1.08	(S)
Drugs, soaps, and toiletries.....	1.39	1.09	.50	.49	1.04	15.22	14.19	70.59	35.52	.32	(NA)	(NA)	1.06	(S)
Agricultural chemicals.....	4.65	3.92	1.66	1.12	1.48	14.26	6.50	79.24	52.02	.46	11.1	1.9	1.38	(S)
Petroleum and Coal Products														
Asphalt paving and roofing materials.....	5.45	3.75	3.15	1.65	1.91	37.08	10.20	52.72	17.72	.62	5.6	11.2	1.36	(S)
Other petroleum refining products.....	2.54	1.32	1.43	1.48	.97	34.32	36.46	29.22	8.82	.60	(NA)	(NA)	1.09	(S)

See footnotes at end of table.

Table G-3. Total Inventories (Seasonal Factors)—Con.

Industry	Average percent changes				Ratio of irregular to cyclical components (I/C)	Relative contribution to variance			F value	Q value	Percent revised		Ratio of seasonal factors	Seasonal adjustment indicator
	Original series (O)	Seasonally adjusted series (CI)	Irregular component (I)	Cyclical component (C)		I	C	S			SF _r	MM _c		
NONDURABLE GOODS INDUSTRIES—Con.														
Rubber and Miscellaneous Plastics Products														
Tires and tubes.	2.59	2.05	.98	1.12	.88	15.09	19.52	65.39	46.17	.29	—	—	1.13	(S)
Rubber and plastics footwear, hose, belting, gaskets, and other rubber products	1.38	.82	.72	.66	1.08	31.65	27.08	41.27	6.24	.66	(NA)	(NA)	1.05	(S)
Miscellaneous plastics products, n.e.c.	1.18	.76	.55	.68	.80	22.19	34.35	43.46	10.36	.43	(NA)	(NA)	1.06	(S)
Leather and Leather Products														
Leather tanning and finishing and footwear cut stock.	4.21	2.52	2.57	1.53	1.68	43.27	15.39	41.34	7.50	.86	.9	—	1.19	(S)
Other leather products	2.73	2.11	1.36	.75	1.81	26.76	8.13	65.11	21.72	.59	—	—	1.14	(S)

— Represents zero. NA Not available. N.e.c. Not elsewhere classified. S Seasonally adjusted.

Table G-4. Materials and Supplies Inventories (Seasonal Factors)

