ONLINE SUPPLEMENT

Parallel Analyses of the CPS

This supplement describes a parallel analysis of data from the 1983 to 2002 Social and Economic Supplements of the CPS (King et al. 2010). The CPS is based on annual representative samples of the non-institutionalized adult population in the U.S. It includes data on basic employment and demographic characteristics as well as detailed information on personal income. This analysis, by corroborating key findings from the main text, is intended to attenuate possible concerns about measurement limitations in the GSS. Although the GSS contains more precise measures of workplace ownership and authority relations, it uses a less accurate interval measure of personal income and is based on smaller samples than the CPS. If key substantive findings can be replicated with alternative samples and measures, this bolsters confidence in their validity. This analysis focuses on the 980,841 respondents from the 1983 to 2002 CPS waves who were 18 to 65 years old and worked full-time during the previous calendar year. This is the period and sample for which a consistent proxy measure of social class can be constructed in the CPS.

Unlike the GSS, the CPS uses an extensive battery of questions to measure income in nominal dollars from employment, businesses, farm operations, and different types of investments. These amounts are then summed to arrive at a measure of personal market income. In the public-use CPS files, very high incomes are topcoded to protect respondent anonymity. These topcoded values are replaced with group means of the uncensored income values above the topcoding threshold, which were computed from restricted-use CPS files and publically reported with special permission by Larrimore et al. (2008). Nominal incomes are adjusted for price inflation using the Consumer Price Index, with all values expressed in 2011 dollars, and a

small number of respondents who report implausibly low annual incomes are truncated (<5000 real dollars). All analyses are based on the natural log transformation of income.

Similar to the GSS, the CPS records a respondent's self-employment status, but it does not directly inquire about a respondent's authority at work. Instead, it asks about a respondent's occupation, which indirectly provides at least some information about supervisory and managerial powers because these social relations are partially expressed through the technical division of labor. Thus, together with information on self-employment, occupational data can be used to construct a proxy measure of social class. Specifically, CPS respondents are classified as proprietors if they are self-employed in an occupation that typically involves supervisory or managerial responsibilities; as independent producers if they are self-employed in an occupation that does not typically involve supervisory or managerial responsibilities; as managers if they work for someone else in an occupation that typically involves supervisory or managerial responsibilities; and as workers if they are employed by someone else in an occupation that does not typically involve supervisory or managerial responsibilities.

To determine which occupations "typically involve supervisory or managerial responsibilities," detailed occupational categories were first collapsed into more aggregate groups to yield sufficiently large sample sizes. Then, these occupational groups were cross-tabulated with respondent reports of supervisory authority from the GSS. This cross-tabulation is presented in the left-hand columns of Table A.1, with occupational groups sorted in descending order based on the percentage of respondents who reported that they supervise others at work. The right-hand column of Table A.1 provides a list of the detailed SOC codes used to construct each aggregate occupational group. Occupational groups in which more than 50 percent of respondents reported that they supervise others at work are defined to "typically involve

supervisory or managerial responsibilities," and thus respondents in these occupations are classified as either proprietors or managers, depending on their self-employment status. Occupational groups in which less than 50 percent of respondents reported supervising others at work are defined to not typically involve supervisory or managerial responsibilities, and thus respondents in these occupations are classified as either independent producers or workers, depending on their self-employment status.

This occupation-based proxy measure of social class is subject to known error. It misclassifies (1) respondents who have control over the work activities of others but are in occupations that do not typically involve supervisory or managerial responsibilities and (2) respondents who do not have any control over the work activities of others but are in occupations that do typically involve supervisory or managerial responsibilities. Table A.2 presents misclassification rates computed from the GSS, which give the percentage of respondents classified differently under the direct versus occupation-based proxy measure of social class. These rates indicate that the occupation-based proxy measure misclassifies about 30 percent of respondents overall. Furthermore, the class-specific rates indicate that independent producers are especially prone to measurement error, as more than 40 percent of this group as defined by the occupation-based proxy measure consists of misclassified proprietors. This pattern of measurement error together with evidence of increasing social class inequality within occupational categories from the GSS suggests that results from the CPS will significantly understate the level of growth in social class inequality. But despite these known limitations, occupational categories still capture at least some information about workplace authority, and thus results from the CPS based on this occupational proxy measure should roughly track those from the GSS.

