

NBER WORKING PAPER SERIES

NEW ESTIMATES OF THE INDUSTRIAL LOCUS OF  
UNIONISM IN THE U.S.

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Working Paper No. 273

NATIONAL BUREAU OF ECONOMIC RESEARCH  
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August 1978

ABSTRACT

This study presents new estimates of collective bargaining coverage and union membership for detailed U.S. industries. It compares the new coverage and membership figures with each other and with figures derived by researchers for the early 1960's and analyzes the divergences. This analysis leads to three primary conclusions: 1) Estimated coverage percentages are on average higher than estimated membership percentages; 2) This relationship is primarily the result of the absence of union security clauses (under which covered employees must at some point become union members); 3) Even among production workers within detailed industries, private sector unionism has been dwindling during the past two decades.

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New Estimates of the Industrial Locus of  
Unionism in the U.S.\*

One prerequisite for analysis of the economic effects of trade unions is a sound set of estimates of the percentage organized by industry. Existing estimates of the industrial locus of unionism in the United States have been obtained by piecing together data from diverse sources. The widely used estimates of Lewis (1963), Weiss (1966), and Fuchs (1968) rely on establishment surveys and union membership data from the 1950's and early 1960's, supplemented when necessary by "gues-timates." Because of the lack of comprehensive data, differences in adjustment procedures, and problems of allocating members of particular unions among industries, the various estimates diverge noticeably and differ from comparable estimates by Troy and the Bureau of Labor Statistics (BLS).<sup>1</sup> The divergence in estimates and patchwork nature of the figures raise the possibility of sizeable errors in the various unionization series which could, by the usual errors-in-variables argument, bias the estimated impact of unions downward in econo-metric work.

This study offers new estimates of the industrial locus of unionism that are based on larger and more comprehensive surveys, which do not require supplementation from scattered sources. Section I describes the potential sources of data on unionism by industry and the methods by which previous estimates have been obtained. The second section presents new fig-ures for two concepts of unionism: (1) the percentage of workers covered by collective bargaining agreements and (2) the percentage who are union members. These figures are compared with each other and with earlier estimates.

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\*We are indebted to C. Brown, J. Fay, J. Lebow, S. Hills, M. Van Denburgh, and P. Voos for their immense assistance in the production and presentation of these estimates. The research reported here is part of the NBER's research program in labor studies. Any opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

## I. Sources of Data and Past Estimates

Data on the union organization of the work force are obtained from three basic sources: establishment surveys, membership figures of unions, and household surveys. Each source provides conceptually different data, which have both advantages and disadvantages for determining the industrial locus of unionism.

The principal establishment survey which provides unionization information is the Expenditures for Employee Compensation (EEC) survey, administered by BLS.<sup>2</sup> Its major advantage is that the union data relate to coverage by union-management agreements (for both the office and nonoffice workers in the establishment taken separately), which is probably the most relevant concept for analysis of the impact of unionization in the labor market.

The EEC survey also reports the total number of office and nonoffice workers by establishment which can be used to construct estimates of the percent of workers covered by collective bargaining in each nonagricultural industry. The biggest disadvantage of the EEC is that establishments are not asked the percentage of workers covered by contracts but rather whether more than 50 percent of the office or nonoffice workforce are covered; measurement problems thus arise when part of the relevant group is covered and part not. (Analysts have usually felt it reasonable to assume that if a majority of the relevant work group is (not) covered, then all (none) of it is.<sup>3</sup>) Another disadvantage is that establishment figures provide no information on the demographic characteristics of workers nor on the particular unions in a given industry.

Union membership data have many disadvantages as the source of information on the industrial distribution of unionized employment.<sup>4</sup> The figures reported to BLS are union "guestimates," as membership and dues data are not gathered on an industrial basis. Several unions fail to provide any information,

and thus force BLS to make its own approximations. Definition of membership also varies; for instance, there is variation in the treatment of the unemployed, and, more importantly, the retired. (Most unions include the unemployed; a few unions, for example the United Mine Workers, also include the retired, whereas most do not). In addition, employment figures used in computing the percentage organized figures must be taken from other sources. The advantage of the membership figures is that they provide data on specific unions.

Household data sources have the advantage of providing detailed demographic and economic facts about individuals in unions. A principal drawback is that in most household surveys, including the Current Population Survey (CPS), one member of the family responds for all family members, which could lead to errors due to inaccurate knowledge (of membership status, occupation, and industry). Another problem is that in the main household survey, the CPS, the union question relates to membership rather than coverage by a collective contract. The effect of collective bargaining is likely to be misstated if, as turns out to be the case, a significant number of nonmembers are covered by contracts or if members are without contracts.

Extant estimates of the industrial locus of unionism rely on membership figures and establishment surveys, generally compared in some fashion. In Unionism and Relative Wages, Lewis estimated the fraction of production workers in the United States who were organized at the 1-digit Standard Industrial Classification (SIC) level using membership information, and obtained noticeably different figures from those of Troy (1953) and BLS (1960), who used similar basic data. He explained the divergence in terms of "differences in the way different persons have allocated the membership of unions by industry... [which are] large [because of] the unsatisfactory state of our knowledge regarding the distribution of unionism among industries."<sup>5</sup>

Lewis' estimates for detailed industries (presented on pp. 254-255 of his book) were obtained as the "central tendency" of membership figures allocated to industries, scattered establishment surveys on collective bargaining coverage, the BLS wage structure series (which provides, as a by-product, figures on coverage), and articles and books on unionism in specific sectors.<sup>6</sup> As a result of the requisite patchwork, the figures are "even more... subject to the hazards of estimating union membership by industry from fragmentary information"<sup>7</sup> than are the 1-digit SIC figures.

The Douty (1960) estimates, which are given at a 2-digit SIC level of aggregation for each of the country's four regions, were based on a 1958 survey of manufacturing establishments conducted by BLS. These figures have a reasonably close correspondence with the BLS industrial estimates of union membership for 1958 that were based on information supplied by the unions for the 1959 edition of the Directory of National and International Labor Unions in the United States.<sup>8</sup> Douty's estimates are also quite correlated with the later Lewis figures, but are typically about 20 percentage points higher.<sup>9</sup>

Weiss' estimates of production worker unionization for 3-digit 1960 Census industries were derived from several sources:<sup>10</sup> the BLS Industry Wage Surveys, supplemented by selected unpublished 3-digit SIC estimates of collective bargaining coverage made by BLS for Douty, other published and unpublished coverage estimates, correspondence with research directors of major unions, union membership data from the BLS's Directory of National and International Labor Unions in the U.S., major contract coverage given in Major Union Contracts in the U.S., Monthly Labor Review lists of "Major Agreement Expirations and Reopenings," and "guesses based on qualitative information."

The estimates of Fuchs, giving the unionization of all workers, rather than of production workers only, in 3-digit 1960 Census industries are based on Weiss' and Lewis' figures "with modifications." Fuchs assumed that no nonproduction workers were organized and multiplied previous estimates of production worker coverage by the ratio of production to total employment in the relevant industry. Fuchs' "final estimates of all industries were submitted to Lewis for review and modified in accordance with his suggestions."<sup>11</sup> The principal modification appears to be a significant downward reduction in Weiss' estimates to place the data on a membership rather than coverage basis.

While Lewis and Fuchs provide reliable estimates for some nonmanufacturing industries such as coal, utilities, and transportation, none of the existing studies contain adequate figures for industries in the service or trade sectors. In Fuchs, for example, frequently the same unionization figure is given to several 3-digit industries, due to lack of disaggregate data.

In sum, while carefully put together, available unionization by industry data involve considerable guesswork and have incomplete coverage, in addition to being seriously outdated for the 1970's and 1980's.

## II. New Estimates of Percentage Covered and Percentage Members

In this section we present new estimates of the industrial locus of unionism in the U.S., for production workers and for the total work force, derived from establishment data on coverage by collective bargaining, and derived from household survey data on union membership. The estimates are presented for three industrial classification schemes: (1) 3-digit 1970 Census, for use with the 1970 Census of Population; (2) 3-digit SIC, for use with the myriad data sources, such as the Census of Manufactures and Annual Survey of Manufactures, which employ the SIC scheme; and (3) for manufacturing, 2-digit SIC,

for comparison with the 1958 estimates of Douty.

Unlike most previous estimates, our coverage and membership percentages are based on only one data source, which should enhance their validity relative to previous estimates based on an amalgamation of numbers from different surveys. While by no means optimal, we believe that the new figures offer a superior picture of the industrial locus of unionism and will, hopefully, be of use to other researchers.

#### Coverage Estimates

Coverage by collective bargaining agreements data come from the Bureau of Labor Statistics' 1968, 1970, and 1972 Expenditures for Employee Compensation surveys, each of which was based on a probability sample of establishments in the private nonfarm sector of the United States and the District of Columbia. When pooled, these surveys contain information on the compensation, employment, and hours of office and nonoffice workers for more than 13,000 establishments. On the EEC questionnaire, establishments were asked if a majority of nonoffice employees were covered by union-management agreements and if a majority of office workers were so covered. Office employees were defined implicitly by the following directions:

Include all employees in executive, administrative, and management positions, above the working supervisor level. Also include supervisory and non-supervisory professional employees and their technical assistants; employees engaged in office clerical operations; and all salespersons whose sales activities are primarily performed outside of the establishment (e.g., real estate salesmen, and door to door salesmen).

