

Online Appendix

For “The Accuracy of Tax Imputations: Estimating Tax Liabilities and Credits

Using Linked Survey and Administrative Data”

by Bruce D. Meyer, Derek Wu, Grace Finley, Patrick Langetieg,

Carla Medalia, Mark Payne, and Alan Plumley*

– *For Online Publication Only* –

* Any opinions and conclusions expressed herein are those of the author(s) and do not necessarily represent the views of the U.S. Census Bureau, the Internal Revenue Service, any other agency of the federal government, or the NBER. All results were approved for release by the U.S. Census Bureau, authorization numbers CBDRB-FY20-ERD002-014 and CBDRB-FY20-ERD002-038.

Appendix Table A.1. Variables Entered Into TAXSIM for Limited Tax Data Imputation

Variables	Tax units with an attached 1040 return (limited tax data)			Tax units without an attached 1040 return (limited tax data)	
	Source	Notes		Source	Notes
		Extensive Tax Data	CPS		CPS
Tax unit ID	1040 Forms			Survey	Generated based on family relationship
Year	1040 Forms			Survey	
Marital status (filing status)	1040 Forms	Based on filing status		Survey	Based on marital status
State	1040 Forms			Survey	FIPS code converted to SOI code
Primary filer age	1040 Forms		Topcoded at 85, age equal to 70 if blind	Survey	Topcoded at 85, age equal to 70 if blind
Secondary filer age	1040 forms		Topcoded at 85, age equal to 70 if blind, only non-missing if married, filing jointly	Survey	Topcoded at 85, age equal to 70 if blind, only non-missing if married, filing jointly
Number of dependents	1040 Forms	Number of dependent exemptions		Survey	Number of qualifying dependents*
Number of individuals eligible for childcare credit	Numident, Survey		Number of qualifying children and other relatives*	Survey	Number of qualifying children and other relatives*
Number of individuals eligible for child tax credit	Numident, Survey		Number of qualifying children and other relatives*	Survey	Number of qualifying children and other relatives*
Number of individuals eligible for EITC	1040 Forms	Number of EITC-eligible children		Survey	Number of EITC-eligible individuals*
Primary filer wages	1040 Forms, DER	Wages and salaries for primary and secondary and self-employment income**		Survey, DER, W-2	Wages + self-employment income (DER/W-2s & survey)***
Secondary filer wages	N/A	Counted as zero because included in primary filer wages		Survey	Counted as zero because included in primary filer wages
Dividend income	1040 Forms			Survey	
Interest income	1040 Forms			Survey	
Short term capital gains/losses	N/A	Counted as zero because included in other property income		N/A	Not available in any dataset
Long term capital gains/losses	N/A	Counted as zero because included in other property income		N/A	Not available in any dataset

(continued on next page)

Appendix Table A.1. Variables Entered Into TAXSIM for Limited Tax Data Imputation (cont.)

Variable	Tax units with an attached 1040 return (limited tax data)			Tax units without an attached 1040 return (limited tax data)	
	Source	Notes		Source	Notes
		Extensive Tax Data	CPS		
Other property income	N/A	Difference between adjusted gross income and wages/salaries, self-employment income, dividends, and interest		Survey	Includes rent, financial assistance, and other sources of income
Other non-property income	1040 Forms			Survey	Includes education assistance and alimony
Pension income	N/A	Counted as zero because included in other property income		1099-R	Gross distributions from the 1099-R form
Social security income	N/A	Counted as zero because included in other property income		Survey	
Unemployment insurance income	N/A	Counted as zero because included in other property income		Survey	
Transfer income	Survey	Includes transfers such as SSI, public assistance, and veteran/survivor benefits		Survey	Includes transfers such as SSI, public assistance, and veteran/survivor benefits
Rent paid	N/A	Not available in any dataset		N/A	Not available in any dataset
Real estate taxes paid	Survey	Converted from household level		Survey	Converted from household level
Other itemized deductions	N/A			N/A	Not available in any dataset
Childcare expenses	1040 Forms	Backed-out from the amount of child care credit received and adjusted gross income		Survey	Converted from household level
Deductions not included in other itemized deductions	1040 Forms	Includes average itemized deductions*****		Survey	Only includes family medical expenses

* Qualifying individuals are based on the 2010 Tax Guide. The number of qualifying children for linked tax units attaches survey children to a linked tax unit if a dependent is not linked from the 1040.

** Self-employment income is pulled from the DER and divided by 0.9235.

*** Survey self-employment income is replaced with non-zero self-employment income from the DER divided by 0.9235.

***** If a linked tax unit notes that it filed a Schedule A, all other itemized deduction variables are set to 0, and deductions not included in other itemized deductions is set to the average itemized deductions based on AGI bucket. If a linked tax unit does not file a Schedule A, all itemized deduction variables are set to 0.

Appendix Table A.2. Variables Entered Into TAXSIM for Extensive Tax Data Calculation

Variables	Tax units with an attached 1040 return (extensive tax data)		Tax units without an attached 1040 return (extensive tax data)			
	Source	Notes		Source	Notes	
		Extensive Tax Data	CPS		Extensive Tax Data	CPS
Tax unit ID	1040 Forms			Survey	Generated based on family relationship	
Year	1040 Forms			Survey		
Marital status (filing status)	1040 Forms	Based on filing status		Survey	Based on marital status	
State	1040 Forms			Survey	FIPS code converted to SOI code	
Primary filer age	1040 Forms	Equal to 70 if claiming an exemption for being over the age of 65 or blind		Survey	Topcoded at 85, age equal to 70 if blind	
Secondary filer age	1040 forms	Equal to 70 if claiming an exemption for being over the age of 65 or blind		Survey	Topcoded at 85, age equal to 70 if blind, only non-missing if married, filing jointly	
Number of dependents	1040 Forms	Maximum of number of dependent exemptions and number of dependent PIKs		Survey	Number of qualifying dependents*	
Number of individuals eligible for childcare credit	Survey		Number of qualifying children and other relatives*	Survey	Number of qualifying children and other relatives*	
Number of individuals eligible for child tax credit	Survey		Number of qualifying children and other relatives*	Survey	Number of qualifying children and other relatives*	
Number of individuals eligible for EITC	1040 Forms	Number of EITC-eligible children		Survey	Number of EITC-eligible individuals*	
Primary filer wages	1040 Forms, DER	Wages and salaries for primary and secondary and self-employment income**		Survey, DER, W-2	Wages + self-employment income (DER/W-2s & survey)***	
Secondary filer wages	N/A	Counted as zero because included in primary filer wages		Survey	Counted as zero because included in primary filer wages	
Dividend income	1040 Forms			Survey		
Interest income	1040 Forms			Survey		
Short term capital gains/losses	1040 forms			N/A	Not available in any dataset	
Long term capital gains/losses	1040 forms			N/A	Not available in any dataset	

(continued on next page)

Appendix Table A.2. Variables Entered Into TAXSIM for Extensive Tax Data Calculation (cont.)

Variable	Tax units with an attached 1040 return (extensive tax data)			Tax units without an attached 1040 return (extensive tax data)	
	Source	Notes		Source	Notes
		Extensive Tax Data	CPS		
Other property income	1040 Forms	Supplemental gains/losses, Schedule E profit/loss, other income		Survey	Includes rent, financial assistance, and other sources of income
Other non-property income	1040 Forms	State income tax refund + alimony - total adjustments		Survey	Includes education assistance and alimony
Pension income	1040 Forms	Taxable IRS distributions and pensions/ annuities (line 36)****		1099-R	Taxable distributions from the 1099-R form
Social security income	1040 Forms			Survey	
Unemployment insurance income	1040 Forms			1099-G	
Transfer income	Survey		Includes transfers such as SSI, public assistance, and veteran/survivor benefits	Survey	Includes transfers such as SSI, public assistance, and veteran/survivor benefits
Rent paid	N/A	Not available in any dataset		N/A	Not available in any dataset
Real estate taxes paid	1040 Forms			Survey	Converted from household level
Other itemized deductions	1040 Forms	Total deductions - estate taxes		N/A	Not available in any dataset
Childcare expenses	1040 Forms	Backed-out from the amount of child care credit received and adjusted gross income		Survey	Converted from household level
Deductions not included in other itemized deductions	1040 Forms	Includes total interest deduction, medical deduction, charitable giving, and casualty/theft loss		Survey	Only includes family medical expenses

*Qualifying individuals are based on the 2010 Tax Guide. The number of qualifying children for linked tax units attaches survey children to a linked tax unit if a dependent is not linked from the 1040.

**Self-employment income for linked tax units is the sum of lines 12 and 18 from the 1040 form.

*** Survey self-employment income for unlinked tax units is replaced with self-employment income from the DER divided by 0.9235 if DER self-employment income is non-zero. Survey wages for unlinked tax units are replaced with W-2 wages if W-2 wages are non-zero.

**** State income tax refund and alimony are placed in other non-property income because TAXSIM does not have a taxable income variable for these two sources of income.

Appendix Table A.3. Aggregate Income and Tax Components Using Various Tax Calculators with Standard Errors, 2010 Tax Year, CPS Data

	Independent Aggregates from IRS SOI or Other Sources (1)	1040 Universe	CPS ASEC Linked to Administrative Data							
		Extensive Tax Data Calculation (2)	CPS Tax Imputation (3)	CPS Data and TAXSIM Imputation (4)	Limited Tax Data Imputation (5)	Extensive Tax Data Calculation (6)	Imputation for Limited Tax Data Filers Only (7)	Imputation for Extensive Tax Data Filers Only (8)	Imputation for Limited Tax Data Filers & Families with Missing PIKs (9)	Imputation for Extensive Tax Data Filers & Families with Missing PIKs (10)
Federal income tax liability	844,600	825,500 (1,524)	807,600 (11,550)	858,700 (12,760)	853,100 (32,420)	845,300 (27,240)	810,400 (32,640)	804,600 (27,500)	814,500 (32,670)	808,600 (27,540)
State income tax liability	243,400		216,800 (2,809)	235,500 (2,945)	246,500 (6,422)	231,900 (5,695)	235,000 (6,391)	219,900 (5,670)	237,000 (6,445)	222,000 (5,733)
Payroll tax liability	435,800		461,100 (4,520)	470,200 (5,036)	432,500 (4,620)	433,400 (4,586)	411,300 (4,406)	412,200 (4,357)	413,800 (4,489)	414,700 (4,442)
Payroll tax on wages	387,900			422,000 (4,633)	380,300 (4,057)	382,200 (4,069)	366,300 (3,960)	368,200 (3,966)	367,300 (3,968)	369,100 (3,976)
Payroll tax on self-emp.	47,900			48,260 (1,267)	52,230 (1,359)	51,250 (1,323)	44,930 (1,247)	44,000 (1,190)	46,520 (1,269)	45,590 (1,214)
Adjusted Gross Income	8,089,000	7,891,000 (6,516)	7,326,000 (68,870)	7,394,000 (76,110)	8,276,000 (152,700)	8,216,000 (148,100)	7,792,000 (151,800)	7,740,000 (147,300)	7,884,000 (152,900)	7,832,000 (148,400)
Taxable income	5,502,000	5,366,000 (5,302)	5,238,000 (52,570)	5,421,000 (58,020)	5,357,000 (115,900)	5,534,000 (116,000)	5,052,000 (116,100)	5,237,000 (116,600)	5,105,000 (116,500)	5,289,000 (117,000)
Fed. inc. tax before credits	1,065,000	1,042,000 (1,626)	917,100 (12,000)	979,100 (12,460)	1,014,000 (32,520)	1,052,000 (27,930)	960,300 (32,650)	999,400 (28,110)	969,100 (32,730)	1,008,000 (28,200)
Earned income tax credit	59,560	59,510 (14)	40,350 (1,240)	34,060 (653)	59,020 (1,716)	59,300 (1,722)	54,560 (1,588)	54,600 (1,593)	56,710 (1,652)	56,810 (1,658)
Child tax credit	56,260	54,580 (13)	45,860 (860)	44,460 (723)	52,910 (1,121)	54,230 (1,158)	50,320 (1,060)	51,560 (1,094)	51,500 (1,089)	52,740 (1,122)
Sample Size		138,800,000	170,000				140,000	139,000	147,000	146,000

See Table 1 for all notes and sources. Standard errors in parentheses are calculated using replicate weights.