Figure A.1 displays trends in mean log income computed from the CPS. The upper panel of the figure displays unadjusted estimates separately for each social class position, and the lower panel displays covariate-adjusted estimates computed from a multivariate model with controls for age, race, gender, education, and geographic region. Specifically, the upper panel of Figure A.1 shows that incomes for proprietors and managers increased by about 18 and 14 percent, respectively, between 1983 and 2002, while incomes for workers increased by just 6 percent over the same time period. These trends are fairly consistent with those estimated from the GSS. In stark contrast to results from the GSS, Figure A.1 indicates that incomes for independent producers increased by about 20 percent, on average, between 1983 and 2002. This anomaly is almost certainly due to the large number of proprietors misclassified as independent producers under the occupational proxy measure of social class. The lower panel of Figure A.1 indicates that divergent income trends between social classes are not simply due to potentially confounding demographic or human capital characteristics.

Figure A.2 displays CPS estimates of total income inequality between social classes as indicated by the mean squared deviation of the estimated class means from the estimated population mean. This metric is scaled to equal one in 1983, and all values thereafter represent proportionate changes. Point estimates indicate that unadjusted income differences between social class positions increased by about 36 percent and that covariate-adjusted income differences more than doubled between 1983 and 2002. Note that these trends are significantly attenuated by what is almost certainly an erroneous pattern of strong income growth observed among independent producers. As a comparative reference, Figure A.2 also displays estimates quantifying growth in income differences between education levels, which indicate that they increased by more than twofold. These results are generally consistent with those from the GSS,

although they indicate a less pronounced level of growth in social class inequality over time. This is expected given the known limitations of the occupational proxy measure of social class.

Figure A.3 displays the trend in total variance of log income computed from the CPS, and Table A.3 decomposes this trend into compositional, between-class, and within-class effects. Between 1983 and 2002, the total variance increased by about 30 percent, from 0.36 to 0.47, in the CPS. Results from the decomposition analysis indicate that compositional changes in the relative sizes of social classes had a negligible dampening effect and that changes in between-class income differences had a modest inflationary effect on the trend in total income inequality. For example, estimates indicate that growth in between-class income differences explains 11 percent of the increase in personal income inequality between 1983 and 2002, and 15 percent of the increase between 1990 and 2002. These results are consistent with those from the GSS.

Figure A.4 displays counterfactual variance estimates that quantify the net effects of changes in income differences between social classes and education levels on trends in personal income inequality in the CPS. In contrast to the observed variance, which increased by about 30 percent from 1983 to 2002, the counterfactual estimates quantifying the between-class effect indicate that the variance of log income would have increased by only 25 percent, from 0.36 to 0.45, if income differences between social class positions had remained unchanged at their 1983 level. The counterfactual estimates quantifying the between-education effect indicate that the variance of log income would have increased by about 20 percent, from 0.36 to 0.43, if income differences between education levels had remained unchanged at their 1983 level. This suggests that increasing income returns to education had a somewhat larger effect on trends in personal income inequality than increasing income differences between social classes, although the between-class effect is muted in the CPS due to known patterns of measurement error.

In sum, results from the CPS, which are based on a more precise measure of personal income but a less precise proxy measure of social class, are generally consistent with results from the GSS. Analyses of both datasets suggest a significant increase in social class inequality driven by growing incomes for proprietors and managers, and stagnating incomes for workers. Both datasets also suggest that these changes had a significant inflationary effect on population-level trends in personal income inequality. It is unlikely that these general patterns are due to unknown measurement limitations.