Industry	Average percent changes				Ratio of irregular to cyclical components (I/C)	Relative contribution to variance			F value	Q value	Percent revised		Ratio of seasonal factors	Seasonal adjustment indicator
	Original series (O)	Seasonally adjusted series (CI)	Irregular component (I)	Cyclical component (C)		I	C	S			SF _r	MM _c		
DURABLE GOODS INDUSTRIES														
Lumber and wood products	3.21	1.60	1.14	.98	1.17	13.59	9.99	76.41	53.31	.30	-	-	1.24	(S)
Furniture and fixtures	1.36	1.17	.83	.70	1.18	42.05	30.03	27.91	8.64	.69	(NA)	(NA)	1.04	(S)
Stone, clay, and glass products	1.13	.85	.65	.46	1.42	41.64	20.56	37.80	6.42	.78	(NA)	(NA)	1.04	(S)
Primary metals industries	1.72	1.15	.71	.87	.81	16.48	25.29	58.24	43.11	.28	(NA)	(NA)	1.10	(S)
Fabricated metal products	1.33	1.15	.92	.66	1.39	49.54	25.63	24.83	5.99	.82	(NA)	(NA)	1.05	(S)
Industrial machinery and equipment	1.44	1.09	.79	.71	1.10	33.26	27.49	39.25	4.27	.77	(NA)	(NA)	1.05	(S)
Electronic and other electrical equipment	1.25	1.06	.62	.82	.76	25.75	44.23	30.02	9.59	.55	(NA)	(NA)	1.05	(S)
Transportation equipment	1.39	1.22	.93	.71	1.31	50.13	29.41	20.46	4.91	.89	(NA)	(NA)	1.04	(S)
Instruments and related products	1.33	1.15	.74	.74	.99	37.89	38.40	23.71	5.19	.60	(NA)	(NA)	1.05	(S)
Other durable goods	1.95	1.56	1.31	.80	1.65	46.79	17.23	35.98	8.40	.80	(NA)	(NA)	1.05	(S)
NONDURABLE GOODS INDUSTRIES														
Food and kindred products	1.88	1.09	.95	.45	2.13	27.99	6.20	65.82	48.45	.40	(NA)	(NA)	1.09	(S)
Tobacco products	2.89	1.17	.83	.79	1.05	8.66	7.85	83.49	93.44	.26	-	-	1.19	(S)
Textile mill products	2.00	1.27	.97	.72	1.34	25.01	13.90	61.10	31.50	.34	(NA)	(NA)	1.10	(S)
Apparel and other finished textile products	1.90	1.33	1.07	.75	1.42	32.75	16.21	51.05	16.78	.51	(NA)	(NA)	1.08	(S)
Paper and allied products	1.02	.86	.51	.59	.85	31.67	43.52	24.81	8.98	.69	(NA)	(NA)	1.04	(S)
Printing, publishing, and allied industries	2.14	1.45	.90	1.08	.83	18.42	26.60	54.98	33.51	.30	(NA)	(NA)	1.10	(S)
Chemicals and allied products95	.78	.62	.44	1.41	45.03	22.65	32.32	6.90	.77	(NA)	(NA)	1.03	(S)
Petroleum and coal products	3.09	2.81	2.17	1.54	1.41	46.60	23.56	29.84	2.60	1.07	(NA)	(NA)	1.10	(S)
Rubber and miscellaneous plastics products	1.89	1.34	.92	.85	1.09	30.99	25.97	43.04	4.61	.73	(NA)	(NA)	1.06	(S)
Leather and leather products	3.50	2.54	1.91	1.42	2.23	38.90	21.46	39.64	4.66	.69	-	-	1.12	(S)

- Represents zero. NA Not available. S Seasonally adjusted.

Table G-5. Work-In-Process Inventories (Seasonal Factors)

Industry	Average percent changes				Ratio of irregular to cyclical components (I/C)	Relative contribution to variance			F value	Q value	Percent revised		Ratio of seasonal factors	Seasonal adjustment indicator
	Original series (O)	Seasonally adjusted series (CI)	Irregular component (I)	Cyclical component (C)		I	C	S			SF _r	MM _c		
DURABLE GOODS INDUSTRIES														
Lumber and wood products	2.31	2.08	1.60	1.10	1.46	49.57	23.25	27.18	6.14	.74	(NA)	(NA)	1.08	(S)
Furniture and fixtures	1.63	1.41	1.14	.79	1.44	2.64	94.23	1.86	8.42	.91	(NA)	(NA)	1.05	(S)
Stone, clay, and glass products	2.37	1.53	1.18	.79	1.50	28.28	12.53	59.19	30.88	.36	-	-	1.14	(S)
Primary metals industries	1.44	1.24	.76	.94	.81	27.20	41.38	31.43	7.44	.50	(NA)	(NA)	1.04	(S)
Fabricated metal products	1.56	.98	.82	.46	1.76	28.18	9.08	62.74	9.79	.71	(NA)	(NA)	1.07	(S)
Industrial machinery and equipment	1.67	1.15	.86	.63	1.37	29.74	15.80	54.46	13.72	.69	(NA)	(NA)	1.09	(S)
Electronic and other electrical equipment	1.38	.92	.51	.70	.73	14.86	28.13	57.01	22.06	.32	(NA)	(NA)	1.07	(S)
Transportation equipment	1.44	1.02	.67	.75	.89	23.34	29.36	47.31	18.04	.46	(NA)	(NA)	1.05	(S)
Instruments and related products	1.65	1.16	.73	.84	.87	22.22	29.25	48.53	14.51	.43	(NA)	(NA)	1.07	(S)
Other durable goods	2.33	1.89	1.56	.78	2.00	52.37	13.12	34.52	6.97	.77	1.9	.9	1.11	(S)
NONDURABLE GOODS INDUSTRIES														
Food and kindred products	2.65	1.21	1.00	.57	1.76	15.32	4.93	79.75	17.89	.66	-	-	1.25	(S)
Tobacco products	20.05	11.27	9.75	4.07	2.40	29.53	5.15	65.32	42.53	.40	38.2	53.1	2.56	(S)
Textile mill products	1.86	1.30	1.08	.57	1.91	43.62	12.02	44.36	6.30	.80	(NA)	(NA)	1.08	(S)
Apparel and other finished textile products	2.55	1.78	1.39	.90	1.54	36.09	15.23	48.68	17.10	.41	-	.9	1.13	(S)
Paper and allied products	1.91	1.50	1.20	.73	1.64	47.58	17.61	34.82	7.57	.67	(NA)	(NA)	1.08	(S)
Printing, publishing, and allied industries	3.57	1.95	1.71	.82	2.09	23.13	5.29	71.53	26.27	.59	.9	1.9	1.19	(S)
Chemicals and allied products	1.79	1.16	.99	.56	1.76	34.24	11.11	54.65	8.02	.68	(NA)	(NA)	1.07	(S)
Petroleum and coal products	3.85	3.47	2.87	1.68	1.71	59.53	20.37	20.10	5.20	.90	-	.7	1.13	(S)
Rubber and miscellaneous plastics products	2.62	2.03	1.75	.87	2.01	50.28	12.48	37.24	4.60	.82	(NA)	(NA)	1.08	(S)
Leather and leather products	4.13	2.89	2.44	1.24	1.97	42.23	10.93	46.84	4.21	.88	-	.7	1.11	(S)