For nonoffice employees, the questionnaire states:

Include all employees, except office employees as defined above, in nonsupervisory, nonprofessional positions. Include employees engaged in fabricating, processing, or assembling; building or excavating; mining, drilling, or pumping; maintaining or repairing; shipping, receiving, handling, warehousing, packing or trucking; retail sales; operating or working on moving vehicles (buses, boats, etc.); janitorial work; guard or watchman work; and similar activities.



We will treat "nonoffice employee" as synonymous with "production worker" and "office employee" as synonymous with "nonproduction worker."

For each industry in an industrial classification scheme we used the EEC establishment data to calculate a figure giving the percent of nonproduction employees covered by collective bargaining agreements and the percent of production employees so covered. The formula employed in deriving the percentage of office or nonoffice workers organized in an industry is:

$$1. C_{jk} = \left( \frac{\sum_i \delta_{ijk} \omega_{ij} l_{ijk}}{\sum_i \omega_{ij} l_{ijk}} \right) \cdot 100$$

where  $C_{jk}$  is the percentage of employees in group k in industry j who are covered by union-management agreements, with k indexing office and nonoffice workers,

$\delta_{ijk}$  is a dichotomous variable that equals 1 if a majority of the workers in group k in establishment i are covered by union-management agreements and 0 if not,

$\omega_{ij}$  is a sampling weight giving the number of establishments represented by establishment i,

and

$l_{ijk}$  gives the number of workers in group k who are employed in establishment i.

The fraction of all workers organized was derived by summing the number of office and nonoffice workers covered by agreements  $(\sum_k \sum_i \delta_{ijk} \omega_{ij} l_{ijk})$  and dividing by total employment in the sector  $(\sum_k \sum_i \omega_{ij} l_{ijk})$ .

The basic data for the estimates were obtained from the publicly available EEC tapes. For reasons of confidentiality, however, these tapes excluded information on a small number of very large establishments. BLS kindly provided weighted counts of covered and total employment in the excluded establishments on a 3-digit SIC basis. These figures were used along with those from the tapes to derive estimates of the fraction organized by industry ( $C_{jk}$ )

on a 3-digit 1967 SIC industry basis. The 3-digit SIC figures were then used to obtain estimates of coverage on 3-digit 1960 and 1970 Census industry classifications, using mappings that are available on request.

Table 1 presents the EEC-based estimates of the percent of all workers and the percent of production workers who are covered by union-management agreements by 3-digit 1967 SIC industry. In addition, it presents a lower bound to the number of establishments used in deriving these estimates. The number of establishments figure is a lower bound since (to preserve confidentiality) BLS did not provide information on the number of establishments represented in its weighted counts of covered and total employment for establishments excluded from the publicly available tapes. It should be noted that since the establishments which employ 6,500 or more workers were supposed to be sampled with a probability of one, those whose employment was greater than or equal to 6,500 in more than one sample year can be expected to have been included in more than one sample. Table 1 also includes the number of workers in total and the number of production workers in establishments surveyed in 1968, 1970, and/or 1972.

Because the EEC files were not designed to provide coverage estimates on a 3-digit SIC basis, some of the percentages in Table 1 are likely to have large standard errors associated with them. Still, the "raw" information and counts in the table are likely to be of use to researchers, both as a direct input into studies and as a guide to assessing the validity of industry coverage estimates. Obviously, the percentages for some industries will be inaccurate due to sample size and should be treated cautiously.

Extent of Collective Bargaining Coverage by 1967 3-Digit SIC Industry:  
1968-72 EEC Surveys

1967 SIC Code	Industry Name (Number of Establish- ments in EEC Public- ly Available File)	Percent of All Workers	Percent of Pro- duction Workers	Number of Workers in Establishments	1967 SIC Code	Industry Name (Number of Establish- ments in EEC Public- ly Available File)	Percent of All Workers	Percent of Pro- duction Workers	Number of Workers Surveyed
071	Misc. Agr. Services (7)	0	0	813	176	Roofing & Sheet Metal Work (82)	60	69	2,661
072	Animal Husbandry Serv.(1)	0	0	23	177	Concrete Work (45)	56	60	1,687
073	Horticultural Serv.(17)	7	8	1,025	178	Water Well Drilling (12)	40	47	315
081	Timber Tracts (2)	0	0	35	179	Misc. Special Trade Contractors (151)	58	69	11,289
091	Fisheries, Except Fish Hatcheries (2)	0	0	99	191	Guns, Howitzers & Mortars (6)	74	100	21,175
098	Fish Hatcheries, Farms & Preserves (2)	0	0	30	192	Ammunition, Except for Small Arms (27)	51	77	180,090
101	Iron Ores (7)	80	100	11,819	193	Tanks & Tank Comp. (1)	0	44	425
102	Copper Ores (3)	80	100	3,548	195	Small Arms (7)	52	77	13,590
104	Gold & Silver Ores (5)	63	71	5,120	196	Small Arms Ammu. (8)	57	62	33,737
109	Misc. Metal Ores (5)	36	48	2,668	199	Ordnance & Acc., Etc.(1)	54	100	3,199
111	Anthracite Mining (1)	82	100	740	201	Meat Products (63)	68	78	55,812
121	Bituminous Coal & Lignite Mining (79)	77	89	45,981	202	Dairy Products (33)	41	50	50,304
131	Crude Petroleum & Natural Gas (15)	25	42	18,664	203	Canned, Cured, & Frozen Foods (57)	53	65	35,312
132	Natural Gas Liquids (2)	41	48	91	204	Grain Mill Products (37)	44	60	32,833
138	Oil & Gas Field Serv. (38)	3	4	32,915	205	Bakery Products (51)	58	65	45,714
141	Dimension Stone (3)	74	100	1,556	206	Sugar (7)	39	52	1,494
142	Crushed & Broken Stone (8)	42	54	1,482	207	Conf. & Rel. Prod. (98)	42	53	54,850
144	Sand & Gravel (8)	76	100	231	208	Beverages (44)	47	62	27,410
145	Clay & Related Min. (2)	97	100	771	209	Misc. Foods & Kindred Products (21)	53	66	11,173
147	Chemical & Fertilizer Minerals (8)	38	58	3,318	211	Cigarettes (15)	77	95	24,350
151	Gen. Bldg. Contr. (162)	53	60	23,606	212	Cigars (7)	22	26	7,019
161	Highway & St. Const.(842)	53	59	85,162	214	Tobacco Stemming & Redrying (4)	59	89	810
162	Heavy Const., n.e.c.(586)	40	47	90,392	221	Weaving Mills, Cot. (37)	20	22	148,868
171	Plumbing, Heating, Air Conditioning(253)	60	71	11,746	222	Weaving Mills, Syn. (13)	13	15	10,705
172	Painting, Paper Hanging, Decorating (95)	33	36	2,092	223	Weaving & Finishing Mills, Wool (3)	0	0	1,170
173	Electrical Work (173)	57	64	11,056	224	Narrow Fabric Mills (5)	62	77	1,000
174	Masonry, Stonework, & Plastering (130)	63	66	6,192	225	Knitting Mills (88)	25	26	43,526
175	Carpentering & Flooring (57)	38	50	1,584	226	Textile Finishing, Except Wool (14)	30	36	14,587