Table A.1. Summary of the Occupational Proxy Measure of Social Class

Occupational group	Pct w/ Auth.	Proxy Coding		1980/1990 SOCs
		Self-employed	Employed	
Production/trade supervisors	86.05	Proprietor	Manager	503,553-8,613,633,803,823,843
Office/clerical supervisors	82.90	Proprietor	Manager	303-7,413-5,433,448,456
FIRE/sales professionals	76.38	Proprietor	Manager	243-55
Jurists	72.92	Proprietor	Manager	178-9
Execs, managers, administrators	72.84	Proprietor	Manager	3-22,23-37
Clergy	70.97	Proprietor	Manager	176
Farm/agricultural managers	69.23	Proprietor	Manager	475-7,485
Health professionals	67.56	Proprietor	Manager	84-9,96
Construction/extraction trades	49.55	Ind. Producer	Worker	563-99,615-7
Architects, engineers	43.00	Ind. Producer	Worker	43-59
Farmers, agricultural workers	40.86	Ind. Producer	Worker	473-4,479-84,486-98
Writers, artists, entertainers	37.94	Ind. Producer	Worker	183-99
Social/recreational workers	33.33	Ind. Producer	Worker	174-5,177
Mechanics	32.71	Ind. Producer	Worker	505-49
Scientists	32.26	Ind. Producer	Worker	63-83,166-73
Precision production workers	30.03	Ind. Producer	Worker	634-99
Sales workers	29.95	Ind. Producer	Worker	256-85
Technicians and programmers	28.36	Ind. Producer	Worker	213-35
Vehicle/machine operators	26.38	Ind. Producer	Worker	703-79,804-13,824-9,844-59
Clerical workers	26.12	Ind. Producer	Worker	308-89
Teachers	25.70	Ind. Producer	Worker	113-65
Other laborers	24.59	Ind. Producer	Worker	863-89
Fabricators, inspectors	23.36	Ind. Producer	Worker	783-99
Service workers	20.07	Ind. Producer	Worker	403-7,416-31,434-47,449-55,457-69
Nurses, health techs	11.93	Ind. Producer	Worker	95,97-106,203-8

Notes: The percentages of respondents with supervisory authority come from GSS respondents who are 18 to 65 years old and work full-time in the 1988 to 2010 waves.

Table A.2. Misclassification Rates for Occupational Proxy Measure of Social Class

Class Position	Misclassification Rate
Workers	0.27
Ind. producers	0.42
Managers	0.32
Proprietors	0.34
Total	0.30

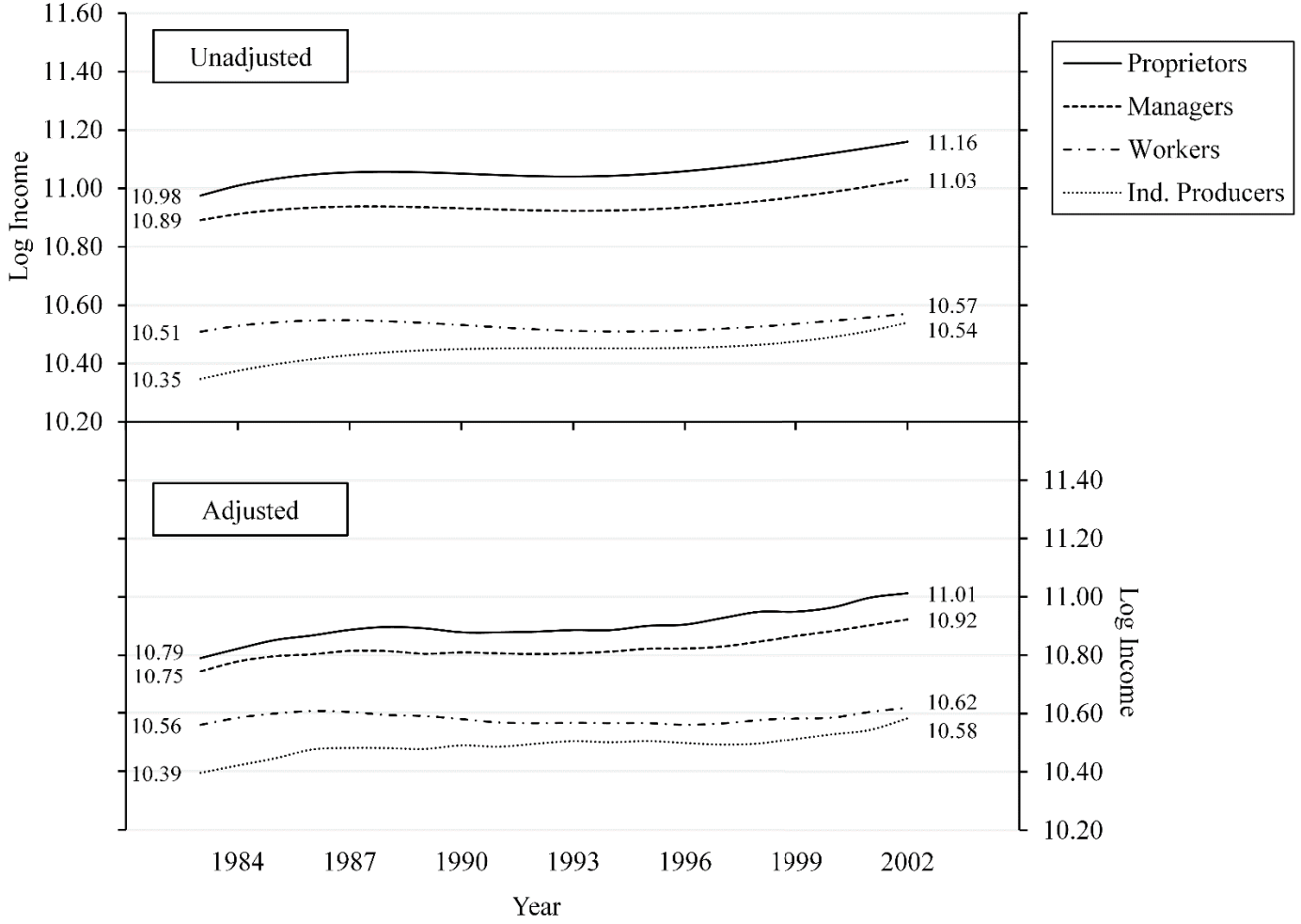
Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1988 to 2010 GSS waves. Misclassification rates give the percentage of respondents classified differently under the direct versus occupational proxy measure.

