

ONLINE APPENDIX: THE CONCENTRATION OF PERSONAL WEALTH IN ITALY 1995–2016

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Appendix A: Wealth totals and main distributional estimates

A.1. Top wealth shares

In this section we report three sets of estimates of wealth shares and wealth thresholds (at 2016 prices) for a number of wealth groups of the adult population (age 20+) between 1995 and 2016. Table A.1 shows the main benchmark distributional estimates derived to be consistent with the balance sheets of the personal sector. Table A.3 shows estimates that, after adjustment to National Accounts, allow also for unreported offshore financial assets. Table A.2 shows estimates that only allow for tax exempt assets and not the full imputation of all assets and liabilities to align distributional estimates to National Accounts.

Year	Bottom 90 %	Bottom 50%	Mid 40%	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.05%	Top 0.01%	Top 10 - 1 %	Top 1 - 0.1%	Top 0.1 - 0.01%	P50	P90	P95	P99	P95	P99.9	P99.5	P99.99
1995	55,37	11,99	43,38	44,63	33,40	16,41	12,04	5,57	3,92	1,83	28,22	10,84	3,74	55,77	275,54	385,73	1024,49	1495,26	3999,01	5225,06	11240,96
1996																					
1997																					
1998	53,40	10,26	43,13	46,60	35,08	17,22	12,34	5,70	4,16	1,88	29,38	11,52	3,82	90,46	299,73	398,04	1237,81	1984,96	4171,63	6009,13	11950,87
1999																					
2000	52,12	9,17	42,95	47,88	36,31	18,63	13,64	7,20	5,43	2,77	29,25	11,43	4,43	97,02	285,58	459,71	1277,81	1910,25	3942,59	7360,48	17420,73
2001																					
2002	48,81	7,59	41,22	51,19	39,61	20,11	14,58	7,17	5,74	2,85	31,08	12,94	4,31	67,20	284,12	649,11	1475,49	1850,00	5978,56	7932,82	19384,54
2003																					
2004	48,04	7,09	40,95	51,96	39,28	19,70	14,30	7,28	5,10	2,01	32,27	12,42	5,26	63,35	366,58	621,68	1783,81	2327,60	5455,22	8860,26	19929,76
2005																					
2006	47,65	6,58	41,07	52,35	39,93	20,68	15,33	8,12	6,28	3,37	31,67	12,56	4,75	66,01	371,95	684,98	1938,65	2840,07	7280,64	9868,99	22341,59
2007																					
2008	45,25	5,04	40,21	54,75	41,40	20,78	15,17	7,24	5,44	2,53	33,97	13,53	4,71	64,80	408,47	651,98	1643,12	2653,43	6451,00	7991,41	19456,90
2009																					
2010	42,62	2,99	39,62	57,38	43,64	21,73	15,72	7,35	5,17	2,22	35,65	14,38	5,13	57,58	418,61	680,98	1799,07	2804,74	7305,79	9431,48	18600,07
2011																					
2012	40,54	2,15	38,39	59,46	45,72	23,78	17,92	9,68	7,68	4,51	35,67	14,11	5,17	56,25	404,38	644,52	1727,23	2683,04	6228,09	8601,93	27017,27
2013																					
2014	42,00	2,94	39,05	58,00	44,89	24,69	19,54	12,03	10,00	7,48	33,31	12,66	4,55	56,86	375,15	580,50	1425,84	2236,94	5690,11	8802,94	31205,09
2015																					
2016	44,03	3,44	40,59	55,97	42,85	22,01	16,80	9,30	7,51	4,93	33,97	12,70	4,37	49,75	358,55	564,06	1442,67	2298,45	5391,75	8008,68	19319,27

TABLE A.1. Top wealth shares and wealth group thresholds in thousands 2016 Euro - benchmark estimates. The table shows estimates of wealth shares and wealth thresholds (at 2016 prices) for a number of wealth groups of the adult population (age 20+) between 1995 and 2016. The table shows the main benchmark distributional estimates derived to be consistent with the balance sheets of the personal sector.

Year	Bottom 90 %	Bottom 50%	Mid 40%	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.05%	Top 0.01%	Top 10 - 1 %	Top 1 - 0.1%	Top 0.1 - 0.01%	P50	P90	P95	P99	P95	P99.9	P99.5	P99.99
1995	55,53	24,00	31,53	44,47	32,90	15,76	11,38	5,06	3,53	1,65	28,71	10,70	3,42		246,24	379,12	950,84	1383,35	3283,34	4446,05	8112,24
1996																					
1997																					
1998	59,91	31,35	28,56	40,09	29,63	13,89	9,80	4,22	3,00	1,26	26,20	9,67	2,95	1,44	244,84	380,66	957,74	1376,06	2901,38	3967,11	9027,14
1999																					
2000	58,45	28,99	29,46	41,55	31,00	15,02	10,79	5,01	3,59	1,66	26,54	10,01	3,35	4,47	262,74	409,83	1068,85	1527,05	3539,91	4670,89	9688,20
2001																					
2002	53,16	20,67	32,49	46,84	35,70	17,26	12,31	5,49	4,20	1,96	29,58	11,76	3,54	-50,08	196,67	286,36	891,00	1173,21	2521,47	3390,20	6698,26
2003																					
2004	52,45	20,24	32,21	47,55	35,41	16,90	12,07	5,58	3,74	1,38	30,65	11,33	4,20		299,98	471,42	1154,76	1667,24	3783,56	5662,19	11283,89
2005																					
2006	52,09	19,81	32,29	47,91	35,99	17,75	12,94	6,22	4,60	2,31	30,16	11,53	3,91		348,52	544,88	1324,88	1942,44	4167,93	6050,12	12368,99
2007																					
2008	47,51	11,38	36,13	52,49	39,13	18,85	13,55	6,07	4,38	1,97	33,64	12,78	4,10	16,35	397,28	623,41	1576,16	2282,53	5101,58	7268,60	14657,75
2009																					
2010	45,82	9,35	36,47	54,18	40,56	19,67	14,00	6,31	4,39	1,83	34,50	13,37	4,48	16,70	391,79	617,56	1552,80	2318,73	5232,48	7257,52	16419,75
2011																					
2012	43,17	6,20	36,97	56,83	42,91	21,40	15,63	7,98	6,20	3,45	35,43	13,42	4,53	20,22	387,61	614,25	1571,91	2240,24	4897,16	6894,61	15396,44
2013																					
2014	44,65	10,42	34,23	55,35	42,41	22,84	17,89	10,67	8,76	6,32	32,51	12,17	4,35	7,90	346,10	545,08	1319,11	1950,01	4569,07	6737,82	15514,31
2015																					
2016	49,28	15,76	33,52	50,72	38,16	18,79	13,95	7,19	5,59	3,44	31,93	11,60	3,74	5,27	326,78	514,05	1267,76	1787,89	4034,24	5344,82	11250,15

TABLE A.2. Top wealth shares and wealth group thresholds in thousands 2016 Euro - estimates imputing only tax-exempt assets. The table shows estimates of wealth shares and wealth thresholds (at 2016 prices) for a number of wealth groups of the adult population (age 20+) between 1995 and 2016. The table shows estimates that only allow for tax exempt assets and not the full imputation of all assets and liabilities to align distributional estimates to National Accounts.

Year	Bottom 90 %	Bottom 50%	Mid 40%	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.05%	Top 0.01%	Top 10 - 1 %	Top 1 - 0.1%	Top 0.1 - 0.01%	P50	P90	P95	P99	P95	P99.9	P99.5	P99.99
1995	54,25	11,77	42,48	45,75	34,74	18,02	13,66	7,05	5,44	2,86	27,73	10,97	4,19	55,77	275,54	385,73	1024,49	1495,26	3999,01	5225,06	11240,96
1996																					
1997																					
1998	52,13	10,05	42,08	47,87	36,60	19,01	14,25	6,82	5,32	3,10	28,86	12,19	3,72	90,46	299,73	398,04	1237,81	1984,96	4171,63	6009,13	11950,87
1999																					
2000	50,54	8,94	41,61	49,46	38,23	20,98	16,03	9,38	6,88	4,30	28,48	11,59	5,08	97,02	285,58	459,71	1277,81	1910,25	3942,59	7360,48	17420,73
2001																					
2002	47,66	7,44	40,22	52,34	41,06	21,91	16,42	8,80	7,10	4,09	30,42	13,11	4,71	67,20	284,12	649,11	1475,49	1850,00	5978,55	7932,82	19384,54
2003																					
2004	46,87	6,94	39,93	53,13	40,72	21,46	16,10	8,94	6,32	2,89	31,67	12,53	6,05	63,35	366,58	621,68	1783,81	2327,60	5455,22	8860,26	19929,76
2005																					
2006	46,48	6,44	40,04	53,52	41,39	22,54	17,26	9,97	7,77	4,83	30,99	12,57	5,14	66,01	371,95	684,98	1938,65	2840,07	7280,64	9868,99	22341,59
2007																					
2008	44,55	4,99	39,57	55,45	42,29	21,94	16,36	8,36	6,58	3,32	33,51	13,58	5,04	64,80	408,47	651,98	1643,12	2653,43	6450,99	7991,41	19456,90
2009																					
2010	41,97	2,97	39,00	58,03	44,49	22,86	16,78	8,44	6,29	2,99	35,17	14,42	5,44	57,58	418,61	680,98	1799,07	2804,74	7305,79	9431,48	18600,07
2011																					
2012	39,78	2,14	37,64	60,22	46,73	25,18	19,33	10,61	8,54	5,43	35,04	14,58	5,18	56,25	404,38	644,52	1727,23	2683,04	6228,09	8601,93	27017,27
2013																					
2014	41,22	2,92	38,30	58,78	45,91	26,03	20,90	13,29	10,80	8,33	32,76	12,74	4,95	56,86	375,15	580,50	1425,84	2236,94	5690,10	8802,94	31205,09
2015																					
2016	43,15	3,40	39,74	56,85	43,99	23,49	18,32	10,71	8,95	5,90	33,36	12,79	4,81	49,75	358,55	564,06	1442,67	2298,45	5391,75	8008,68	19319,27

TABLE A.3. Top wealth shares and wealth group thresholds in thousands 2016 Euro - Estimates including unreported financial assets in offshore accounts. The table shows estimates of wealth shares and wealth thresholds (at 2016 prices) for a number of wealth groups of the adult population (age 20+) between 1995 and 2016. The table shows estimates that, after adjustment to National Accounts, allow also for unreported offshore financial assets.

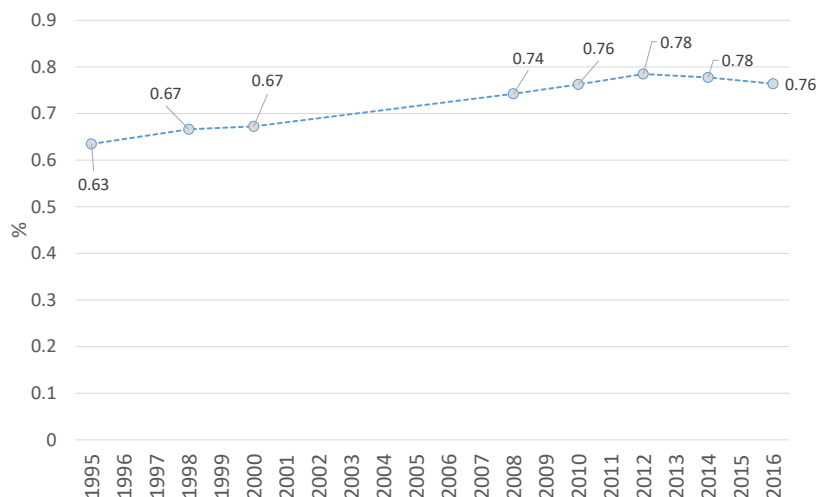


FIGURE A.1. Increasing wealth inequality over time. The evolution of the Gini coefficient of individual holding of net wealth of the adult population from 1995 to 2016.

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A.2. Gini Coefficient

We illustrate this point with the evolution of the Gini coefficient, which recorded a 14 percentage point increase, from 62% in 1995 to 76% in 2016. A practical interpretation considers the change in the net wealth per adult, which increased from €137,000 to €176,000 over the same period: this means that if we take any two adults from the population at random, the expected difference of their wealth holding increased from €171,000 to €268,000.⁴⁶ This is a substantial change if compared with results from SHIW data. ? show a Gini of per capita wealth that has very similar levels to our benchmark estimates for the mid-1990s and remains relatively flat throughout the period (see also Figure 7).

A.3. Wealth totals: households sector balance sheet

In this section we describe how we derived the total net wealth of the household sector (excluding the non-profit sector serving households - NPSH). First, we used the assessment of the overall wealth of Italian households published by the Bank of

46. A Gini coefficient of G percent means that, if we take any two individuals randomly, the expected difference is 2G percent of the mean. A rise in the Gini coefficient from 50 to 70 percent implies that the expected difference has gone up from 100 to 140 percent of the mean.

Italy in the Supplement to the Statistical Bulletin. Estimates of the balance sheets of the household sector and the household sector including the non-profit sector are available for the years 1995 to 2013.

Data on financial assets and liabilities obtained from the Financial Accounts run by the Bank of Italy have been supplemented with an estimate of the value of their real assets released by the Italian statistical office (ISTAT). In particular, we have retrieved these statistical series from table 1A and table 1B of the report “household Wealth in Italy - 2014”, published in 2015 by the Bank of Italy. This publication of the households balance sheet was discontinued in the same year. A similar exercise was then resumed in 2019, in collaboration with ISTAT covering a shorter time horizon (from 2005) and aggregating the household sector and the NPSH. The 2022 release of the household balance sheet as well as the detailed set of Financial Accounts were then used to extrapolate the balance sheet of the household sector from 2013 to 2020. The series for 1995-2020 are then linked proportionally in 1995 to the earlier series beginning in 1966, published by the World Inequality Database (WID.world).

Year	Net personal wealth	Gross personal wealth	Housing & land assets	Fixed capital, valuables, and other nonfinancial assets	Currency, deposits, bonds & loans	Business equities & fund shares	Life insurance & pension	Liabilities
1966	1.076	1.112	568	89	319	69	42	36
1967	1.170	1.209	615	95	360	67	46	40
1968	1.290	1.335	683	104	408	63	52	45
1969	1.406	1.455	743	112	450	68	56	49
1970	1.478	1.530	785	117	478	66	58	52
1971	1.542	1.598	822	121	520	52	61	56
1972	1.683	1.746	896	130	585	47	65	63
1973	1.761	1.833	948	135	611	51	63	72
1974	2.033	2.103	1.222	172	588	39	59	70
1975	2.230	2.298	1.408	196	595	21	57	68
1976	2.273	2.340	1.447	198	606	14	57	67
1977	2.297	2.359	1.469	199	612	10	56	63
1978	2.336	2.398	1.460	195	650	23	57	62
1979	2.535	2.598	1.545	203	680	93	56	63
1980	2.834	2.898	1.742	225	672	177	54	64
1981	3.178	3.241	1.996	255	681	226	54	63
1982	3.333	3.394	2.101	264	697	249	54	61
1983	3.346	3.408	2.086	258	720	262	54	61
1984	3.372	3.436	2.015	246	780	272	102	64
1985	3.406	3.478	1.895	228	845	338	147	72
1986	3.590	3.674	1.854	219	900	503	155	84
1987	3.733	3.827	1.873	218	975	550	165	94
1988	3.861	3.965	1.957	224	1.079	495	175	104
1989	4.324	4.518	2.269	256	1.225	545	184	195
1990	4.894	5.172	2.761	306	1.329	552	189	278
1991	5.364	5.659	3.144	343	1.406	543	201	294
1992	5.919	6.231	3.591	385	1.498	531	219	312
1993	6.299	6.618	3.890	411	1.562	529	234	319
1994	6.325	6.683	3.744	389	1.711	592	248	358
1995	6.138	6.538	3.577	365	1.737	594	266	400
1996	6.274	6.690	3.612	363	1.820	615	281	416
1997	6.683	7.123	3.745	368	1.841	860	309	440
1998	6.893	7.349	3.701	374	1.694	1.240	340	456
1999	7.045	7.557	3.685	378	1.585	1.514	395	512
2000	7.358	7.922	3.826	388	1.669	1.596	443	564
2001	7.371	7.968	3.962	396	1.761	1.365	484	597
2002	7.646	8.277	4.245	404	1.831	1.274	523	631
2003	7.925	8.593	4.540	412	1.840	1.222	579	668
2004	8.305	9.023	4.779	421	1.933	1.261	628	717
2005	8.925	9.704	5.087	433	1.985	1.515	684	779
2006	9.565	10.413	5.480	448	2.033	1.742	710	848
2007	9.518	10.422	5.780	461	2.065	1.426	690	904
2008	9.323	10.237	5.839	469	2.146	1.133	649	913
2009	9.206	10.130	5.852	465	2.083	1.045	685	924
2010	9.167	10.125	5.916	477	2.026	985	721	959
2011	9.062	10.025	5.929	481	2.014	887	714	963
2012	8.987	9.928	5.649	476	2.036	1.043	722	941
2013	8.770	9.688	5.368	465	1.955	1.147	752	917
2014	8.724	9.629	5.232	457	1.874	1.251	815	906
2015	8.674	9.575	5.101	452	1.782	1.374	866	900
2016	8.548	9.451	5.004	446	1.760	1.327	914	903
2017	8.602	9.511	4.938	445	1.741	1.428	959	909
2018	8.353	9.270	4.881	441	1.740	1.252	955	917
2019	8.590	9.522	4.838	437	1.774	1.428	1.044	932
2020	8.658	9.586	4.784	432	1.813	1.457	1.100	928

TABLE A.4. Aggregate values of total wealth and asset classes of the household sector- 1966-2020 - Billions 2016 Euro.