1967 SIC Code	Industry Name (Number of Establishments in EEC Publicly Available File)	Percent of All Workers	Percent of Production Workers	Number of Workers Surveyed	1967 SIC Code	Industry Name (Number of Establishments in EEC Publicly Available File)	Percent of All Workers	Percent of Production Workers	Number of Workers Surveyed
227	Floor Covering Mills (13)	7	8	6,305	273	Books (16)	13	26	1,465
228	Yarn & Thread Mills (22)	21	23	16,219	274	Misc. Publishing (6)	27	13	2,716
229	Misc. Textile Goods (19)	43	52	5,915	275	Commercial Printing (54)	39	51	30,026
231	Men's & Boy's Suits & Coats (17)	83	88	10,990	276	Manifold Business Forms (10)	30	62	2,490
232	Men's & Boy's Furn. (178)	37	40	74,024	277	Greeting Card Pub. (1)	0	0	2,224
233	Women's & Misses' Outerwear (226)	56	63	18,125	278	Blankbooks & Bookbinding (14)	46	52	5,306
234	Women's & Children's Undergarments (17)	19	22	41,018	279	Printing Trade Serv. (6)	35	41	242
235	Hats, Caps, & Mill. (2)	53	59	161	281	Industrial Chemicals (30)	44	74	320,239
236	Children's Outerwear (11)	34	36	1,738	282	Plastics Materials & Synthetics (30)	55	84	75,998
238	Misc. Apparel & Acc. (11)	64	72	1,581	283	Drugs (23)	22	41	67,021
239	Misc. Fabricated Textile Products (25)	43	49	7,855	284	Soap, Cleaners, & Toilet Goods (16)	27	55	45,433
241	Logging Camps & Logging Contractors (16)	49	52	19,443	285	Paints & Allied Prod. (16)	34	50	1,995
242	Sawmills & Planing Mills (52)	34	38	15,732	286	Gum & Wood Chemicals (3)	66	70	7,726
243	Millwork, Plywood & Related Products (34)	28	32	4,710	287	Agr. Chemicals (9)	40	57	41,303
244	Wooden Containers (8)	0	0	546	289	Misc. Chemical Prod. (19)	7	77	20,578
249	Misc. Wood Products (17)	29	34	2,683	291	Petroleum Refining (16)	31	63	214,033
251	Household Furniture (69)	38	44	37,271	295	Paving & Roofing Mat. (4)	81	100	1,191
252	Office Furniture (4)	50	70	2,529	301	Tires & Inner Tubes (15)	65	100	173,410
253	Public Bldg. Furn. (3)	39	61	1,220	302	Rubber Footwear (3)	22	24	1,286
254	Partitions & Fixtures (13)	9	64	2,003	306	Fabricated Rubber Products, n.e.c. (30)	50	65	24,359
259	Misc. Furn. & Fix. (10)	41	52	1,924	307	Misc. Plastics Prod. (47)	32	42	11,762
261	Pulp Mills (20)	80	98	6,901	311	Leather Tanning & Finishing (1)	79	100	351
262	Paper Mills, Except Building Paper (206)	80	98	152,804	312	Ind. Leather Belting (2)	80	100	1,330
263	Paperboard Mills (18)	55	70	13,087	313	Footwear Cut Stock (1)	0	0	33
264	Misc. Converted Paper Products (31)	52	78	105,647	314	Footwear, Exc. Rub. (40)	43	49	90,863
265	Paperboard Containers & Boxes (42)	40	49	9,889	317	Handbags & Personal Leather Goods (12)	81	92	3,510
266	Building Paper & Board Mills (32)	77	97	9,513	319	Leather Goods, n.e.c. (2)	0	0	114
271	Newspapers (66)	42	58	94,086	321	Flat Glass (12)	86	100	29,305
272	Periodicals (8)	18	63	10,912	322	Glass & Glassware, Pressed or Blown (21)	79	100	108,739
					323	Products of Purchased Glass (7)	43	52	6,191

1967 SIC Code	Industry Name (Number of Establishments in EEC Public-ly Available File)	Percent of All Workers	Percent of Production Workers	Number of Workers Surveyed	1967 SIC Code	Industry Name (Number of Establishments in EEC Public-ly Available File)	Percent of All Workers	Percent of Production Workers	Number of Workers Surveyed
324	Cement, Hydraulic (10)	65	89	1,831	355	Special Industrial Machinery (54)	32	47	41,968
325	Structural Clay Prod.(12)	69	81	1,368	356	Gen. Indust. Mach. (73)	48	69	89,850
326	Pottery & Rel. Prod. (12)	57	65	6,626	357	Off. & Comp. Mach. (24)	10	15	566,577
327	Concrete, Gypsum, & Plaster Products (43)	57	69	4,076	358	Serv. Industry Mach.(29)	55	80	38,843
328	Cut Stone & Stone Products (6)	0	0	451	359	Misc. Machinery, Exc. Electrical (41)	26	34	8,775
329	Misc. Nonmetallic Mineral Products (21)	56	82	19,672	361	Electric Test & Distributing Eqpt. (28)	21	28	49,338
331	Blast Furnace & Basic Steel Products (288)	77	98	1199,750	362	Elec. Ind. Apparatus(37)	41	59	51,596
332	Iron & Steel Found. (51)	75	87	39,913	363	Household Appliances(37)	68	85	80,739
333	Primary Nonferrous Metals (14)	73	90	52,075	364	Electric Lighting & Wiring Equipment (31)	56	71	31,077
334	Secondary Nonferrous Metals (4)	73	100	32,983	365	Radio & TV Rec. Eqpt.(22)	59	78	78,836
335	Nonferrous Rolling & Drawing (38)	61	78	88,975	366	Communication Eqpt. (53)	45	82	670,610
336	Nonferrous Foundries(14)	56	65	5,445	367	Electronic Components & Accessories (70)	17	24	146,392
339	Misc. Primary Metal Products (15)	51	63	5,042	369	Misc. Electrical Equip. & Supplies(9)	49	56	2,584
341	Metal Cans (18)	90	100	17,242	371	Motor Veh. & Equip. (75)	72	98	2267,915
342	Cutlery, Hand Tools, & Hardware (33)	30	40	27,607	372	Aircraft & Parts (93)	51	87	1055,435
343	Plumbing & Heating, Exc. Electric (20)	67	80	14,213	373	Ship & Boat Building & Repairing (40)	65	80	233,891
344	Fabricated Structural Metal Products (239)	44	58	129,349	374	Railroad Equipment (11)	87	100	19,680
345	Screw Machine Products, Bolts, Etc. (18)	5	6	9,293	375	Motorcycles, Bicycles, & Parts (1)	0	0	32
346	Metal Stampings (36)	53	65	19,730	379	Misc. Transp. Eqpt. (16)	25	29	2,382
347	Metal Services, n.e.c.(21)	24	28	3,764	381	Engineering & Scientific Inst. (14)	18	28	16,216
348	Misc. Fab. Wire Prod.(11)	47	57	2,936	382	Mechanical Measuring & Control Dev. (18)	51	77	33,148
349	Misc. Fab. Met. Prod.(33)	54	76	17,074	383	Opt. Inst. & Lenses (3)	61	86	4,670
351	Engines & Turbines (19)	80	99	62,629	384	Med. Inst. & Suppl. (16)	31	46	9,244
352	Farm Machinery (31)	57	77	169,643	385	Ophthalmic Goods (4)	0	0	1,096
353	Construction & Related Machinery (45)	53	80	146,610	386	Photo. Eqpt. & Suppl.(7)	9	16	178,190
354	Metal Working Mach. (73)	32	41	43,073	387	Watches, Clocks, & Watchcases (5)	42	51	3,149
					391	Jewelry, Silverware, & Plated Ware (13)	35	48	18,082

1967 SIC Code	Industry Name (Number of Establishments in EEC Publicly Available File)	Percent of All Workers	Percent of Production Workers	Number of Workers Surveyed	1967 SIC Code	Industry Name (Number of Establishments in EEC Publicly Available File)	Percent of All Workers	Percent of Production Workers	Number of Workers Surveyed	Number of Establishments
393	Musical Inst. & Parts (4)48	61	61	1,069	492	Gas Companies & Syst.(38)45	75	61	78,098	
394	Toys & Sporting Goods(23)37	46	46	13,221	495	Combination Companies & Systems (43)	55	89	341,524	
395	Pens, Pencils, Office & Art Supplies (10)	65	71	3,634	494	Water Supply (5)	38	38	644	
396	Costume Jewelry & Notions (15)	30	37	6,621	495	Sanitary Services (6)	41	41	621	
399	Misc. Manufactures (32)	45	56	3,397	497	Irrigation Systems (1)	77	100	542	
401	Railroads (84)	98	99	1329,688	501	Motor Veh. & Automotive Eqpt.. Sales (41)	9	12	2,319	
404	Railway Express Serv.(2)	81	100	40,867	502	Drugs, Chemicals, & Allied Products (30)	18	48	23,894	
411	Local & Suburb. Trans(15)67	67	77	8,829	503	Dry Goods & Apparel (14)	19	50	2,167	
412	Taxicabs (18)	41	46	12,660	504	Groceries & Rel. Pr.(85)23	23	33	9,734	
413	Intercity Highway Trans(2)24	24	26	701	505	Farm Prod. Raw Mat. (18)	8	8	687	
414	Transp. Charter Serv. (1)	0	0	25	506	Electrical Goods (34)	9	22	23,263	
415	School Busses (9)	11	13	289	507	Hardware; Plumbing & Heating Equipment(25)	23	43	2,258	
417	Bus Terminal & Service Facilities (2)	0	0	5	508	Machinery, Equipment, & Supplies (93)	8	13	17,645	
421	Trucking, Local & Long Distance (163)	61	71	124,049	509	Misc. Wholesalers (182)	17	31	17,422	
422	Public Warehousing (16)	43	56	482	521	Lumber & Other Bldg. Materials (43)	6	9	1,386	
441	Deep Sea Foreign Trans(6)33	33	100	34,523	522	Plumbing & Heating Equip. Dealers (5)	5	6	1,837	
442	Deep Sea Dom. Transp. (4)	64	97	772	523	Paint, Glass & Wallpaper Stores (12)	52	62	280	
443	Great Lakes Transp. (2)	93	100	168	525	Hardware & Farm Eqpt.(40)3	3	4	772	
444	Transp. on Rivers & Canals (2)	51	45	325	531	Department Stores (297)	9	12	1604,410	
445	Local Water Transp. (5)	40	46	690	532	Mail Order Houses (9)	25	66	18,124	
446	Water Transp. Serv. (6)	76	87	1,774	533	Variety Stores (20)	6	5	45,428	
451	Certificated Air Tr. (13)59	59	95	427,375	534	Merchandising Machine Operators (4)	27	35	163	
458	Air Transp. Services (4)	28	47	151	535	Direct Selling Orgs. (3)31	31	36	312	
461	Pipe Lines, Except Natural Gas (8)	69	90	8,537	539	Misc. General Merchandise Stores (37)	0	0	1,161	
471	Freight Forwarding (7)	25	57	241	541	Grocery Stores (158)	49	53	308,271	
472	Arrangement of Transp. (9)	0	0	338	542	Meat & Fish (Sea Food) Markets (9)	0	0	82	
478	Misc. Transp. Serv.(3)58	58	100	113	543	Fruit Stores & Vegetable Markets (6)	0	0	138	
481	Telephone Commun. (43)	86	98	1336,401						
482	Telegraph Commun. (1)	40	100	18,639						
483	Radio & TV Broadcastg. (13)	24	65	2,587						
489	Commun. Serv., n.e.c. (2)	44	90	17						
491	Elec. Companies & Systems (64)	57	78	212,670						