- Represents zero. NA Not available. S Seasonally adjusted.

Table G-6. Finished Goods Inventories (Seasonal Factors)

Industry	Average percent changes				Ratio of irregular to cyclical components (I/C)	Relative contribution to variance			F value	Q value	Percent revised		Ratio of seasonal factors	Seasonal adjustment indicator
	Original series (O)	Seasonally adjusted series (CI)	Irregular component (I)	Cyclical component (C)		I	C	S			SF _r	MM _c		
DURABLE GOODS INDUSTRIES														
Lumber and wood products	3.17	1.90	1.40	1.00	1.40	17.94	9.11	72.96	39.34	.38	3.7	1.9	1.21	(S)
Furniture and fixtures	1.93	1.25	.98	.65	1.50	26.40	11.70	61.90	21.84	.40	—	—	1.12	(S)
Stone, clay, and glass products	1.88	.96	.76	.50	1.53	17.29	7.43	75.28	85.85	.28	(NA)	(NA)	1.10	(S)
Primary metals industries	1.91	1.41	1.00	.80	1.25	28.05	18.02	53.93	13.57	.48	(NA)	(NA)	1.08	(S)
Fabricated metal products	1.78	1.02	.77	.53	1.48	19.27	8.86	71.87	27.25	.42	—	—	1.14	(S)
Industrial machinery and equipment	2.10	1.36	1.10	.71	1.55	27.65	11.55	60.80	8.77	.53	(NA)	(NA)	1.08	(S)
Electronic and other electrical equipment	1.99	1.16	.73	.84	.87	14.67	19.42	65.90	52.89	.27	—	—	1.12	(S)
Transportation equipment	2.84	1.82	1.62	.71	2.30	34.87	6.60	58.53	6.62	.78	—	—	1.11	(S)
Instruments and related products	1.73	1.12	.73	.80	.92	21.98	26.15	51.87	10.45	.48	(NA)	(NA)	1.08	(S)
Other durable goods	2.22	1.48	1.15	.79	1.46	30.62	14.35	55.03	14.98	.49	(NA)	(NA)	1.09	(S)
NONDURABLE GOODS INDUSTRIES														
Food and kindred products	2.56	.88	.69	.44	1.57	7.98	3.24	88.78	130.68	.22	—	—	1.15	(S)
Tobacco products	10.75	6.32	5.42	2.63	2.06	27.88	6.59	65.53	6.85	.81	39.8	37.4	1.47	(S)
Textile mill products	2.11	1.08	.85	.62	1.37	16.18	8.64	75.17	60.08	.30	—	—	1.15	(S)
Apparel and other finished textile products	3.69	1.60	.97	1.18	.82	6.42	9.48	84.10	129.68	.21	—	—	1.23	(S)
Paper and allied products	1.98	1.08	.71	.75	.95	13.31	14.87	71.83	42.29	.25	(NA)	(NA)	1.10	(S)
Printing, publishing, and allied products	2.83	1.53	1.31	.74	1.77	21.11	6.75	72.13	112.51	.27	—	—	1.19	(S)
Chemicals and allied products	1.46	1.06	.75	.63	1.18	30.77	22.23	47.01	14.01	.35	(NA)	(NA)	1.08	(S)
Petroleum and coal products	3.38	2.77	1.94	1.69	1.15	36.60	27.91	35.49	8.82	.63	.7	2.1	1.12	(S)
Rubber and miscellaneous plastics products	1.86	.96	.69	.64	1.07	14.72	12.82	72.47	50.97	.28	—	—	1.12	(S)
Leather and leather products	3.88	2.21	1.80	1.05	1.72	24.11	8.19	67.71	14.52	.62	1.9	—	1.13	(S)