Approved for release by the U.S. Census Bureau, authorization numbers CBDRB-FY20-ERD002-014, CBDRB-FY20-ERD002-038.

Appendix Table A.4. Mean Family Income and Tax Calculations or Imputations by Pre-Tax Money Income Decile, 2010 Tax Year, CPS Data (Replacing Differences with Overall Means)

Income or Tax Component	Decile of Equivalized Survey Family Income	<i>Mean</i>		<i>Imputation</i>	
		Extensive Tax Data Calculation	CPS Tax Imputation	CPS Data and TAXSIM Imputation	Limited Tax Data Imputation
		(1)	(2)	(3)	(4)
Federal income tax liability	All	6,824	6,662	6,852	6,907
	1	-1,056	-1,580	-1,381	-577
	2	-2,326	-3,241	-2,874	-2,201
	3	-562	-2,037	-1,824	-389
	4	-475	-520	-451	-219
	5	988	983	963	1,294
	6	3,903	2,692	2,663	4,234
	7	5,509	4,931	4,941	5,718
	8	7,846	8,133	8,413	7,962
	9	14,350	14,416	14,904	14,532
	10	40,080	42,860	43,183	38,737
State income tax liability	All	2,095	1,958	2,033	2,208
	1	24	-26	-60	129
	2	47	-16	-58	150
	3	473	198	154	620
	4	611	512	461	724
	5	979	863	818	1,100
	6	1,638	1,328	1,305	1,743
	7	2,038	1,842	1,872	2,161
	8	2,592	2,528	2,688	2,490
	9	4,083	3,696	3,936	4,200
	10	8,470	8,659	9,217	8,566
Payroll tax liability	All	4,098	4,342	4,166	4,082
	1	770	331	272	733
	2	1,218	1,047	906	1,171
	3	1,819	1,670	1,468	1,796
	4	2,468	2,436	2,189	2,444
	5	3,035	3,207	2,936	3,009
	6	3,915	4,122	3,854	3,894
	7	4,790	5,173	4,909	4,766
	8	5,674	6,282	6,051	5,666
	9	7,141	7,823	7,761	7,109
	10	10,150	11,329	11,308	10,234
Total tax liability	All	13,020	12,965	13,054	13,201
	1	-262	-1,275	-1,169	285
	2	-1,060	-2,209	-2,025	-879
	3	1,729	-170	-203	2,027
	4	2,604	2,428	2,200	2,949
	5	5,001	5,052	4,716	5,402
	6	9,456	8,142	7,822	9,871
	7	12,340	11,949	11,725	12,648
	8	16,110	16,941	17,149	16,319
	9	25,570	25,931	26,598	25,837
	10	58,710	62,859	63,718	57,547

(continued on next page)

Appendix Table A.4. Mean Family Income and Tax Calculations or Imputations by Pre-Tax Money Income Decile, 2010 Tax Year, CPS Data (Replacing Differences with Overall Means) (Continued)

Income or Tax Component	Decile of Equivalized Survey Family Income	<i>Mean</i>		<i>Imputation</i>	
		Extensive Tax Data Calculation (1)	CPS Tax Imputation (2)	CPS Data and TAXSIM Imputation (3)	Limited Tax Data Imputation (4)
Adjusted Gross Income	All	73,680	66,765	64,027	74,083
	1	19,720	4,310	3,740	19,729
	2	22,670	13,861	12,280	22,650
	3	34,350	22,590	20,320	34,470
	4	41,170	32,564	29,770	41,254
	5	50,470	44,470	41,024	50,669
	6	66,820	57,311	54,030	67,052
	7	76,480	72,092	68,874	76,618
	8	91,320	89,609	86,411	91,707
	9	121,800	116,473	113,549	122,216
	10	212,100	214,450	210,178	214,566
Taxable income	All	48,010	46,419	45,841	46,593
	1	9,028	104	31	8,596
	2	6,682	1,106	672	6,565
	3	14,350	6,016	5,106	14,252
	4	17,910	13,448	12,135	17,593
	5	25,790	22,660	21,253	25,370
	6	39,890	33,898	32,790	38,625
	7	49,310	47,568	47,139	47,779
	8	61,180	63,835	64,460	58,871
	9	87,200	89,401	91,013	84,123
	10	168,800	186,170	183,830	164,195
Federal income tax before credits	All	9,221	7,961	8,287	8,828
	1	1,473	11	3	1,773
	2	996	99	69	967
	3	2,523	359	530	2,460
	4	2,462	829	1,352	2,379
	5	3,663	1,908	2,588	3,579
	6	6,288	3,508	4,240	6,187
	7	7,766	5,702	6,448	7,417
	8	9,884	8,909	9,721	9,428
	9	15,930	15,131	15,690	15,529
	10	41,230	43,150	42,230	38,567
Earned Income Tax Credit	All	733	540	438	728
	1	1,504	1,129	962	1,487
	2	1,828	2,064	1,745	1,816
	3	1,390	1,237	1,004	1,376
	4	1,013	520	360	1,008
	5	679	212	143	679
	6	379	108	65	377
	7	221	53	43	223
	8	170	43	28	172
	9	86	16	14	86
	10	52	8	9	51

(continued on next page)

Appendix Table A.4. Mean Family Income and Tax Calculations or Imputations by Pre-Tax Money Income Decile, 2010 Tax Year, CPS Data (Replacing Differences with Overall Means) (Continued)

Income or Tax Component	Decile of Equivalized Survey Family Income	<i>Mean</i>		<i>Imputation</i>	
		Extensive Tax Data Calculation (1)	CPS Tax Imputation (2)	CPS Data and TAXSIM Imputation (3)	Limited Tax Data Imputation (4)
Child Tax Credit	All	740	666	632	724
	1	590	292	258	568
	2	964	915	828	914
	3	999	979	904	972
	4	1,026	967	918	995
	5	971	934	897	954
	6	928	921	897	920
	7	812	826	810	800
	8	657	637	622	656
	9	348	182	178	355
	10	109	11	13	114

See Table 2 for all notes and sources. Standard errors in parentheses are calculated using replicate weights.

Approved for release by the U.S. Census Bureau, authorization numbers CBDRB-FY20-ERD002-014, CBDRB-FY20-ERD002-038.

Appendix Table A.5 Mean Family Income and Tax Calculations or Imputations by Pre-Tax Money Income Decile with Standard Errors, 2010 Tax Year, CPS Data

Income or Tax Component	Decile of Equivalized Survey Family Income	<i>Mean</i>		<i>Imputation Minus Extensive Tax Data Calculation</i>	
		Extensive Tax Data Calculation	CPS Tax Imputation	CPS Data and TAXSIM Imputation	Limited Tax Data Imputation
		(1)	(2)	(3)	(4)
Federal income tax liability	All	6,824 (208)	-162 (175)	28 (177)	83 (66)
	1	-1,056 (442)	-524 (443)	-325 (444)	479 (234)
	2	-2,326 (108)	-915 (106)	-548 (108)	125 (25)
	3	-562 (447)	-1,475 (446)	-1,262 (446)	173 (67)
	4	-475 (147)	-45 (144)	24 (140)	256 (34)
	5	988 (207)	-5 (209)	-25 (206)	306 (49)
	6	3,903 (573)	-1,211 (576)	-1,240 (576)	331 (177)
	7	5,509 (536)	-578 (535)	-568 (534)	209 (50)
	8	7,846 (254)	287 (247)	567 (238)	116 (110)
	9	14,350 (821)	66 (816)	554 (817)	182 (429)
	10	40,080 (1,593)	2,780 (1,441)	3,103 (1,460)	-1,343 (490)
State income tax liability	All	2,095 (48)	-137 (38)	-62 (39)	113 (19)
	1	24 (29)	-50 (29)	-84 (28)	105 (11)
	2	47 (20)	-63 (21)	-105 (20)	103 (7)
	3	473 (92)	-275 (92)	-319 (92)	147 (21)
	4	611 (38)	-99 (38)	-150 (37)	113 (8)
	5	979 (52)	-116 (51)	-161 (50)	121 (9)
	6	1,638 (105)	-310 (104)	-333 (103)	105 (10)
	7	2,038 (132)	-196 (130)	-166 (131)	123 (14)
	8	2,592 (68)	-64 (65)	96 (63)	-102 (15)
	9	4,083 (308)	-387 (303)	-147 (306)	117 (37)
	10	8,470 (305)	189 (231)	747 (241)	96 (189)

(continued on next page)

Appendix Table A.5. Mean Family Income and Tax Calculations or Imputations by Pre-Tax Money Income Decile with Standard Errors, 2010 Tax Year, CPS Data (Continued)

Income or Tax Component	Decile of Equivalized Survey Family Income	<i>Mean</i>		<i>Imputation Minus Extensive Tax Data Calculation</i>	
		Extensive Tax Data Calculation	CPS Tax Imputation	CPS Data and TAXSIM Imputation	Limited Tax Data Imputation
		(1)	(2)	(3)	(4)
Payroll tax liability	All	4,098 (27)	244 (18)	68 (18)	-16 (5)
	1	770 (23)	-439 (21)	-498 (21)	-37 (7)
	2	1,218 (26)	-171 (22)	-312 (24)	-47 (7)
	3	1,819 (48)	-149 (43)	-351 (45)	-23 (7)
	4	2,468 (35)	-32 (28)	-279 (32)	-24 (8)
	5	3,035 (40)	172 (29)	-99 (32)	-26 (8)
	6	3,915 (47)	207 (40)	-61 (42)	-21 (9)
	7	4,790 (58)	383 (49)	119 (54)	-24 (10)
	8	5,674 (66)	608 (51)	377 (55)	-8 (9)
	9	7,141 (97)	682 (91)	620 (95)	-32 (15)
10	10,150 (129)	1,179 (123)	1,158 (126)	84 (45)	
Total tax liability	All	13,020 (262)	-55 (208)	34 (212)	181 (72)
	1	-262 (447)	-1,013 (448)	-907 (450)	547 (234)
	2	-1,060 (125)	-1,149 (125)	-965 (125)	181 (31)
	3	1,729 (564)	-1,899 (560)	-1,932 (563)	298 (81)
	4	2,604 (187)	-176 (190)	-404 (186)	345 (37)
	5	5,001 (263)	51 (260)	-285 (256)	401 (52)
	6	9,456 (673)	-1,314 (675)	-1,634 (673)	415 (177)
	7	12,340 (700)	-391 (692)	-615 (694)	308 (53)
	8	16,110 (339)	831 (320)	1,039 (309)	209 (106)
	9	25,570 (1,136)	361 (1,121)	1,028 (1,130)	267 (448)
10	58,710 (1,882)	4,149 (1,659)	5,008 (1,702)	-1,163 (549)	

(continued on next page)

Appendix Table A.5 Mean Family Income and Tax Calculations or Imputations by Pre-Tax Money Income Decile with Standard Errors, 2010 Tax Year, CPS Data (Continued)