1967 SIC Code	Industry Name (Number of Establishments in EEC Publicly Available File)	Percent of All Workers	Number of Workers Surveyed	1967 SIC Code	Industry Name (Number of Establishments in EEC Publicly Available File)	Percent of All Workers	Number of Workers Surveyed	Percent of Production Workers	Percent of Production Workers	Number of Workers Surveyed	Number of Establishments
544	Candy, Nut, & Confectionery Stores (1)	75	12	597	Jewelry Stores (5)	0	46	0	0	46	46
545	Dairy Products Stores (4)	19	642	598	Fuel & Ice Dealers (15)	10	288	10	10	288	288
546	Retail Bakeries (21)	12	309	599	Retail Stores, n.e.c. (35)	2	698	2	2	698	698
549	Misc. Food Stores (3)	0	75	601	Federal Reserve Banks (15)	0	15,498	--	--	15,498	15,498
551	New & Used Car Dealers (115)	11	4,860	602	Commercial & Stock Savings Banks (613)	1	710,365	8	8	710,365	710,365
552	Used Car Dealers (5)	0	38	603	Mutual Savings Banks (37)	0	8,168	0	0	8,168	8,168
553	Tire, Battery, & Accessory Dealers (20)	5	389	604	Trust Companies, Nondeposit (2)	0	781	--	--	781	781
554	Gasoline Service Sta. (87)	2	1,777	605	Functions Closely Related to Banking (9)	0	945	0	0	945	945
559	Misc. Automotive Drls. (13)	1	618	612	Savings & Loan Asso. (27)	0	1,845	0	0	1,845	1,845
561	Men's & Boy's Clothing & Furnishings (10)	9	187	613	Agr. Credit Inst. (2)	0	44	--	--	44	44
562	Women's Ready-to-Wear Stores (33)	8	3,500	614	Personal Credit Inst. (22)	0	42,225	0	0	42,225	42,225
563	Women's Accessory & Specialty Stores (5)	0	76	615	Business Credit Inst. (8)	0	764	0	0	764	764
564	Children's & Infants' Wear Stores (1)	0	8	616	Loan Correspondents & Brokers (4)	0	407	0	0	407	407
565	Family Clothing Stores (16)	13	2,020	621	Security Bkrs. & Dlrs (27)	0	8,231	0	0	8,231	8,231
566	Shoe Stores (22)	3	666	623	Security & Commodity Exchanges (1)	100	745	--	--	745	745
567	Custom Tailors (2)	95	42	628	Security & Commodity Services (2)	0	173	--	--	173	173
568	Furriers & Fur Shops (1)	0	5	631	Life Insurance (54)	6	366,428	2	2	366,428	366,428
571	Furniture & Home Furnishings (41)	11	1,827	632	Accident & Hlth. Ins. (23)	24	29,528	0	0	29,528	29,528
572	Household Appl. Stores (12)	8	239	633	Fire, Marine, & Casualty Insurance (63)	2	186,565	0	0	186,565	186,565
573	Radio, TV, & Music St. (12)	0	315	635	Surety Insurance (1)	0	4	--	--	4	4
581	Eating & Drinking Pl. (357)	8	17,611	636	Title Insurance (5)	0	3,293	--	--	3,293	3,293
591	Drug Stores & Proprietary Stores (53)	9	1,904	639	Insurance Car. (3)	80	490	100	100	490	490
592	Liquor Stores (13)	3	112	641	Insurance Agents, Brokers, & Service (33)	3	4,180	0	0	4,180	4,180
593	Antique Stores & Second-hand Stores (1)	0	204	651	Real Estate Operators & Lessors (39)	20	1,740	26	26	1,740	1,740
594	Book & Stationery St. (15)	0	378	653	Agents, Bkrs. & Man. (14)	8	527	0	0	527	527
595	Sporting Goods Stores & Bicycle Shops (5)	47	110	655	Subdividers & Dev. (9)	5	470	59	59	470	470
596	Farm & Garden Supply Stores, n.e.c. (12)	18	311	656	Operative Builders (5)	55	425	71	71	425	425
				661	Combined Real Estate, Insurance, Etc. (5)	0	155	0	0	155	155

1967 SIC Code	Industry Name (Number of Establishments in EEC Publicly Available File)	Percent of All Workers	Percent of Production Workers	Number of Workers Surveyed	1967 SIC Code	Industry Name (Number of Establishments in EEC Publicly Available File)	Percent of All Workers	Percent of Production Workers	Number of Workers Surveyed
671	Holding Companies (3)	0	--	924	783	Motion Pic. Theaters(19)	8	10	1,758
672	Investment Companies (1)	0	--	232	791	Dance Halls, Studios, & Schools (2)	0	0	20
701	Hotels, Tourist Courts, & Motels (400)	23	25	127,355	792	Producers, Orchestras, Entertainers (4)	78	86	152
703	Trailer Parks & Camps (5)	0	0	226	793	Bowling & Billiard Establishments (14)	7	8	613
704	Membership-Basis Organization Hotels (1)	0	0	175	794	Misc. Amusement, Recreation Serv. (39)	3	4	9,342
721	Laundries & Dry Cleaning Plants (405)	27	29	35,435	801	Offices of Physicians & Surgeons (45)	4	0	409
722	Photographic Studios (4)	0	0	292	802	Offices of Dentists, Dental Surgeons (12)	0	0	55
723	Beauty Shops (32)	0	0	343	803	Off. of Osteo. Phys.(1)	0	0	39
724	Barber Shops (7)	15	15	32	806	Hospitals (225)	9	10	214,168
725	Shoe Repair & Hat Cleaning Shops (2)	0	0	45	807	Med. & Dent. Labs.(10)	0	0	1,371
726	Funeral Service & Crematories (8)	0	0	115	809	Health & Allied Services, n.e.c. (64)	3	4	3,720
727	Garment Pressing, Alteration, Repair (3)	75	77	50	811	Legal Services (32)	2	0	1,702
729	Misc. Personal Serv. (5)	0	0	689	821	Elem. & Sec. Schools(43)	3	12	1,242
731	Advertising (27)	8	37	5,115	822	Coll. & Universities(55)	4	17	136,101
732	Credit Reporting & Col.(13)	0	0	4,546	824	Correspondence & Vocational Schools(5)	0	0	4,591
733	Duplicating, Mailing, Stenographic (10)	3	6	797	829	Sch. & Ed. Serv., n.e.c.(1)	0	0	36
734	Services to Bldgs. (29)	22	23	25,640	841	Museums & Art Gal. (3)	0	0	16
736	Private Employment Ag.(7)	0	0	2,251	861	Business Asso. (14)	0	0	1,467
739	Misc. Business Serv.(246)	8	11	161,970	862	Professional Orgs.(5)	0	0	861
751	Automobile Rentals, Without Drivers (6)	5	7	62	863	Labor Organizations(15)	63	11	414
752	Automobile Parking (3)	0	0	121	864	Civic & Social Asso(33)	8	10	1,090
753	Auto. Repair Shops (29)	12	14	549	866	Religious Orgs. (124)	0	0	14,506
754	Auto. Serv., Exc. Rep.(6)	0	0	111	867	Charitable Orgs. (74)	8	4	8,190
762	Electrical Rep. Sh. (12)	2	3	166	869	Nonprofit Member Orgs., n.e.c.(31)	1	2	5,158
763	Watch, Clock, & Jewelry Repair (1)	0	0	10	891	Engineering & Architectural Serv. (74)	2	13	25,916
764	Reupholst. & Furn. Rep(5)	15	16	39	892	Nonprofit Res. Ag. (21)	4	0	26,589
769	Misc. Repair Shops (14)	9	12	171	893	Accounting, Auditing, & Bookkeeping (26)	0	0	2,568
781	Motion Picture Filming & Distributing (11)	27	41	2,068	899	Services, n.e.c. (4)	0	--	77
782	Motion Pic. Prod. (1)	81	100	106					



### Membership Estimates

Union membership data for private sector wage and salary employees came from the 1973, 1974, and 1975 May Current Population Surveys. Since 1973, the May questionnaire has asked about the union status of each individual who is in the labor force. The question reads, "Does... belong to a labor union?" The three years were pooled to obtain 119,706 useable records for employed private sector (wage and salary) workers.

The May CPS files code the respondent's industry in a number of ways. We have used two of these codings: The first is based on the 2-digit SIC industry classification scheme; the second is the 3-digit 1970 Census industrial classification.