Table A.3. Decomposition of Trends in Personal Income Inequality by Social Class Position

Period	Compositional effect	Between-class effect	Within-class effect
	Point est.	Point est.	Point est.
1983 to 1990	–0.03	0.05	0.98
1983 to 1995	–0.02	0.06	0.95
1983 to 2002	–0.01	0.11	0.90
1990 to 1995	–0.02	0.08	0.93
1990 to 2002	–0.02	0.15	0.87

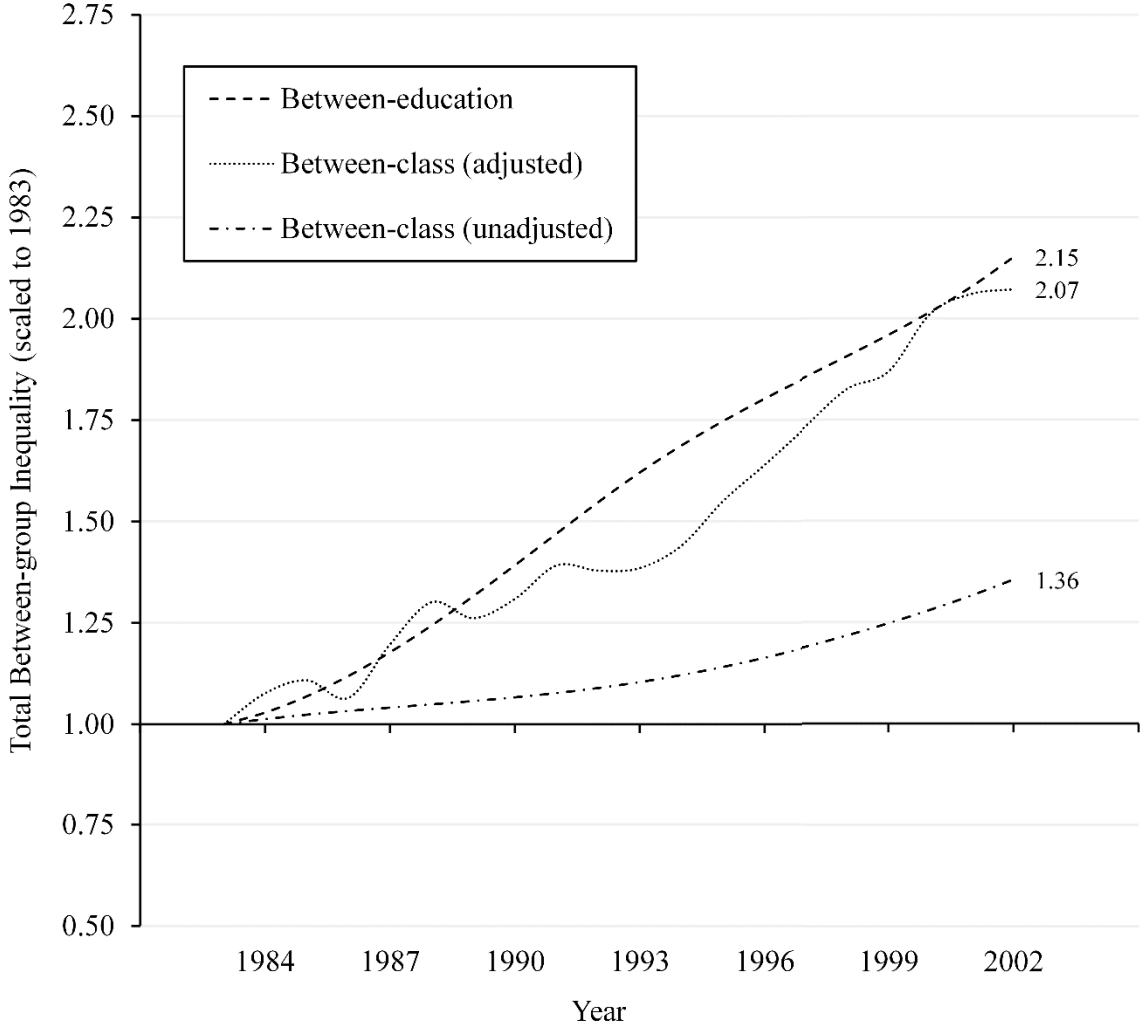
Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1983 to 2002 CPS waves. Results are based on 10 multiple imputation datasets.