Income or Tax Component	Decile of Equivalized Survey Family Income	<i>Mean</i>	<i>Imputation Minus Extensive Tax Data Calculation</i>		
		Extensive Tax Data Calculation	CPS Tax Imputation	CPS Data and TAXSIM Imputation	Limited Tax Data Imputation
		(1)	(2)	(3)	(4)
Adjusted Gross Income	All	73,680 (1,033)	-6,915 (924)	-9,653 (933)	403 (182)
	1	19,720 (3,048)	-15,410 (3,039)	-15,980 (3,039)	9 (130)
	2	22,670 (534)	-8,809 (487)	-10,390 (491)	-20 (54)
	3	34,350 (1,649)	-11,760 (1,642)	-14,030 (1,659)	120 (53)
	4	41,170 (660)	-8,606 (655)	-11,400 (679)	84 (51)
	5	50,470 (949)	-6,000 (909)	-9,266 (924)	199 (103)
	6	66,820 (2,724)	-9,509 (2,715)	-12,790 (2,689)	232 (69)
	7	76,480 (2,506)	-4,388 (2,486)	-7,606 (2,488)	138 (90)
	8	91,320 (1,291)	-1,711 (1,183)	-4,909 (1,191)	387 (103)
	9	121,800 (4,710)	-5,327 (4,646)	-8,251 (4,684)	416 (154)
10	212,100 (7,680)	2,350 (7,557)	-1,922 (7,637)	2,466 (1,787)	
Taxable income	All	48,010 (738)	-1,591 (643)	-2,169 (647)	-1,417 (190)
	1	9,028 (2,970)	-8,924 (2,970)	-8,997 (2,970)	-432 (407)
	2	6,682 (374)	-5,576 (371)	-6,010 (371)	-117 (62)
	3	14,350 (1,334)	-8,334 (1,331)	-9,244 (1,339)	-98 (192)
	4	17,910 (515)	-4,462 (535)	-5,775 (529)	-317 (79)
	5	25,790 (710)	-3,130 (701)	-4,537 (683)	-420 (143)
	6	39,890 (2,314)	-5,992 (2,320)	-7,100 (2,320)	-1,265 (205)
	7	49,310 (1,626)	-1,742 (1,604)	-2,171 (1,594)	-1,531 (146)
	8	61,180 (1,113)	2,655 (1,067)	3,280 (1,054)	-2,309 (314)
	9	87,200 (3,435)	2,201 (3,425)	3,813 (3,432)	-3,077 (954)
10	168,800 (4,976)	17,370 (4,551)	15,030 (4,610)	-4,605 (1,348)	

(continued on next page)

Appendix Table A.5 Mean Family Income and Tax Calculations or Imputations by Pre-Tax Money Income Decile with Standard Errors, 2010 Tax Year, CPS Data (Continued)

Income or Tax Component	Decile of Equivalized Survey Family Income	<i>Mean</i>		<i>Imputation Minus Extensive Tax Data Calculation</i>	
		Extensive Tax Data Calculation	CPS Tax Imputation	CPS Data and TAXSIM Imputation	Limited Tax Data Imputation
		(1)	(2)	(3)	(4)
Federal income tax before credits	All	9,221 (208)	-1,260 (176)	-934 (177)	-393 (64)
	1	1,473 (453)	-1,462 (453)	-1,470 (453)	300 (224)
	2	996 (86)	-897 (87)	-927 (86)	-29 (20)
	3	2,523 (433)	-2,164 (433)	-1,993 (433)	-63 (63)
	4	2,462 (135)	-1,633 (134)	-1,110 (136)	-83 (22)
	5	3,663 (203)	-1,755 (206)	-1,075 (200)	-84 (42)
	6	6,288 (568)	-2,780 (572)	-2,048 (570)	-101 (180)
	7	7,766 (539)	-2,064 (537)	-1,318 (535)	-349 (40)
	8	9,884 (249)	-975 (239)	-163 (233)	-456 (109)
	9	15,930 (815)	-799 (809)	-240 (810)	-401 (424)
10	41,230 (1,608)	1,920 (1,450)	1,000 (1,470)	-2,663 (483)	
Earned Income Tax Credit	All	733 (9)	-193 (9)	-295 (8)	-5 (1)
	1	1,504 (37)	-375 (37)	-542 (37)	-17 (5)
	2	1,828 (42)	236 (36)	-83 (38)	-12 (5)
	3	1,390 (33)	-153 (28)	-386 (29)	-14 (6)
	4	1,013 (29)	-493 (27)	-653 (27)	-5 (3)
	5	679 (28)	-467 (28)	-536 (27)	0 (3)
	6	379 (21)	-271 (19)	-314 (20)	-2 (2)
	7	221 (15)	-168 (14)	-178 (13)	2 (1)
	8	170 (15)	-127 (15)	-142 (14)	2 (1)
	9	86 (10)	-70 (11)	-72 (10)	0 (1)
10	52 (8)	-44 (7)	-43 (7)	-1 (1)	

(continued on next page)

Appendix Table A.5 Mean Family Income and Tax Calculations or Imputations by Pre-Tax Money Income Decile with Standard Errors, 2010 Tax Year, CPS Data (Continued)

Income or Tax Component	Decile of Equivalized Survey Family Income	<i>Mean</i>			
		Extensive Tax Data Calculation	CPS Tax Imputation	CPS Data and TAXSIM Imputation	Limited Tax Data Imputation
		(1)	(2)	(3)	(4)
Child Tax Credit	All	740 (6)	-74 (4)	-108 (5)	-16 (2)
	1	590 (17)	-298 (14)	-332 (14)	-22 (5)
	2	964 (22)	-49 (15)	-136 (17)	-50 (7)
	3	999 (24)	-20 (18)	-95 (19)	-27 (7)
	4	1,026 (23)	-59 (13)	-108 (14)	-31 (7)
	5	971 (20)	-37 (15)	-74 (17)	-17 (5)
	6	928 (20)	-7 (12)	-31 (14)	-8 (4)
	7	812 (18)	14 (12)	-2 (12)	-12 (5)
	8	657 (17)	-20 (10)	-35 (11)	-1 (4)
	9	348 (11)	-166 (10)	-170 (10)	7 (2)
	10	109 (8)	-98 (8)	-96 (7)	5 (2)

See Table 2 for all notes and sources. Standard errors in parentheses are calculated using replicate weights.

Approved for release by the U.S. Census Bureau, authorization numbers CBDRB-FY20-ERD002-014, CBDRB-FY20-ERD002-038.

Appendix Table A.6a. Mean Absolute Difference Between Imputations and Extensive Tax Calculation with Std. Errors, 2010 Tax Year, CPS Data

Income or Tax component	Quartile of Equivalized Survey Family Income	Extensive Tax Data Calculation	CPS Tax Imputation		CPS Data and TAXSIM Imputation		Limited Tax Data Imputation	
		Mean	Mean absolute difference	% of Column (1)	Mean absolute difference	% of Column (1)	Mean absolute difference	% of Column (1)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Federal income tax liability	All	6,824 (208)	7,202 (187)	105.5	7,434 (188)	108.9	1,654 (68)	24.2
	1	-1,561 (208)	2,741 (187)	175.6	2,822 (188)	180.8	565 (68)	36.2
	2	184 (144)	3,258 (143)	1768.0	3,259 (143)	1771.2	734 (27)	399.1
	3	5,159 (338)	5,285 (328)	102.4	5,429 (329)	105.2	1,349 (89)	26.1
	4	23,520 (659)	17,530 (593)	74.5	18,230 (589)	77.5	3,966 (229)	16.9
State income tax liability	All	2,095 (48)	1,367 (42)	65.3	1,415 (42)	67.5	342 (20)	16.3
	1	100 (22)	420 (23)	421.0	400 (23)	400.0	161 (6)	160.6
	2	752 (39)	691 (39)	91.9	693 (38)	92.2	219 (8)	29.1
	3	1,957 (77)	1,131 (73)	57.8	1,174 (74)	60.0	291 (8)	14.9
	4	5,571 (166)	3,226 (149)	57.9	3,394 (149)	60.9	699 (80)	12.5
Payroll tax liability	All	4,098 (27)	1,521 (18)	37.1	1,651 (18)	40.3	124 (5)	3.0
	1	1,131 (21)	669 (19)	59.1	747 (20)	66.0	66 (4)	5.9
	2	2591 (23)	1,009 (16)	38.9	1,176 (19)	45.4	75 (5)	2.9
	3	4,564 (36)	1,543 (23)	33.8	1,700 (26)	37.2	102 (6)	2.2
	4	8,106 (66)	2,862 (59)	35.3	2,981 (58)	36.8	253 (18)	3.1

(continued on next page)

Appendix Table A.6a. Mean Abs. Diff. Between Imputations and Extensive Tax Calculation with Std. Errors, 2010 Tax Year, CPS Data (Cont.)

Income or Tax component	Quartile of Equivalized Survey Family Income	Extensive Tax Data Calculation	CPS Tax Imputation		CPS Data and TAXSIM Imputation		Limited Tax Data Imputation	
		Mean (1)	Mean absolute difference (2)	% of Column (1) (3)	Mean absolute difference (4)	% of Column (1) (5)	Mean absolute difference (6)	% of Column (1) (7)
Total tax liability	All	13,020 (262)	9,385 (227)	72.1	9,870 (230)	75.8	1,913 (73)	14.7
	1	-330 (249)	3,225 (249)	976.4	3,232 (247)	979.4	712 (96)	215.7
	2	3,527 (185)	4,530 (186)	128.4	4,601 (185)	130.5	925 (31)	26.2
	3	11,680 (424)	7,401 (406)	63.4	7,832 (408)	67.1	1,565 (88)	13.4
	4	37,190 (812)	22,380 (721)	60.2	23,810 (719)	64.0	4,450 (250)	12.0
Adjusted Gross Income	All	73,680 (1033)	32,050 (949)	43.5	34,670 (960)	47.1	790 (183)	1.1
	1	23,150 (1308)	15,100 (1298)	65.2	16,190 (1303)	69.9	525 (57)	2.3
	2	44,170 (648)	18,410 (600)	41.7	21,080 (602)	47.7	527 (50)	1.2
	3	74,800 (1,616)	26,800 (1,567)	35.8	29,760 (1,565)	39.8	520 (53)	0.7
	4	152,600 (3,286)	67,900 (3,127)	44.5	71,650 (3,157)	47.0	1,587 (717)	1.0
Taxable income	All	48,010 (738)	27,280 (649)	56.8	28,780 (653)	59.9	4,924 (167)	10.3
	1	8,724 (1,253)	8,655 (1,252)	99.2	8,580 (1,253)	98.3	1104 (168)	12.7
	2	20,760 (467)	14,140 (472)	68.1	14,980 (465)	72.2	1952 (73)	9.4
	3	47,170 (1,266)	23,950 (1,203)	50.8	25,830 (1,204)	54.8	4,399 (125)	9.3
	4	115,400 (2,143)	62,370 (1,915)	54.1	65,740 (1,906)	57.0	12,240 (575)	10.6

(continued on next page)

Appendix Table A.6a. Mean Abs. Diff. Between Imputations and Extensive Tax Calculation with Std. Errors, 2010 Tax Year, CPS Data (Cont.)