Year	Net personal wealth	Gross personal wealth	Housing & land assets	Fixed capital, valuables, and other nonfinancial assets	Currency, deposits, & bonds loans	Business equities & fund shares	Life insurance & pension	Liabilities	Price index (2016 = 100)	Total population - thousand
1966	20.492	21.169	10.816	1.693	6.071	1.319	792	677	4	52.519
1967	22.113	22.859	11.627	1.797	6.814	1.269	876	747	4	52.901
1968	24.235	25.080	12.827	1.957	7.670	1.179	969	845	4	53.236
1969	26.265	27.184	13.887	2.091	8.402	1.270	1.040	919	4	53.538
1970	27.455	28.424	14.592	2.169	8.887	1.219	1.077	969	5	53.822
1971	28.515	29.558	15.193	2.229	9.615	956	1.124	1.043	5	54.073
1972	30.955	32.114	16.485	2.386	10.760	858	1.191	1.160	5	54.381
1973	32.164	33.482	17.324	2.474	11.163	925	1.152	1.319	6	54.751
1974	36.883	38.162	22.180	3.121	10.672	700	1.062	1.279	7	55.111
1975	40.220	41.451	25.398	3.531	10.723	383	1.036	1.232	9	55.441
1976	40.799	42.002	25.973	3.559	10.884	250	1.015	1.202	10	55.718
1977	41.045	42.164	26.251	3.549	10.929	175	996	1.118	12	55.955
1978	41.595	42.701	25.996	3.465	11.574	404	1.011	1.106	14	56.155
1979	45.019	46.128	27.433	3.603	12.068	1.656	1.003	1.110	16	56.318
1980	50.224	51.352	30.864	3.994	11.899	3.135	964	1.127	19	56.434
1981	56.246	57.369	35.325	4.506	12.059	3.993	950	1.123	23	56.502
1982	58.938	60.021	37.160	4.673	12.320	4.403	948	1.083	27	56.544
1983	59.162	60.246	36.872	4.568	12.726	4.633	960	1.084	31	56.564
1984	59.596	60.733	35.611	4.347	13.780	4.809	1.802	1.137	34	56.577
1985	60.182	61.454	33.488	4.026	14.938	5.974	2.604	1.272	37	56.593
1986	63.435	64.912	32.759	3.877	15.907	8.886	2.739	1.477	40	56.596
1987	65.955	67.612	33.091	3.856	17.231	9.721	2.917	1.657	42	56.602
1988	68.181	70.021	34.564	3.962	19.052	8.734	3.094	1.840	45	56.629
1989	76.297	79.730	40.033	4.514	21.622	9.616	3.244	3.433	48	56.672
1990	86.284	91.194	48.680	5.399	23.439	9.732	3.340	4.910	52	56.719
1991	94.513	99.699	55.387	6.047	24.775	9.566	3.540	5.185	56	56.759
1992	104.205	109.698	63.231	6.786	26.380	9.352	3.855	5.494	58	56.797
1993	110.829	116.449	68.456	7.228	27.478	9.315	4.111	5.619	60	56.832
1994	111.277	117.567	65.859	6.838	30.096	10.407	4.364	6.290	63	56.843
1995	107.982	115.023	62.930	6.418	30.559	10.443	4.673	7.041	66	56.844
1996	110.348	117.662	63.522	6.376	32.013	10.808	4.943	7.314	69	56.860
1997	117.465	125.203	65.825	6.468	32.357	15.117	5.436	7.738	70	56.890
1998	121.124	129.141	65.031	6.569	29.766	21.793	5.982	8.017	72	56.907
1999	123.778	132.777	64.738	6.648	27.843	26.609	6.939	8.999	73	56.916
2000	129.218	139.121	67.192	6.820	29.303	28.020	7.786	9.904	75	56.942
2001	129.354	139.839	69.533	6.949	30.904	23.950	8.503	10.484	77	56.980
2002	133.901	144.959	74.351	7.073	32.061	22.311	9.164	11.059	80	57.100
2003	138.030	149.666	79.071	7.177	32.050	21.285	10.084	11.636	82	57.413
2004	143.576	155.979	82.626	7.271	33.424	21.794	10.863	12.403	84	57.845
2005	153.379	166.761	87.415	7.448	34.118	26.030	11.751	13.383	86	58.191
2006	163.709	178.215	93.791	7.666	34.793	29.818	12.147	14.507	87	58.428
2007	161.903	177.286	98.324	7.843	35.125	24.262	11.732	15.383	90	58.787
2008	157.380	172.792	98.569	7.909	36.232	19.121	10.961	15.413	92	59.242
2009	154.524	170.029	98.227	7.808	34.962	17.537	11.495	15.505	94	59.578
2010	153.214	169.235	98.887	7.967	33.866	16.459	12.056	16.021	94	59.830
2011	150.885	166.916	98.725	8.008	33.531	14.763	11.890	16.031	95	60.060
2012	148.936	164.534	93.628	7.894	33.748	17.293	11.970	15.598	96	60.339
2013	144.290	159.384	88.317	7.655	32.164	18.870	12.378	15.095	98	60.783
2014	143.491	158.387	86.053	7.523	30.830	20.576	13.404	14.896	99	60.796
2015	142.988	157.831	84.079	7.446	29.367	22.655	14.283	14.843	99	60.666
2016	141.085	155.987	82.587	7.363	29.048	21.899	15.090	14.902	100	60.589
2017	142.149	157.176	81.602	7.351	28.778	23.603	15.841	15.027	101	60.513
2018	138.203	153.380	80.763	7.303	28.786	20.720	15.807	15.177	102	60.438
2019	142.306	157.749	80.149	7.247	29.387	23.662	17.303	15.442	102	60.362
2020	143.620	159.014	79.355	7.159	30.082	24.174	18.245	15.394	103	60.286

TABLE A.5. Per capita values of total wealth and asset classes of the household sector- 1966-2020 - Billions 2016 Euro.

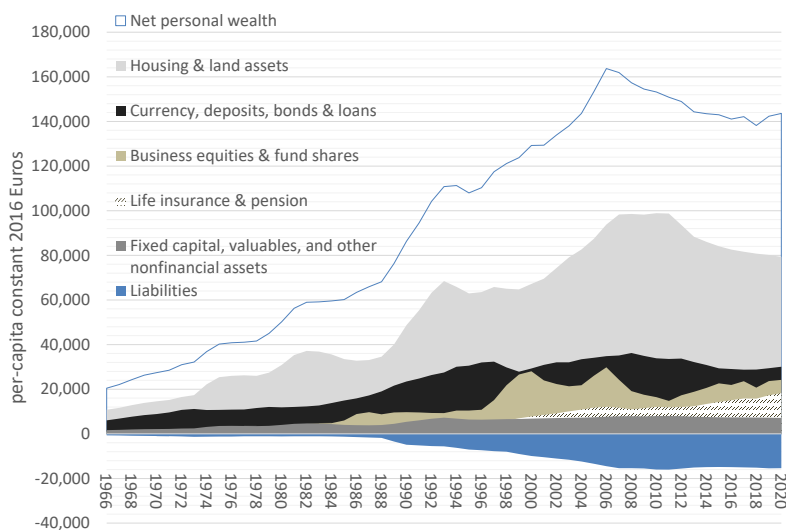


FIGURE A.2. The growing relevance of households per capita net wealth. The graph shows unstacked estimates of five different asset classes (i.e. Housing and land; currency, deposits, and bonds; directly held shares in listed and unlisted corporations, other equity in quasi-corporations, and investment fund shares; life insurance reserves and the balance of private pension funds; Fixed capital and other non financial assets of small personal businesses of producer households (such as plant, machinery, equipment, inventories, and goodwill); and liabilities held by the household sector excluding the non-profit sector serving households). The series is derived assembling data from Bank of Italy, ISTAT, and WID.world. The top line in the graph shows the evolution of household net wealth derived by stacking (summing) all asset classes and subtracting all liabilities.

A.4. The aggregate value of business assets and shares

According to international statistical standards, shares of corporations owned by households are always shown as financial assets in the financial accounts of the household sector under the asset class “shares and other equity”. These corporation shares could be either listed or unlisted. For listed shares a direct observation of a market price exists whereas for unlisted shares a market price is inferred based on similar characteristics of listed corporations.

The manual for Italian financial accounts published by the Bank of Italy (Banca d'Italia, 2018) states that “Unlisted shares are usually reported in their financial statements at nominal value, and are not therefore directly usable in the financial accounts, which adopt as their valuation criterion market value. To estimate their market value, a method provided in the ESA manuals under which the valuation of shares and other equity investments issued by unlisted companies is carried out using the average stock market prices of listed companies belonging to the same industry. From the ratio of market capitalization to the balance sheet equity of the listed companies, coefficients are obtained for each industry and applied to the book value of unlisted companies to estimate their market value. In order to overcome the low representativeness of listed companies compared to the universe of Italian corporations, market price valuation is applied only to unlisted companies with a size comparable to that of listed companies and limited to branches of business with a sufficient number of listed companies. For the remaining unlisted companies, the valuation on the basis of balance sheet equity is retained.” (2018, p. 32, translation by the authors from Italian). Moreover, the Bank of Italy’s manual points to additional statistical adjustments needed to obtain quarterly estimates for the financial accounts. It is worth noting that balance sheets of corporations are available in the Cerved - Italian Chambers of Commerce - archives on an annual basis and the financial statements typically become available with a delay of approximately 18 months from the reporting date, due to the time required to collect and reclassify information. “To overcome these two drawbacks, estimation techniques are used both to obtain an updated annual figure and to temporally disaggregate the historical series; both of these processes exploit the dynamics and statistical properties contained in related time series, mainly those of listed stocks.” (2018, p. 32, translation by the authors from Italian).

Things are more complicated for unincorporated businesses which belong to either the non-financial corporations sector (as ‘quasi-corporations’) or to the households sector (as ‘producer households’), depending on size and other legal characteristics.

As detailed in Rodano and Signorini (2008), “Unincorporated businesses fall into two categories for the purposes of statistical classification. According to international recording standards as set out in ESA95, some of them are called “quasi-corporations” and are included in the non-financial corporations sector.

Quasi-corporations are defined as organizations not having independent legal status, that keep a full set of accounts, and whose economic and financial behaviour is different from that of their owners. This is a rather general description and it has to be operationalised at the national level. In Italy, the operational definition of nonfinancial quasi-corporations includes all firms that take the more formal types of unlimited liability partnerships (*società in nome collettivo*, *società in accomandita semplice*) regardless of size; it also includes simpler partnerships (*società semplici*, *società di fatto*) and sole proprietorships (*ditte individuali*), provided they have more than five employees. Enterprises falling within this category are assumed to possess the character of a quasi-corporation and are therefore to be recorded in the non-financial corporations sector. The rest (i.e., simple partnerships and sole proprietorships with up to five employees) are to be recorded in the producer households sub-sector.”

The estimation of the market value of quasi-corporations (total market value excluding the value of buildings) in the Italian financial accounts is made on the basis of information collected in the SHIW survey by the Bank of Italy. As reported in the Financial Accounts manual (Banca d’Italia, 2018), “Households are asked to report the market value of the quasi-corporations they own, together with the number of employees. The sum of the market values, weighted by the household’s sample weight, is divided by the number of employees, also weighted by the sample weight, yielding a value of the firm per employee. This ratio, obtained from the micro-data of the Italian Survey of Household Income and Wealth, is multiplied by the number of employees in the quasi-firms that results from Istat so as to obtain the market value total of these enterprises.”⁴⁷

In the case of producer-households firms, financial assets and liabilities, such as bank accounts or loans received, are recorded directly in the financial accounts of households and bundled with the households’ holdings; the value of land used in agriculture and other non-residential buildings belonging to the personal enterprise are also bundled within the same real asset classes belonging to households; the value of plant, machinery, equipment, inventories, and goodwill are included in a separate class of real assets called ‘fixed capital’ and are ignored in the financial accounts. Such production assets are valued at substitution price net of depreciation.

Cannari et al. (2008) describe this process in detail: “First, an initial value of the net capital stock of producer households at current prices is estimated for 1990, the base year. Producer household investments are then added to this value and depreciation subtracted, calculated by Istat at current prices for producer households

47. The question available in SHIW to evaluate personal businesses is the following: “How much do you believe your business would be worth if you were to sell it, ceasing to be involved in the business, counting the equipment used in the activity, inventory and goodwill but not the value of the buildings used?”

and deflated using the National Accounts implicit deflators of fixed investment and of depreciation. In this way an estimate is obtained of the stock of net capital at constant prices for the producer household sector in each of the years considered. The net capital stock series at substitution prices is then reconstructed using the relevant deflators calculated by Istat for the whole economy.” (p. 124).

Figure A.3 shows the total value of financial shares and other equities accounting for €1010 billions in 2020 and €314 billions in 1995 (growing from 7.8% to 11.3% of total net wealth of the household sector from 1995 to 2020). Financial shares in listed and unlisted corporations accounted roughly for 75% of total value with the remainder going to financial shares in quasi-corporations. The value of fixed capital only accounted 0.33% of total net wealth in 1995 and this share declined to 0.11% in 2020.

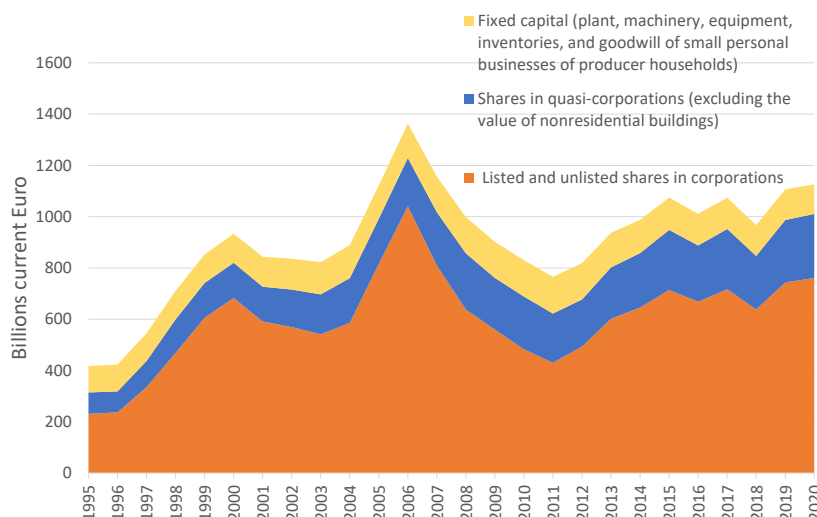


FIGURE A.3. The aggregate value of business assets and shares in the household sector. The figure shows the aggregate value of Fixed assets from the balance sheets of the household sector and the aggregate value of "shares and other equities" from the financial accounts of the household sector (excluding the Non Profit Institutions Serving Households). Fixed assets are real assets valued at substitution price net of depreciation. Shares in listed corporations are valued at market price. Shares in unlisted corporations are valued at market price estimated from listed corporations of similar characteristics. Shares in quasi-corporations are valued at market price estimated based on self-reported valuations in survey data.

A.5. Total Financial Assets: The Contribution of Volume vs Price Changes

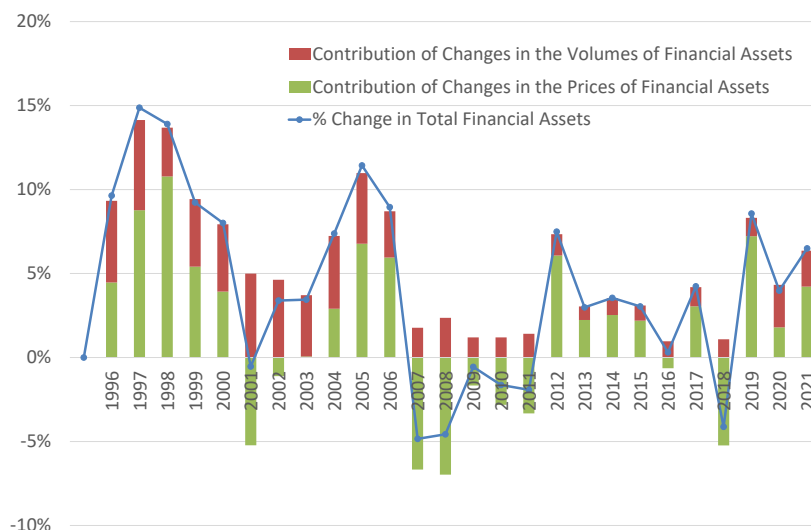


FIGURE A.4. Price vs Volume Changes of Total Financial Assets: 1996-2021. Using detailed quarterly data from the Financial Accounts published by the Bank of Italy we could decompose total change in the valuation of each financial asset class into price adjustments and financial flows. The figure shows that the overall contribution of price changes for total financial assets is relatively dominant in almost all years from 1995 to 2021. The estimates are consistent with the work of Caprara et al. (2020) and effectively extend their series to 2021.

Appendix B: Data sources on reported wealth at death in Italy

Data used in this paper come from the full inheritance tax returns, referred to as “successions,” opened between 1995 and 2016. The tax return is filed by the estate executor (one of the heir, or a legal representative) within twelve months of death and is then submitted to the office of the revenue agency (*Agenzia delle Entrate*) in the province where the deceased had residence. The time limit was set to 6 months up to 2003. Our data are evaluated at year of death. The data are considered to be consolidated after two years following the year of death.⁴⁸ The information contained in the first page of the paper tax form (the so-called “Modello 4.”) are digitized by the Ministry of Economy and Finance (see figure B.1). The last data update in this paper was obtained in May 2020. A set of 19,200 tax returns presented in 2017 and 2018 with the new electronic form, but related to deaths that occurred in 2016, were included in the data. Microdata are transformed into detailed tabular form by the

48. This is done because the heirs might miss the 12-month deadline, or the assessing procedure by the Revenue Agency might last several months for the most complex inheritances.

statistical office of the Ministry of Economics and Finance and shared.

The main tabulations provided have 34 net wealth ranges, from negative values to the highest range worth €20 million or more. The demographic information is provided by seven age groups (i.e., under 20, 20 to 40, 40 to 50, 50 to 60, 60 to 70, 70 to 80, and over 80), two gender groups (i.e., males, females), and three Italian macro areas (i.e., south and islands, north, and center). A gender not stated and age not stated groups also appear when needed. Tabulations by more refined age classes (every 5 years, from under 5 to 100 years old and above) were also provided with for a subset of years, namely for 1995 and for the post-2012 period, confirming that the use of more coarse age groups has a negligible effect on the application of the mortality multiplier method. Four asset classes are identified in the tabulations: Housing and land; business and financial assets; other assets (including current and saving deposits, valuables, etc.); and liabilities and deductible expenses. Similarly, the tabulations identify the taxes paid (on the global value of the estate as well as on the inherited shares), the value of assets sold within six months from death (reported between 1990 and 2000), and the capitalized value of all gifts and donations done in life.

DICHIARAZIONE DI SUCCESSIONE

Direzione Provinciale di

Ufficio Territoriale di

PARTE RISERVATA ALL'UFFICIO	ESTREMI DELLA PRESENTAZIONE (barrare la casella che interessa)			
	NUMERO		VOLUME	
	☐ 1	PRIMA DICHIARAZIONE		
	☐ 2	DICHIARAZIONE MODIFICATIVA		
	☐ 3	DICHIARAZIONE INTEGRATIVA		
	☐ 4	DICHIARAZIONE SOSTITUTIVA		
	☐ 5	DICHIARAZIONE AGGIUNTIVA		
	DICHIARAZIONI PRECEDENTI		NUMERO	
		NUMERO		
		NUMERO		
DATI ANAGRAFICI DEL DEFUNTO				
Data di apertura della successione giorno mese anno				
Codice fiscale				
Cognome (1)		Nome (1)		
Comune o Stato estero di nascita (1)			Prov. (2)	
Data di nascita giorno mese anno Sesso (3)				
Ultima residenza: Comune (1)			Prov. (2)	
Via o Piazza			N. Civico	
Celibe/Nubile ☐ Coniugato/a ☐ Regime patrimoniale Comunione ☐ Separazione ☐ Vedovo/a ☐ Divorziato/a ☐				
Eredità devoluta per: Legge ☐ Testamento ☐				
Testamento per notaio		pubblicato il: giorno mese anno		
registrato a:				
ASSE EREDITARIO				
Immobili e diritti reali immobiliari				
Aziende, azioni, obbligazioni e quote societarie				
Altri cespiti		Totale		
		Passività		
		Totale beni venduti negli ultimi 6 mesi		
Firma per esteso e generalità del dichiarante		Qualità e indirizzo completo del dichiarante		

(1) Senza abbreviazioni

(2) Sigla automobilistica

(3) M o F

— Le parti evidenziate con fondino colorato sono riservate all'Ufficio

AVVERTENZA: Ove i quadri risultino insufficienti compilare quadri aggiuntivi.

FIGURE B.1. The first page of the Modello 4 - Inheritance tax form. Document retrieved from <https://www.agenziaentrate.gov.it>.