We defined the production worker group to include all private sector employees in the following occupations:

Craftsmen and kindred workers; operatives, except transport; transport equipment operatives; non-farm laborers; private household workers; all other service workers; and farm laborers and foremen.

The non-production worker group was defined to include all private sector employees who were:

Professional, technical and kindred workers; managers and administrators, except farm; sales workers; clerical and kindred workers; and farmers and farm managers.

The key difference between the EEC and CPS definitions involves salesworkers whose sales activities are primarily performed inside the establishment; they are defined to be in the production group under the former but in the nonproduction group under the latter.

We calculated separate union membership percentages for production and nonproduction employees in the private sector of each 3-digit 1970 Census industry according to the formula:

$$2. M_{jk} = \left( \frac{\sum_i \delta_{ijk} \omega_{ijk}}{\sum_i \omega_{ijk}} \right) \cdot 100,$$

where  $M_{jk}$  is the percentage of private sector employees in occupation  $k$  ( $k$  indicates production or nonproduction) in industry  $j$  who are union members,

$\delta_{ijk}$  is a dichotomous variable stating whether employee  $i$  is a union member ( $\delta_{ijk} = 1$ ) or not ( $\delta_{ijk} = 0$ ),

and

$\omega_{ijk}$  is the CPS sampling weight attached to employee  $i$ .

Table 2 presents the CPS private sector union membership percentages on a 3-digit 1970 Census industrial classification basis,<sup>14</sup> and gives comparable figures for the percent covered by collective bargaining from the EEC surveys. The total number of workers and the number of production workers in the CPS sample are also given. As is the case with the Table 1 percentages, those in Table 2 must be approached with caution, since the estimates for some industries are likely to have large standard errors.

#### Comparisons of the New Coverage and Membership Estimates

How do the coverage (EEC) and membership (CPS) percentages of unionism compare? By which concept is unionism larger and why? Are there systematic similarities or differences by industry?

One difference in the picture of unionism given by each set of estimates can be observed by deriving comparable weighted average unionism figures for the economy as a whole under the coverage (EEC) and membership (CPS) concepts. Table 3 presents such economy-wide figures for production workers and all workers in the private sector. These estimates show that for both the production and total workforce, the fraction covered by collective bargaining is substantially greater than the fraction who have joined unions.

Table 4 takes the comparison a step further by tabulating the distribution of differences between the percentage of production workers covered by collective bargaining and the percentage who are union members in the 193 3-digit Census industries for which both estimates exist. While

**Extent of Collective Bargaining Coverage and Union Membership  
by 1970 3-Digit Census Industry**

1970 Census Industry Code	Industry Name	Extent of Collective Bargaining Coverage from 1968-72 BEC Surveys		Extent of Union Membership from 1974-75 May CPS Surveys			
		Percent of All Workers	Percent of Pro- duction Workers	Percent of All Workers	Percent of Pro- duction Workers	Number of Work- ers in Sample	Number of Production Workers in Sample
<b>AGRICULTURE, FORESTRY &amp; FISHERIES</b>							
017	Agr. Production	--	--	3	3	2,077	1,986
018	Agr. Services, Exc. Horticultural	0	0	2	3	320	225
019	Horticultural Serv.	7	8	6	7	241	213
027	Forestry	0	0	4	4	22	19
028	Fisheries	0	0	42	45	52	24
<b>MINING</b>							
047	Metal Mining	73	91	57	69	225	178
048	Coal Mining	77	89	71	81	314	271
049	Crude Petroleum & Natural Gas Extractions	14	18	6	9	501	235
057	Nonmetallic Mining & Quarrying; Except Fuel	58	76	30	36	208	172
<b>CONSTRUCTION</b>							
067	General Building Contractors	53	60	33	39	2,341	1,870
068	General Contractors, Except Building	44	51	40	47	1,183	953
069	Special Trade Cont.	56	64	40	45	3,471	2,960
077	Not Specified Const.	--	--	36	48	301	195
<b>MANUFACTURING</b>							
107	Logging	49	52	18	19	253	232
108	Sawmills, Planing Mills, & Mill Wk.	32	35	33	37	700	608
109	Misc. Wood Products	22	25	21	25	211	178
118	Furniture & Fixtures	40	49	26	29	918	748
119	Glass & Glass Prod.	74	92	63	77	394	305
127	Cement, Concrete, Gypsum, & Plaster Products	58	72	42	54	394	293
128	Structural Clay Prod.	69	81	28	36	84	59
137	Pottery & Rel. Prod.	57	65	55	66	52	42
138	Misc. Nonmetallic Min. & Stone Prod.	50	71	41	55	228	169
139	Blast Furnaces, Steel Works, Rolling & Finishing Mills	77	98	72	84	1,104	872
147	Other Primary Iron & Steel Industries	72	86	56	67	629	494
148	Primary Alum. Ind.	61	75	54	64	341	269
149	Other Primary Non- Ferrous Industries	62	78	54	64	467	372
157	Cutlery, Handtools, & Other Hardware	30	40	43	49	256	197
158	Fabricated Struc- tural Met. Prod.	44	58	40	52	1,025	746

1970 Census Industry Code	Industry Name	Percent of All Workers	Percent of Pro- duction Workers	Percent of All Workers	Percent of Pro- duction Workers	Number of Work- ers in Sample	Number of Production Workers in Sample
159	Screw Machine Prod.	5	6	23	30	193	146
167	Metal Stamping	53	65	51	60	275	224
168	Misc. Fabricated Metal Products	55	68	42	53	862	644
169	Not Specified Metal Industries	--	--	57	57	7	7
177	Engines & Turbines	80	99	60	75	174	126
178	Farm Mach. & Equip.	57	77	44	58	378	265
179	Construction & Mate- rial Handling Mach.	53	80	45	65	599	373
187	Metalworking Mach.	32	41	27	36	604	437
188	Office & Acctg. Mach.	7	15	20	35	236	129
189	Elec. Computing Eqpt.	11	15	4	10	410	137
197	Machinery, Except Electrical, n.e.c.	40	57	33	44	1,727	1,194
198	Not Specified Mach.	--	--	22	28	9	7
199	Household Appliances	68	85	49	61	330	252
207	Radio, TV, & Commu- nication Equip.	47	81	35	53	1,168	680
208	Electrical Mach., Eqpt., & Suppl., n.e.c.	32	43	31	41	2,381	1,591
209	Not Specified Elec- trical Machinery, Equip., & Suppl.	--	--	19	29	25	16
219	Motor Vehicles & Motor Veh. Eqpt.	72	98	70	82	1,945	1,553
227	Aircraft & Parts	51	87	40	60	1,018	513
228	Ship & Boat Bldg. & Repairing	65	80	45	52	368	278
229	Railroad Locomotives & Equipment	87	100	75	87	105	81
237	Mobile Dwellings & Campers	25	29	15	18	161	133
238	Cycles & Misc. Transp. Eqpt.	14	15	44	50	91	73
239	Scientific & Con- trolling Inst.	40	60	31	50	292	161
247	Optical & Health Serv. Supplies	29	41	15	24	334	189
248	Photo. Eqpt. & Suppl.	9	16	12	21	216	112
249	Watches, Clocks, & Clockwork-Operated Devices	42	51	35	45	42	34
257	Not Spec. Prof. Eqpt.	--	--	--	--	0	0
258	Ordnance	51	77	39	64	342	176
259	Misc. Mfg. Indust.	41	52	27	34	932	690
268	Meat Products	68	78	45	51	600	495
269	Dairy Products	41	50	41	51	382	290
278	Canning & Preserving Fruits, Vegetables, & Sea Foods	53	65	47	55	480	386
279	Grain-mill Products	44	60	35	49	239	165
287	Bakery Products	58	65	53	59	471	384
288	Confectionery & Related Products	42	53	35	39	140	106

1970 Census Industry Code	Industry Name	Percent of All Workers	Percent of Pro- duction Workers	Percent of All Workers	Percent of Pro- duction Workers	Number of Work- ers in Sample	Number of Production Workers in Sample
289	Beverage Industries	47	62	42	56	450	308
297	Misc. Food Prepara- tion & Kind. Prod.	50	64	31	43	303	198
298	Not Spec. Food Ind.	--	--	0	0	4	1
299	Tobacco Manufactures	61	76	34	42	135	104
307	Knitting Mills	25	26	14	17	412	334
308	Dyeing & Finishing Textiles, Except Wool & Knit Goods	30	36	29	38	102	74
309	Floor Coverings, Exc. Hard Surface	7	8	15	22	77	46
317	Yarn, Thread, & Fabric Mills	19	22	11	12	901	755
318	Misc. Textile Mill Products	43	52	37	40	105	95
319	Apparel & Acces.	49	54	34	37	2,136	1,830
327	Misc. Fabricated Textile Products	43	49	27	31	302	250
328	Pulp, Paper, & Paperboard Mills	72	89	66	79	529	413
329	Misc. Paper & Pulp Products	52	78	44	59	400	285
337	Paperboard contain- ers & Boxes	40	49	46	61	422	311
338	Newspaper Publishing & Printing	42	58	19	48	964	261
339	Printing, Publish- ing, & Allied Ind., Except Newspapers	31	45	22	35	1,549	825
347	Industrial Chemicals	44	74	32	51	663	374
348	Plastics, Synthetics & Resins, Except Fibers	52	84	36	53	197	117
349	Synthetic Fibers	58	84	24	32	167	118
357	Drugs & Medicines	22	41	19	43	354	120
358	Soaps & Cosmetics	27	55	25	43	214	109
359	Paints, Varnishes, & Rel. Products	34	50	25	43	157	76
367	Agr. Chemicals	40	57	24	39	122	69
368	Misc. Chemicals	48	76	27	49	164	82
369	Not Specified Chem.	--	--	26	54	12	4
377	Petroleum Refining	31	63	33	59	408	204
378	Misc. Petroleum & Coal Products	81	100	43	62	54	37
379	Rubber Products	53	72	52	61	567	452
387	Misc. Plastic Prod.	32	42	32	40	598	455
388	Tanned, Curried, & Finished Leather	79	100	31	34	39	36
389	Footwr., Exc. Rubber	40	46	27	31	386	326
397	Leather Products, Exc. Footwear	68	79	36	45	106	82
398	Not Specified Manu- facturing Ind.	--	--	48	44	21	18