Income or Tax component	Quartile of Equivalized Survey Family Income	Extensive Tax Data Calculation	CPS Tax Imputation		CPS Data and TAXSIM Imputation		Limited Tax Data Imputation	
		<i>Mean</i>	<i>Mean absolute difference</i>	<i>% of Column (1)</i>	<i>Mean absolute difference</i>	<i>% of Column (1)</i>	<i>Mean absolute difference</i>	<i>% of Column (1)</i>
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Federal income tax before credits	All	9,221 (208)	6,366 (191)	69.0	6,553 (191)	71.1	1,438 (66)	15.6
	1	1,427 (227)	1,447 (227)	101.4	1,413 (227)	99.0	327 (92)	22.9
	2	3,016 (142)	2,512 (143)	83.3	2,413 (143)	80.0	388 (22)	12.9
	3	7,436 (338)	4,637 (332)	62.4	4,903 (331)	65.9	1,018 (90)	13.7
	4	25,010 (662)	16,870 (607)	67.5	17,480 (602)	69.9	4,018 (224)	16.1
Earned Income Tax Credit	All	733 (9)	550 (8)	75.1	569 (8)	77.6	2 (1)	0.3
	1	1,642 (27)	1,094 (21)	66.6	1,157 (21)	70.5	2 (4)	0.1
	2	925 (17)	763 (15)	82.5	774 (16)	83.7	2 (2)	0.2
	3	283 (10)	266 (9)	93.9	268 (9)	94.8	2 (1)	0.7
	4	80 (6)	77 (6)	96.5	76 (6)	95.4	5 (1)	5.7
Child Tax Credit	All	740 (6)	275 (4)	37.2	306 (4)	41.3	43 (2)	5.8
	1	825 (13)	373 (9)	45.2	421 (10)	51.1	74 (5)	9.0
	2	994 (13)	293 (8)	29.5	341 (8)	34.3	55 (4)	5.5
	3	838 (12)	238 (7)	28.4	261 (7)	31.2	29 (2)	3.5
	4	304 (8)	197 (6)	64.6	200 (6)	65.9	12 (2)	4.1

See Table 3a for all notes and sources. Standard errors in parentheses are calculated using replicate weights.

Approved for release by the U.S. Census Bureau, authorization numbers CBDRB-FY20-ERD002-014, CBDRB-FY20-ERD002-038.

Appendix Table A.6b. Median Abs. Diff. Between Imputations and Extensive Tax Calculation with Std. Errors, 2010 Tax Year, CPS Data

Income or Tax component	Quartile of Equivalized Survey Family Income	Extensive Tax Data Calculation	CPS Tax Imputation		CPS Data and TAXSIM Imputation		Limited Tax Data Imputation	
		<i>Mean</i>	<i>Median absolute difference</i>	<i>% of Column (1)</i>	<i>Median absolute difference</i>	<i>% of Column (1)</i>	<i>Median absolute difference</i>	<i>% of Column (1)</i>
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Federal income tax liability	All	6,824 (208)	2,265 (13)	33.2	2,442 (14)	35.8	238 (4)	3.5
	1	-1,561 (226)	700 (14)	44.8	723 (15)	46.3	2 (0)	0.1
	2	184 (144)	1,454 (16)	790.2	1,475 (16)	801.6	92 (4)	50.0
	3	5,159 (338)	2,430 (21)	47.1	2,607 (21)	50.5	471 (9)	9.1
	4	23,520 (659)	6,763 (61)	28.8	7,444 (56)	31.6	1,481 (16)	6.3
State income tax liability	All	2,095 (48)	260 (3)	12.4	261 (3)	12.5	0 (0)	0.0
	1	100 (22)	0 (0)	0.0	0 (0)	0.0	0 (0)	0.0
	2	752 (39)	182 (4)	24.2	172 (4)	22.8	0 (0)	0.0
	3	1,957 (77)	411 (5)	21.0	424 (6)	21.7	31 (2)	1.6
	4	5,571 (166)	1,065 (14)	19.1	1,170 (16)	21.0	163 (4)	2.9
Payroll tax liability	All	4,098 (27)	563 (4)	13.7	597 (4)	14.6	0 (0)	0.0
	1	1,131 (21)	207 (4)	18.3	225 (5)	19.9	0 (0)	0.0
	2	2,591 (23)	448 (6)	17.3	499 (7)	19.3	0 (0)	0.0
	3	4,564 (36)	723 (9)	15.8	759 (10)	16.6	0 (0)	0.0
	4	8,106 (66)	1,216 (17)	15.0	1,199 (18)	14.8	0 (0)	0.0

(continued on next page)

Appendix Table A.6b. Median Abs. Diff. Between Imputations and Extensive Tax Calculation with Std. Errors, 2010 Tax Year, CPS Data (Cont.)

Income or Tax component	Quartile of Equivalized Survey Family Income	Extensive Tax Data Calculation	CPS Tax Imputation		CPS Data and TAXSIM Imputation		Limited Tax Data Imputation	
		Mean	Median absolute difference	% of Column (1)	Median absolute difference	% of Column (1)	Median absolute difference	% of Column (1)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Total tax liability	All	13,020 (262)	3,116 (18)	23.9	3,345 (20)	25.7	446 (5)	3.4
	1	-330 (249)	1,000 (16)	303.0	1,032 (17)	312.7	30 (2)	9.2
	2	3,527 (185)	2,196 (23)	62.3	2,270 (25)	64.4	237 (5)	6.7
	3	11,680 (424)	3,679 (32)	31.5	3,961 (35)	33.9	652 (9)	5.6
	4	37,190 (812)	8,981 (80)	24.1	10,200 (83)	27.4	1,693 (19)	4.6
Adjusted Gross Income	All	73,680 (1,033)	10,090 (57)	13.7	11,210 (66)	15.2	0 (0)	0.0
	1	23,150 (1,308)	4,405 (66)	19.0	5,096 (79)	22.0	0 (0)	0.0
	2	44,170 (648)	7,801 (84)	17.7	8,997 (100)	20.4	0 (0)	0.0
	3	74,800 (1,616)	11,680 (118)	15.6	12,710 (130)	17.0	0 (0)	0.0
	4	152,600 (3,286)	23,160 (245)	15.2	24,470 (254)	16.0	0 (0)	0.0
Taxable income	All	48,010 (738)	8,660 (58)	56.8	9,621 (66)	20.0	0 (0)	0.0
	1	8,724 (1253)	0 (0)	99.2	0 (0)	0.0	0 (0)	0.0
	2	20,760 (467)	6,593 (75)	68.1	7,345 (80)	35.4	0 (0)	0.0
	3	47,170 (1,266)	12,610 (116)	50.8	14,220 (121)	30.1	628 (59)	1.3
	4	115,400 (2143)	27,280 (230)	54.1	30,130 (243)	26.1	6,368 (73)	5.5

(continued on next page)

Appendix Table A.6b. Median Abs. Diff. Between Imputations and Extensive Tax Calculation with Std. Errors, 2010 Tax Year, CPS Data (Cont.)

Income or Tax component	Quartile of Equivalized Survey Family Income	Extensive Tax Data Calculation	CPS Tax Imputation		CPS Data and TAXSIM Imputation		Limited Tax Data Imputation	
		<i>Mean</i> (1)	<i>Median absolute difference</i> (2)	<i>% of Column (1)</i> (3)	<i>Median absolute difference</i> (4)	<i>% of Column (1)</i> (5)	<i>Median absolute difference</i> (6)	<i>% of Column (1)</i> (7)
Federal income tax before credits	All	9,221 (208)	1,351 (10)	69.0	1,391 (11)	15.1	3 (0)	0.0
	1	1,427 (227)	0 (0)	101.4	0 (0)	0.0	0 (0)	0.0
	2	3,016 (142)	968 (10)	83.3	888 (10)	29.5	2 (0)	0.1
	3	7,436 (338)	1,916 (16)	62.4	2,194 (19)	29.5	136 (7)	1.8
	4	25,010 (662)	6,049 (55)	67.5	6,737 (53)	26.9	1,339 (17)	5.4
Earned Income Tax Credit	All	733 (9)	0 (0)	75.1	0 (0)	0.0	0 (0)	0.0
	1	1,642 (27)	146 (7)	66.6	125 (8)	7.6	0 (0)	0.0
	2	925 (17)	0 (0)	82.5	0 (0)	0.0	0 (0)	0.0
	3	283 (10)	0 (0)	93.9	0 (0)	0.0	0 (0)	0.0
	4	80 (6)	0 (0)	96.5	0 (0)	0.0	0 (0)	0.0
Child Tax Credit	All	740 (6)	0 (0)	37.2	0 (0)	0.0	0 (0)	0.0
	1	825 (13)	0 (0)	45.2	0 (0)	0.0	0 (0)	0.0
	2	994 (13)	0 (0)	29.5	0 (0)	0.0	0 (0)	0.0
	3	838 (12)	0 (0)	28.4	0 (0)	0.0	0 (0)	0.0
	4	304 (8)	0 (0)	64.6	0 (0)	0.0	0 (0)	0.0

See Table 3b for all notes and sources. Standard errors in parentheses are calculated using replicate weights.

Approved for release by the U.S. Census Bureau, authorization numbers CBDRB-FY20-ERD002-014, CBDRB-FY20-ERD002-038.

Appendix Table A.7. Results of Statistical Testing of Statements in Text

Statement in Text	Result of Statistical Tests
“We find that aggregate estimates of various tax components using the limited and extensive tax data estimates are close to each other and much closer to public IRS tabulations than any of the imputations using survey data alone.” (Abstract, p. 3)	Diff. in total federal taxes between limited and CPS imputation = 45,550 (30,690) [0.138]
	Diff. in total state taxes between limited and CPS imputation = 29,680 (5,677) [<.001]
	Diff. in total payroll taxes between limited and CPS imputation = -28,620 (2,100) [<.001]
	Diff. in total AGI between limited and CPS imputation = 950,400 (133,800) [<.001]
	Diff. in total taxable income between limited and CPS imputation = 118,900 (106,400) [0.264]
	Diff. in total federal taxes before credits between limited and CPS imputation = 97,240 (30,540) [0.001]
	Diff. in total EITC between limited and CPS imputation = 18,670 (756) [<.001]
	Diff. in total CTC between limited and CPS imputation = 7,048 (413) [<.001]
	Diff. in total federal taxes between limited and CPS-TAXSIM imputation = -5,523 (30,740) [0.857]
	Diff. in total state taxes between limited and CPS-TAXSIM imputation = 10,970 (5,702) [0.054]
	Diff. in total payroll taxes between limited and CPS-TAXSIM imputation = -37,720 (2,050) [<.001]
	Diff. in total AGI between limited and CPS-TAXSIM imputation = 882,100 (134,200) [<.001]
	Diff. in total taxable income between limited and CPS-TAXSIM imputation = -64,380 (106,100) [0.544]
	Diff. in total federal taxes before credits between limited and CPS-TAXSIM imputation = 35,240 (30,490) [0.248]
	Diff. in total EITC between limited and CPS-TAXSIM imputation = 24,960 (1,009) [<.001]
	Diff. in total CTC between limited and CPS-TAXSIM imputation = 8,449 (532) [<.001]
	Diff. in total federal taxes between extensive and CPS imputation = 37,700 (25,120) [0.133]
	Diff. in total state taxes between extensive and CPS imputation = 15,060 (49,180) [0.759]
	Diff. in total payroll taxes between extensive and CPS imputation = -27,720 (2,000) [<.001]
	Diff. in total AGI between extensive and CPS imputation = 889,900 (130,400) [<.001]
	Diff. in total taxable income between extensive and CPS imputation = 296,100 (109,300) [0.007]
	Diff. in total federal taxes before credits between extensive and CPS imputation = 134,800 (25,430) [<.001]
	Diff. in total EITC between extensive and CPS imputation = 18,950 (768) [<.001]
	Diff. in total CTC between extensive and CPS imputation = 8,371 (457) [<.001]
	Diff. in total federal taxes between extensive and CPS-TAXSIM imputation = -13,300 (25,110) [0.596]
	Diff. in total state taxes between extensive and CPS-TAXSIM imputation = -3,639 (4,933) [0.461]
	Diff. in total payroll taxes between extensive and CPS-TAXSIM imputation = -36,820 (1,954) [<.001]
	Diff. in total AGI between extensive and CPS-TAXSIM imputation = 821,600 (130,700) [<.001]
	Diff. in total taxable income between extensive and CPS-TAXSIM imputation = 112,800 (108,700) [0.299]
	Diff. in total federal taxes before credits between extensive and CPS-TAXSIM imputation = 72,800 (25,320) [0.004]
Diff. in total EITC between extensive and CPS-TAXSIM imputation = 25,240 (1,019) [<.001]	
Diff. in total CTC between extensive and CPS-TAXSIM imputation = 9,772 (567) [<.001]	