Appendix C: Re-weighting the population of the deceased using the mortality multiplier method

We make use of the information reported to the tax authorities for the administration of inheritance or estate taxes as well as detailed mortality rates by a set of socio-demographic characteristics. The inverse of the mortality rate of each decedent group i (e.g. multiplier is defined as $m_i \equiv \frac{1}{p_i}$, where p_i is the mortality rate of group i) represents the number of living individuals with similar socio-demographic characteristics. In this paper we multiply the number of decedents and their reported wealth value by the relevant mortality multiplier m_i for each specific socio-demographic group i . This procedure reshapes the decedent population, creating a representation of the living population to estimate its distribution of wealth.

We define the estate value of each decedent as $w_{E,i}$ and arranged them in descending order, so that $w_{E,i} \geq w_{E,j}$, if $i < j$. The population of decedents is N_E and the total value of their estates is defined as W_E and takes the following form:

$$W_E = \sum_{i=1}^{N_E} w_{E,i}. \quad (\text{C.1})$$

The application of the mortality multiplier provides the following result:

$$W = \sum_{i=1}^{N_E} m_i w_{E,i}. \quad (\text{C.2})$$

where W is the total wealth among the living population of the group i .

Figure C.1, illustrates how the age distribution of wealth holdings is affected by the application of mortality multipliers, shifting from the population of decedents (panels (a) and (d)) to the population of the living (panels (b) and (e)). Figure C.1 also illustrates, in the panels (c) and (f), how the share of prevalent age groups differs across the wealth distribution by zooming into the richest 1%. The population of decedents is clearly skewed towards the individuals aged 80 and above, whereas the application of mortality multipliers rescales the population in favour of middle-aged groups. Yet, on average, wealthy individuals belonging to the top 1% tend to be older than the overall population.

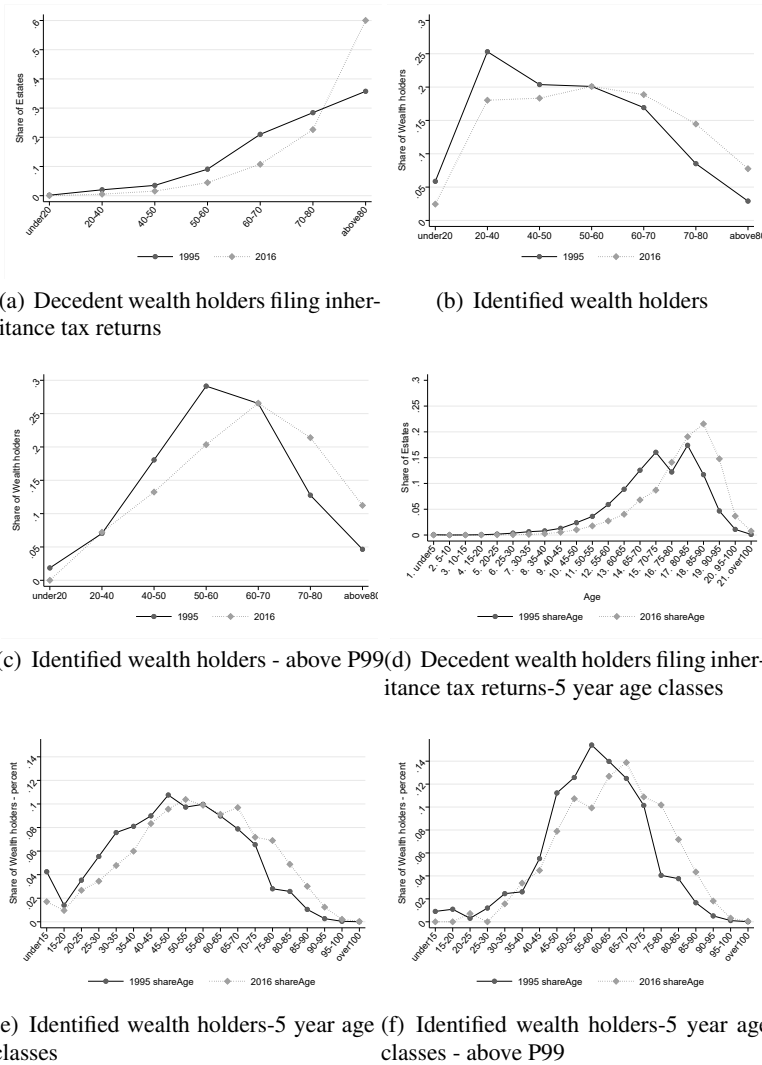


FIGURE C.1. From the population of decedent to that of living wealth holders using mortality multipliers: distribution by age groups over time. Panels a) and d) represent the age distribution of decedents whose wealth is represented on MEF micro data on inheritance tax returns. Panels b) and e) represent the age distribution of living wealth holders derived by multiplying the inheritance tax returns by mortality rates (obtained from ISTAT mortality tables) Panels c) and f) are similar to b) and e) conditioned on having a net wealth value higher than the 99th percentile.

Appendix D: Mortality rates

D.1. Data source

The main source of information for mortality rates in Italy is the database assembled by ISTAT and publicly released online at demo.istat.it. The information on mortality is provided on a yearly basis. It includes age, gender, and geographical location up

to the level of province of residence. We use the information at the level of the given five macro-areas of residence (north-east, north-west, center, south, and islands) and consolidate this into three macro-areas: south (including islands), center, and north. The database includes, for each age, gender, year, and location, biometric variables such as the number of deaths, life expectation, survival probability, and the probability of death. These biometric details are estimated out of a synthetic population of 100,000 individuals.

Once the database of mortality rates is structured, we invert the rates to obtain mortality multipliers. The heterogeneous pattern of mortality rates and multipliers by age can be observed in figure D.1 comparing the evidence in 1995 and 2016 for Italian men. As seen in panels (a) and (b), the probability of death raises exponentially above the 70 year-old threshold, and the average reduction of mortality rates occurred between 1995 and 2016 can be visibly observed as the 2016 line lies below the 1995 one especially for older groups. The mortality multipliers, by construction, show large heterogeneity for younger groups, especially below 30 years old. Panels (c) and (d) of figure D.1, also reveals that imperceptible changes in mortality rates for younger cohorts would generate substantial variation in multipliers. Equally, more substantial changes in mortality rates for older cohorts is not necessarily reflected in substantial changes in mortality multipliers.

We further group age information to mimic the structure of tax tabulated information on estate left at death. Tax tabulations are structured in 7 age groups : under 20, between 20 and 40, between 40 and 50, between 50 and 60, between 60 and 70, between 70 and 80, and above 80 years old. We discard mortality observations below 10 years old and above 103 years old to avoid outliers. We also create 20 age groups, in 5-year ranges, to mimic the set of more detailed tax tabulations available in 1995 and yearly between 2012 and 2016. In this case, no age information is discarded.

The average mortality rate, as computed for individuals between 10 and 103 years old, was 1.27 percent in 1995 and declined slightly to 1.20 in 2016. The resulting mortality multipliers range from 78 in 1995 to 83 in 2016. These trends can be seen in figure D.2. The number of deaths are close to 600,000 individuals per annum in the most recent years, up by approximately 50,000 units from 1995.

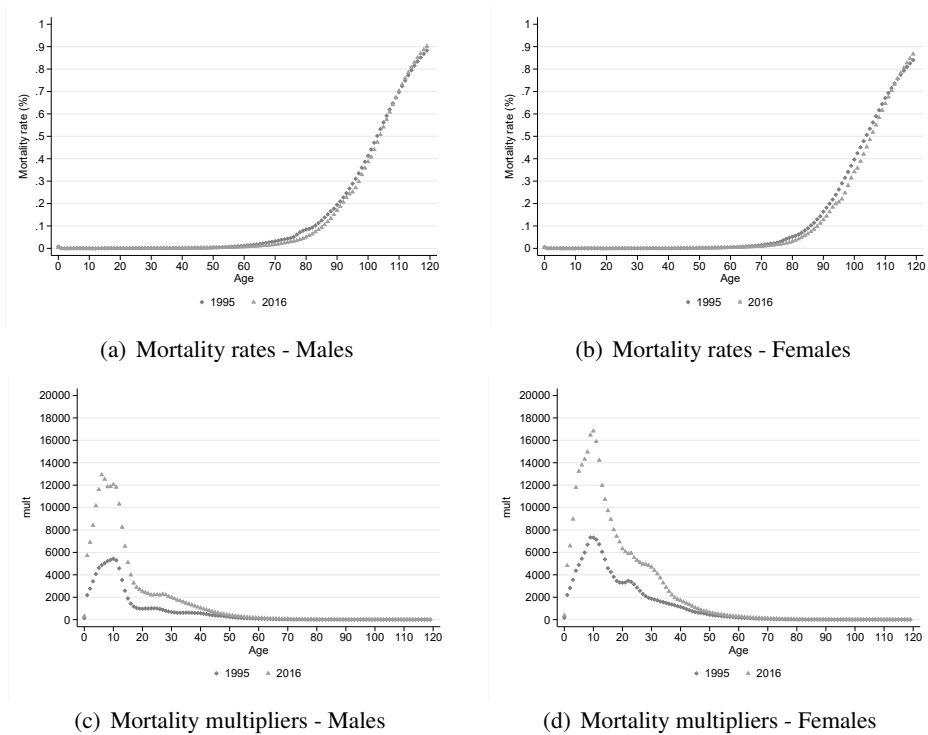


FIGURE D.1. The mortality rate and multiplier across the age distribution: 1995 vs 2016. Source: Own computation from ISTAT mortality tables. Mortality multiplier is defined as the inverse of the mortality rate.

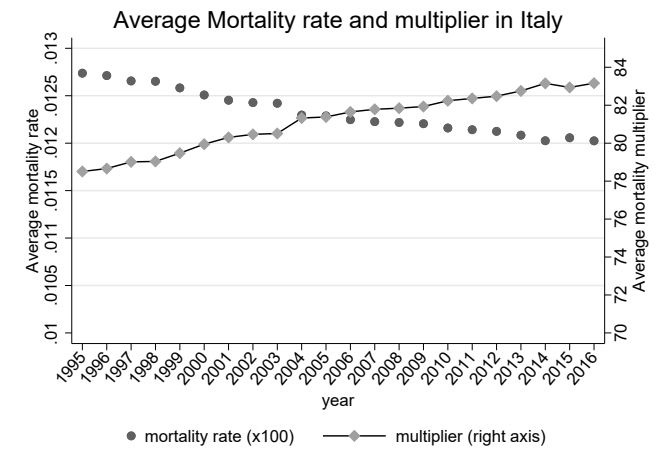


FIGURE D.2. The evolution of average mortality rates and multipliers: 1995-2016. Own computation from ISTAT mortality tables. Mortality multiplier is defined as the inverse of the mortality rate.

Appendix E: Adjusting the value of real estate in the inheritance tax records

E.1. The aggregate market to cadastral value ratio

Real estate assets are declared using a notional valuation (i.e. cadastral value) for inheritance tax purposes, rather the current market value. As Italian real estate cadastral values are typically well below market values, the use of unadjusted amounts declared in the inheritance tax returns will lead to distorted distributional information as well as an underestimation of the value of personal wealth. Ideally, one would want to substitute the cadastral value for its equivalent market price for every building recorded within tax data. However, this would require an extremely refined and sophisticated set of data which is not possible to access. To overcome this problem, instead, we multiply the cadastral values by an annual adjustment factor derived as the share of average national nominal house price and cadastral value.

The derived ratio of average market price to cadastral value of housing is observed to be constant over the years 2009-2012 and equal to 3.3. In the following years, and following the reduction of housing prices, the ratio declined to 3.2 in 2013, 3.0 in 2014-2015 and 2.9 in 2016. The detailed time series of adjustment factors applied to our data for 2009-2012 is shown in table E.1.

	2009	2010	2011	2012
Cadastral rent - total value	13,060,818,875	13,354,007,469	13,824,649,519	14,047,787,404
N. of owners	26,742,044	27,058,332	28,269,412	28,502,721
Average rent	488	494	489	493
Market value - total value (current Euro)	4,983,370,521,246	5,107,630,342,488	5,319,036,384,226	5,294,979,063,776
N. of owners	26,757,715	27,063,237	28,278,342	28,511,215
Average market value (current Euro)	186,241	188,729	188,096	185,716
	488	1.010496435	0.990893001	1.007822964
		494	489	493
	2009	2010	2011	2012
Calculation Cadastral value = (cadastral rent* 110 * 1.05)	1,508,524,580,063	1,542,387,862,670	1,596,747,019,445	1,622,519,445,162
N. of owners	26,742,044	27,058,332	28,269,412	28,502,721
Average cadastral value	56,410	57,002	56,483	56,925
Ratio Market Value/cadastral value	3.30	3.31	3.33	3.26
Ratio Market Value/cadastral value (one decimal point)	3.3	3.3	3.3	3.3

TABLE E.1. The evolution of average cadastral and market values for housing

Average annual market value of properties for the years 2009-2016 is obtained from the “Osservatorio del Mercato Immobiliare - OMI”, published by the Revenue Agency/Nomisma. Similarly, data on the average annual cadastral rent of houses owned by physical persons are derived from the internal data of the Revenue Agency and the Ministry of Economics and Finance, “Analisi Patrimonio Immobiliare - API”, used for the annual publication by the Ministry of Economy and Finance, “Gli immobili in Italia.”

The average cadastral values are then derived multiplying average cadastral rents by tax coefficients used for the inheritance tax base. For owner-occupying houses the coefficient equals 100 up to 2003 and 110 since 2004, and since 1997 an additional

	year	annual percentage change house nominal price (BIS)	annual percentage increase cadastral rents (MEF)	Inheritance tax coefficients on cadastral rent (owner occupied houses)	Inheritance tax revaluation coefficient of cadastral rent	Market value/ cadastral value
Estimates based on cadastral rent and market price evolution	1995	0.01	0.004	100	1	2.2
	1996	0.04	0.004	100	1	2.3
	1997	0.03	0.004	100	1.05	2.2
	1998	0.00	0.004	100	1.05	2.2
	1999	0.01	0.004	100	1.05	2.2
	2000	0.04	0.004	100	1.05	2.3
	2001	0.06	0.004	100	1.05	2.4
	2002	0.12	0.004	100	1.05	2.7
	2003	0.06	0.004	100	1.05	2.8
	2004	0.06	0.004	110	1.05	2.7
	2005	0.08	0.004	110	1.05	2.9
	2006	0.06	0.004	110	1.05	3.1
	2007	0.05	0.004	110	1.05	3.2
	2008	0.03	0.004	110	1.05	3.3
MEF - Official estimates	2009			110	1.05	3.3
	2010			110	1.05	3.3
	2011			110	1.05	3.3
	2012			110	1.05	3.3
	2013			110	1.05	3.2
	2014			110	1.05	3.0
	2015			110	1.05	3.0
	2016			110	1.05	2.9

TABLE E.2. Adjustment coefficient for cadastral value of real estates

flat re-valuation of cadastral value of 5 percent is applied for tax purposes.⁴⁹

Average cadastral value was relatively stable at around €56 thousand between 2009 and 2016, whereas the average marked value declined, over the same period, from €186 thousand to €162 thousand.

Unfortunately, for the years before 2009 we could not resort to the publication “Gli immobili in Italia” and we had to estimate the ratio of market price to cadastral value. To do so, we estimated the average market value by using the observed yearly variation of housing prices (using the Bank of International Settlements - BIS - estimates of nominal growth rate of house price index based on the published figures by the Bank of Italy for more recent years). Similarly, we made use of the average yearly percentage change of average cadastral rent over the period 2007-2013, to estimate the average cadastral value between 1995 and 2009. Cadastral rents increased, on average, by 0.4 percent every year. As explained above, allowance for changes in the tax legislation affecting the cadastral values should also be made. As detailed in table E.2, the derived yearly adjustment factors applied to the cadastral values range between 1.9 in 1995 to 3.3 in 2013.

E.2. The heterogeneity of the market to cadastral value ratio

The use of a yearly national adjustment factor for cadastral values may have a series of shortcomings. The use of a national multiplier could mask potential heterogeneity

49. The cadastral value for year 2013, as an example, would therefore be derived as the cadastral rent in 2013 times 110 times 1.05.

across the wealth distribution (e.g. the degree of underestimation of real estate market values could be more pronounced for rich individuals). To address this concern, we proceed in four main steps.

First of all we match the full cadastral records including more than 34 million properties to the corresponding OMI market value of the area and to the income tax statistics for more than 32 million tax payers (the OMI market value is the average market price of the micro-zone where the real estate is situated). The exercise, carried out for the year 2014, shows that the ratio between market and cadastral value is equal to 3.0, the same as the national ratio in that year, for all income classes below euro 55,000 referring to 95.2% of taxpayers owning real estate. It then rises to 3.1 between €55,000 and €120,000 and to 3.2 above the €120,000 income class, referring to 0.9% of taxpayers owning real estate (See Figure E.1 and Table E.3).

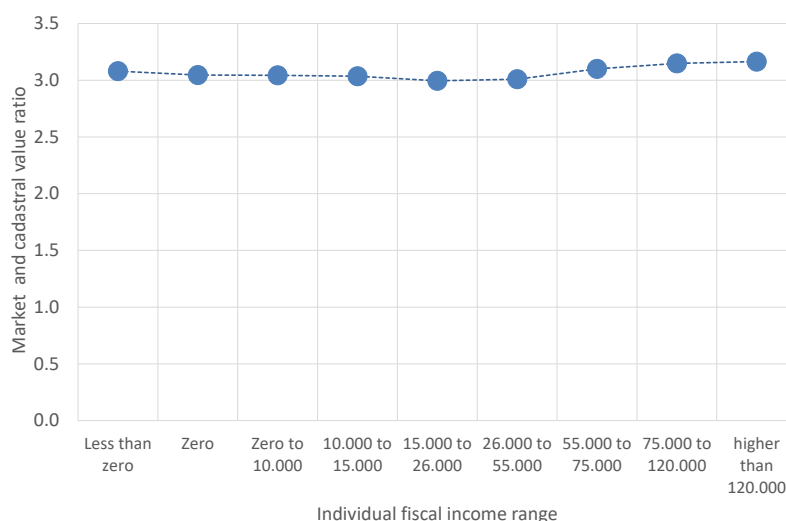


FIGURE E.1. Market to cadastral value of properties by individual fiscal income ranges - 2014. The graph is based on the matching of all property owners to the full cadastral and income records in 2014. Values expressed in current Euro. All properties of cadastral class A are included (excluding A10).

Income (Euro)	Range	Number of tax payers (property owners)	% tax payers	Number of properties	Full cadastral rent	Market Value (OMI)	Cadastral value (rent*110*1,05)	Market/Cadastral value
Negative income		102,997	0.3%	93,330	45,117,418	16,046,533,001	5,211,061,807	3.1
Zero income		6,297,705	19.5%	6,755,834	2,794,864,119	983,180,390,629	322,806,805,723	3.0
Zero to 10000		5,972,644	18.5%	5,546,781	2,421,977,342	851,210,697,656	279,738,382,944	3.0
10000 to 15000		3,492,757	10.8%	3,358,884	1,457,382,994	510,904,137,593	168,327,735,854	3.0
15000 to 26000		8,347,354	25.9%	8,119,209	3,767,898,827	1,303,244,002,044	435,192,314,550	3.0
26000 to 55000		6,515,054	20.2%	7,587,886	4,092,552,587	1,422,226,730,991	472,689,823,755	3.0
55000 to 75000		722,676	2.2%	1,089,295	700,704,560	250,837,436,095	80,931,376,704	3.1
75000 to 120000		545,070	1.7%	960,090	659,793,403	239,899,949,945	76,206,138,093	3.1
More than 120000		288,003	0.9%	1,121,952	759,804,303	277,682,269,245	87,757,397,047	3.2
Total		32,284,260	100.0%	34,633,261	16,700,095,554	5,855,232,147,199	1,928,861,036,477	3.0

Notes: The table matches all property owners to the full cadastral and income records in 2014. Values expressed in current Euro.