1970 Census Industry Code	Industry Name	Percent of All Workers	Percent of Pro- duction Workers	Percent of All Workers	Percent of Pro- duction Workers	Number of Work- ers in Sample	Number of Production Workers in Sample
TRANSPORTATION, COMMUNICATIONS, & OTHER PUBLIC UTILITIES							
407	Railroads & Railway Express Service	97	99	81	90	1,128	710
408	Street Railways & Bus Lines	48	54	42	48	328	259
409	Taxicab Service	41	46	32	34	157	131
417	Trucking Service	61	71	49	57	1,840	1,435
418	Warehousing & Storage	43	56	25	30	214	145
419	Water Transportation	65	80	52	66	285	163
427	Air Transportation	64	89	45	63	700	308
428	Pipe Lines, Except Natural Gas	69	90	26	44	22	13
429	Services Incidental to Transportation	14	47	22	54	205	62
447	Radio Broadcasting & Television	24	65	16	31	264	10
448	Telephone (Wire & Radio)	86	98	57	75	1,894	702
449	Telegraph & Misc. Communication Serv.	42	96	34	43	78	24
467	Elect. Light & Power	57	78	41	56	699	389
468	Electric-Gas Util.	75	89	48	60	268	150
469	Gas & Steam Supply Systems	45	61	35	50	288	145
477	Water Supply	55	38	14	27	51	19
478	Sanitary Services	38	41	22	26	82	66
479	Other & Not Specified Utilities	77	100	42	38	14	10
WHOLESALE & RETAIL TRADE							
507	Motor Veh. & Equip.	9	12	12	27	471	122
508	Drugs, Chemicals, & Allied Products	18	48	8	25	333	67
509	Dry Goods & Apparel	19	50	9	17	164	25
527	Food & Rel. Products	23	33	23	35	898	489
528	Farm Prod.- Raw Mat.	8	8	8	17	159	61
529	Electrical Goods	9	22	8	31	389	62
537	Hardware, Plumbing, & Heating Supplies	23	43	9	30	263	58
538	Not Specified Elec. & Hardware Products	--	--	--	--	0	0
539	Machinery Equipment & Supplies	8	13	8	21	1,208	342
557	Metals & Min., n.e.c.	17 <sup>a</sup>	31 <sup>a</sup>	19	50	145	50
558	Petroleum Products	17 <sup>a</sup>	31 <sup>a</sup>	14	32	293	97
559	Scrap & Waste Mat.	17 <sup>a</sup>	31 <sup>a</sup>	22	28	156	114
567	Alcoholic Beverages	17 <sup>a</sup>	31 <sup>a</sup>	28	44	152	61
568	Paper & its Products	17 <sup>a</sup>	31 <sup>a</sup>	10	32	136	35
569	Lumber & Construction Materials	17 <sup>a</sup>	31 <sup>a</sup>	13	33	232	88
587	Wholesalers, n.e.c.	17 <sup>a</sup>	31 <sup>a</sup>	9	21	720	210
588	Not Specified Wholesale Trade	--	--	5	0	17	1

1970 Census Industry Code	Industry Name	Percent of All Workers	Percent of Pro- duction Workers	Percent of All Workers	Percent of Pro- duction Workers	Number of Work- ers in Sample	Number of Production Workers in Sample
607	Lumber & Bldg. Mate- rial Retailing	13	18	11	19	680	262
608	Hardware & Farm Equip. Stores	3	4	3	4	476	160
609	Department & Mail Order Establ.	11	14	9	13	3,619	619
617	Limited Price Variety Stores	6	5	4	6	383	85
618	Vending Mach. Oper.	27	35	18	24	109	81
619	Direct Selling Estab.	31	36	2	17	389	12
627	Misc. General Mer- chandise Stores	0	0	4	9	252	40
628	Grocery Stores	49	53	35	39	3,125	1,392
629	Dairy Product Stores	19	20	2	4	97	25
637	Retail Bakeries	12	13	10	17	189	77
638	Food Stores, n.e.c.	20	23	10	17	199	75
639	Motor Veh. Dealers	10	13	8	13	1,528	731
647	Tire, Battery, & Acces. Dealers	5	8	5	13	415	144
648	Gas Service Stations	2	2	4	4	998	827
649	Misc. Veh. Dealers	1	2	4	5	183	73
657	Apparel & Accessories Stores, Except Shoe Stores	9	11	7	15	999	142
658	Shoe Stores	3	4	9	8	216	14
667	Furniture & Home Furnishings Stores	11	12	8	13	644	279
668	Household Appliances, TV, & Radio Stores	4	6	5	8	337	91
669	Eating & Drinking Pl.	8	8	7	8	5,677	4,829
677	Drug Stores	9	11	7	7	791	131
678	Liquor Stores	3	4	2	4	167	25
679	Farm & Garden Supply Stores	18	20	2	4	251	132
687	Jewelry Stores	0	0	2	4	163	40
688	Fuel & Ice Dealers	10	10	20	30	148	97
689	Retail Florists	2	2	3	4	190	111
697	Misc. Retail Stores	7	8	2	3	971	217
698	Not Specified Retail Trade	--	--	9	0	24	0
FINANCE, INSURANCE, & REAL ESTATE							
707	Banking	1	8	2	8	2,289	113
708	Credit Agencies	0	0	2	0	718	16
709	Security, Commodity Brokerage, & Investment Companies	2	0	2	0	407	8
717	Insurance	7	46	4	4	2,683	65
718	Real Estate, Inclu- ding Real Estate Insurance-Law Off.	19	30	8	21	1,642	493

1970 Census Industry Code	Industry Name	Percent of All Workers	Percent of Pro- duction Workers	Percent of All Workers	Percent of Pro- duction Workers	Number of Work- ers in Sample	Number of Production Workers in Sample
<b>BUSINESS &amp; REPAIR SERVICES</b>							
727	Advertising	8	37	8	41	227	25
728	Services to Dwellings & Other Buildings	22	23	26	29	384	331
729	Commercial Research, Dev. & Testing Labs	8 <sup>b</sup>	11 <sup>b</sup>	4	17	166	23
737	Employment & Temporary Help Agencies	7	7	4	15	249	47
738	Business Management & Consulting Serv.	8 <sup>b</sup>	11 <sup>b</sup>	2	21	216	10
739	Computer Programming Services	8 <sup>b</sup>	11 <sup>b</sup>	3	0	175	8
747	Detective & Protec- tive Services	8 <sup>b</sup>	11 <sup>b</sup>	16	18	290	234
748	Business Serv., n.e.c.	7	10	7	16	830	231
749	Auto Services, Except Repair	2	2	16	21	299	175
757	Auto Repair & Related Services	12	14	7	8	666	575
758	Elec. Repair Shops	4	6	19	25	173	124
759	Misc. Repair Serv.	10	12	16	18	281	230
<b>PERSONAL SERVICES</b>							
769	Private Households	--	--	1	1	3,944	3,923
777	Hotels & Motels	23	25	16	21	1,034	711
778	Lodging Places, Exc. Hotels & Motels	0	0	1	1	178	129
779	Laundering, Cleaning, & Other Garment Serv.	29	31	20	25	716	489
787	Beauty Shops	0	0	3	3	590	567
788	Barber Shops	15	15	23	23	85	84
789	Shoe Repair Shops	0	0	0	0	11	8
797	Dressmaking Shops	0	0	0	0	6	5
798	Misc. Personal Serv.	0	0	6	7	288	89
<b>ENTERTAINMENT &amp; RECREATION SERVICES</b>							
807	Theaters & Motion Pictures	33	41	33	31	399	111
808	Bowling Alleys, Bil- liard & Pool Parlors	7	8	4	6	112	74
809	Misc. Entertainment & Recreation Services	3	4	9	9	722	470