(continued on next page)

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
<p>“In contrast, the limited tax imputations have 22-23% the absolute error of the CPS imputation for federal income taxes and 19-20% of the absolute error of the CPS imputation for total taxes.” (Abstract, p. 3)</p>	<p>Diff. in mean abs. error for federal taxes between limited and CPS imputation = -5549 (150) [$<.001$] Diff. in mean abs. error for total taxes between limited and CPS imputation = -7472 (187) [$<.001$]</p>
<p>“For the Earned Income Tax Credit, the limited tax data imputation is off by less than \$20 for a typical family (compared to more than \$500 using either of the survey-only imputations).” (Abstract)</p>	<p>Diff. in mean abs. error for EITC between limited imputation and \$20 = -18 (1) [$<.001$] Diff. in mean abs. error for EITC between CPS imputation and \$500 = 50 (8) [$<.001$] Diff. in mean abs. error for EITC between CPS-TAXSIM imputation and \$500 = 69 (8) [$<.001$] Diff. in mean abs. error for EITC between limited and CPS imputation = 536 (8) [$<.001$]</p>
<p>“The improvement in tax calculation using the limited tax data is particularly noticeable in the top half of the survey income distribution.” (p. 3, 32)</p>	<p>Diff. in mean abs. error (as % of mean amount) for fed. taxes between quartiles 3 and 1 using ltd imp. = -0.623 (0.0844) [$<.001$] Diff. in mean abs. error (as % of mean amount) for fed. taxes between quartiles 4 and 1 using ltd. imp. = -0.531 (0.0815) [$<.001$] Diff. in mean abs. error (as % of mean amount) for fed. taxes between quartiles 3 and 2 using ltd. imp. = 3.724 (3.121) [0.233] Diff. in mean abs. error (as % of mean amount) for fed. taxes between quartiles 4 and 2 using ltd. imp. = 3.816 (3.121) [0.221] Diff. in mean abs. error (as % of mean amount) for tot. taxes between quartiles 3 and 1 using ltd. imp. = -2.290 (1.651) [0.165] Diff. in mean abs. error (as % of mean amount) for tot. taxes between quartiles 4 and 1 using ltd. imp. = -2.275 (1.651) [0.168] Diff. in mean abs. error (as % of mean amount) for tot. taxes between quartiles 3 and 2 using ltd. imp. = 0.1281 (0.0186) [$<.001$] Diff. in mean abs. error (as % of mean amount) for tot. taxes between quartiles 4 and 2 using ltd. imp. = 0.1425 (0.0179) [$<.001$]</p>
<p>“For a typical family, we also find that the limited tax data imputation is off...by less than \$50 for the Child Tax Credit (compared to \$275 using the survey imputation).” (p. 3)</p>	<p>Diff. in mean abs. error for CTC between limited imputation and \$50 = -7 (2) [$<.001$] Diff. in mean abs. error for CTC between limited and CPS imputation = -232 (3) [$<.001$]</p>
<p>“As a result, we can see that the SOI aggregates – containing late filers from previous tax years – uniformly exceed the extensive tax data aggregates for all items.” (p. 25)</p>	<p>Diff. in total federal taxes between extensive calculation and SOI = -19,100 (1,524) [$<.001$] Diff. in total AGI between extensive calculation and SOI = -198,000 (6,516) [$<.001$] Diff. in total taxable income between extensive calculation and SOI = -136,000 (5,302) [$<.001$] Diff. in total federal income taxes before credits between extensive calculation and SOI = -23,000 (1,626) [$<.001$] Diff. in total EITC between extensive calculation and SOI = -50 (14) [$<.001$] Diff. in total CTC between extensive calculation and SOI = -1,680 (13) [$<.001$]</p>

(continued on next page)

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
<p>“Focusing first on the CPS tax imputation in Column 3, we see that it estimates a total of \$808 billion in federal income tax liabilities and \$217 billion in state income tax liabilities, both of which fall short of the independent aggregates.” (p.25)</p>	<p>Diff. in total federal taxes between CPS imputation and SOI = -37,000 (11,550) [0.001] Diff. in total state taxes between CPS imputation and SOI = -26,600 (2,809) [<.001]</p>
<p>“Interestingly, the underestimation of federal income taxes (defined as federal income taxes paid net of federal tax credits) persists despite the CPS tax imputation underestimating total EITC amounts by nearly one-third and total CTC amounts by nearly one-fifth.” (p.25)</p>	<p>Diff. in total EITC between CPS imputation and SOI = -19,210 (1,240) [<.001] Diff. in total CTC between CPS imputation and SOI = -10,400 (860) [<.001]</p>
<p>“In fact, much of this underestimation can be attributed to the CPS underestimating AGI and therefore taxable income, resulting in much lower estimates of federal income taxes before credits relative to the independent aggregates.” (p.25)</p>	<p>Diff. in total AGI between CPS imputation and SOI = -763,000 (68,870) [<.001] Diff. in total taxable income between CPS imputation and SOI = -264,000 (52,570) [<.001] Diff. in total federal income taxes before credits between CPS imputation and SOI = -147,900 (12,000) [<.001]</p>
<p>“In contrast, the CPS estimates a total of \$461 billion in payroll tax liabilities, which exceeds the SOI aggregate by approximately 6%.” (p.25)</p>	<p>Diff. in total payroll taxes between CPS imputation and SOI = 25,300 (4,520) [<.001]</p>

(continued on next page)

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
<p>“Interestingly, the CPS-TAXSIM imputation in Column 4 yields estimates of federal income tax liabilities (\$859 billion) that are higher than the estimates from the CPS tax imputation and closer to the independent aggregates, despite continuing to rely on CPS income reports and CPS-constructed tax unit structures.” (p.25)</p>	<p>Diff. in total federal taxes between CPS and CPS-TAXSIM imputation = -51,070 (2,229) [$<.001$] Diff. in total federal taxes between CPS-TAXSIM imputation and SOI = 14,100 (12,760) [0.269]</p>
<p>“To see this, note that the gap in taxable income between the CPS tax imputation and the CPS-TAXSIM imputation is nearly three times the gap in AGI, with much of the conceptual difference between AGI and taxable income due to itemized deductions.” (p.25)</p>	<p>Diff. in total taxable income gap and total AGI gap b/w CPS and CPS-TAXSIM imputation = -115,000 (4,692) [$<.001$]</p>
<p>“The CPS-TAXSIM imputation also yields estimates of state income tax liabilities (\$236 billion) and payroll tax liabilities (\$470 billion) that are higher than those obtained using the CPS tax imputation (and therefore closer to the independent aggregates for state income taxes and farther from those aggregates for payroll taxes), while estimates of the EITC and CTC are slightly underestimated relative to those from the CPS tax imputation and the SOI aggregates.” (p.25, 26)</p>	<p>Diff. in total state taxes between CPS-TAXSIM imputation and SOI = -7,900 (12,760) [0.536] Diff. in total payroll taxes between CPS-TAXSIM imputation and SOI = 34,400 (5,036) [$<.001$] Diff. in total EITC between CPS-TAXSIM imputation and SOI = -25,500 (653) [$<.001$] Diff. in total CTC between CPS-TAXSIM imputation and SOI = -11,800 (723) [$<.001$] Diff. in total state taxes between CPS and CPS-TAXSIM imputation = -18,700 (776) [$<.001$] Diff. in total payroll taxes between CPS and CPS-TAXSIM imputation = -9,099 (700) [$<.001$] Diff. in total EITC between CPS and CPS-TAXSIM imputation = 6,293 (427) [$<.001$] Diff. in total CTC between CPS and CPS-TAXSIM imputation = 1,401 (175) [$<.001$]</p>

(continued on next page)

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
<p>“Starting with federal income tax liabilities, we find that the limited tax data imputation yields \$853 billion and the extensive tax data calculation yields \$845 billion, with the former within approximately 1% and the latter within a tenth of 1% of the SOI aggregate.” (p.26)</p>	<p>Diff. in total federal taxes between limited imputation and SOI = 8,500 (32,420) [0.793] Diff. in total federal taxes between extensive calculation and SOI = 700 (27,240) [0.979]</p>
<p>“On one hand, the limited tax data imputation appears to overstate itemized deductions, as the estimate of taxable income – and therefore federal income taxes before credits – is smaller using the limited tax data imputation.” (p.26)</p>	<p>Diff. in total taxable income between limited imputation and extensive calculation = -177,200 (28,450) [<.001] Diff. in federal income taxes before credits between limited imputation and extensive calculation = -37,560 (8,959) [<.001]</p>
<p>“We also find that the limited and extensive tax data estimates in Columns 5 and 6 are comparable to each other for payroll tax liabilities, while the extensive tax data estimate is slightly smaller for state income tax liabilities.” (p.26)</p>	<p>Diff. in total state taxes between limited imputation and extensive calculation = 14,610 (1,742) [<.001] Diff. in total payroll taxes between limited imputation and extensive calculation = -900 (618) [0.145]</p>
<p>“Finally, the estimates for the EITC and CTC in Columns 5 and 6 are remarkably close to each other and to their respective independent aggregates.” (p.27)</p>	<p>Diff. in total EITC between limited imputation and SOI = -540 (1,716) [0.753] Diff. in total EITC between extensive calculation and SOI = -260 (1,722) [0.880] Diff. in total EITC between limited imputation and extensive calculation = -1,323 (150) [<.001] Diff. in total CTC between limited imputation and SOI = -3,350 (1,121) [0.003] Diff. in total CTC between extensive calculation and SOI = -2,030 (1,158) [0.080] Diff. in total CTC between limited imputation and extensive calculation = -277 (87) [0.001]</p>

(continued on next page)

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
<p>“Specifically, we find that families in the bottom decile of survey-reported income do not have lower levels of taxable income and federal income tax before credits (per the extensive tax data) than those in the second decile.” (p.27)</p>	<p>Diff. in avg. taxable income between first and second decile using extensive calculation = 2,346 (3,008) [0.435] Diff. in avg. federal tax before credits between first and second decile using extensive calculation = 477 (462) [0.302]</p>
<p>“We start by examining differences in federal income tax liabilities. We find that the CPS tax imputations understate federal income tax liabilities in the bottom seven deciles of survey-reported income, before overstating federal income tax liabilities in the top three deciles of survey-reported income.” (p.28)</p>	<p>Diff. in avg. federal taxes between CPS and extensive calculation in decile 1 = -524 (443) [0.237] Diff. in avg. federal taxes between CPS and extensive calculation in decile 2 = -915 (106) [<.001] Diff. in avg. federal taxes between CPS and extensive calculation in decile 3 = -1475 (446) [<.001] Diff. in avg. federal taxes between CPS and extensive calculation in decile 4 = -45 (144) [0.755] Diff. in avg. federal taxes between CPS and extensive calculation in decile 5 = -5 (209) [0.981] Diff. in avg. federal taxes between CPS and extensive calculation in decile 6 = -1,211 (576) [0.036] Diff. in avg. federal taxes between CPS and extensive calculation in decile 7 = -578 (535) [0.280] Diff. in avg. federal taxes between CPS and extensive calculation in decile 8 = 287 (247) [0.245] Diff. in avg. federal taxes between CPS and extensive calculation in decile 9 = 66 (816) [0.936] Diff. in avg. federal taxes between CPS and extensive calculation in decile 10 = 2,780 (1,441) [0.054]</p>
<p>“In contrast, the limited tax data imputation statistically overstates federal income tax liabilities in the majority of survey income deciles.” (p.29)</p>	<p>Diff. in avg. federal taxes between limited imputation and extensive calculation in decile 1 = 479 (234) [0.041] Diff. in avg. federal taxes between limited imputation and extensive calculation in decile 3 = 173 (67) [0.010] Diff. in avg. federal taxes between limited imputation and extensive calculation in decile 4 = 256 (34) [<.001] Diff. in avg. federal taxes between limited imputation and extensive calculation in decile 5 = 306 (49) [<.001] Diff. in avg. federal taxes between limited imputation and extensive calculation in decile 6 = 331 (177) [0.061] Diff. in avg. federal taxes between limited imputation and extensive calculation in decile 7 = 209 (50) [<.001] Diff. in avg. federal taxes between limited imputation and extensive calculation in decile 8 = 116 (110) [0.292] Diff. in avg. federal taxes between limited imputation and extensive calculation in decile 9 = 182 (429) [0.671]</p>