Figure A.1. Income Trends by Social Class Position (Occupational Proxy Measure)



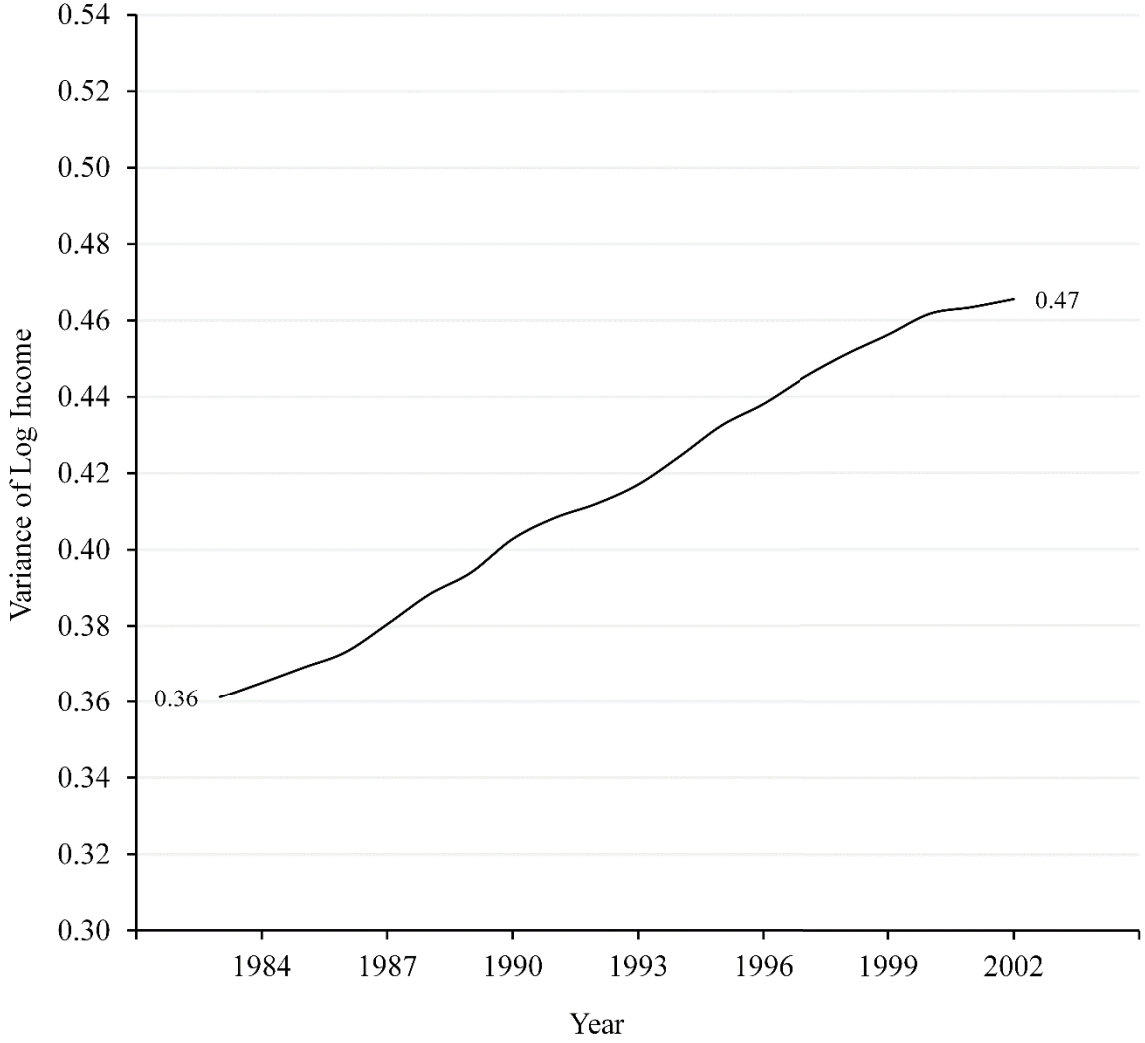
Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1983 to 2002 CPS waves. Results are combined estimates from 10 multiple imputation datasets.