1970 Census Industry Code	Industry Name	Percent of All Workers	Percent of Pro- duction Workers	Percent of All Workers	Percent of Pro- duction Workers	Number of Work- ers in Sample	Number of Production Workers in Sample
PROFESSIONAL & RELATED SERVICES							
828	Offices of Physicians	4	0	2	3	850	184
829	Offices of Dentists	0	0	1	1	413	243
837	Offices of Chiro- practores	--	--	0	0	25	9
838	Hospitals	9	10	9	12	4,015	1,671
839	Convalescent Institutions	3 <sup>c</sup>	4 <sup>c</sup>	8	9	1,350	1,076
847	Offices of Health Practitioners, n.e.c.	3 <sup>c</sup>	4 <sup>c</sup>	0	0	60	15
848	Health Services, n.e.c.	0	0	2	4	345	107
849	Legal Services	2	0	1	13	590	10
857	Elementary & Secondary Schools	3	12	6	6	1,279	326
858	Colleges & Univs.	4	17	6	15	1,058	214
859	Libraries	--	--	0	0	26	1
867	Educational Services, n.e.c.	0	0	4	0	188	26
868	Not Specified Educational Serv.	--	--	0	0	4	0
869	Museums, Art Gal- leries, & Zoos	0	0	5	13	44	17
877	Religious Orgs.	0	0	2	1	1,031	251
878	Welfare Services	8 <sup>d</sup>	4 <sup>d</sup>	4	5	226	51
879	Residential Welfare Facilities	8 <sup>d</sup>	4 <sup>d</sup>	10	14	119	72
887	Nonprofit Membership Organizations	16	8	19	14	776	195
888	Engineering & Architectural Serv.	2	13	3	23	646	43
889	Accounting, Auditing, & Bookkeeping Serv.	0	0	2	17	406	6
897	Misc. Professional & Related Services	3	0	4	13	154	8

<sup>a</sup>This figure was based on the corresponding EEC figure for 1967 SIC industry 509.

<sup>b</sup>This figure was based on the corresponding EEC figure for 1967 SIC industry 739.

<sup>c</sup>This figure was based on the corresponding EEC figure for 1967 SIC industry 809.

<sup>d</sup>This figure was based on the corresponding EEC figure for 1967 SIC industry 867.

Table 3:

Mean Unionism for Production Workers and for All Workers  
Under the Coverage (EEC) and Membership (CPS) Concepts

	Membership (CPS)	Coverage (EEC)
Production Workers	36.3% <sup>a</sup> (33.3) <sup>b</sup>	45.1% <sup>a</sup> (42.6) <sup>d</sup>
All Workers	23.7% <sup>a</sup> (22.6) <sup>c</sup>	29.8% <sup>a</sup> (30.8) <sup>d</sup>

Notes:

<sup>a</sup>This estimate is a weighted average of the percentages in the 193 1970 3-digit Census industries for which both EEC and CPS figures could be derived; the weights were based on weighted counts of employees (production, for the production worker estimates and all, for the all workers estimates), represented in the 1973, 1974, and 1975 May CPS surveys.

<sup>b</sup>This estimate is a weighted average comparable to that described in a, based on the 205 industries for which production worker membership percentages could be derived.

<sup>c</sup>This estimate is a weighted average comparable to that described in a, based on the 207 industries for which all worker membership percentages could be derived.

<sup>d</sup>This estimate is a weighted average of the percentage covered in 1967 3-digit SIC industries based on the 328 industries for which production worker coverage percentages could be derived or the 339 industries for which all worker coverage percentages could be derived. Each industry's weight was based on EEC weighted counts of production or total employees multiplied by the ratio of total employment in U.S. Bureau of the Census, County Business Patterns, 1970, to the EEC weighted total employee count.

the two sets of figures are reasonably highly correlated ( $r = .87$  for production workers;  $r = .89$  for all workers), there are noticeable systematic differences in the patterns of organization shown by sector. Overall, Table 4 shows that in 124 out of the 193 industries, the EEC-based coverage percentage for production workers was greater (in many cases substantially) than the comparable CPS-based union membership percentage. Interestingly, Table 4 also demonstrates that while the coverage estimates are more likely to be greater than the membership figures in the "traditional" union sectors (mining, construction, manufacturing, and transportation, communications, and other public utilities (1970 Census codes 047-479)), this is not the case in the "traditional" non-union sectors (agriculture, forestry and fisheries, wholesale and retail trade, finance, insurance and real estate, business and repair services, personal services, and entertainment and recreation (codes 017-028 and 507-897)).

#### Reasons for Differences

There are three potential reasons why the EEC-based coverage percentages are on average larger than the comparable CPS-based membership percentages. First, since many union-management agreements do not have union security provisions and at least some workers may choose not to join unions in their absence, it can be expected that some covered production (or nonproduction) workers will not be union members. Second, as suggested earlier, the individual responding to the CPS survey might have a tendency to state that other family members are not union members when in fact they are. Third, even though a majority of an establishment's production (or nonproduction) workers are covered by union-management agreements, all of the workers may not be so covered.

Table 4:

Counts of 3-Digit 1970 Census Industries by Absolute Difference  
Between Coverage by Collective Bargaining Agreement (EEC)  
and Union Membership (CPS) Percentages for Production Workers

Difference in Percentages	All Industries	Industries in Traditional Union Sectors <sup>a</sup>	Industries in Traditional Nonunion Sectors <sup>b</sup>
40 or more	8	7	1
30 to 39.9	7	6	1
20 to 29.9	18	17	1
10 to 19.9	49	40	9
0 to 9.9	42	18	24
-.1 to -9.9	50	8	42
-10 to -19.9	14	2	12
-20 to -29.9	3	2	1
-30 to -39.9	1	1	0
-40 or less	1	0	1
Total EEC > CPS	124	88	36
Total CPS > EEC	69	13	56

<sup>a</sup> Mining; construction; manufacturing; transportation, communications and other public utilities.

<sup>b</sup> Agriculture; forestry and fisheries; wholesale and retail trade; finance, insurance and real estate; business and repair services; personal services; entertainment and recreation.

Table 5 uses data from the 1971 National Longitudinal Surveys (NLS), which contains a question relating to the membership of workers covered by collective contracts, to assess the first of these possibilities. The NLS data suggest that a significant fraction of all workers who are covered by collective bargaining agreements are not union members, and that younger, female or Southern workers are especially likely not to be union members even though the union is representing them. While the NLS sample is drawn from groups encompassing only half of all employees, the NLS age-sex boundaries would seem to permit a reasonable estimate for the employed labor force as a whole. When the percentage for each age-sex category is weighted by the category's fraction of the employed civilian labor force in 1970,<sup>15</sup> membership is about 17.5 percent less than coverage. If this were the sole reason for the difference between membership and coverage estimates, the membership percentage would be 5.3 percentage points less than the coverage percentage. Thus, more than 85 percent of the 6.1 percentage point divergence between the CPS and EEC all-worker unionism figures is most likely explicable by the fact that many covered workers do not join unions, presumably because a relatively large number of contracts (17 percent, according to the latest BLS tabulation of major collective bargaining contracts)<sup>16</sup> do not contain union security clauses.

With respect to the second possible explanation, it appears that some of the divergence between the CPS and EEC unionism estimates that cannot be explained by the membership status of covered employees can be explained by reporting errors on the part of CPS respondents. This claim is based on a comparison of the CPS membership percentages with membership statistics provided to BLS by unions. The percentage of the employed private sector civilian labor force in unions in 1974 according to the reports of the worker organizations was 26.4,<sup>17</sup> which is moderately above the 22.6 percent estimate based on the 1973 to 1975 May CPS surveys. However, because some unions include the unemployed and retired in their membership counts,

Table 5:

Collective Bargaining Coverage by Union Membership:

Data from 1971 National Longitudinal Surveys

		MEN	
		<u>19-29 years old</u>	<u>50-64 years old</u>
		Percent of those employed at interview date and covered by collective bargaining who belong to union*	Percent of those employed at interview date and covered by collective bargaining who belong to union
Total		85	94
South		78	88
Non-South		86	96
		WOMEN	
		<u>18-28 years old</u>	<u>34-48 years old</u>
		Percent of those employed at interview date and covered by collective bargaining who belong to union*	Percent of those employed at interview date and covered by collective bargaining who belong to union*
Total		71	85
South		64	82
Non-South		72	85

\*This percent is based on weighted counts; the weights correct for the oversampling of blacks in the NLS surveys.

it is difficult to use this difference to assess the magnitude of under-reporting on the part of CPS respondents.

Finally, bargaining units that encompass less than 100 percent of an establishment's production or non-production employees undoubtedly also contribute to explaining the difference. Unfortunately, at present the contribution of this factor cannot be quantified.

As Table 4 indicates, despite the overall pattern of greater unionization implied by the coverage as opposed to the membership data, in over 60 percent of traditionally non-union industries, the CPS-based membership figures are larger than the corresponding EEC-based coverage figures. There are three potential explanations of why the CPS estimates are often greater than the EEC estimates in these industries. First, collective bargaining units which include less than one half of all production workers are probably more common in the traditionally non-union industries. Second, when unions achieve recognition in the traditionally non-union sectors, they are more likely to demand and receive union security agreements. In 1975, 92 percent of the major (more than 1,000 workers) contract workforce in the traditionally non-union sectors of wholesale trade, retail trade, hotels and restaurants, services, and miscellaneous non-manufacturing were covered by agreements with a union shop or modified union shop provision, whereas only 64 percent of the major contract workforce in the traditionally union sectors of manufacturing, mining, crude petroleum and natural gas, transportation, communication, utilities, and construction were covered by agreements with either of these provisions. While this could not explain membership greater than coverage, it would be expected to move the two closer together.