All properties of cadastral class A are included (excluding A10). The main owner-occupied housing multiplier is 110 (the so called 'prima casa')

TABLE E.3. Market to cadastral value of properties by individual income classes - 2014

In a second step, we show how the market to cadastral value ratio varies across different regions. If the concern is correct we should observe richer regions to have higher ratios on average. However, as shown in Figure E.1 there is no obvious apparent pattern between average regional income and overall underestimation of market prices. All the regions which individually account for more than 5% of total property stock, and 77% taken together, have an average ratio of market to cadastral value of exactly 3 (e.g. this group includes the most populous regions, namely Campania, Emilia Romagna, Lazio, Lombardia, Piemonte, Puglia, Sicilia, Toscana and Veneto). The only two notable exceptions are two autonomous and relatively wealthy provinces of Trento and Bolzano, accounting for just under 2% of total properties and where the ratio is estimated to be around 5. In those autonomous provinces the cadastral system is different from the one of the other regions, since it rely on the methods used by the Austrian-Hungarian empire who had the control of those provinces before WWI. Apart those exceptions, all the regions range from the minimum of 2.5 in Puglia and the maximum of 3.5 in Toscana and Marche and the majority of the regions are within the interval of confidence of 10% around the average.

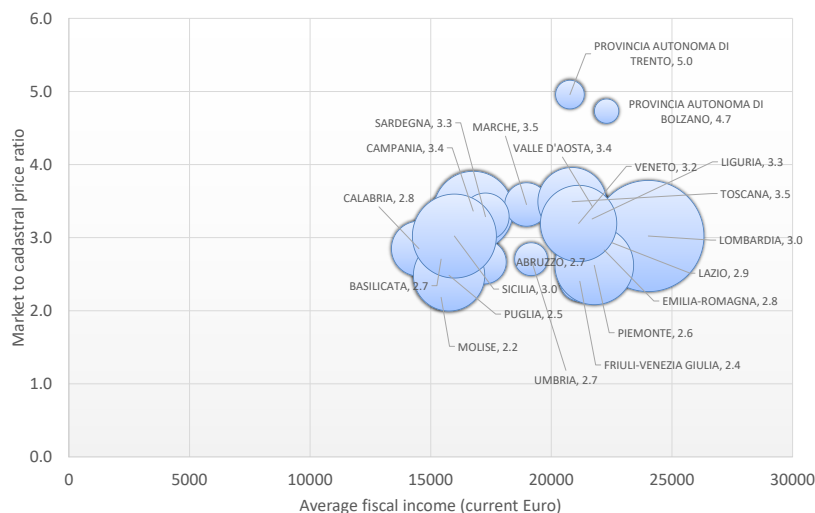


FIGURE E.2. Market to cadastral value of properties by average fiscal income across regions - 2014. Values expressed in current Euro. All properties of cadastral class A are included (excluding A10).

Third, we leverage the entire cadastral record and rank individual real estates by their OMI market prices and derive the market to cadastral value ratio across the distribution of housing value at market price. Although such ranking is not directly relevant to the focus of this paper (i.e., ranking of individual total wealth holdings), the exercise reveals that individual buildings in the value range of €600,000 and above have a market to cadastral value ratio as high as 3.9 (see table E.4)

Finally, we made use of an integration of the survey EU-SILC with data from the cadastre and from OMI market value (carried out internally at the Ministry of Economy and Finance to run a microsimulation model) in order to rank individuals in deciles of total real estate wealth observed at OMI market values, and, for all real estates, compute the ratio market value/cadastral value for each decile. In this exercise the cadastral values were expressed in line with the municipal tax on real estate, so for an easier comparison we simply converted the multipliers proportionally to the ones used for inheritance tax and for our study. The EU-SILC survey data are reported to the whole population using appropriate weights. When we observe the data by deciles of the individuals included in the sample, classified by real estate wealth at market values, we found that, the first five quintiles of the survey do not have any real estate. In the other quintiles, moving upwards, we observe a slightly increasing underestimation of the cadastral values. Only the top decile has

Classes of real estates at market price (OMI) - Current Euro	Number of buildings	Cadastral Rent	Market value (OMI)	Cadastral value (rent* 110*1,05)	Market/Cadastral value
up to 10.000	280,123	19,106,807	1,878,587,178	2,206,836,209	0.9
10.000 to 20.000	729,738	37,346,340	11,114,051,197	4,313,502,270	2.6
20.000 to 30.000	872,911	74,975,975	21,939,585,826	8,659,725,113	2.5
30.000 to 40.000	1,027,085	126,370,117	36,098,550,155	14,595,748,514	2.5
40.000 to 60.000	2,593,168	462,591,191	130,835,787,005	53,429,282,561	2.4
60.000 to 80.000	3,175,807	773,805,411	223,024,187,967	89,374,524,971	2.5
80.000 to 100.000	3,422,501	1,038,517,848	308,144,438,625	119,948,811,444	2.6
100.000 to 130.000	4,925,638	1,831,702,125	565,028,179,288	211,561,595,438	2.7
130.000 to 150.000	2,876,633	1,256,359,469	402,049,648,980	145,109,518,670	2.8
150.000 to 170.000	2,466,185	1,196,422,683	393,896,811,718	138,186,819,887	2.9
170.000 to 190.000	2,067,183	1,100,290,670	371,391,063,991	127,083,572,385	2.9
190.000 to 210.000	1,703,027	985,103,238	340,070,769,836	113,779,423,989	3.0
210.000 to 230.000	1,387,001	865,885,101	304,626,558,366	100,009,729,166	3.0
230.000 to 250.000	1,142,768	763,212,172	273,755,544,792	88,151,005,866	3.1
250.000 to 270.000	946,501	673,192,598	245,752,324,279	77,753,745,069	3.2
270.000 to 300.000	1,102,653	843,270,004	313,506,304,195	97,397,685,462	3.2
300.000 to 330.000	825,981	683,969,276	259,548,102,207	78,998,451,378	3.3
330.000 to 380.000	959,696	872,515,760	338,928,482,455	100,775,570,280	3.4
380.000 to 460.000	872,893	909,845,184	362,879,553,435	105,087,118,752	3.5
460.000 to 600.000	683,775	863,787,856	355,022,544,800	99,767,497,368	3.6
higher than 600.000	650,368	1,351,657,285	604,541,885,572	156,116,416,418	3.9
Total	34,711,635	16,729,927,110	5,864,032,961,867	1,932,306,581,205	3.0

TABLE E.4. Market to cadastral value of properties by classes of real estates at market value (OMI) classes - 2014

a multiplier slightly higher than the global one, 3.2 instead than 3.0. Quintiles 7th and 8th have 2.6 and 2.7 respectively (around 10% lower than the global one) and quintile 6th has 2.3, around 20% lower than the global one, however this quantile owns only 1.9% of the total real estate of the EU-SILC sample. If we focus, rather than on deciles, on top 5% and top 1% individuals, using the same classification, we discover a multiplier of 3.2 and 3.3 respectively. In the highest case, this is 10% higher than the overall multiplier. The result of this exercise is similar to the one based on PIT income classes and on houses only.

Overall, the main results suggest that although the full heterogeneity across locations and rankings in the real estate or income distribution is ignored, the use of a national multiplier should only marginally affect estimates of wealth concentration. Our distributional results are likely to represent conservative estimates as controlling for the full heterogeneity discussed above would have likely increased the level of wealth concentration even further, albeit marginally. An example can help here understanding. Consider, for simplicity that an individual with a total value of net wealth equal to €20 million, enough, on its own, to belong to the Top 0.01% of the net wealth distribution. We also know that only around 10% of total net wealth of this person is held under the form of housing and land assets (i.e., 2 out of 20 million). The ‘correct’ market value of properties for this individual should be $2 * (3.3/3) = 2.2$ million. Assuming that such an underestimation of property value applies to the entire group consisting of around 5000 individuals (and no overestimation applies to the groups below) this would mechanically lead to an

Individuals ranked by the market value of real estate - Deciles	N. of real estates	Average cadastral value of real estate owned in euros [inheritance tax values]	Average market value of real estate owned in Euro (in OMI market values)	Ratio between market and cadastral values [using inheritance tax values]
1st	0			n.a.
2nd	0			n.a.
3rd	0			n.a.
4th	0			n.a.
5th	0			n.a.
6th	2,184,434	15,937	36,655	2.30
7th	5,148,575	31,049	80,728	2.60
8th	6,961,123	37,860	102,221	2.70
9th	8,959,226	44,207	128,201	2.90
10th	19,465,274	51,602	165,128	3.20
Total population	42,718,633	43,511	130,391	3.00
Focus on the upper tail:				
Top 5%	13,148,626	54,443	174,216	3.20
Top 1%	5,065,590	59,575	196,599	3.30

Source: Ministry of Economy and Finance microsimulation model based on a sample (EU-SILC) reported with weights to the whole population.

TABLE E.5. Ratios of market values/cadastral values by deciles of total real estate wealth. Evidence from matched EU-SILC survey data and tax records - 2017

approximate upward adjustment of a mere 0.012 percentage points in the top 0.01% wealth share (i.e. assuming a total wealth of 9000 billion for this simple back-of-the-envelope calculation, the top 0.01% wealth share would be equal to €20 millions $\times 5000 / \text{€}9000 \text{ billions} = 1\%$ which has to be compared to a “correct” share of €22 millions $\times 5000 / \text{€}9000 \text{ billions} = 1,12\%$).

It is also worth mentioning that another potential problem relates to the fact that we have also adopted a unique adjustment factor across cadastral classes. However, different cadastral classes has different cadastral adjustment coefficients to be applied to the cadastral rent for tax purposes. As written above, as of January 2004, 110 is the multiplier applied to the main owner-occupied housing (the so called ‘prima casa’, falling within the cadastral classes A/1 to A/11 with the exception of A/10). The coefficient, as of mid 2004, is 120 if the house is not the main residence. These coefficients apply to regular dwellings, to castles, villas, and historical building alike. If most secondary houses were concentrated only in the hands of wealthy individuals, the use of a constant adjustment factor to house cadastral rents, may create a bias. Other things being equal, this may result in an upward bias for our estimates of wealth concentration, as the reported value of a secondary house in the inheritance tax return is 9% higher than the owner occupied house (120/110). However, the final effect on the wealth shares cannot be entirely known in advance as second homes may also have a larger systematic undervaluation of market value. Cadastral multiplier vary according to the type of real estate, 120 also applies to many buildings in the C cadastral categories such as covered car parks, cellars, stores, laboratories and small businesses, with the exception of shops (cadastral category C1), in this case the coefficient is 40.8. On land rents the coefficient is 90 and on offices rent (cadastral category A10) the coefficient is 60. Other cadastral categories

mainly apply to public spaces and buildings and may not be relevant for personal ownership of real estates. As a systematic assessment of the market value of all different cadastral categories is not available, it is not possible to assess how the adjustment factor based on the owner-occupied houses we used fits with the degree of underestimation of cadastral values of other real estate categories. Unfortunately, we could not obtain the information about cadastral types from our individual data but we could observe the share composition of different types of buildings owned by different individuals across the income distribution. Although not precise this exercise provides informative results. Indeed, real estate different from housing represent less than 10% of household real estate wealth and is distributed quite evenly across income classes. Despite some existing heterogeneity, the share of houses and apartment structure remains quite high even for the highest income class (86%).

The combination of such empirical evidence and that shown above about the limited systematic heterogeneity of the ratio between market and cadastral values across geographical areas or across the income and wealth classes, we conclude that allowing for different adjustment factors should not produce large biases in our estimates.

Appendix F: The identified population using inheritance tax records

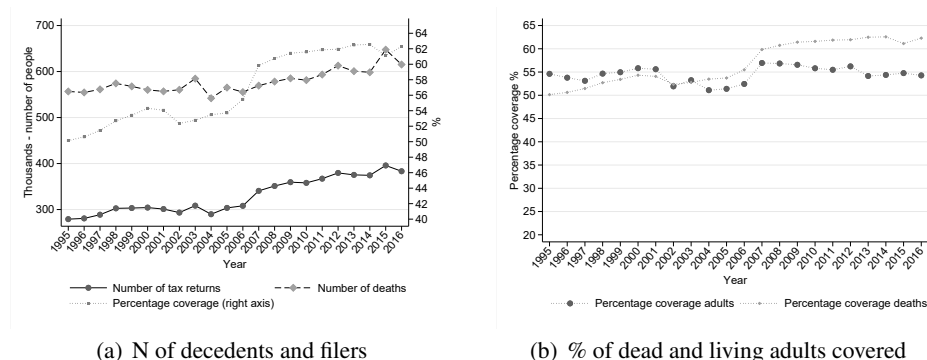


FIGURE F.1. The coverage of decedents people and total adult population using inheritance tax records. Panel a) shows the number of inheritance tax returns compared to the number of dead person every year. Panel b) shows the coverage rate of the decedent people through the inheritance tax returns (i.g. the ratio between the number of tax returns and the number of deceased) as well as the coverage rate of the total adult population (i.e. the ratio between the number of identified adults via the mortality multiplier method and the actual number of adults). Population and mortality statistics are obtained from ISTAT.

The missing population is identified as the non-homeowners who have net wealth below the inheritance tax reporting threshold. The assumption here, following the tax code, is that such individuals are likely not to be represented in the inheritance tax records in the event of death. The evidence that the population identified via the mortality method is found to be close to that of the number of homeowners identified in the SHIW, for each age class, corroborates the empirical strategy to recoup the wealth of the missing population. (F.2(b)).

The total population thus derived turns out to be slightly smaller but extremely close to the population within each age class above 20 years old in the SHIW (see F.2(c)). The remainder population gap (mostly young people) is assumed to hold zero net wealth. Additional marginal adjustments warrant that the final numbers are in line with the SHIW by age, gender, and location. The total identified population between 20 and 40, is generally found to be slightly higher than the actual one identified through SHIW. In this case, we reduce the number of individuals in this age group, in equal proportion for each gender, location, and wealth classes, to match the total number derived from SHIW. Such adjustments are marginal and are done so that the final population of the adjusted tax records can fully match the actual population, as reported in SHIW by different age groups, gender, and geographical location.

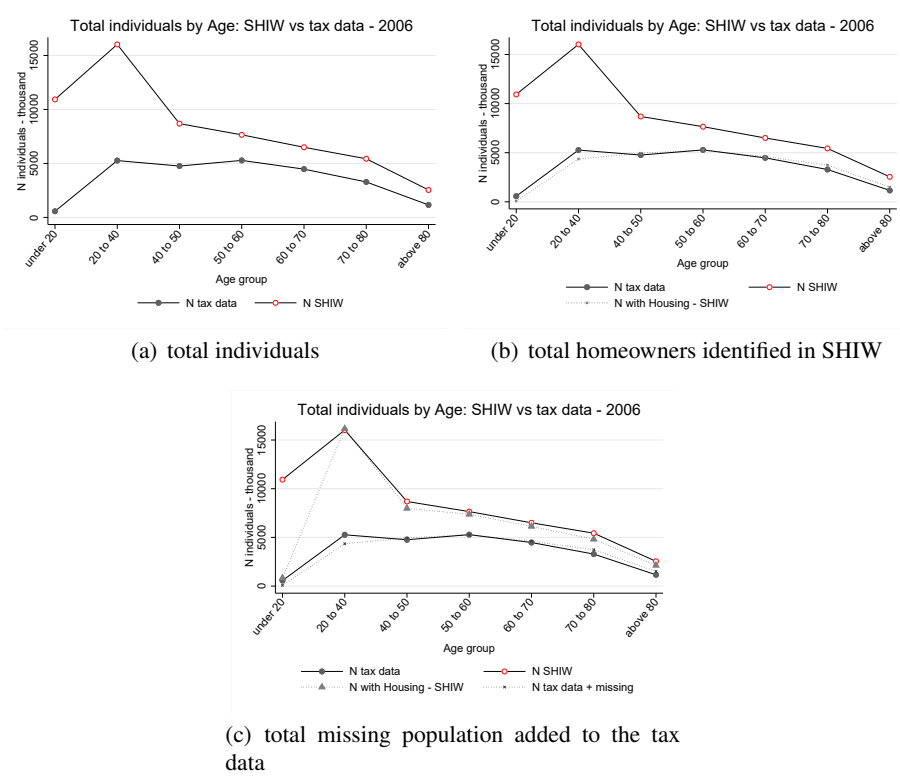


FIGURE F.2. Coverage of total population by age groups: multiplied-up inheritance tax records vs. SHIW

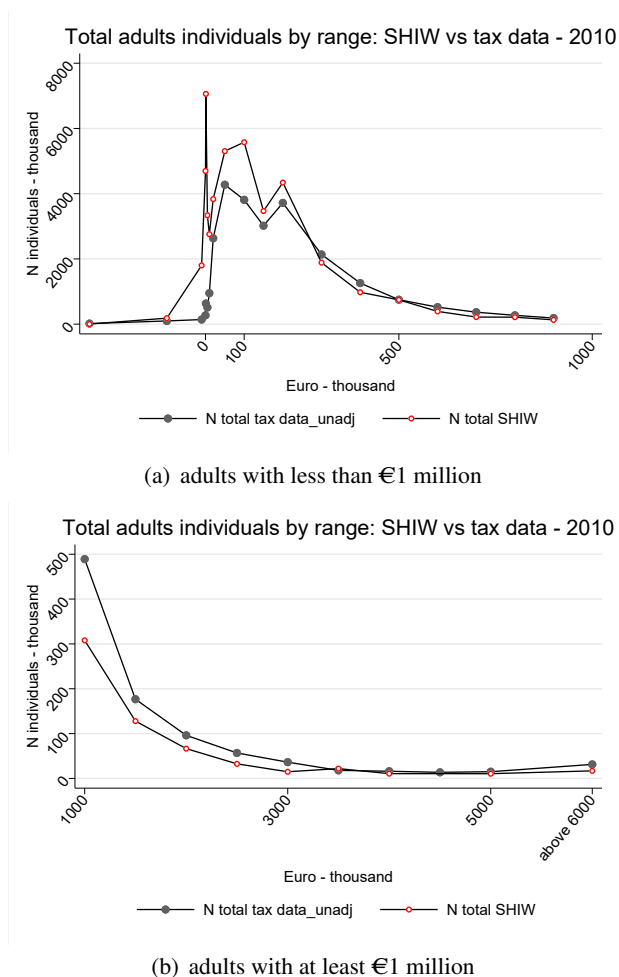


FIGURE F.3. Frequency of adults across the wealth distribution: 2010 tax-based identified wealth vs. SHIW. The graphs compare, for each wealth range, the number of adults (aged 20 or more) identified from multiplied-up inheritance tax records (i.e. figures re-scaled using mortality multipliers) to that estimated from the SHIW data. Panel a) shows the trimmed distribution below 1 million Euro. Panel b) shows data above the 1 million Euro range. Wealth holdings of the households in the SHIW data are allocated to individual adults before comparing it to the tax-based information. The Tax-based information presented here does not allow for the wealth of the missing population or for underreporting of wealth.