— Represents zero. NA Not available. S Seasonally adjusted.

Appendix H.

Description of the Annual Survey of Manufactures and M3 Benchmark Data

GENERAL

The estimates for the 1994 Annual Survey of Manufactures are based on reports from a representative sample of approximately 58,000 manufacturing establishments and administrative-record information for approximately 170,000 establishments. These estimates represent the portion of the manufacturing population accounted for by establishments with paid employees. Nonemployers are defined as out-of-scope of the ASM. The results of the survey provide estimates for employment, plant hours, payrolls, value added by manufacture, capital expenditures, cost of materials, inventories, value of industry shipments, and fuels and electric energy consumed for most manufacturing industries. Establishments are classified in manufacturing industries by industry definitions described in the 1987 edition of the Standard Industrial Classification (SIC) Manual.¹

SCOPE AND USE OF ANNUAL SURVEY

The 1994 ASM is the 37th survey of this type conducted by the Bureau of the Census to provide the key measures of manufacturing activity for industry groups and important industries for intercensal years. These key measures, as well as other detailed statistics for manufacturing, were collected in the censuses of manufactures; the three most recent censuses covered the years 1992, 1987, and 1982. An annual survey was conducted for each of the years between censuses starting with 1949.

During intercensal periods, these annual surveys provide a continuous series of basic statistics for industries and furnish benchmarks for current business indicators and for measures of industrial production and productivity. The survey also provides significant data in connection with planning for industrial mobilization.

DESCRIPTION OF THE SURVEY SAMPLE

In 1992, there were approximately 370,000 individual manufacturing establishments. For sample efficiency and

cost considerations, the 1992 manufacturing population was partitioned into two components for developing estimates within the ASM; a mail stratum and a nonmail stratum.

Mail stratum. The mail stratum of the survey is comprised of larger single-location manufacturing companies and all manufacturing establishments of multiunit companies (companies that operate at more than one physical location). Approximately 230,000 of the 370,000 establishments in the 1992 census were assigned to the mail stratum.

On an annual basis, the mail stratum is supplemented with larger, newly active single-location companies identified from a list provided by the Internal Revenue Service (IRS) and new manufacturing locations of multiunit companies identified from the Census Bureau's Company Organization Survey (COS).

For the 1994 survey, a new sample of approximately 58,000 individual establishments was selected from the mail stratum assembled from the 1992 census. Supplemental samples representing both 1993 and 1994 births (newly active establishments that were not included in the 1992 census) were also selected. Establishments selected for the sample will be mailed an ASM survey questionnaire for each year through 1998.