Finally, as stated above, the EEC and CPS classifications treat one important occupational group differently. By the EEC definition, sales workers operating inside establishments are nonoffice or production employees. In the classification used in tabulating the CPS data, all sales workers are treated as non-production workers. Since sales workers are especially important in the traditional nonunion sectors and are likely to be less organized than other nonoffice workers, this difference is a possible explanation of the observed sectoral pattern of divergences between the EEC and CPS estimates. One way of assessing the importance of this difference in classifications is to contrast the percentage point differences in coverage and membership for all workers with those for production workers only. If the definitional differences were the sole source of the lower EEC estimates, the EEC-based and CPS-based all-worker figures would be expected to differ in a similar way in both the traditionally union and traditionally nonunion industries. The all-worker differences do indeed show a much less marked sectoral pattern than is given in Table 4. The all-worker coverage figure is higher than the membership figure in 91 out of 101 traditionally union industries and in 52 out of 92 traditionally nonunion industries, compared to 88 out of 101 and 36 out of 92 for production workers. Thus, it appears that some, but not all, of the differential pattern in membership and coverage is attributable to the inside sales worker problem.

#### Comparison with Previous Estimates

In addition to examining the systematic relationships between the EEC-based and CPS-based estimates, it is also fruitful to compare the new figures with some of the earlier figures discussed above. Our comparisons will be with the estimates of Weiss, Fuchs and Douty.



The correlation coefficient between Weiss' union coverage estimates for 80 industries in 1963 and our comparable production worker EEC estimates is .71. A simple tabulation shows that Weiss' figures exceed ours in 50 industries, while ours are larger in 30 industries. Weiss did not calculate a weighted average unionism figure based on the industries in his sample. We derived this number using 1960 Census industry employment weights multiplied by the ratio of production workers to all workers in each industry; it equals 70.0. The comparable weighted average of our new coverage estimates for the 80 industries in the Weiss sample is 64.3.

The correlation coefficient between our CPS membership estimates (which appear most comparable to those of Fuchs) and Fuchs' percentage unionized estimates is .82. In 84 out of the 131 industries for which both figures exist, Fuchs' estimate of membership exceeds ours. The 1960 Census employment weighted average of membership percentages for the 131 industries is 31.3 percent with Fuchs' figures and 26.3 percent with ours. Because Fuchs assumed that no nonproduction workers are unionized, however, these comparisons are biased toward showing our figures to be closer to his figures. We adjusted for this bias by recalculating our membership percentages for Fuchs' 131 industries under his assumption that no nonproduction workers were unionized. Under this assumption, our figures are smaller than his in 91 out of the 131 industries and our weighted average unionism figure of 21.9 percent is 9.4 percentage points below his.

Finally, Table 6 presents our 2-digit SIC coverage (EEC) and membership (CPS) percentages for manufacturing production workers and Douty's estimates for 1958. Since Douty's figures pertain to coverage, the relevant comparison is between our EEC-based estimates and his. As the table indicates, Douty's estimate of the percentage of production workers covered by collective bargaining in all manufacturing in 1958 (67) is significantly larger than our

Table 6:  
Comparison of Douty and Freeman-Medoff Estimates of the Extent of  
Unionization of Production Workers in U.S. Manufacturing Industries

INDUSTRY GROUPS (SIC NUMBER)	Extent of Collective Bargaining Coverage (percent)		Extent of Union Membership (percent)
	Douty (1958)	Freeman-Medoff (1968-72)	Freeman-Medoff (1973-75)
All Manufacturing	67	61	49
Ordnance & Accessories (19)	84	77	64
Food & Kindred Products (20)	68	65	52
Tobacco Manufactures (21)	63	76	42
Textile Mill Products (22)	30	26	17
Apparel & Other Finished Textile Products (23)	60	53	36
Lumber & Wood Products (24)	44	35	30
Furniture & Fixtures (25)	50	49	29
Paper & Allied Products (26)	76	72	67
Printing, Publishing, & Allied Industries (27)	65	49	38
Chemicals & Allied Products (28)	65	68	46
Products of Petroleum & Coal (29)	89	74	59
Rubber Products (30)	81	56	51
Leather & Leather Products (31)	49	57	34
Stone, Clay, & Glass Products (32)	78	78	62
Primary Metal Industries (33)	89	88	73
Fabricated Metal Industries (34)	71	56	51
Machinery, Except Electrical (35)	68	57	46
Electrical Machinery (36)	73	58	46
Transportation Equipment (37)	87	87	71
Instruments & Related Products (38)	52	44	33
Miscellaneous Manufacturing Industries (39)	54	52	34

EEC-based percentage (61). Moreover, in only 3 out of the 21 2-digit SIC manufacturing industries is our estimate of production worker unionism above his.

The comparisons of our unionization estimates for the period since the late 1960's with Douty's 1958 estimates, Weiss' 1963 estimates and Fuchs' early sixties estimates<sup>18</sup> are consistent with the dwindling of U.S. private sector unionism that has been occurring since the mid 1950's.<sup>19</sup> Moreover, they indicate that explanations of the current trend in the percentage organized in the U.S. based solely on changes in the industrial and (broad) occupational composition of the labor force are incomplete. Thus, our new estimates of the industrial locus of unionism have raised an important question: Why has unionization been declining within detailed industries in the private sector?

FOOTNOTES

<sup>1</sup>Leo Troy, Distribution of Union Membership among the States, 1939 and 1953, (NBER, Occasional Paper 56, 1957). Unpublished estimates by Leo Wolman and Leo Troy also exist. BLS union surveys are reported in its Labor Union Directory, 1953, 1955, and 1957; see also its Wage Structure series.

<sup>2</sup>The EEC survey is described in U.S. Department of Labor, Bureau of Labor Statistics, BLS Handbook of Methods for Surveys and Studies, (Bulletin 1910) (Washington, D.C.: U.S. Government Printing Office, 1976).

<sup>3</sup>For example, H.M. Douty, "Collective Bargaining Coverage in Factory Employment, 1958," Monthly Labor Review, Vol. 83, No. 4 (April, 1960), p. 345 states, "In the aggregate, situations involving minority coverage are believed to affect comparatively few workers."

<sup>4</sup>See H.G. Lewis, Unionism and Relative Wages in the United States, (Chicago: University of Chicago Press, 1963), pp. 262-264, for a good discussion of the problems with these data.

<sup>5</sup>Ibid., p. 251.

<sup>6</sup>Ibid., pp. 271-273.

<sup>7</sup>Ibid., p. 252.

<sup>8</sup>Douty, "Collective Bargaining Coverage in Factory Employment, 1958," pp. 348-349.

<sup>9</sup>Leonard W. Weiss, "Appendix to 'Concentration and Labor Earnings' American Economic Review, March 1966," (Unpublished Paper: University of Wisconsin, 1966), p. 10. This appendix presents the following results from a regression of Douty's 2-digit SIC manufacturing unionization percentages on Lewis':  
Douty's Estimate = 26.6 + .88 Lewis' Estimate;  $r = .79$ .

<sup>10</sup>Ibid., pp. 6-11 details his amalgamation procedure.

<sup>11</sup>Victor R. Fuchs, The Service Economy, (New York: National Bureau of Economic Research, 1968), p. 251.

<sup>12</sup>U.S. Department of Labor, Bureau of Labor Statistics, Employee Compensation in the Private Nonfarm Economy, 1970, (Bulletin 1770) (Washington, D.C.: U.S. Government Printing Office, 1973), p. 59.

<sup>13</sup>Ibid.

<sup>14</sup> The EEC figures were also used to derive estimates for 1960 Census industries, which are available upon request.

<sup>15</sup> The labor force estimate is based on U.S. Bureau of the Census, Census of Population: 1970, Detailed Characteristics, United States Summary, (Washington, D.C.: U.S. Government Printing Office, 1973), Table 215.

<sup>16</sup> U.S. Department of Labor, Bureau of Labor Statistics, Characteristics of Major Collective Bargaining Agreements, July 1, 1975 Bulletin 1957, Table 2.1, p. 16.

<sup>17</sup> Total U.S. union membership in the private sector was 18,663,000 in 1974, U.S. Department of Labor, Bureau of Labor Statistics, Directory of National Unions and Employee Associations, 1975 (Bulletin 1937), (Washington, D.C.: U.S. Government Printing Office, 1977), p. 71. Total U.S. private sector employment of 70,665,000 was calculated as total jobs less the number of persons who are primarily self-employed or unpaid family workers, Employment and Training Report of the President, 1977, (Washington, D.C.: U.S. Government Printing Office, 1977), pp. 165 and 259.

<sup>18</sup> The Fuchs estimates were based primarily on the Weiss estimates for 1963, in conjunction with the older Lewis estimates, before publication in 1968 Fuchs' estimates were submitted to Lewis for adjustments. They probably reflect the situation in the early sixties.

<sup>19</sup> This issue is addressed in R.B. Freeman and J.L. Medoff, "Where Have All the Members Gone? The Dwindling of Private Sector Unionism in the United States" (Unpublished Paper: Harvard University, October 1976) and What Do Unions Do? (New York: Basic Books, forthcoming).