Appendix G: Total estates and total identified wealth using inheritance tax records

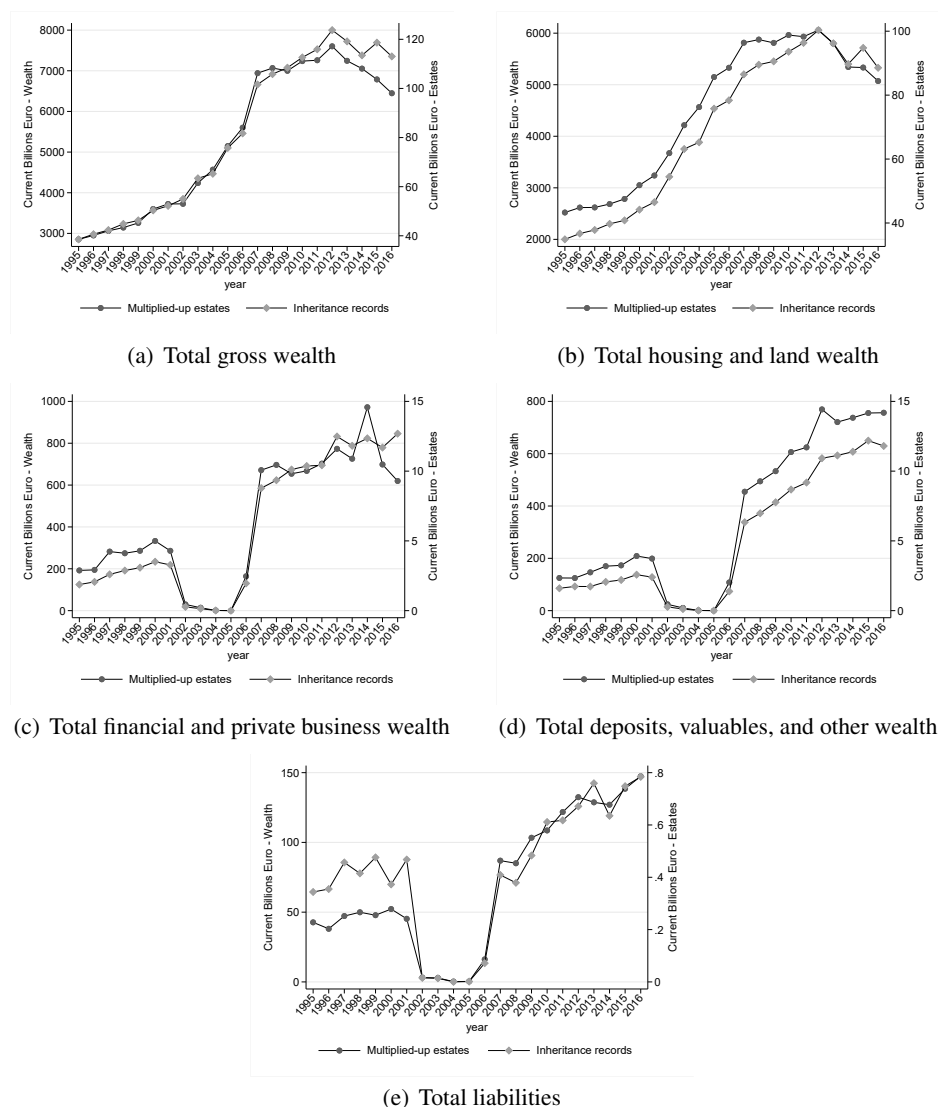


FIGURE G.1. Total estates and total identified wealth by asset classes. The figure compares the total value reported on inheritance tax records to the total net wealth identified by multiplying-up the reported net estates with the inverse of mortality rates. The comparison is carried out for total gross wealth (panel a), total market value of land and housing wealth (panel b), total value of financial and private business assets (panel c), total value of deposits, valuables, and other wealth (panel d), and total liabilities (panel e). Note that the inheritance and gift tax was repealed between 2001 and 2006, causing reported values, other than housing and land, to plummet.

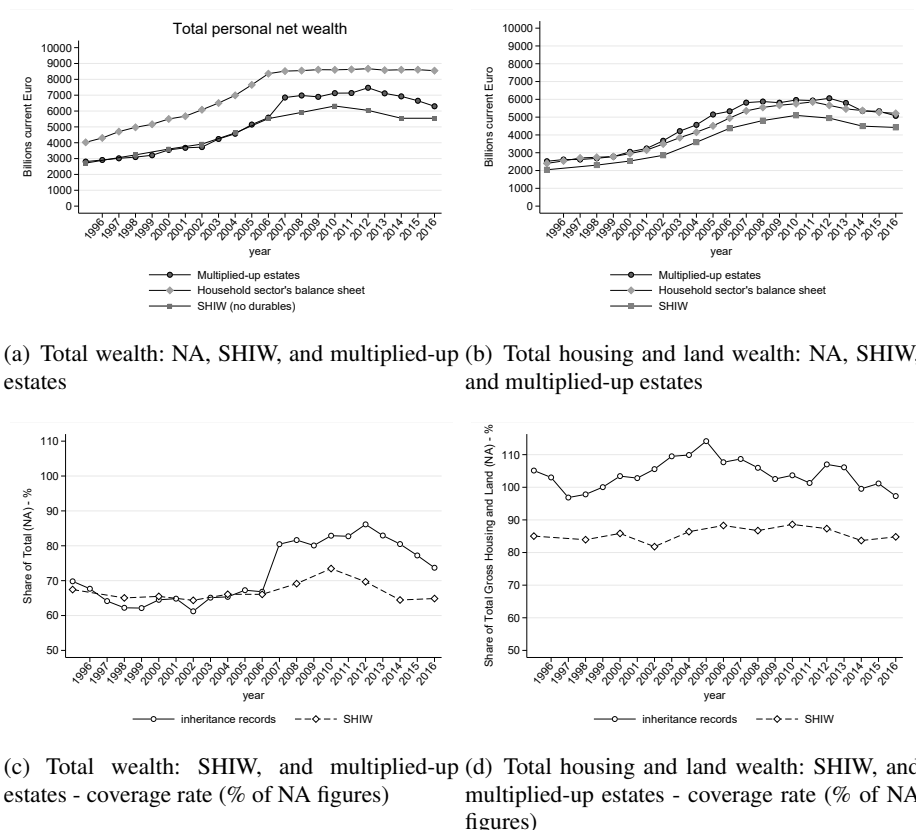


FIGURE G.2. Total estates, total wealth and total housing and land wealth: household's sector balance sheet, SHIW, and multiplied-up estates data. Panels a) and b) show values of total households net wealth and total gross value of housing and land using three different independent sources: the household's sector balance sheet (estimated using data from ISTAT and Bank of Italy); the household survey - SHIW (with full coverage of the population), and the total value of wealth reported on inheritance tax records multiplied-up with the inverse of mortality rates (with partial coverage of the population). Note that, at this stage, the only adjustments applied to the inheritance tax data are the transformation of real estate cadastral values into market values.

Appendix H: Imputation of missing wealth

H.1. Estimation and imputation of the wealth of the missing population

The inheritance tax return filing is necessary to legally transfer real estate property rights to the heirs. In the absence of real estate, tax returns should be filed if the total estate (net of liabilities) is above 35.000 Euro. In 2014, the latter threshold was raised to 100.000 Euro. Hence, any individual decedent who has relatively little accumulated financial wealth and no real estate is in principle not be represented in the tax records.

Using the SHIW, we identified the so called ‘missing population’. To do so, we first allocate household wealth to each single adult composing the households. Following the work by D’Alessio (2018), we make use of information about individual asset holding to allocate each specific asset to different individuals.⁵⁰ Alternatively, we split equally the total household specific asset value between the head of the household and her partner. In the absence of a partner all household wealth is allocated to the head.

Based on information about pension and insurance contributions, we also estimated the outstanding accumulated reserves available in these funds and allocated them to individuals.⁵¹ Once individual asset holding is estimated we identify every head of household or partner who is not in possession of housing and who is below the reporting threshold as required by the inheritance tax legislation: approximately 25.000 Euro, increased to 100.000 Euro from 2014 onward. Everyone who is below this threshold and is not a homeowner is considered to belong to the missing population. This also includes every adult, different than the head of the household or her partner, with wealth below the specified thresholds. In 1995, there were approximately 21 million adults not homeowners and whose wealth is below the specified threshold. This number declined gradually by 1 million till 2010 before starting to raise back again to 1995 levels in 2016.

The identified missing population and its net wealth is appended to the tax-based information.

The process consists of two main steps. First we classify the survey-based information about missing wealth into the wealth ranges, age, and gender classes available in the tax data. More precisely we transform the survey microdata into detailed tabulations with 34 net wealth ranges, from negative values to the highest range worth €20 million or more. We have seven 10-year age groups (i.e., under 20, 20 to 40, 40 to 50, 50 to 60, 60 to 70, 70 to 80, and over 80), two gender groups (i.e., males, females), and three geographical areas (south and islands, north, and center). We also classify our wealth holding in four major asset classes: Housing and land; business and financial assets; other assets (including current and saving deposits, valuables, etc.); and liabilities and deductible expenses. Second, we simply append the survey-based estimates of the missing left tail of the wealth distribution to the tax-based wealth tabulations derived by simply applying the mortality multipliers to our tabulations of wealth left at death. To account for underreporting of wealth in the SHIW, we also proportionally adjust reported wealth in the survey data using the ratio of wealth values between the balance sheet and SHIW. This is done for each

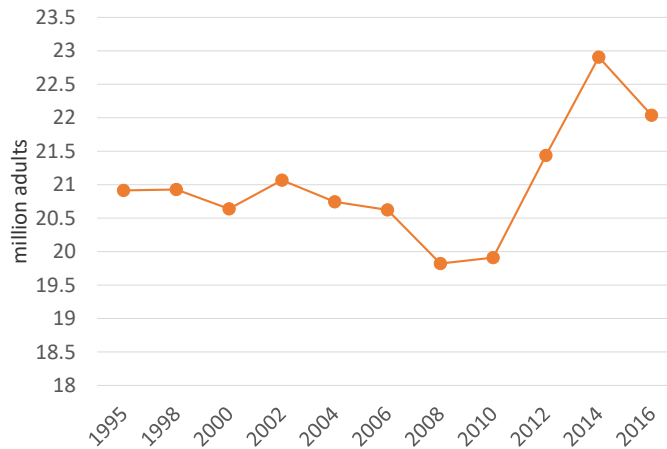
50. The final exercise slightly differs from D’Alessio (2018) as the information needed to split asset holding is not always readily available in the household survey public use file. The exact procedure used in this paper is explained in the AppendixK and differences in the procedure used by D’Alessio (2018) will be pointed out.

51. This exercise is explained within the Appendix L.

asset class that is available both in SHIW and in the balance sheet for the household sector only.



(a) Wealth of the missing population



(b) Missing population (number of adults)

FIGURE H.1. Number of missing adults and their wealth by asset type. Estimates from SHIW data.

H.2. Imputation of tax-exempt assets

To derive a measure of unreported tax-exempt assets we use the tax code and practice in filing. The value of these assets are then imputed. The imputation is based on the observed proportional distribution of joint financial and business assets (observed from the tax data adjusted for the missing population).⁵² In particular, we impute the total value of insurance technical reserves net of liabilities (the total value of assets accumulated in pension, life insurance, and severance payment funds), and 50% of Italian government securities. Indeed, the reporting of government bonds is often recommended by tax accountants and most certainly happens in those cases where securities are bundled with other assets in investment funds, as officially documented by banks and other financial intermediaries following death of a legal owner. Such investment bundles can be fully reported on the inheritance tax form, and the tax authority would then compute the relevant tax deductions. We impute 100% of government securities during the years where the estate, gift, and inheritance tax was not in place (e.g. the period included between October 2001 to October 2006). We also include 90% of notes and coins (100% in years where the tax was abolished) in our definition of unreported tax exempted assets, although this is not technically the case. The contribution of this asset is very marginal and makes this choice practically irrelevant.⁵³

The total net value of financial tax-exempt assets which are likely to be unreported in the inheritance tax records was worth €320 billion in 1995 and €940 billion in 2016, just above 10% of total personal net wealth in the country (cfr. Figure H.2).

H.3. Matching NA aggregates: imputing the remaining wealth gaps

The derivation of our benchmark series of wealth distribution and concentration requires, by construction, the alignment of our aggregates with those based on the National Accounts household's balance sheet. The imputation of the wealth of the missing population and the unreported tax exempt assets are complemented with the imputation procedure of any remaining discrepancies (positive or negative) between the national accounts aggregates and our data (see Figure H.3). The imputation is based on four macro wealth categories: Financial plus private business assets; valuables, deposits, and others; housing and land assets; and liabilities.

52. The value of the shares in unquoted companies is taken at the book value for tax purposes and it is not modified for our distributional exercise.

53. Unless specifically inventoried, cash money is considered to be evaded by the tax authority (a general rule of thumb is applied to compute tax liabilities, considering notes and coins to amount to 10% of the value of the declared estate).

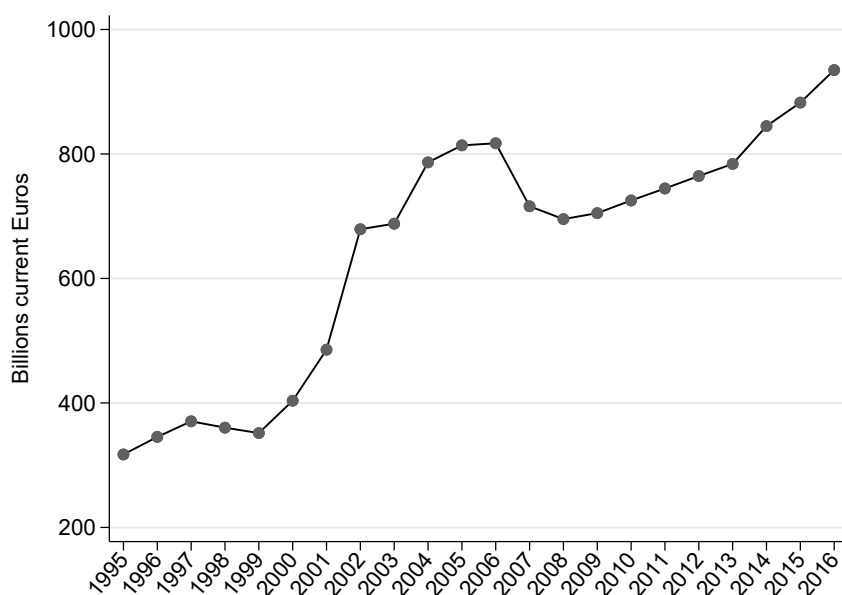


FIGURE H.2. Total net value of financial assets exempted from inheritance tax and likely to be unreported on inheritance tax forms.

As described above for the imputation of tax exempt assets, the imputation is based on the observed proportional distribution of these assets macro categories (observed from the tax data adjusted for the missing population). Such proportional distributions are visually represented in Figure H.4.

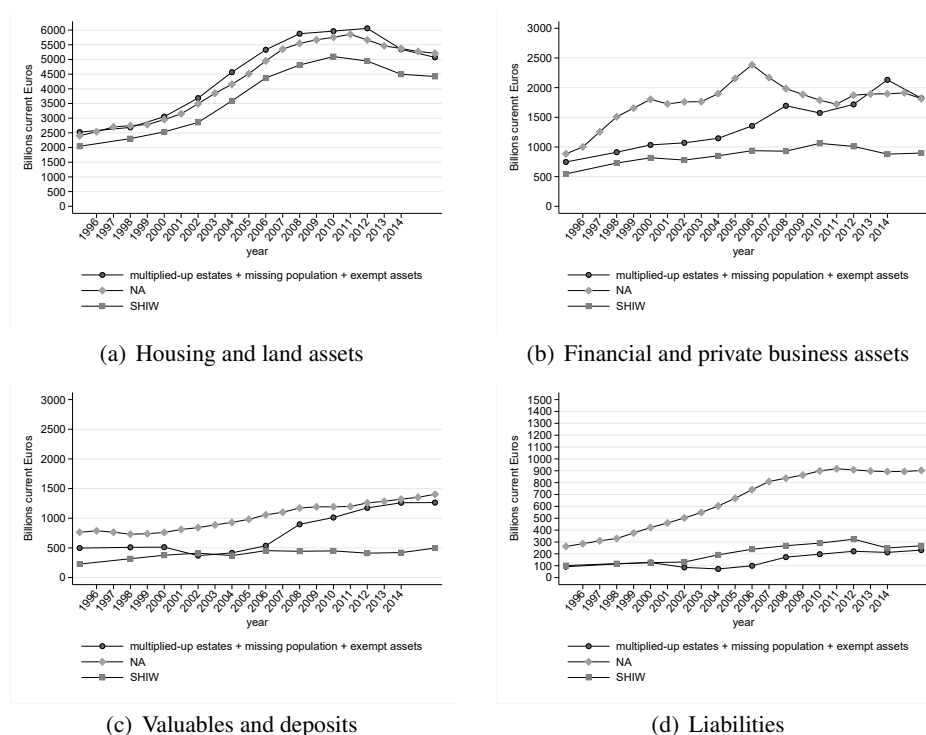


FIGURE H.3. Adjusted identified wealth, SHIW, and the national balance sheet. The figures show values of total reported wealth, by asset classes, using three different independent sources: the household's sector balance sheet (estimated using data from ISTAT and Bank of Italy); the household survey - SHIW (with full coverage of the population), and the total adjusted value of wealth reported on inheritance tax records multiplied-up with the inverse of mortality rates. The adjustments to the reported wealth make allowances for the unobserved wealth held by the non-filers (missing population) and for the unreported tax exempt assets. Hence the adjusted values reported here refer to the full population as in SHIW.

Year	Shares, business assets, investment funds, government securities, and Bonds	Life insurance and funded private pension wealth	Financial liabilities	Deposits, CDs, repos, postal savings certificates	Valuables	Cash	Financial and business assets	Housing and Land	Deposits, cash, valuables, credit to other households	Financial liabilities
1995	55,10%	65,88%	38,49%	23,06%	71,93%	17,27%	51,53%	85,03%	28,95%	38,49%
1998	39,15%	74,44%	35,69%	39,02%	74,78%	14,51%	41,61%	83,93%	42,24%	35,69%
2000	37,11%	57,50%	29,95%	43,58%	93,64%	12,53%	38,31%	85,86%	48,45%	29,95%
2002	35,31%	48,16%	26,06%	38,79%	128,06%	15,01%	35,81%	81,80%	47,57%	26,06%
2004	36,21%	39,77%	31,71%	31,11%	113,08%	11,74%	35,06%	86,39%	39,57%	31,71%
2006	32,23%	34,22%	32,20%	33,86%	116,47%		31,20%	88,28%	43,55%	32,20%
2008	39,10%	35,04%	32,04%	32,68%	113,37%	7,99%	36,02%	86,72%	38,81%	32,04%
2010	51,45%	31,58%	32,29%	32,62%	96,76%		43,03%	88,61%	39,11%	32,29%
2012	48,69%	23,83%	35,58%	28,73%	83,91%		39,27%	87,32%	33,98%	35,58%
2014	38,49%	24,81%	27,91%	29,77%	72,86%		32,57%	83,68%	32,73%	27,91%
2016	36,64%	30,33%	29,70%	34,21%	81,37%		32,87%	84,80%	36,48%	29,70%

TABLE H.1. SHIW household survey data : ratio of total value with respect to household balance sheets. Data shows the ratio of total value reported in the household survey data (SHIW) with respect to the total value as recored in the household balance sheets macroeconomic statistics. Elaboration of the authors.