The 1994-98 ASM sample design is similar to the one used since 1984. Companies in the 1992 Census of Manufactures with manufacturing shipments of at least \$500 million were defined as company certainties. For these large companies, each manufacturing establishment is included in the mail sample. For the 1994-98 sample, there are approximately 650 certainty companies collectively accounting for over 18,000 establishments.

For the remaining portion of the mail component of the survey, the establishment was defined as the sample unit. All establishments with 250 employees or more were defined as employment certainties. In addition, all establishments producing products in SIC 3571 (Electronic Computers) were defined as certainties. Across these three arbitrary certainty classes, there were approximately 25,000 establishments included in the sample with certainty. Collectively, these certainty establishments accounted for approximately 80 percent of the total value of shipments in the 1992 Census of Manufactures.

¹*Standard Industrial Classification Manual: 1987.* For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-003142.

Smaller establishments in the remaining portion of the mail stratum were sampled with probabilities ranging from .02 to 1.00. The initial probabilities of selection assigned to these establishments were proportionate to a measure-of-size determined for each establishment. The measure-of-size was a function of the establishment's 1992 industry classification, its 1992 product class data, and the historical variability of the year-to-year estimates of the product class estimates. For each product class (1,755) and four-digit industry (459), a desired reliability constraint was specified. Using a technique developed by Dr. James R. Chromy of the Research Triangle Institute, the initial establishment probabilities were optimized such that the expected sample satisfied all industry and product class reliability constraints while the sample size was minimized. This technique reduces the likelihood of selecting nonrepresentative samples for individual product classes or industries.

This method of assigning probabilities based on product class shipments is motivated by our primary desire to produce reliable estimates of both product class and industry shipments. The high correlation between shipments and employment, value-added, and other general statistics assures that these variables will also be well represented by the sample. The actual sample selection-procedure uses an independent chance of selection method (Poisson sampling) which permits us to prevent small establishments from being selected in consecutive samples without introducing a bias into the survey estimates.

Nonmail component. The initial nonmail component of the survey was comprised of approximately 140,000 small, single-establishment companies that were tabulated as administrative records in the 1992 Census of Manufactures. The nonmail stratum is also supplemented annually using the list of newly active single-location companies provided by the IRS and payroll cutoffs. Companies with payroll below the payroll cutoff are added to the nonmail stratum.

For this portion of the population, sampling is not used. The data for this group are estimated based on selected information obtained annually from the administrative records of the IRS and Social Security Administration (SSA). This

administrative information, which includes payroll, total employment, industry classification, and physical location, is obtained under conditions which safeguard the confidentiality of both tax and census records.

DESCRIPTION OF THE ESTIMATING PROCEDURE

Most of the ASM estimates derived for the mail stratum are computed using a difference estimator. At the establishment level, there is a strong correlation between the current year data values and the corresponding 1992 (base) data values. Therefore, within the mailed stratum, for each item at each level of aggregation, an estimate of the "difference" between the current year and the base year is computed from sample cases and added to the corresponding base year values. For the 1993-1997 ASM estimates, the 1992 Census of Manufactures values serve as the base year. For the 1998 ASM, the base will be updated to be the 1997 Census of Manufactures.

Due to the positive year-to-year correlation, estimates derived using this methodology are generally more reliable than comparable estimates developed from the current sample data alone. Estimates for the capital expenditures variables are not generated using the difference estimator because the year-to-year correlations are considerably weaker. The standard linear estimator is used for these variables.

For the nonmail stratum, estimates for payroll and employment are directly tabulated from the administrative-record data provided by IRS and SSA. Estimates of data other than payroll and employment are developed from industry averages. Although the nonmail stratum contains approximately 170,000 individual establishments in 1994, it accounts for less than 2 percent of the estimate for total value of shipments at the total manufacturing level.

Corresponding estimates for the mail and nonmail components are combined to produce the estimates included in this publication.

Call 301-457-4769 with questions regarding the annual survey of manufactures.