Figure A.2. Trends in Between-class Income Differences (Occupational Proxy Measure)



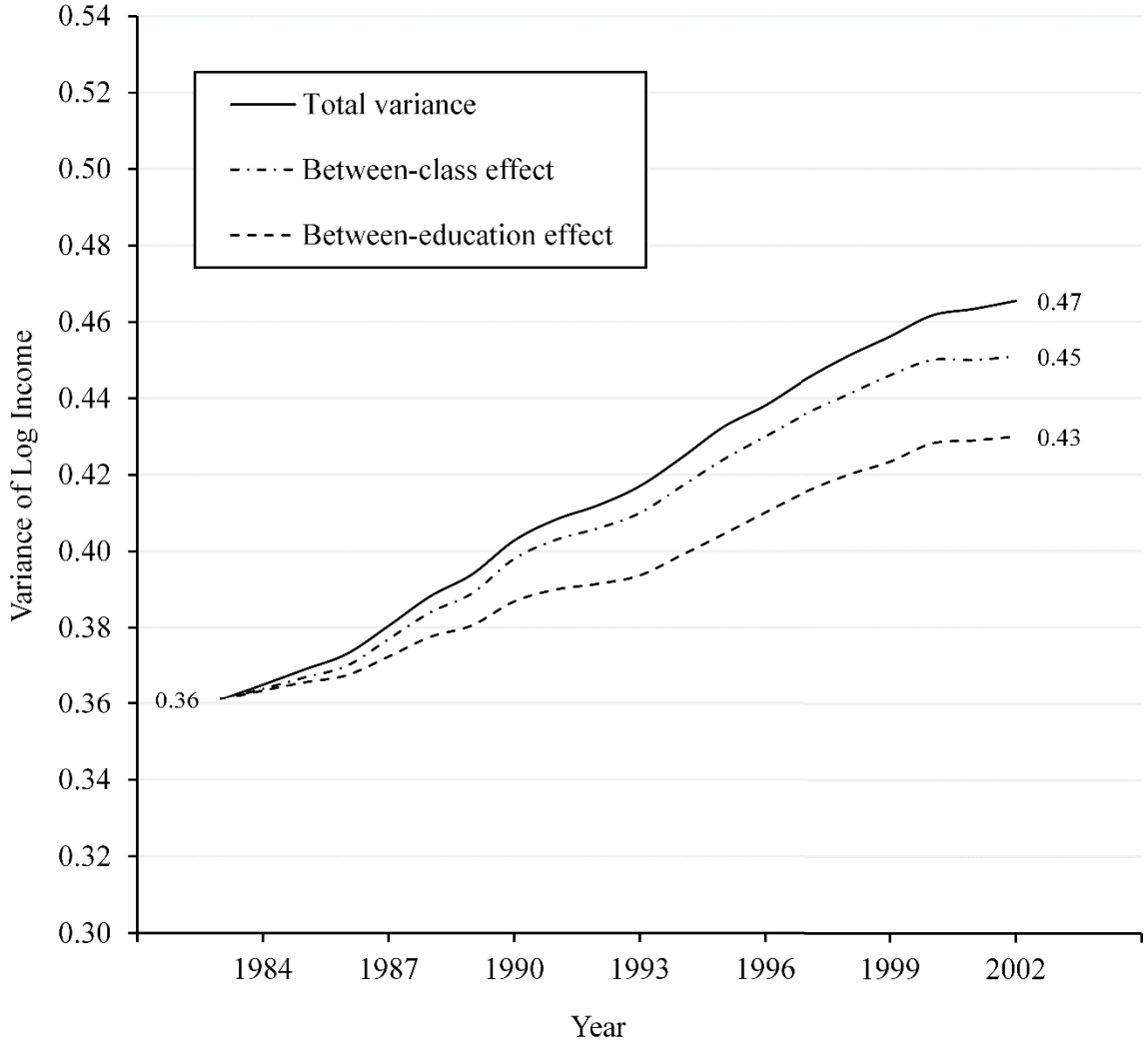
Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1983 to 2002 CPS waves. Results are combined estimates from 10 multiple imputation datasets.