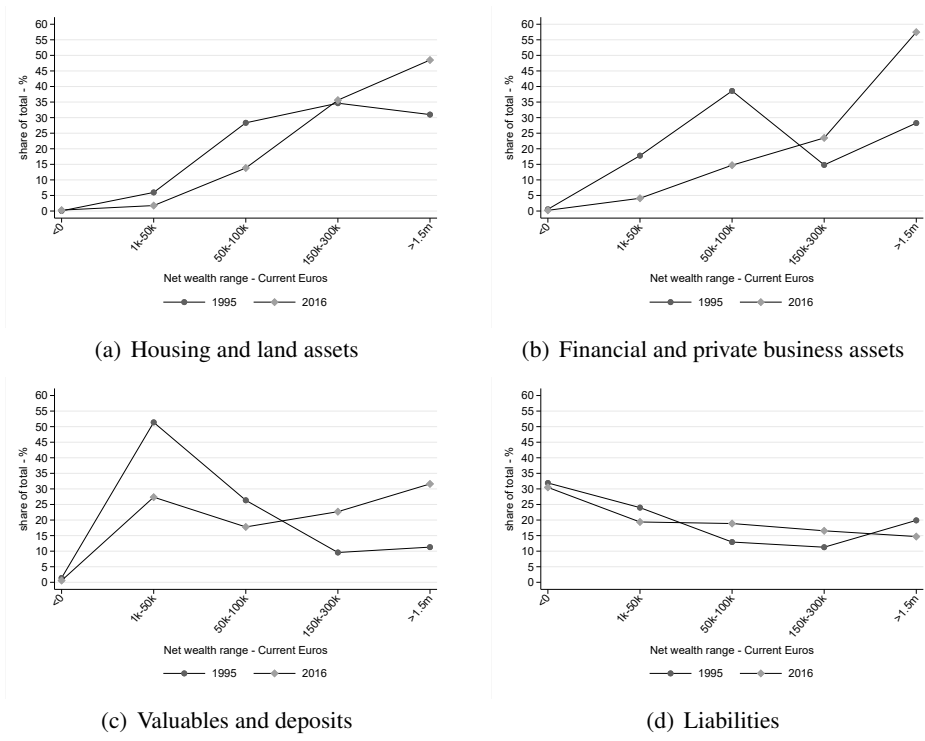


FIGURE H.4. Proportional distribution of assets by types and wealth ranges. The graph shows a simplified representation, for each class of assets, of the proportions of total assets held across the wealth groups (ranked across total net wealth). These proportional factors are used to impute missing assets and liabilities and matching aggregates with the relevant series of the household's sector balance sheets.

Appendix I: The inheritance tax revenue, coverage, and its progressivity structure

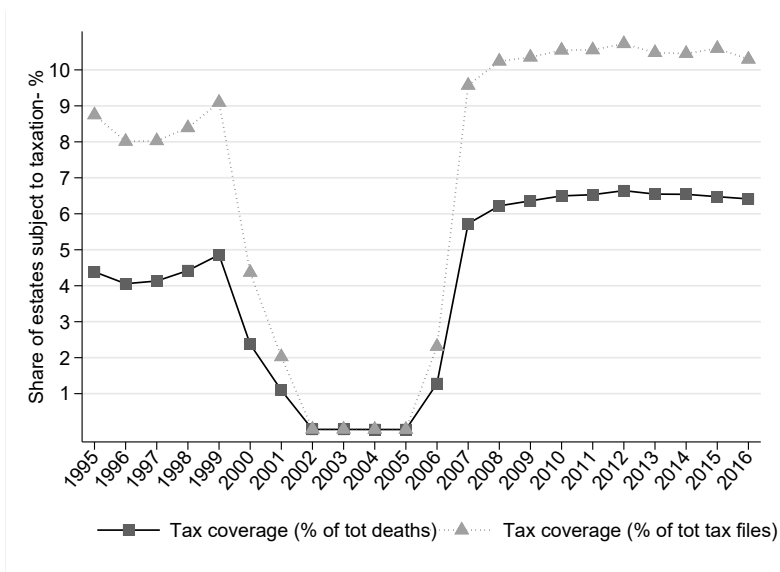


FIGURE I.1. The share of total estates subject to taxation

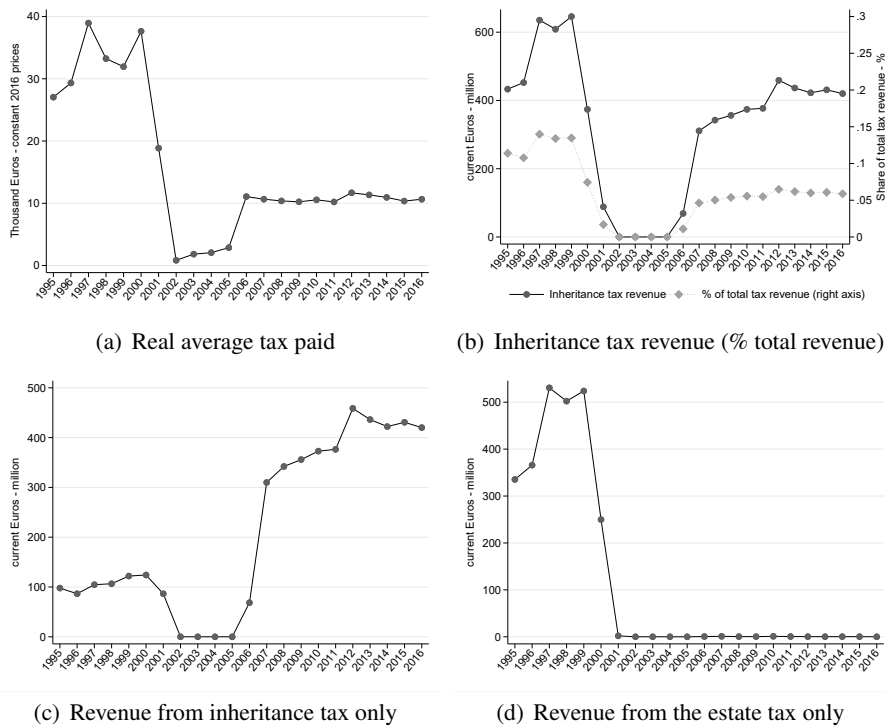
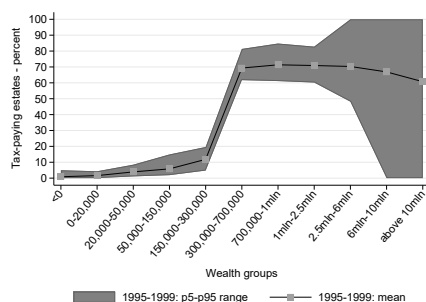
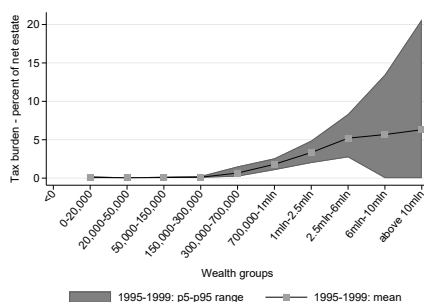


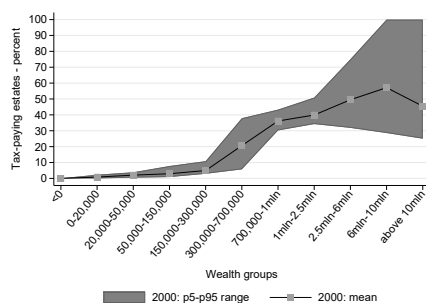
FIGURE I.2. Average tax paid and inheritance tax revenue: 1995-2016.



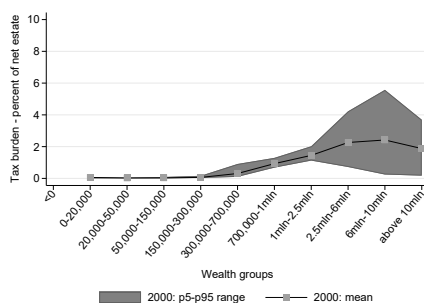
(a) % of estates taxed: 1995-1999



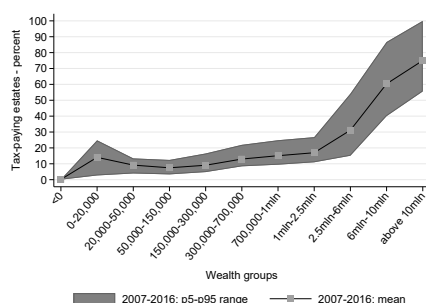
(b) Average tax burden:1995-1999



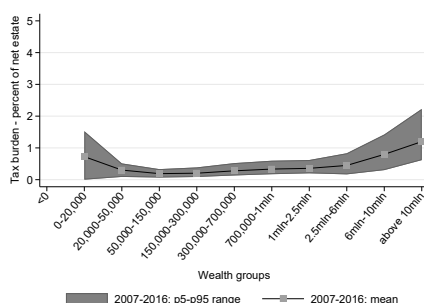
(c) % of estates taxed: 2000



(d) Average tax burden:2000



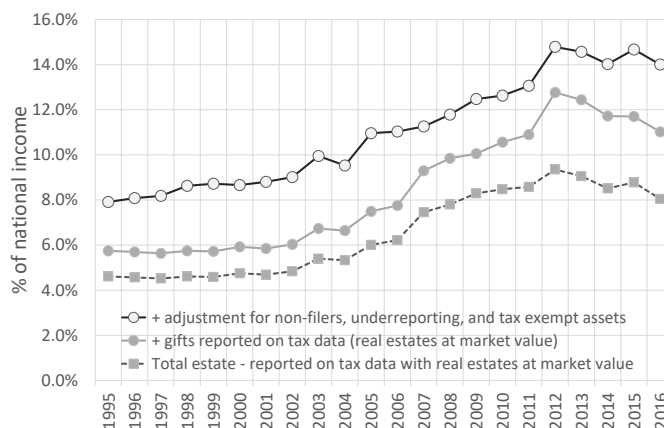
(e) % of estates taxed: 2007-2016



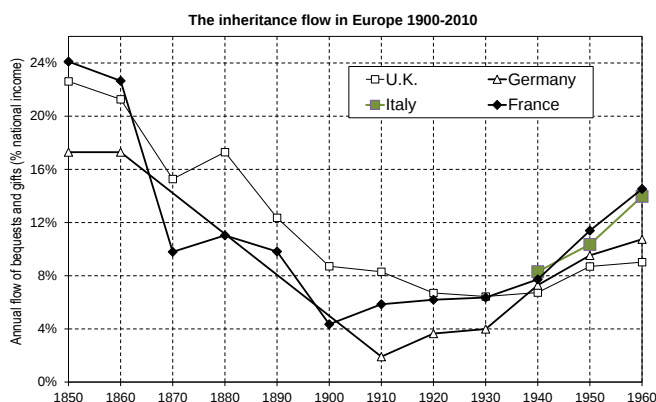
(f) Average tax burden:2007-2016

FIGURE I.3. The heterogeneity of the share of estates subject to taxation and the effective tax burden: a comparison across three tax regimes (1995-199, 2000, and 2007-2016).

Appendix J: Total inheritances and gifts



(a) Annual flows of inheritances (and gifts) over national income



(b) Decennial averages: comparison with other countries

FIGURE J.1. Growing wealth transfers as % of total income. Panel a) estimates the annual flows of inheritances and gifts starting from the information reported on the inheritance tax records and the gift tax records. The reported values of housing and land are adjusted to reflect market value. The final estimate makes allowances for the wealth of non-filers as well as additional underreporting of assets. Panel b) replicates Figure 4, "The inheritance flow in Europe 1900-2010" from the work of Alvaredo et al. (2017), adding the decennial average series for Italy.

Appendix K: Allocating household wealth to individuals using the Survey on Household Income and Wealth

The derivation of the personal distribution of assets from the observations available at the household level can be approximated thanks to information about asset holdings available within the household survey responses to a variety of questions. In doing so, we follow the exercise carried out by D'Alessio 2018. Two main caveats apply. First, as we use the public available survey data, subject to a more restricted set of information, our results slightly differ from D'Alessio 2018. Second, whenever possible, we distribute each asset to the adult members of the household. However, the sum of the components of each asset subgroup is generally slightly different than the aggregate subgroup available in the survey. In fact, the imputations of missing assets carried out by the statistical office of the Bank of Italy are only distributed at a higher level of aggregation and not asset by asset. The observed discrepancy for each subgroup of assets is then distributed to individuals within the households (without changing the derived individual distributional of each asset subgroup). There are ten main asset subgroups relating to different subcategories of real and financial assets and liabilities. Net wealth in the Survey of Household Income and Wealth is defined as total real assets (AR) plus total financial assets (AF) minus total financial liabilities (PF). In turn, AR has three main subgroups (AR1= housing, land and other buildings, AR2 = businesses, AR3 = valuables), AF has four subgroups (AF1= Deposits, CDs, repos, postal savings certificates, AF2= Government securities, AF3= bonds, mutual funds, equity, shares in private limited companies and partnerships, foreign securities, loans to cooperatives, AF4 = Credit due from other households), and PF has three subgroups (PF1= Liabilities to banks and financial companies, PF2= Trade debt, PF3= Liabilities to other households).

The details of the exercise are the following. AR1 is the result of the property value (VALABIT) times the household's ownership share (QPRO). The number of adult owners can also be identified. Each adult owner is given an equal share of the real estate. The amount of advance payments on property that household does not yet own (ANTIC) are also added to the variable AR1 and equally allocated to the adult members of the households.

AR2 is composed of the business equity value, excluding the value of properties. This information is contained in one variable (VALAZ) that can be extracted from three different datasets within the Self-employment income section of the survey: LINB - Self-employment income: until 1989 members of the professions, the self-employed, sole proprietors and entrepreneurs with fewer than 20 employees; LINC - Self-employment income: entrepreneurs with 20 or more employees, after 1989 active shareholder/partner; and LIND - Self-employment income: family businesses. In the first two datasets the personal ownership share of business equity can be directly identified. In the case of family business, we allocate the ownership share

proportionally to the number of hours worked in the business (D'Alessio, 2018).

AR3 value is allocated to the households and there is no usable information within the survey that can be used to infer a distribution to individual members of the household. The reported value is equally split among each adult members of the household.

The value of AF1 (e.g. Deposits, CDs, repos, postal savings certificates) can in principle be allocated within the family after “according to the number of owners, selecting the components ordered by age (adults/non-adults), status in household (head of household, spouse, other member) and income” as described in D'Alessio (2018). However, the variable identify the number of owners within the households is not available in the public database. Hence, we only divide AF1 equally among all adult members of the households, similarly to what D'Alessio in doing for years preceding 2008.

Variables AF2 and AF3 (e.g. Government securities, bonds, mutual funds, equity, shares in private limited companies and partnerships, foreign securities, loans to cooperatives) can also be allocated to members of the households after 2008 by using the variable ICTIT containing information about the number of owners of investment and government securities within the households. Differently from the variable AF1, this can also be done using the public use files, although the information is only available in the annual wave files of the survey and not in the historically harmonized dataset. Following D'Alessio (2018) we distribute the value of AF2+AF3 to the members of the household by sorting them by age, status in household, and income. For year preceding 2008, the total value is divided equally among household adult members.

The variable AF4 is composed of business credits (CREC12d) from two datasets LINB e LIND, plus credits from other households (TCREDIT), which is only available in the annual wave files of the survey and not in the historically harmonized dataset. Hence, we derive the variable TCREDIT in the historically harmonized SHIW dataset as a residual from the difference between AF4 and the sum of the CREC12d from both LIND and LINB databases. The exact individual share of CREC12d can be computed directly from LINB whereas the value of CREC12d from LIND is allocated to individual members of the household based on the number of yearly hours worked in the family business. The variable PF1 is composed of business debts (i.e. DEBC12AB and DEBC12C from LINB and LIND databases) as well as all debts not linked to business activities (i.e. DEB12A; DEB12B; DEB12C; DEB12D; DEB12E; DEB12F; DEB12P from the FAMI database). The individual share of business debts from LINB are directly allocated to household members whereas they are estimated from LIND based on estimated yearly worked hours within the family business. The sum of DEBC12AB from LIND and LINB should match the aggregate DEB12O reported in the FAMI database. This is not

the case as imputation procedures are only reported at the higher aggregation level (e.g. DEB12O). The observed discrepancy for each households is distributed to its members using the observed number of yearly hours worked in the family business. The same applies to DEBC12C. The variable DEB12A, linked to housing ownership are allocated to individuals following the same criteria used to allocate housing assets within the household (e.g. method used to allocate AR1). The remaining debts, in the absence of more detailed information, are allocated equally to each adult member of the households. The sum of total sub-components would still be smaller than the estimated value of PF1 for each household as reported in the FAMI database. To match precisely the aggregates, we distribute the observed discrepancy to each household and keep the observed proportions of PF1 across household adult members. The variable PF2 is composed of self-employment and family business debts, DEBC12D from both databases LINB and LIND. As above, the exact individual share of DEBC12D can be identified from LINB whereas we estimate it in LIND by looking at the individual reported yearly hours worked in the family business. Similarly, to what was done for PF1, we distribute within each household, the difference between the household aggregate value of PF2 and the total PF2 derived as the sum of each sub-components. The variable PF3 (Liabilities to other households) was distributed equally among all adult members of the household.

Appendix L: Estimating private pension and life insurance accumulated assets using the Survey on Household Income and Wealth

The SHIW asks households about the value of their accumulated capital private pension and life insurance funds. However, this information is not available in every year and contains lots of missing values. In order to estimate the accumulated reserves into pension and life insurance funds we also resort to additional information about the value of annual payments and contributions into pension funds and life insurance as well as the beginning year of contribution. The information is available at the household level and the information available within annual waves matches precisely the historically harmonized database. The accumulated capital in year t is then computed as the reported or estimated accumulated capital at time $t-1$ capitalized to time t using a constant 3% return plus the new contributions done between $t-1$ and t .

For the panel sample of the survey we can compare the reported year when contributions to pension or life insurance funds begins. When the answers are not consistent we consider the first answer available as the ‘true’ beginning year. If such information is not available or if the information is not consistent with the first reported payment contribution, we consider as the official beginning year of the accumulation, the first year of reported contribution into life insurance (e.g. variable *assvita*) or pension fund (e.g. variable *pensint*). If the contributions is reported to begin before the first wave of the survey, we used the year of the first

reported contribution as the beginning of the accumulation process (e.g. this would presumably under-estimate the potential asset accumulation of older households).

In some years the variables *assvita* and *pensint* do not report any value. However, if any information is reported in both earlier and later years we compute the average between the two values and impute it to the missing observation. In 2016, the survey asks what is the initial contribution to the insurance or the pension fund. If this information is reported we consider this as the correct information to compute accumulated capital.