(continued on next page)

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
“Indeed, we find that the CPS tax imputation understates the extensive tax data calculation for AGI in the bottom nine deciles of survey income, for taxable income in the bottom seven deciles, and for federal income tax before credits in the bottom nine deciles.” (p.28)	Diff. in avg. AGI between CPS and extensive calculation in decile 1 = -15,410 (3,039) [$<.001$]
	Diff. in avg. AGI between CPS and extensive calculation in decile 2 = -8,809 (487) [$<.001$]
	Diff. in avg. AGI between CPS and extensive calculation in decile 3 = -11,760 (1,642) [$<.001$]
	Diff. in avg. AGI between CPS and extensive calculation in decile 4 = -8,606 (655) [$<.001$]
	Diff. in avg. AGI between CPS and extensive calculation in decile 5 = -6,000 (909) [$<.001$]
	Diff. in avg. AGI between CPS and extensive calculation in decile 6 = -9,509 (2,715) [$<.001$]
	Diff. in avg. AGI between CPS and extensive calculation in decile 7 = -4,388 (2,486) [0.078]
	Diff. in avg. AGI between CPS and extensive calculation in decile 8 = -1,711 (1,183) [0.148]
	Diff. in avg. AGI between CPS and extensive calculation in decile 9 = -5,327 (4,646) [0.252]
	Diff. in avg. AGI between CPS and extensive calculation in decile 10 = 2,350 (7,557) [0.756]
	Diff. in avg. taxable income between CPS and extensive calculation in decile 1 = -8,924 (2,970) [0.003]
	Diff. in avg. taxable income between CPS and extensive calculation in decile 2 = -5,576 (371) [$<.001$]
	Diff. in avg. taxable income between CPS and extensive calculation in decile 3 = -8,334 (1,331) [$<.001$]
	Diff. in avg. taxable income between CPS and extensive calculation in decile 4 = -4,462 (535) [$<.001$]
	Diff. in avg. taxable income between CPS and extensive calculation in decile 5 = -3,130 (701) [$<.001$]
	Diff. in avg. taxable income between CPS and extensive calculation in decile 6 = -5,992 (2,320) [0.010]
	Diff. in avg. taxable income between CPS and extensive calculation in decile 7 = -1,742 (1,604) [0.277]
	Diff. in avg. taxable income between CPS and extensive calculation in decile 8 = 2,655 (1,067) [0.013]
	Diff. in avg. taxable income between CPS and extensive calculation in decile 9 = 2,201 (3,425) [0.520]
	Diff. in avg. taxable income between CPS and extensive calculation in decile 10 = 17,370 (4,551) [$<.001$]
	Diff. in avg. federal tax before credits between CPS and extensive calculation in decile 1 = -1,462 (453) [0.001]
	Diff. in avg. federal tax before credits between CPS and extensive calculation in decile 2 = -897 (87) [$<.001$]
	Diff. in avg. federal tax before credits between CPS and extensive calculation in decile 3 = -2,164 (433) [$<.001$]
	Diff. in avg. federal tax before credits between CPS and extensive calculation in decile 4 = -1,633 (134) [$<.001$]
	Diff. in avg. federal tax before credits between CPS and extensive calculation in decile 5 = -1,755 (206) [$<.001$]
	Diff. in avg. federal tax before credits between CPS and extensive calculation in decile 6 = -2,780 (572) [$<.001$]
	Diff. in avg. federal tax before credits between CPS and extensive calculation in decile 7 = -2,064 (537) [$<.001$]
	Diff. in avg. federal tax before credits between CPS and extensive calculation in decile 8 = -975 (239) [$<.001$]
	Diff. in avg. federal tax before credits between CPS and extensive calculation in decile 9 = -799 (809) [0.323]
	Diff. in avg. federal tax before credits between CPS and extensive calculation in decile 10 = 1,920 (1,450) [0.185]

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
“Likewise, the CPS-TAXSIM imputation understates the extensive tax data calculations in six of the bottom seven deciles for federal income tax liabilities, all ten deciles for AGI, the bottom seven deciles for taxable income, and the bottom nine deciles for federal income tax before credits” (p.28)	Diff. in avg. federal taxes between CPS-TAXSIM and extensive calculation decile 1 = -325 (444) [0.464]
	Diff. in avg. federal taxes between CPS-TAXSIM and extensive calculation decile 2 = -548 (108) [<.001]
	Diff. in avg. federal taxes between CPS-TAXSIM and extensive calculation decile 3 = -1,262 (446) [0.005]
	Diff. in avg. federal taxes between CPS-TAXSIM and extensive calculation decile 4 = 24 (140) [0.864]
	Diff. in avg. federal taxes between CPS-TAXSIM and extensive calculation decile 5 = -25 (206) [0.904]
	Diff. in avg. federal taxes between CPS-TAXSIM and extensive calculation decile 6 = -1,240 (576) [0.031]
	Diff. in avg. federal taxes between CPS-TAXSIM and extensive calculation decile 7 = -568 (534) [0.287]
	Diff. in avg. federal taxes between CPS-TAXSIM and extensive calculation decile 8 = 567 (238) [0.017]
	Diff. in avg. federal taxes between CPS-TAXSIM and extensive calculation decile 9 = 554 (817) [0.498]
	Diff. in avg. federal taxes between CPS-TAXSIM and extensive calculation decile 10 = 3,103 (1,460) [0.034]
	Diff. in avg. AGI between CPS-TAXSIM and extensive calculation in decile 1 = -15,980 (3,039) [<.001]
	Diff. in avg. AGI between CPS-TAXSIM and extensive calculation in decile 2 = -10,390 (491) [<.001]
	Diff. in avg. AGI between CPS-TAXSIM and extensive calculation in decile 3 = -14,030 (1,659) [<.001]
	Diff. in avg. AGI between CPS-TAXSIM and extensive calculation in decile 4 = -11,400 (679) [<.001]
	Diff. in avg. AGI between CPS-TAXSIM and extensive calculation in decile 5 = -9,266 (924) [<.001]
	Diff. in avg. AGI between CPS-TAXSIM and extensive calculation in decile 6 = -12,790 (2,689) [<.001]
	Diff. in avg. AGI between CPS-TAXSIM and extensive calculation in decile 7 = -7,606 (2,488) [0.002]
	Diff. in avg. AGI between CPS-TAXSIM and extensive calculation in decile 8 = -4,909 (1,191) [<.001]
	Diff. in avg. AGI between CPS-TAXSIM and extensive calculation in decile 9 = -8,251 (4,684) [0.078]
	Diff. in avg. AGI between CPS-TAXSIM and extensive calculation in decile 10 = -1,922 (7,637) [0.801]
	Diff. in avg. taxable income between CPS-TAXSIM and extensive calculation in decile 1 = -8,997 (2,970) [0.003]
	Diff. in avg. taxable income between CPS-TAXSIM and extensive calculation in decile 2 = -6,010 (371) [<.001]
	Diff. in avg. taxable income between CPS-TAXSIM and extensive calculation in decile 3 = -9,244 (1,339) [<.001]
	Diff. in avg. taxable income between CPS-TAXSIM and extensive calculation in decile 4 = -5,775 (529) [<.001]
	Diff. in avg. taxable income between CPS-TAXSIM and extensive calculation in decile 5 = -4,537 (683) [<.001]
	Diff. in avg. taxable income between CPS-TAXSIM and extensive calculation in decile 6 = -7,100 (2,320) [0.002]
	Diff. in avg. taxable income between CPS-TAXSIM and extensive calculation in decile 7 = -2,171 (1,594) [0.173]
	Diff. in avg. taxable income between CPS-TAXSIM and extensive calculation in decile 8 = 3,280 (1,054) [0.002]
	Diff. in avg. taxable income between CPS-TAXSIM and extensive calculation in decile 9 = 3,813 (3,432) [0.266]
	Diff. in avg. taxable income between CPS-TAXSIM and extensive calculation in decile 10 = 15,030 (4,610) [0.001]
	Diff. in avg. federal tax before credits between CPS-TAXSIM and extensive calculation in decile 1 = -1,470 (453) [0.001]
	Diff. in avg. federal tax before credits between CPS-TAXSIM and extensive calculation in decile 2 = -927 (86) [<.001]
	Diff. in avg. federal tax before credits between CPS-TAXSIM and extensive calculation in decile 3 = -1,993 (433) [<.001]
	Diff. in avg. federal tax before credits between CPS-TAXSIM and extensive calculation in decile 4 = -1,110 (136) [<.001]
	Diff. in avg. federal tax before credits between CPS-TAXSIM and extensive calculation in decile 5 = -1,075 (200) [<.001]
	Diff. in avg. federal tax before credits between CPS-TAXSIM and extensive calculation in decile 6 = -2,048 (570) [<.001]
	Diff. in avg. federal tax before credits between CPS-TAXSIM and extensive calculation in decile 7 = -1,318 (535) [0.013]
	Diff. in avg. federal tax before credits between CPS-TAXSIM and extensive calculation in decile 8 = -163 (233) [0.484]
	Diff. in avg. federal tax before credits between CPS-TAXSIM and extensive calculation in decile 9 = -240 (810) [0.764]
	Diff. in avg. federal tax before credits between CPS-TAXSIM and extensive calculation in decile 10 = 1,000 (1,470) [0.497]

(continued on next page)