Figure A.3. Smoothed Trends in Total Income Inequality



Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1983 to 2002 CPS waves. Results are combined estimates from 10 multiple imputation datasets.

Figure A.4. Counterfactual Estimates of Total Income Inequality



Notes: Sample includes respondents who are 18 to 65 years old and work full-time in the 1983 to 2002 CPS waves. Results are combined estimates from 10 multiple imputation datasets.

Measurement of Occupational Classes in the GSS

Table B.1. Occupational Coding in the GSS

Disaggregate Occupations		Aggregate Occupations		1970 SOCs
Code	Label	Code	Label	
1	architects	1	professionals	2
2	engineers	1	professionals	6,10-15,20-23
3	natural scientists	1	professionals	34-36,42-45,51-54
4	engineering/science techs	1	professionals	150-156,161-162,172
5	physicians and dentists	1	professionals	62,65
6	other health professionals	1	professionals	61,63-64,71-74
7	nurses and hygienists	1	professionals	75,81,923
8	therapists	1	professionals	76,84
9	health techs	1	professionals	80,82-83,85
10	social scientists	1	professionals	91-94,96
11	religious workers	1	professionals	86,90
12	social workers	1	professionals	100-101,174
13	professors and instructors	1	professionals	102-105,110-116,120-126,130-135,140
14	primary/secondary teachers	1	professionals	141-145
15	jurists	1	professionals	30-31
16	librarians and curators	1	professionals	32-33
17	creative artists	1	professionals	175,182,185,190,193-194
18	authors and journalists	1	professionals	181,184
19	designers and decorators	1	professionals	183,425
20	accountants	1	professionals	1
21	computer specialists	1	professionals	3-5
22	personnel workers	1	professionals	56
23	public relations profs.	1	professionals	192
24	applied research workers	1	professionals	55,95,195
25	professionals, n.e.c.	1	professionals	24-26,163-164,170-171,173,180,191,363

Table B.1. Occupational Coding in the GSS Continued

Disaggregate Occupations		Aggregate Occupations		1970 SOCs
Code	Label	Code	Label	
26	government officials	2	managers/admin.	201,213,215,222,224
27	financial managers	2	managers/admin.	202,210
28	buyers	2	managers/admin.	203,205,225
29	sales managers	2	managers/admin.	231,233
30	office managers, n.e.c.	2	managers/admin.	220
31	building managers	2	managers/admin.	216,940
32	restaurant managers	2	managers/admin.	230
33	health administrators	2	managers/admin.	212
34	school administrators	2	managers/admin.	235,240
35	managers, n.e.c.	2	managers/admin.	211,221,223,245
36	insurance agents	3	sales occupations	265
37	real estate agents	3	sales occupations	270
38	agents, n.e.c.	3	sales occupations	260,261,271
39	salespersons	3	sales occupations	262,264,280-285
40	clerical supervisors	4	clerical occupations	312
41	estimators and investigators	4	clerical occupations	321
42	insurance adjusters	4	clerical occupations	326
43	cashiers	4	clerical occupations	310
44	bank tellers	4	clerical occupations	301
45	counter clerks (not food)	4	clerical occupations	314,390
46	secretaries	4	clerical occupations	364,370-372,376,391
47	accounting clerks	4	clerical occupations	303,305,360
48	office machine operators	4	clerical occupations	341-345,350,355
49	tabulation clerks	4	clerical occupations	334,375
50	postal clerks	4	clerical occupations	361