Appendix M: Accounting for the wealth hidden in offshore accounts

A fraction, perhaps substantial, of financial wealth remains hidden from official statistics and tax agencies. With the help of the wealth management industry and a growing freedom of capital movements, this could generate growing tax revenue losses. Zucman (2013) estimates that the hidden wealth held offshore accounts to \$5.6 trillion, or 10% of the world GDP. The global estimates of portfolio securities held offshore can be derived using two main sources, as described by Zucman (2013). First, one can estimate the total amount of financial wealth managed by Swiss banks on behalf of foreigners (approximately \$2.3 trillion in 2017) using data from the central bank of Switzerland. This is sizeable and the authors suggest this 'data source alone captures a large fraction of the world's total offshore wealth (30–50% in recent years)'. Moreover, to estimate the global amount of offshore portfolio securities, beyond what is held in Switzerland banks, one could track anomalies in global investment statistics, namely the positive discrepancy between global portfolio liabilities and assets, indicating to what extent the portfolio securities are less likely to be reported as assets on the international investment positions of countries.

Until very recently, the information publicly available was not sufficient to reconstruct how the global offshore wealth was distributed across countries and whom this wealth belongs to. The distributional implication of unreported offshoring of wealth was, therefore, difficult to be precisely investigated (see Roine and Waldenstrom, 2008 for a previous attempt to investigate this important issue). A series of recent works, helped to shed light on these important issues.

First, Alstadsæter et al. (2018) approximated the relative distribution of world offshore wealth across countries around 2007. The authors unveil the cross-sectional heterogeneity of the incidence of offshore wealth across different countries in the world. In the abstract of their work the authors write that 'The equivalent of 10% of world GDP is held in tax havens globally, but this average masks a great deal of heterogeneity from a few percent of GDP in Scandinavia, to about 15% in Continental Europe, and 60% in Gulf countries and some Latin American

economies'. According to this estimates, Italians held approximately 12% of GDP of financial wealth in offshore accounts in 2007, equivalent to approximately 190 billion of Euro.

This estimate is obtained in two main steps. The most important country-specific information is derived from the Bank for International Settlements who recently disclosed bilateral deposits holdings by foreigners in the most significant offshore financial centers in the world (Switzerland, Hong Kong, Singapore, Cayman Island etc.). In doing so, Alstadsæter et al. (2018) compute the share of total deposits held in most offshore financial centers held by Italians. Bank deposits, however, only account for a small share of total financial wealth held offshore as it excludes portfolios of equities, bonds and mutual fund shares and other securities. In order to overcome this limitation, Alstadsæter et al. (2018) assume the remaining global financial wealth (portfolio securities) held offshore, as estimated in Zucman (2013), is distributed across countries in the same way as offshore bank deposits are. This is clearly an imperfect adjustment although the only feasible one with the current data availability. The authors suggest that “the correlation between the two distributions is likely to be high but imperfect.”

To provide an external validation of this tentative estimate an alternative series based on the estimates provided by Pellegrini et al. (2016) who independently attempted to estimate securities financial assets held in offshore centers by investors resident in Italy, Germany, France, the Netherlands, and Spain between 2001 and 2013. In this paper the authors, similarly to what done in Zucman (2013), made use of global discrepancy between the stock of financial assets and liabilities to derive the global stock of financial assets held in offshore centers. The global undeclared amount of undeclared assets was then allocated to different investor countries based on two approaches. The baseline approach distributed undeclared assets according to the official derived liabilities share of each issuing country as declared in the CPIS data (Coordinated Portfolio Investment Survey), implicitly assuming that “investors resident in any given country allocate the unreported foreign wealth to the same portfolio of assets used for the investment of declared wealth” (p.16). This procedure results into an estimated total value of undeclared debt and equity securities of approximately 140 billion Euro in 2007.

In order to compare these figures directly with those provided in Alstadsæter et al. (2018) we further need to estimate the value of undeclared bank deposits held by individual investors in offshore centers. The work by Pellegrini et al. (2016) only derive the global amount of undeclared bank deposits held by non-banking sector in offshore centers as obtained from the cross-border banking statistics released by the Bank of International Settlements. In order to derive the share of offshore bank deposits held by Italians, we first assume that 1/2 of the undeclared bank deposits

are allocated to individuals⁵⁴. We then distribute a share of the global amount of individual bank deposits held offshore according the country's relative share of global GDP. The resulting estimated value of total financial wealth held offshore by Italian investors is approximately 187 billion Euro in 2007. Incidentally this a very similar value to what independently derived by Alstadsæter et al. (2018).

This exercise is carried out also for the remaining years from 2001 to 2013 to derive a time series evolution of Italian financial wealth held in offshore accounts. In order to derive the evolution of offshore wealth for a longer period of time, between 1995 and 2016, we anchor the level of financial wealth held offshore in 2007 as reported in Alstadsæter et al. (2018) and we assume that the time series evolution follows the relative evolution of European offshore wealth. The results indicate that Italian financial wealth held offshore went from 5% of GDP in 1970 to approximately 18% in 2016. We will use the absolute values of this series between 1995 and 2001 and its relative evolution between 2013 and 2016, when no time series and country-specific information can be estimated from Pellegrini et al. (2016).

One important feature to highlight of latter work is the allowance made in their statistics for the voluntary declaration of financial assets held abroad to the Italian tax authority thanks to the Voluntary Disclosure (VD) agreement scheme put in place by the Italian government in 2009/2010. Under very favorable tax and legal conditions, thousands of taxpayers decided to declare approximately 100 billion of financial assets under this VD scheme, leading to subsequent revisions of the official statistics on the international investment positions and the Italian balance of payments.

The resulting final series suggests that Italian financial wealth held in offshore accounts went from 5% of GDP in 1970 to approximately 11% of GDP in 2016. Given the strong relative rise in household wealth over the same period, the choice of the comparator clearly matters. Offshore wealth as a share of total net personal wealth appears to be more stable and oscillating around 2% between 1970 and 2015. The estimation of the time series of financial wealth held offshore by Italian households it is only the first step to investigate its distributional implications. The second step involves the estimation of the share of the financial wealth held offshore that remains undeclared and therefore unaccounted in tax administrative data and the national accounts. The third step requires the estimation of how undeclared financial wealth held offshore is distributed among wealth holders.

54. The same share was assumed in Johannesen and Zucman (2014) and appears consistent with more recent works by García Luna and Hardy (2019) who found that at end-March 2019, households (including non-profit institutions serving households) accounted for 51% of Switzerland banks' cross-border liabilities. In the same work, if considering all the countries in the sample, households accounts for only 14% of banks' cross-border liabilities.

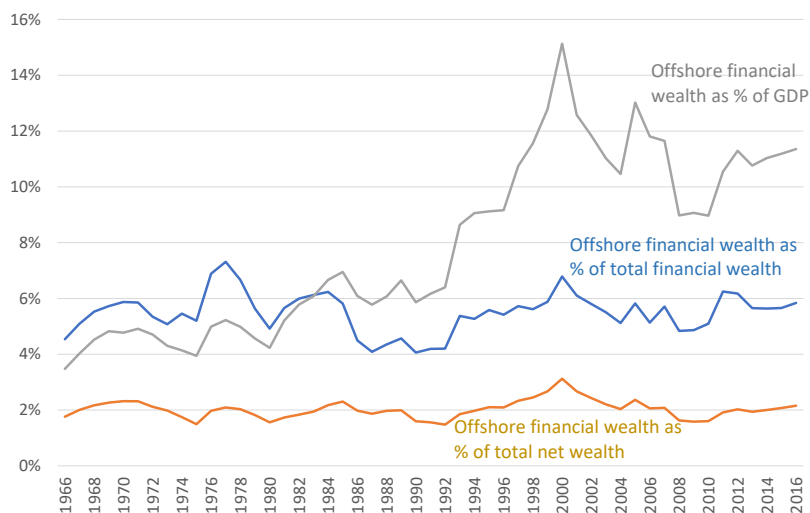


FIGURE M.1. The share of financial wealth held offshore as % of GDP, total financial wealth, and total personal net wealth.

Alstadsæter et al. (2019) matched individual tax records on income and wealth to records obtained from tax amnesties in Denmark and Norway as well as recent random leaks from offshore financial institutions (e.g. Panama Papers in 2016 and the “Swiss Leaks” from HSBC Switzerland). The investigation suggests that the 90 to 95% of total wealth held offshore is evading taxes as it goes unreported to tax authorities. Moreover, their findings suggest that offshore wealth is highly skewed at the top of the wealth distribution being concentrated almost entirely (up to 95%) to the top 1 percent (50% of which being allocated to the richest top 0.01% group alone).

We consequently assume that 95% of offshore wealth is undeclared, this high share is also consistent with data of financial wealth abroad declared to Italian tax authorities in the context of the stamp duty (*IVAFE - Imposta sul Valore delle Attività Finanziarie all'Ester*): reported financial wealth held in "black listed" countries in tax year 2016 was only 2.9 billion euros over a total of 114 billion euros of financial wealth held in all foreign countries (source: Italian Ministry of Economy and Finance). Applying the same distribution described above to the Italian data reveals that wealth concentration is even more concentrated than what tax data alone imply. The level of the share of total net wealth held by the richest one percent of the adult population increases by approximately 2 percentage points throughout. This is a sizeable effect that becomes even more visible at the very top of the distribution.

The richest one in one thousand individuals saw its share of total net personal wealth increasing by 65% in 1995 (from 1.9 to 3.2 percent) and by 15% in 2016 (from 7.3 to 8.4 percent). The inclusion of unreported offshore financial wealth, however, does not appear to substantially affect the trend of the wealth concentration over the period of investigation.

It would be interesting to observe the future trends of wealth hidden in offshore accounts in the light of the recent achievements in terms of new standards of global exchange of information among tax authorities. While Johannesen and Zucman (2014) find that total bank accounts in International Financial Centers (IFCs) had not declined significantly since the expansion of exchange of information in 2008, more recent OECD work (O’Reilly et al., 2019) show a significant decline associated to exchange of information on request, automatic exchange of information and FATCA (the US Foreign Account Tax Compliance Act). In particular, automatic exchange of information commencement in 2017 and 2018 is associated with a reduction in IFC bank deposits of 22%. This virtuous process of exchange of information at the international level in the near future might render wealth declared on inheritance tax returns closer to the actual wealth. Further information on this domain can be found on the OECD website⁵⁵.

55. www.oecd.com/tax/exchange-of-tax-information/

Appendix N: Wealth determinants: additional analyses

N.1. *Wealth composition across wealth groups*

To further probe the role of heterogeneous portfolios and their returns, we use our data to show how different assets classes contributed to the rise in the concentration of wealth. We divide wealth into net housing assets and net non-housing assets (e.g. mostly financial assets), and allocate both to different groups of the distribution (preserving the ranking of adults according to net wealth). For each group i we define the share in total net wealth as S_i , which in turn can be written as the weighted average of the housing (H) wealth share and the non-housing (NH) wealth share of the same group i :

$$S_i = \frac{H_i + NH_i}{W} = \frac{H_i}{H} \alpha_H + \frac{NH_i}{NH} (1 - \alpha_H) = S_i^H \alpha_H + S_i^{NH} (1 - \alpha_H), \quad (\text{N.1})$$

where α_H and $1 - \alpha_H$ are the relative weights of net housing and net non-housing wealth in the total net wealth of the household sector. The results of this simple exercise reveal, in Figure N.1, that wealthy individuals have been capturing a growing share of non-housing wealth. By contrast, the share of total housing stock captured at the very top of the net wealth distribution has remained relatively flat since 1995 (Figure N.1, panels (c) to (f)). Upper end groups aside, the share of non-housing wealth decreased visibly for the bottom 50% group, turning negative since early 2000s, and increased by 5 percentage points for the middle 40% group. The share of non-housing net wealth drives most of the negative trend for the bottom 90% and the positive trend for top groups, above the 90th percentile. For instance, the share of non-housing net wealth tripled between 1995 and 2016 for the top 0.1% group, growing from 5% to 15%. This is in agreement with the findings described by Alvaredo et al. (2018) for the UK, in the sense that housing wealth may have well “moderated the tendency for concentration to increase in other forms of wealth” (p.37). However, this does not apply outside the top ranges of the wealth distribution. The pronounced downward trend in the share of the bottom 50% was driven by both housing and non-housing wealth (Figure N.1(a)); the magnitude of the decline in the relative share of middle 40% was reduced by a slight increase in the share of net housing assets (Figure N.1(b)).

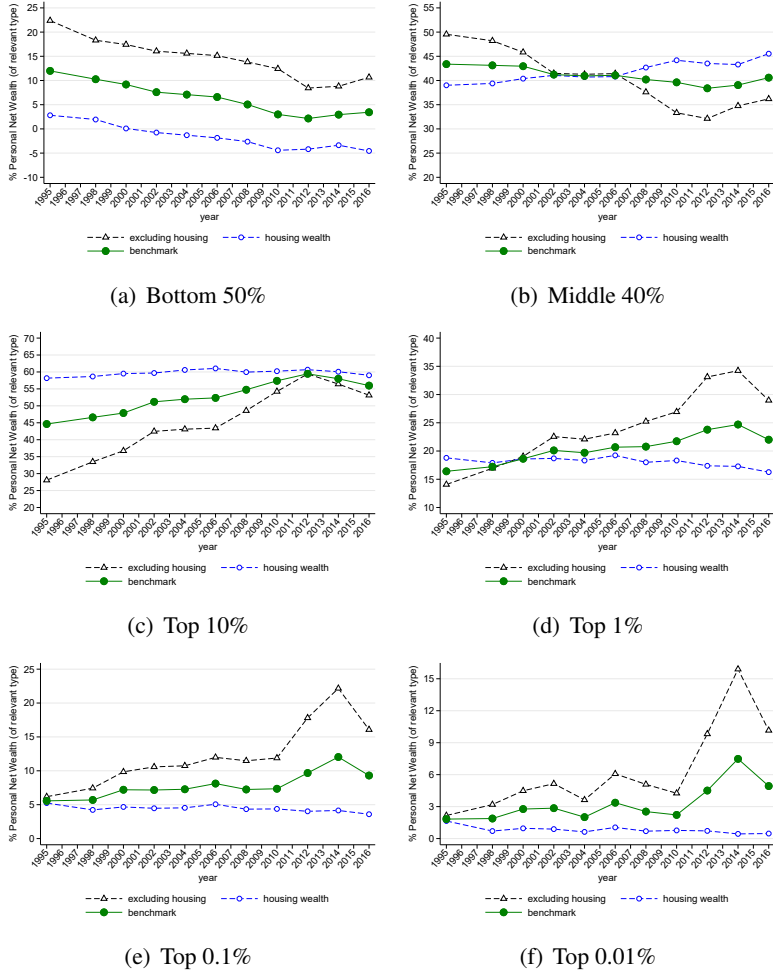


FIGURE N.1. The contribution of housing and non-housing wealth to the growing concentration of wealth. We divide wealth into net housing assets and net non-housing assets, and allocate both to different groups of the distribution (preserving the ranking of adults according to total net wealth). For each group i we define the share in total net wealth as S_i , which in turn can be written as the weighted average of the housing (H) wealth share and the non-housing (NH) wealth share of the same group i can be defined as $S_i = \frac{W_i}{W} = S_i^H \alpha_H + S_i^{NH} (1 - \alpha_H)$ where α_H and $1 - \alpha_H$ are the relative weights of net housing and net non-housing wealth in the total net wealth of the household sector.

year	Wealth thresh- old (thousands 2016 EUR)	Wealth group	Debt (billions 2016 EUR)	Financial & Business assets (billions 2016 EUR)	Deposits & Valuables assets (billions 2016 EUR)	Housing & Land assets (billions 2016 EUR)	Wealth total (billions 2016 EUR)	Debt share	Financial assets share	Deposits & valuables assets share	Housing & land assets share	Wealth total share
1995		Bottom50	239	702	840	830	2375	0.35	0.30	0.35	-0.10	1
1995	56	Mid40	65	492	220	1503	2223	0.68	0.22	0.10	-0.03	1
1995	276	P90-P95	14	59	22	284	366	0.77	0.16	0.06	-0.04	1
1995	386	P95-P99	59	231	52	766	1055	0.73	0.22	0.05	-0.06	1
1995	1024	P99-P99.9	11	96	12	166	277	0.60	0.35	0.04	-0.04	1
1995	3999	P99.9-P99.99	11	99	14	86	200	0.43	0.50	0.07	-0.06	1
1995	11241	Top001	0	1	11	29	41	0.71	0.03	0.26	0.00	1
1998		Bottom50	257	535	570	332	1446	0.23	0.37	0.39	-0.18	1
1998	90	Mid40	90	1151	314	1978	3441	0.57	0.33	0.09	-0.03	1
1998	300	P90-P95	3	23	7	64	94	0.68	0.25	0.07	-0.04	1
1998	398	P95-P99	63	417	67	1004	1499	0.67	0.28	0.04	-0.04	1
1998	1238	P99-P99.9	30	221	25	332	577	0.58	0.38	0.04	-0.05	1
1998	4172	P99.9-P99.99	6	89	11	85	185	0.46	0.48	0.06	-0.03	1
1998	11951	Top001	4	64	30	12	107	0.11	0.60	0.28	-0.04	1
2000		Bottom50	278	538	502	216	1263	0.17	0.43	0.40	-0.22	1
2000	97	Mid40	129	1335	345	1955	3635	0.54	0.37	0.09	-0.04	1
2000	286	P90-P95	26	167	44	482	694	0.70	0.24	0.06	-0.04	1
2000	460	P95-P99	50	376	76	827	1275	0.65	0.29	0.06	-0.04	1
2000	1278	P99-P99.9	55	192	36	312	544	0.57	0.35	0.07	-0.10	1
2000	3943	P99.9-P99.99	10	196	15	128	340	0.38	0.58	0.05	-0.03	1
2000	17421	Top001	3	132	9	28	171	0.16	0.78	0.05	-0.02	1
2002		Bottom50	255	278	404	744	1420	0.52	0.20	0.28	-0.18	1
2002	67	Mid40	98	669	290	1572	2544	0.62	0.26	0.11	-0.04	1
2002	284	P90-P95	40	306	108	602	1049	0.57	0.29	0.10	-0.04	1
2002	649	P95-P99	63	608	138	971	1758	0.55	0.35	0.08	-0.04	1
2002	1475	P99-P99.9	33	323	52	353	843	0.42	0.38	0.06	-0.04	1
2002	5979	P99.9-P99.99	5	95	16	118	298	0.40	0.32	0.05	-0.02	1
2002	19385	Top001	0	36	1	31	145	0.21	0.25	0.01	0.00	1
2004		Bottom50	214	416	533	541	1496	0.36	0.28	0.36	-0.14	1
2004	63	Mid40	75	766	272	1810	2971	0.61	0.26	0.09	-0.03	1
2004	367	P90-P95	8	250	47	1004	1557	0.64	0.16	0.03	-0.01	1
2004	622	P95-P99	12	178	34	968	1634	0.59	0.11	0.02	-0.01	1
2004	1784	P99-P99.9	0	29	0	412	747	0.55	0.04	0.00	0.00	1
2004	5455	P99.9-P99.99	0	12	0	181	363	0.50	0.03	0.00	0.00	1
2004	19930	Top001	0	5	0	27	159	0.17	0.03	0.00	0.00	1
2006		Bottom50	428	481	562	473	1517	0.31	0.32	0.37	-0.28	1
2006	66	Mid40	197	978	318	2352	3645	0.65	0.27	0.09	-0.05	1
2006	372	P90-P95	37	303	80	899	1298	0.69	0.23	0.06	-0.03	1
2006	685	P95-P99	73	550	108	1138	1814	0.63	0.30	0.06	-0.04	1
2006	1939	P99-P99.9	36	460	65	627	1184	0.53	0.39	0.05	-0.03	1
2006	7281	P99.9-P99.99	10	209	44	140	397	0.35	0.53	0.11	-0.03	1
2006	22342	Top001	3	89	10	42	230	0.18	0.39	0.04	-0.01	1
2008		Bottom50	514	445	542	379	1366	0.28	0.33	0.40	-0.38	1
2008	65	Mid40	231	1014	417	2893	4326	0.67	0.23	0.10	-0.05	1
2008	408	P90-P95	31	170	62	666	897	0.74	0.19	0.07	-0.03	1
2008	652	P95-P99	67	491	124	1237	1853	0.67	0.27	0.07	-0.04	1
2008	1643	P99-P99.9	46	453	89	723	1264	0.57	0.36	0.07	-0.04	1
2008	6451	P99.9-P99.99	8	160	38	114	313	0.37	0.51	0.12	-0.03	1
2008	19457	Top001	2	162	21	34	217	0.16	0.75	0.10	-0.01	1
2010		Bottom50	561	379	520	335	1236	0.27	0.31	0.42	-0.45	1
2010	58	Mid40	234	828	390	2907	4123	0.71	0.20	0.09	-0.06	1
2010	419	P90-P95	34	166	58	606	831	0.73	0.20	0.07	-0.04	1
2010	681	P95-P99	59	546	142	1330	2022	0.66	0.27	0.07	-0.03	1
2010	1799	P99-P99.9	45	488	99	754	1337	0.56	0.37	0.07	-0.03	1
2010	7306	P99.9-P99.99	20	200	33	164	396	0.41	0.50	0.08	-0.05	1
2010	18600	Top001	4	99	44	36	180	0.20	0.55	0.24	-0.02	1
2012		Bottom50	565	276	456	355	1088	0.33	0.25	0.42	-0.52	1
2012	56	Mid40	220	781	399	2746	3926	0.70	0.20	0.10	-0.06	1
2012	404	P90-P95	30	187	75	630	888	0.71	0.21	0.08	-0.03	1
2012	645	P95-P99	63	543	174	1319	2038	0.65	0.27	0.09	-0.03	1
2012	1727	P99-P99.9	36	442	99	633	1175	0.54	0.38	0.08	-0.03	1
2012	6228	P99.9-P99.99	18	235	64	151	449	0.34	0.52	0.14	-0.04	1
2012	27017	Top001	8	277	53	34	364	0.09	0.76	0.14	-0.02	1
2014		Bottom50	524	244	489	398	1131	0.35	0.22	0.43	-0.46	1
2014	57	Mid40	216	816	423	2194	3433	0.64	0.24	0.12	-0.06	1
2014	375	P90-P95	44	173	98	795	1067	0.75	0.16	0.09	-0.04	1
2014	381	P95-P99	57	445	174	1248	1867	0.67	0.24	0.09	-0.03	1
2014	1426	P99-P99.9	35	358	94	606	1061	0.57	0.34	0.09	-0.03	1
2014	5690	P99.9-P99.99	18	210	33	188	432	0.43	0.49	0.08	-0.04	1
2014	31205	Top001	3	560	45	16	617	0.03	0.91	0.07	-0.01	1
2016		Bottom50	438	163	394	107	660	0.16	0.25	0.60	-0.66	1
2016	50	Mid40	308	1043	568	2504	4114	0.61	0.25	0.14	-0.07	1
2016	359	P90-P95	37	180	96	694	971	0.72	0.19	0.10	-0.04	1
2016	564	P95-P99	55	464	184	1160	1811	0.64	0.26	0.10	-0.03	1
2016	1443	P99-P99.9	34	408	123	604	1137	0.53	0.36	0.11	-0.03	1
2016	5392	P99.9-P99.99	13	168	32	118	320	0.37	0.52	0.10	-0.04	1
2016	19319	Top001	6	376	21	25	423	0.06	0.89	0.05	-0.02	1