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
“Looking however at AGI, taxable income, and federal income tax before credits, the limited tax data estimates are closer to the extensive tax data counterparts throughout most of the survey income distribution.” (p.29)	Diff. in avg. AGI between limited and CPS imputation in decile 1 = 15,420 (3,043) [$<.001$]
	Diff. in avg. AGI between limited and CPS imputation in decile 2 = 8,789 (490) [$<.001$]
	Diff. in avg. AGI between limited and CPS imputation in decile 3 = 11,880 (1,641) [$<.001$]
	Diff. in avg. AGI between limited and CPS imputation in decile 4 = 8,690 (654) [$<.001$]
	Diff. in avg. AGI between limited and CPS imputation in decile 5 = 6,199 (910) [$<.001$]
	Diff. in avg. AGI between limited and CPS imputation in decile 6 = 9,741 (2,718) [$<.001$]
	Diff. in avg. AGI between limited and CPS imputation in decile 7 = 4,526 (2,488) [0.069]
	Diff. in avg. AGI between limited and CPS imputation in decile 8 = 2,098 (1,196) [0.079]
	Diff. in avg. AGI between limited and CPS imputation in decile 9 = 5,743 (4,643) [0.216]
	Diff. in avg. AGI between limited and CPS imputation in decile 10 = 115 (8,076) [0.989]
	Diff. in avg. taxable income between limited and CPS imputation in decile 1 = 8,492 (2,590) [0.001]
	Diff. in avg. taxable income between limited and CPS imputation in decile 2 = 5,458 (360) [$<.001$]
	Diff. in avg. taxable income between limited and CPS imputation in decile 3 = 8,236 (1,266) [$<.001$]
	Diff. in avg. taxable income between limited and CPS imputation in decile 4 = 4,144 (499) [$<.001$]
	Diff. in avg. taxable income between limited and CPS imputation in decile 5 = 2,709 (673) [$<.001$]
	Diff. in avg. taxable income between limited and CPS imputation in decile 6 = 4,727 (2,168) [0.029]
	Diff. in avg. taxable income between limited and CPS imputation in decile 7 = 211 (1,571) [0.893]
	Diff. in avg. taxable income between limited and CPS imputation in decile 8 = -4,964 (930) [$<.001$]
	Diff. in avg. taxable income between limited and CPS imputation in decile 9 = -5,279 (3,401) [0.121]
	Diff. in avg. taxable income between limited and CPS imputation in decile 10 = -21,980 (5,178) [$<.001$]
	Diff. in avg. federal tax before credits between limited and CPS imputation in decile 1 = 1,762 (643) [0.006]
	Diff. in avg. federal tax before credits between limited and CPS imputation in decile 2 = 868 (83) [$<.001$]
	Diff. in avg. federal tax before credits between limited and CPS imputation in decile 3 = 2,101 (408) [$<.001$]
	Diff. in avg. federal tax before credits between limited and CPS imputation in decile 4 = 1,551 (120) [$<.001$]
	Diff. in avg. federal tax before credits between limited and CPS imputation in decile 5 = 1,671 (187) [$<.001$]
	Diff. in avg. federal tax before credits between limited and CPS imputation in decile 6 = 2,678 (706) [$<.001$]
	Diff. in avg. federal tax before credits between limited and CPS imputation in decile 7 = 1,716 (527) [0.001]
	Diff. in avg. federal tax before credits between limited and CPS imputation in decile 8 = 519 (277) [0.061]
	Diff. in avg. federal tax before credits between limited and CPS imputation in decile 9 = 399 (1,115) [0.720]
	Diff. in avg. federal tax before credits between limited and CPS imputation in decile 10 = -4,584 (1,737) [0.008]

(continued on next page)

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
<p>“Interestingly, compared to the CPS tax imputation, the limited tax data imputation yields estimates of federal income tax liabilities that are closer to the extensive tax data estimates at many of the bottom and top deciles of survey income (but not in the middle).” (p.29)</p>	<p>Diff. in avg. federal taxes between limited and CPS imputation in decile 1 = 1,003 (649) [0.122] Diff. in avg. federal taxes between limited and CPS imputation in decile 2 = 1,040 (105) [<.001] Diff. in avg. federal taxes between limited and CPS imputation in decile 3 = 1,648 (422) [<.001] Diff. in avg. federal taxes between limited and CPS imputation in decile 8 = -171 (288) [0.553] Diff. in avg. federal taxes between limited and CPS imputation in decile 9 = 116 (1,119) [0.917] Diff. in avg. federal taxes between limited and CPS imputation in decile 10 = -4,123 (1,744) [0.018]</p>
<p>“For state income tax liabilities, we continue to find that the CPS tax imputation and the CPS-TAXSIM imputation understates the extensive tax data aggregates throughout most of the survey-reported income distribution and that the limited tax data overstates the extensive tax data aggregates throughout the distribution.” (p.29)</p>	<p>Diff. in avg. state taxes between CPS and extensive calculation in decile 1 = -50 (29) [0.085] Diff. in avg. state taxes between CPS and extensive calculation in decile 2 = -63 (21) [0.003] Diff. in avg. state taxes between CPS and extensive calculation in decile 3 = -275 (92) [0.003] Diff. in avg. state taxes between CPS and extensive calculation in decile 4 = -99 (38) [0.009] Diff. in avg. state taxes between CPS and extensive calculation in decile 5 = -116 (51) [0.023] Diff. in avg. state taxes between CPS and extensive calculation in decile 6 = -310 (104) [0.003] Diff. in avg. state taxes between CPS and extensive calculation in decile 7 = -196 (130) [0.132] Diff. in avg. state taxes between CPS and extensive calculation in decile 8 = -64 (65) [0.325] Diff. in avg. state taxes between CPS and extensive calculation in decile 9 = -387 (303) [0.202] Diff. in avg. state taxes between CPS and extensive calculation in decile 10 = 189 (231) [0.413] Diff. in avg. state taxes between CPS-TAXSIM and extensive calculation in decile 1 = -84 (28) [0.003] Diff. in avg. state taxes between CPS-TAXSIM and extensive calculation in decile 2 = -105 (20) [0.003] Diff. in avg. state taxes between CPS-TAXSIM and extensive calculation in decile 3 = -319 (92) [<.001] Diff. in avg. state taxes between CPS-TAXSIM and extensive calculation in decile 4 = -150 (37) [<.001] Diff. in avg. state taxes between CPS-TAXSIM and extensive calculation in decile 5 = -161 (50) [0.001] Diff. in avg. state taxes between CPS-TAXSIM and extensive calculation in decile 6 = -333 (103) [0.001] Diff. in avg. state taxes between CPS-TAXSIM and extensive calculation in decile 7 = -166 (131) [0.205] Diff. in avg. state taxes between CPS-TAXSIM and extensive calculation in decile 8 = -96 (63) [0.128] Diff. in avg. state taxes between CPS-TAXSIM and extensive calculation in decile 9 = -147 (306) [0.631] Diff. in avg. state taxes between CPS-TAXSIM and extensive calculation in decile 10 = 747 (241) [0.002] Diff. in avg. state taxes between limited imputation and extensive calculation in decile 1 = 105 (11) [<.001] Diff. in avg. state taxes between limited imputation and extensive calculation in decile 2 = 103 (7) [<.001] Diff. in avg. state taxes between limited imputation and extensive calculation in decile 3 = 147 (21) [<.001] Diff. in avg. state taxes between limited imputation and extensive calculation in decile 4 = 113 (8) [<.001] Diff. in avg. state taxes between limited imputation and extensive calculation in decile 5 = 121 (9) [<.001] Diff. in avg. state taxes between limited imputation and extensive calculation in decile 6 = 105 (10) [<.001] Diff. in avg. state taxes between limited imputation and extensive calculation in decile 7 = 123 (14) [<.001] Diff. in avg. state taxes between limited imputation and extensive calculation in decile 8 = -102 (15) [<.001] Diff. in avg. state taxes between limited imputation and extensive calculation in decile 9 = 117 (37) [0.002] Diff. in avg. state taxes between limited imputation and extensive calculation in decile 10 = 96 (189) [0.611]</p>

(continued on next page)

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
<p>“For payroll taxes, we find that the limited tax data imputation yields estimates that are much closer to the extensive tax data counterparts than the CPS tax imputation, which understates payroll taxes in most of the bottom half of the survey income distribution and overstates payroll taxes in the top half.” (p.29)</p>	<p>Diff. in avg. payroll tax between limited and CPS imputation in decile 1 = 401 (20) [$<.001$] Diff. in avg. payroll tax between limited and CPS imputation in decile 2 = 124 (21) [$<.001$] Diff. in avg. payroll tax between limited and CPS imputation in decile 3 = 127 (44) [0.004] Diff. in avg. payroll tax between limited and CPS imputation in decile 4 = 8 (28) [0.775] Diff. in avg. payroll tax between limited and CPS imputation in decile 5 = -198 (29) [$<.001$] Diff. in avg. payroll tax between limited and CPS imputation in decile 6 = -227 (41) [$<.001$] Diff. in avg. payroll tax between limited and CPS imputation in decile 7 = -406 (51) [$<.001$] Diff. in avg. payroll tax between limited and CPS imputation in decile 8 = -616 (52) [$<.001$] Diff. in avg. payroll tax between limited and CPS imputation in decile 9 = -714 (90) [$<.001$] Diff. in avg. payroll tax between limited and CPS imputation in decile 10 = -1,096 (130) [$<.001$]</p>
<p>“Comparably, the CPS-TAXSIM imputation understates payroll taxes in the bottom six deciles of the survey income distribution.” (p. 29)</p>	<p>Diff. in avg. payroll tax between CPS-TAXSIM and extensive calculation in decile 1 = -498 (21) [$<.001$] Diff. in avg. payroll tax between CPS-TAXSIM and extensive calculation in decile 2 = -312 (24) [$<.001$] Diff. in avg. payroll tax between CPS-TAXSIM and extensive calculation in decile 3 = -351 (45) [0.004] Diff. in avg. payroll tax between CPS-TAXSIM and extensive calculation in decile 4 = -279 (32) [0.775] Diff. in avg. payroll tax between CPS-TAXSIM and extensive calculation in decile 5 = -99 (32) [0.002] Diff. in avg. payroll tax between CPS-TAXSIM and extensive calculation in decile 6 = -61 (42) [0.1471] Diff. in avg. payroll tax between CPS-TAXSIM and extensive calculation in decile 7 = 119 (54) [0.028] Diff. in avg. payroll tax between CPS-TAXSIM and extensive calculation in decile 8 = 377 (55) [$<.001$] Diff. in avg. payroll tax between CPS-TAXSIM and extensive calculation in decile 9 = 620 (95) [$<.001$] Diff. in avg. payroll tax between CPS-TAXSIM and extensive calculation in decile 10 = 1,158 (126) [$<.001$]</p>

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
<p>“For the EITC, the limited tax data imputation yields estimates that are within 1% of the extensive tax data aggregates at every decile of survey income.” (p.29)</p>	<p>Diff. in avg. EITC between limited imputation and extensive calculation in decile 1 = -17 (5) [$<.001$] Diff. in avg. EITC between limited imputation and extensive calculation in decile 2 = -12 (5) [0.016] Diff. in avg. EITC between limited imputation and extensive calculation in decile 3 = -14 (6) [0.020] Diff. in avg. EITC between limited imputation and extensive calculation in decile 4 = -5 (3) [0.096] Diff. in avg. EITC between limited imputation and extensive calculation in decile 5 = 0 (3) [1.000] Diff. in avg. EITC between limited imputation and extensive calculation in decile 6 = -2 (2) [0.317] Diff. in avg. EITC between limited imputation and extensive calculation in decile 7 = 2 (1) [0.046] Diff. in avg. EITC between limited imputation and extensive calculation in decile 8 = 2 (1) [0.046] Diff. in avg. EITC between limited imputation and extensive calculation in decile 9 = 0 (1) [1.000] Diff. in avg. EITC between limited imputation and extensive calculation in decile 10 = -1 (1) [0.317]</p>
<p>“Finally, the limited tax data imputation also yields estimates of the CTC that are closer to the extensive aggregates than the CPS tax imputation, both on average and throughout most of the survey income distribution.” (p.30)</p>	<p>Diff. in avg. CTC between limited and CPS imputation for all deciles = 58 (4) [$<.001$] Diff. in avg. CTC between limited and CPS imputation in decile 1 = 276 (13) [$<.001$] Diff. in avg. CTC between limited and CPS imputation in decile 2 = 0 (14) [1.000] Diff. in avg. CTC between limited and CPS imputation in decile 3 = -7 (16) [0.662] Diff. in avg. CTC between limited and CPS imputation in decile 4 = 28 (11) [0.011] Diff. in avg. CTC between limited and CPS imputation in decile 5 = 20 (13) [0.124] Diff. in avg. CTC between limited and CPS imputation in decile 6 = -1 (11) [0.928] Diff. in avg. CTC between limited and CPS imputation in decile 7 = -26 (11) [0.018] Diff. in avg. CTC between limited and CPS imputation in decile 8 = 19 (10) [0.057] Diff. in avg. CTC between limited and CPS imputation in decile 9 = 174 (10) [$<.001$] Diff. in avg. CTC between limited and CPS imputation in decile 10 = 102 (8) [$<.001$]</p>