Table B.1. Occupational Coding in the GSS Continued

Disaggregate Occupations		Aggregate Occupations		1970 SOCs
Code	Label	Code	Label	
51	mail carriers	4	clerical occupations	331
52	mail distribution clerks	4	clerical occupations	332,333,383
53	telephone operators	4	clerical occupations	384-385
54	expediters	4	clerical occupations	323
55	stock clerks/storekeepers	4	clerical occupations	381
56	warehouse clerks	4	clerical occupations	374,392
57	teacher aides	4	clerical occupations	382,952
58	clerks, n.e.c.	4	clerical occupations	165,311,313,315,320,325,330,362,394-395,505,931,954
59	supervisors of manual labor	5	craft occupations	441,821
60	inspectors	5	craft occupations	452
61	metal processors	5	craft occupations	403,442,446,503-504,533,622,626
62	machinists	5	craft occupations	454,461-462,502,561-562
63	structural metal workers	5	craft occupations	404,535-536,540,550
64	stationary engine operators	5	craft occupations	525,545,666
65	heavy machinery operators	5	craft occupations	412,424,436
66	power/phone line workers	5	craft occupations	433,554
67	rail conductors/engineers	5	craft occupations	226,455-456
68	printers	5	craft occupations	405,422-423,434,515,530-531
69	tailors	5	craft occupations	444,542,551,613,636
70	bakers	5	craft occupations	402
71	HVAC mechanics	5	craft occupations	470
72	aircraft mechanics	5	craft occupations	471
73	automobile mechanics	5	craft occupations	401,472-474
74	small electronics mechanics	5	craft occupations	475,484-485
75	heavy equipment mechanics	5	craft occupations	480-481,486

Table B.1. Occupational Coding in the GSS Continued

Disaggregate Occupations		Aggregate Occupations		1970 SOCs
Code	Label	Code	Label	
76	mechanics, n.e.c.	5	craft occupations	482-483,491-492,495,552
77	electricians	5	craft occupations	430-431
78	brickmasons	5	craft occupations	410-411
79	carpenters	5	craft occupations	415-416
80	painters	5	craft occupations	510-511
81	plumbers	5	craft occupations	522-523
82	construction crafts, n.e.c.	5	craft occupations	413,420-421,440,445,512,520-521,534,560,601,615
83	craft occupations, n.e.c.	5	craft occupations	426,435,443,450,453,506,514,516,543,546,563,571-572,575
84	graders and sorters	6	operatives	625
85	launderers	6	operatives	611,630
86	sewers	6	operatives	663
87	textile operatives	6	operatives	620,670-674
88	precision machine operative	6	operatives	650,652-653
89	finishing machine operatives	6	operatives	621,635,651
90	assemblers	6	operatives	602
91	welders	6	operatives	680
92	meat cutters	6	operatives	631,633-634
93	packagers	6	operatives	604,643
94	machine operatives, n.e.c.	6	operatives	501,612,641,644-645,656,660,664-665,681,690,692
95	miners	6	operatives	614,640
96	lumbermen and sawyers	6	operatives	662,761
97	fork lift operatives	6	operatives	706
98	home delivery occupations	6	operatives	266,705
99	mass transit drivers	6	operatives	703-704
100	taxicab drivers	6	operatives	714

Table B.1. Occupational Coding in the GSS Continued

Disaggregate Occupations		Aggregate Occupations		1970 SOCs
Code	Label	Code	Label	
101	truck drivers	6	operatives	715
102	garage occupations	6	operatives	623
103	operatives, n.e.c.	6	operatives	605,642,661,694-695.701,710-713
104	freight handlers	7	general laborers	753,760,770
105	retail stock handlers	7	general laborers	762
106	construction laborers	7	general laborers	750-751
107	gardeners	7	general laborers	755
108	laborers, n.e.c.	7	general laborers	740,754,763-764,780,785
109	cleaners	8	service occupations	901-903
110	bartenders	8	service occupations	910
111	wait staff	8	service occupations	911,915
112	cooks	8	service occupations	912
113	kitchen helpers	8	service occupations	913,916
114	practical nurses	8	service occupations	921,924,926
115	health aides	8	service occupations	922,925
116	childcare occupations	8	service occupations	942
117	hair stylists	8	service occupations	935,944-945
118	attendents, n.e.c.	8	service occupations	932-934,941,943,953,960
119	law enforcement officers	8	service occupations	963-965
120	guards	8	service occupations	962
121	firefighters	8	service occupations	961
122	housekeepers (not private)	8	service occupations	950
123	food counter workers	8	service occupations	914
124	private household workers	8	service occupations	980-984
125	farmers	9	agr. occupations	801-802,823
126	farm laborers	9	agr. occupations	752,822,824
127	military personnel	8	service occupations	580,590