(continued on next page)

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
<p>“In contrast, the CPS tax imputation understates those aggregates for EITC in nearly every decile of survey income (except for the second), with these differences being most pronounced for families in the fourth and fifth deciles.” (p.29)</p>	<p>Diff. in avg. EITC between CPS and extensive calculation in decile 1 = -375 (37) [$<.001$] Diff. in avg. EITC between CPS and extensive calculation in decile 2 = 236 (36) [$<.001$] Diff. in avg. EITC between CPS and extensive calculation in decile 3 = -153 (28) [$<.001$] Diff. in avg. EITC between CPS and extensive calculation in decile 4 = -493 (27) [$<.001$] Diff. in avg. EITC between CPS and extensive calculation in decile 5 = -467 (28) [$<.001$] Diff. in avg. EITC between CPS and extensive calculation in decile 6 = -271 (19) [$<.001$] Diff. in avg. EITC between CPS and extensive calculation in decile 7 = -168 (14) [$<.001$] Diff. in avg. EITC between CPS and extensive calculation in decile 8 = -127 (15) [$<.001$] Diff. in avg. EITC between CPS and extensive calculation in decile 9 = -70 (11) [$<.001$] Diff. in avg. EITC between CPS and extensive calculation in decile 10 = -44 (7) [$<.001$] Diff. in avg. EITC between deciles 4 and 1 for CPS imputation = -118 (47) [0.012] Diff. in avg. EITC between deciles 4 and 2 for CPS imputation = -729 (44) [$<.001$] Diff. in avg. EITC between deciles 4 and 3 for CPS imputation = -340 (38) [$<.001$] Diff. in avg. EITC between deciles 4 and 6 for CPS imputation = -222 (34) [$<.001$] Diff. in avg. EITC between deciles 4 and 7 for CPS imputation = -326 (28) [$<.001$] Diff. in avg. EITC between deciles 4 and 8 for CPS imputation = -366 (30) [$<.001$] Diff. in avg. EITC between deciles 4 and 9 for CPS imputation = -423 (28) [$<.001$] Diff. in avg. EITC between deciles 4 and 10 for CPS imputation = -448 (28) [$<.001$] Diff. in avg. EITC between deciles 5 and 1 for CPS imputation = -92 (43) [0.032] Diff. in avg. EITC between deciles 5 and 2 for CPS imputation = -703 (45) [$<.001$] Diff. in avg. EITC between deciles 5 and 3 for CPS imputation = -315 (37) [$<.001$] Diff. in avg. EITC between deciles 5 and 6 for CPS imputation = -196 (34) [$<.001$] Diff. in avg. EITC between deciles 5 and 7 for CPS imputation = -300 (31) [$<.001$] Diff. in avg. EITC between deciles 5 and 8 for CPS imputation = -340 (31) [$<.001$] Diff. in avg. EITC between deciles 5 and 9 for CPS imputation = -397 (29) [$<.001$] Diff. in avg. EITC between deciles 5 and 10 for CPS imputation = -423 (29) [$<.001$]</p>
<p>“The CPS-TAXSIM imputation understates EITC aggregates in every decile of survey income.” (p.30)</p>	<p>Diff. in avg. EITC between CPS-TAXSIM and extensive calculation in decile 1 = -542 (37) [$<.001$] Diff. in avg. EITC between CPS-TAXSIM and extensive calculation in decile 2 = -83 (38) [0.029] Diff. in avg. EITC between CPS-TAXSIM and extensive calculation in decile 3 = -386 (29) [$<.001$] Diff. in avg. EITC between CPS-TAXSIM and extensive calculation in decile 4 = -653 (27) [$<.001$] Diff. in avg. EITC between CPS-TAXSIM and extensive calculation in decile 5 = -536 (27) [$<.001$] Diff. in avg. EITC between CPS-TAXSIM and extensive calculation in decile 6 = -314 (20) [$<.001$] Diff. in avg. EITC between CPS-TAXSIM and extensive calculation in decile 7 = -178 (13) [$<.001$] Diff. in avg. EITC between CPS-TAXSIM and extensive calculation in decile 8 = -142 (14) [$<.001$] Diff. in avg. EITC between CPS-TAXSIM and extensive calculation in decile 9 = -72 (10) [$<.001$] Diff. in avg. EITC between CPS-TAXSIM and extensive calculation in decile 10 = -43 (7) [$<.001$]</p>

(continued on next page)

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
<p>“For federal income tax liabilities, the mean absolute error for the CPS tax imputation is \$7,202 for all families, which is greater than the average federal income tax amount (\$6,824) and nearly 10% of average AGI (\$73,680).” (p.30)</p>	<p>Diff. in mean abs. error for federal taxes between CPS imputation and extensive calculation = 7,202 (187) [$<.001$]</p>
<p>“The mean absolute errors in state income tax liabilities and payroll tax liabilities are much smaller than the mean absolute error in federal income tax liabilities as a share of AGI (each approximately 2% of AGI), even though these errors are sizeable as a share of their mean values from the extensive tax data (65% for state income taxes and 37% for payroll taxes).” (p.31)</p>	<p>Diff. in mean abs. error between federal and state taxes for the CPS imputation = 5,835 (163) [$<.001$] Diff. in mean abs. error between federal and payroll taxes for the CPS imputation = 5,682 (175) [$<.001$]</p>
<p>“Once again, the mean absolute errors in total tax liabilities as a share of AGI are highest in the bottom and top quartiles.” (p.31)</p>	<p>Diff. in mean abs. error for total taxes (as % of mean AGI) between quartiles 1 and 2 for CPS imp. = 0.0368 (0.0141) [0.009] Diff. in mean abs. error for total taxes (as % of mean AGI) between quartiles 1 and 3 for CPS imp. = 0.0404 (0.0146) [0.006] Diff. in mean abs. error for total taxes (as % of mean AGI) between quartiles 4 and 2 for CPS imp. = 0.0441 (0.0072) [$<.001$] Diff. in mean abs. error for total taxes (as % of mean AGI) between quartiles 4 and 3 for CPS imp. = 0.0478 (0.0081) [$<.001$]</p>
<p>“For example, Duncan and Hill (1985) find that the average absolute difference between survey and administrative values of earnings in their 1982 sample was \$2123 – amounting to approximately 7% of mean earnings. Compared to this difference, the average absolute difference that we calculate for total taxes (13% of AGI, which is typically a larger income base than earnings) is considerably greater.” (p.31)</p>	<p>Diff. in mean abs. error for total taxes (as % of mean AGI) between CPS imputation and 7% = 0.1274 (0.0036) [$<.001$]</p>

(continued on next page)

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
<p>“As a share of the mean amount, the mean absolute error in AGI is largest in the bottom quartile (65%).” (p.31)</p>	<p>Diff. in mean abs. error for AGI (as % of mean AGI) between quartiles 1 and 2 for CPS imputation = 0.2355 (0.0687) [<.001] Diff. in mean abs. error for AGI (as % of mean AGI) between quartiles 1 and 3 for CPS imputation = 0.2941 (0.0707) [<.001] Diff. in mean abs. error for AGI (as % of mean AGI) between quartiles 1 and 4 for CPS imputation = 0.2074 (0.0708) [0.003]</p>
<p>“The mean absolute difference in taxable income for the CPS is \$27,280, which is 57% of the mean taxable income amount and among the highest (as a share of the mean amount) in the bottom quartile.” (p.31)</p>	<p>Diff. in mean abs. error for taxable income between extensive and CPS imputation = 27,280 (649) [<.001] Diff. in mean abs. error for taxable income (as % of mean amt.) between quartiles 1 and 2 for CPS imputation = 0.3111 (0.2041) [0.127] Diff. in mean abs. error for taxable income (as % of mean amt.) between quartiles 1 and 3 for CPS imputation = 0.4841 (0.2043) [0.018] Diff. in mean abs. error for taxable income (as % of mean amt.) between quartiles 1 and 4 for CPS imputation = 0.4514 (0.2032) [0.026]</p>
<p>“Analogously, the mean absolute difference in federal income tax before credits for the CPS is \$6,366, which is 69% of the mean taxable income amount and among the highest in the bottom quartile (as a share of the mean amount).” (p.31)</p>	<p>Diff. in mean abs. error for federal taxes before credits between extensive and CPS imputation = 6,366 (191) [<.001] Diff. in mean abs. err. for fed. taxes before credits (as % of mean amt.) between q. 1 and 2 for CPS imputation = 0.1817 (0.2350) [0.439] Diff. in mean abs. err. for fed. taxes before credits (as % of mean amt.) between q. 1 and 3 for CPS imputation = 0.3909 (0.2328) [0.093] Diff. in mean abs. err. for fed. taxes before credits (as % of mean amt.) between q. 1 and 4 for CPS imputation = 0.3399 (0.2287) [0.137]</p>
<p>“For federal income tax liabilities, the mean absolute error between the limited tax data imputation and extensive tax data calculation is 24% for all families. This is approximately a quarter of the absolute error for the CPS tax imputation (106%) and CPS-TAXSIM imputation (109%).” (p.32)</p>	<p>Diff. in mean abs. error for federal taxes between limited and CPS imputation = -5,549 (150) [<.001]</p>
<p>“Similarly, the mean absolute error between the limited and extensive tax data estimates is a mere 1% for AGI (compared to 44% for the CPS tax imputation), 10% for taxable income (compared to 57% for the CPS tax imputation), and 16% for federal income tax before credits (compared to 69% for the CPS tax imputation).” (p.32)</p>	<p>Diff. in mean abs. error for AGI between limited and CPS imputation = -31,270 (948) [<.001] Diff. in mean abs. error for taxable income between limited and CPS imputation = -22,350 (552) [<.001] Diff. in mean abs. error for federal taxes before credits between limited and CPS imputation = -4,928 (153) [<.001]</p>

(continued on next page)

Appendix Table A.7. Results of Statistical Testing of Statements in Text (Continued)

Statement in Text	Result of Statistical Tests
<p>“The mean absolute difference between the limited and extensive tax data estimates is 16% for state income taxes (compared to 65% for the CPS tax imputation) and 3% for payroll taxes (compared to 37% for the CPS tax imputation).” (p.32)</p>	<p>Diff. in mean abs. error for state taxes between limited and CPS imputation = 1,025 (42) [$<.001$] Diff. in mean abs. error for payroll taxes between limited and CPS imputation = -1,396 (17) [$<.001$]</p>
<p>“Taken together, the mean absolute error between the limited tax data imputation and extensive tax data calculation for total tax liabilities is 15%, which is approximately 20% of the absolute error for the CPS tax imputation (72%) and CPS-TAXSIM imputation (76%).” (p.32)</p>	<p>Diff. in mean abs. error for total taxes between limited and extensive calculation = 1,913 (73) [$<.001$] Diff. in mean abs. error for total taxes between limited and CPS imputation = -7,472 (187) [$<.001$] Diff. in mean abs. error for total taxes between limited and CPS-TAXSIM imputation = -7,957 (191) [$<.001$]</p>

See Tables 1, 2, 3a, and 3b for all other notes and sources. Standard errors in parentheses are calculated using replicate weights and p-values corresponding to t-test of null hypothesis (that mean is equal to zero) are in brackets.

Approved for release by the U.S. Census Bureau, authorization numbers CBDRB-FY20-ERD002-014, CBDRB-FY20-ERD002-038.