TABLE N.1. Wealth composition across groups - total values and shares: 1995-2008

N.2. The role of savings, indebtedness, and capital gains

It is worth noting that the use of external share and housing price indexes to derive “synthetic saving rates” for different wealth groups does not preserve the consistency with the national accounts framework. As discussed in Bauluz et al. (2022), to derive implied asset price changes that are consistent with the balance sheet of the household sector, one needs the saving flows of each asset class in the financial and real assets accounts of the households sector. These serve to estimate, as residuals, the shares of the aggregate wealth accumulation explained by changes in asset prices. Using detailed quarterly data from the Financial Accounts published by the Bank of Italy, we could decompose the change in the valuation of each financial asset class into price adjustments and financial flows. We show in Appendix A.3, Figure A.4 that the overall contribution of price changes for total financial assets is relatively dominant in almost all years from 1995 to 2021.⁵⁶

Interestingly, the role of changes in the volumes of assets and savings remains very large even with no allowance for corporate retained earnings, including at the top of the distribution. As discussed in Mian et al. (2020) and Bauluz et al. (2022), a growing share of the evolution of equity prices may reflect changes in retained corporate earnings. To the extent that retained earnings are effectively considered, at least in part, as a saving flow concentrated at the top of the distribution, the method adopted above could underestimate the role of saving at the top of the distribution.⁵⁷

Moreover, the role of changes in the volume of assets remains strong despite a sustained declining trend of the saving capacity of Italian households over the past decades. Whereas the household saving rate in percentage of disposable household income was one of the highest in the world in 1995 (around 16%), it declined to moderate levels at around 3.2% in 2016. Using the survey data from SHIW we estimated the gradient of household saving rates (defined as the difference between disposable income and consumption as a proportion of disposable income) with respect to ranking of household along the net wealth distribution. We then preserve this gradient but adjust the estimated levels of saving rates to account for the proportional difference between the aggregate saving rates estimated in survey data and OECD macroeconomic statistics. The results averaged out for the 2000-2006 and 2008-2016 periods are shown in Figure 11 and show no evidence for a growing degree of dispersion of saving rates by wealth levels. Saving rates were more than halved for every net wealth decile from 2000-2006 to 2008-2016. Saving rate of the

56. The estimates are consistent with existing ones from the work of Caprara et al. (2020), who documented a “...dominance of price adjustments over financial flows” for Italy, Spain, Canada, the United Kingdom, and the United States. However, in our case we cannot make use of the implied price changes for each financial asset class from the previous exercise as our data does not allow for a precise identification of different types of financial assets holdings (our class of financial assets bundles together shares, bonds, mutual funds, and other financial instruments). Moreover, a similar exercise cannot be carried out for real assets as no official accounting of the real asset flows exists.

57. Such underestimation may even be greater over time to the extent that retained earnings have grown in recent decades as shown Bauluz et al. (2022) for a number of high-income countries.

richest decile was 12% on average between 2000 and 2006, 10 percentage points higher than that of the bottom decile. Over the 2008-2016 the saving rate of the top decile was halved to 6 %, whereas the average saving rate of the bottom decile turned slightly negative.

billions 2016 EUR								Net wealth growth rate	Decomposition of net wealth growth by asset class					Proportion of net wealth growth of each asset class			
t	P	W_t^P	NW_t^P	Dep_t^P	H_t^P	F_t^P	D_t^P	$\frac{dNW_t^P}{NW_t^P}$		$\frac{dDep_t^P}{NW_t^P}$	$\frac{dH_t^P}{NW_t^P}$	$\frac{dF_t^P}{NW_t^P}$	$\frac{-dD_t^P}{NW_t^P}$				
year	wealth group	Total gross wealth	Total net wealth	Deposits and Valuables	Housing and Land Assets	Financial and Business Assets	Debt	Total wealth	net	Deposits and Valuables	Housing and Land Assets	Financial and Business Assets	Debt	Deposits and Valuables	Debt	Housing and Land Assets	Financial and Business Assets
1995	All	6538	6140	1172	3664	1680	399	52%		2%	39%	20%	-8%	4%	-16%	75%	38%
2008	All	10237	9337	1292	6046	2898	900										
2016	All	9436	8545	1418	5212	2802	891	39%		4%	25%	18%	-8%	10%	-20%	64%	47%
1995	Bottom 50%	2375	2137	840	830	702	239	-60%		-14%	-21%	-12%	-13%	23%	21%	35%	20%
2008	Bottom 50%	1366	852	542	379	445	514										
2016	Bottom 50%	660	222	394	107	163	438	-90%		-21%	-34%	-25%	-9%	23%	10%	38%	28%
1995	Mid 40%	2223	2158	220	1503	492	65	90%		9%	64%	24%	-8%	10%	-9%	72%	27%
2008	Mid 40%	4326	4095	417	2893	1014	231										
2016	Mid 40%	4114	3806	568	2504	1043	308	76%		16%	46%	26%	-11%	21%	-15%	61%	33%
1995	Top 10%	1940	1845	112	1330	486	95	138%		12%	78%	52%	-3%	9%	-2%	57%	37%
2008	Top 10%	4544	4390	333	2774	1438	154										
2016	Top 10%	3691	4517	456	2601	1596	145	145%		19%	69%	60%	-3%	13%	-2%	48%	42%
1995	Top 1%	518	497	37	281	196	22	250%		22%	119%	117%	-7%	9%	-3%	48%	47%
2008	Top 1%	1794	1737	147	871	776	56										
2016	Top 1%	1880	1827	176	746	952	53	268%		28%	94%	152%	-6%	10%	-2%	35%	57%
1995	Top 0,1%	241	230	25	115	100	11	126%		15%	14%	97%	0%	12%	0%	11%	77%
2008	Top 0,1%	529	519	58	148	323	10										
2016	Top 0,1%	743	724	53	142	543	19	215%		12%	12%	193%	-3%	6%	-2%	6%	90%

TABLE N.2. Wealth portfolio decomposition across groups: 1995-2008 and 1995-2016. The decomposition exercise of the growth of net wealth follows equation (2). The asset portfolio composition used in the exercise are taken from Table N.1.

		billions 2016 EUR											Net wealth growth rate						Decomposition of net wealth growth by asset class					Proportion of net wealth growth				
t	P	W_t^P	NW_t^P	Dep_t^P	D_t^P	H_t^P	F_t^P	ΔDep_t^P	ΔD_t^P	$q_t^H H_t^P$	$q_t^F F_t^P$	RS_t^P		$\frac{\Delta NW_t^P}{NW_t^P}$	$\frac{\Delta Dep_t^P}{NW_t^P}$	$\frac{-\Delta D_t^P}{NW_t^P}$	$\frac{q^H H_t^P}{NW_t^P}$	$\frac{q^F F_t^P}{NW_t^P}$	$\frac{RS_t^P}{NW_t^P}$									
year	wealth group	Total gross wealth	Total net wealth	Deposits and Valuables	Debt	Housing and Land assets	Financial and Business Assets	Deposits and Valuables	Debt	Capital gains housing and land assets	Capital gains financial and business assets	Residual Change (residual savings)	Period	Total net wealth	Deposits and Valuables	Debt	Capital gains housing and land assets	Capital gains financial and business assets	Residual savings		Deposits and Valuables	Debt	Capital gains housing and land assets	Capital gains financial and business assets	Residual savings			
1995	All	6538	6140	1172	399	3664	1680																					
2000	All	7921	7370	1028	551	3949	2936	-144	152	-210	3677	-1940																
2008	All	10237	9337	1292	900	6046	2898	265	349	1702	-879	1227																
2012	All	9928	8988	1319	939	5869	2740	27	40	-686	-1201	1551	1995-2008	52%	2.8%	-8.3%	27.8%	33.9%	-4.1%		5%	-16%	53%	65%	-8%			
2016	All	9436	8545	1418	891	5212	2802	98	-48	-915	682	-356	1995-2016	39%	3.2%	-7.0%	13.7%	25.7%	3.6%		8%	-18%	35%	66%	9%			
1995	Bottom 50%	2375	2137	840	239	830	702																					
2000	Bottom 50%	1263	984	502	278	216	538	-337	40	-48	1076	-1803																
2008	Bottom 50%	1366	852	542	514	379	445	40	236	93	-113	84																
2012	Bottom 50%	1088	523	456	565	355	276	-85	51	-43	-129	-21	1995-2008 (average)	-60%	-7.5%	-32.1%	10.3%	25.5%	-56.4%		12%	53%	-17%	-42%	94%			
2016	Bottom 50%	660	222	394	438	107	163	-63	-127	-55	48	-358	1995-2016 (average)	-90%	-15.9%	-15.0%	0.2%	16.0%	-75.0%		18%	17%	0%	-18%	84%			
1995	Mid 40%	2223	2158	220	65	1503	492																					
2000	Mid 40%	3635	3506	345	129	1955	1335	125	64	-86	753	620																
2008	Mid 40%	4326	4095	417	231	2893	1014	72	102	843	-280	56																
2012	Mid 40%	3926	3706	399	220	2746	781	-18	-11	-328	-294	241	1995-2008 (average)	90%	9.1%	-7.7%	34.6%	22.2%	31.4%		10%	-9%	39%	25%	35%			
2016	Mid 40%	4114	3806	568	308	2504	1043	169	88	-428	136	311	1995-2016 (average)	76%	11.3%	-8.5%	17.1%	17.6%	38.9%		15%	-11%	22%	23%	51%			
1995	Top 10%	1940	1845	112	95	1330	486																					
2000	Top 10%	3024	2880	180	144	1778	1063	-69	49	-76	1064	164																
2008	Top 10%	4544	4390	333	154	2774	1438	153	10	766	-318	850																
2012	Top 10%	4913	4759	464	155	2767	1683	131	1	-315	-596	1149	1995-2008 (average)	138%	20.9%	-3.2%	37.9%	39.4%	55.3%		15%	-2%	27%	29%	40%			
2016	Top 10%	3691	4517	456	145	2601	1596	-8	-9	-432	419	-230	1995-2016 (average)	145%	23.8%	-3.1%	25.8%	36.7%	74.3%		16%	-2%	18%	25%	51%			
1995	Top 1%	518	497	37	22	281	196																					
2000	Top 1%	1055	988	61	67	469	521	23	45	-16	559	-29																
2008	Top 1%	1794	1737	147	56	871	776	86	-11	202	-202	653																
2012	Top 1%	1988	1833	215	62	819	953	68	5	-99	-418	550	1995-2008 (average)	250%	21.2%	-8.4%	33.4%	90.4%	113.2%		8%	-3%	13%	36%	45%			
2016	Top 1%	1880	1827	176	53	746	952	-40	-8	-128	308	-155	1995-2016 (average)	268%	24.0%	-8.7%	23.1%	88.2%	141.2%		9%	-3%	9%	33%	53%			
1995	Top 0.1%	241	230	25	11	115	100																					
2000	Top 0.1%	511	498	25	12	156	329	0	1	-7	286	-9																
2008	Top 0.1%	529	519	58	10	148	323	34	-2	67	-128	45																
2012	Top 0.1%	813	751	117	26	186	511	58	16	-17	-174	380	1995-2008 (average)	126%	10.9%	0.2%	19.2%	85.0%	10.7%		9%	0%	15%	67%	8%			
2016	Top 0.1%	743	724	53	19	142	543	-64	-7	-29	-104	162	1995-2016 (average)	215%	17.8%	-2.1%	18.1%	62.6%	118.7%		8%	-1%	8%	29%	55%			

TABLE N.3. Wealth growth decomposition across groups: Savings vs Capital Gains. The decomposition exercise of the growth of net wealth follows equation (4). Capital gains for housing and financial assets were computed using Real House Price Index and Shares Price Index from OECD.Stat as described in Table N.4. The asset portfolio composition used in the exercise are taken from Table N.1.

N.3. The joint distribution of income and wealth

We define labor income as the sum of employment income (“Reddito da lavoro dipendente”) and self-employment income. We define self-employed income as the sum of professional income, income from sole proprietorship and partnerships.⁵⁸ For those categories it should be taken into account that a part of income is generated from labor, while the remaining part is generated from capital.

As regards professional income, we have imputed 100% of income to labor, since this income comes from the exercise of any profession or vocation which calls for an intellectual or manual skill. For sole proprietorship and partnerships we have followed Saez and Zucman (2020) who allocate to labor 80% of sole proprietorship income. Differently from Saez and Zucman (2020), we apply the same 80% proportion also to partnership income since in Italy partnerships are typically very small and not different from sole proprietorship.⁵⁹ Capital income is instead defined as the sum of financial capital income (including realized capital gains), lands and buildings income, and the residual 20% of business income that we assume are not attributable to labor. However, it is worth noting that some forms of financial income are taxed at source, so they are not captured in personal income tax returns.⁶⁰

58. Self-employment income include the following categories: “reddito da lavoro autonomo, perdita da lavoro autonomo, reddito d’impresa in contabilità ordinaria, perdita d’impresa in contabilità ordinaria, reddito d’impresa in contabilità semplificata, perdita d’impresa in contabilità semplificata, reddito da partecipazione, perdita da partecipazione, redditi diversi”. There are no S-corporations in Italy.

59. According to tax returns statistics of tax year 2019, 99,9% of Italian partnerships are small enterprises (i.e. with a turnover lower than 10 million euros). This share of 80% for the labor component of income of sole proprietorship and partnerships has also been used specifically for the Italian case in EC (2004), p. 175.

60. Capital income include the following categories:” reddito dominicale e agrario, reddito da fabbricati e cedolare secca, reddito di capitale (include plusvalenze di natura finanziaria)”.

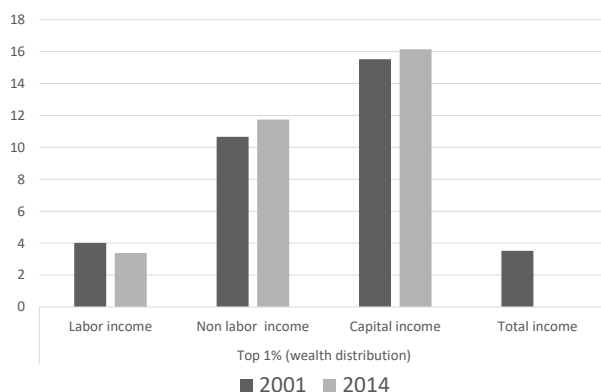


FIGURE N.2. The concentration of different sources of income for the top 1% wealthiest adults. The joint distribution of income and wealth is estimated using records linking individual income tax data in the year before death and the adjusted value of reported net wealth at death. We define labor income as the sum of employment and self-employment incomes (i.e., professional incomes + 80% of partnership and sole proprietorship incomes). Capital income is defined as the sum of financial capital income (including realized capital gains), lands and buildings income, and the residual 20% of business incomes that we assume are not attributable to labor. Non-labor income is defined as the sum of capital income and old-age taxable pension incomes (excluding non-contributory social protection pensions).

N.4. Wealth shares and asset price changes

year		Housing price index (2010=100) OECD	Shares price index (2010=100) OECD	CPI (OECD) 2016=100
1995		78.1	58.9	66.6
1996		72.6	59.3	69.3
1997		67.8	81.2	70.7
1998		67.9	129.9	72.1
1999		70.3	144.7	73.3
2000		73.7	187.9	75.2
2001		77.6	152.5	77.2
2002		82.7	120.9	79.1
2003		88.6	109.1	81.3
2004		95.1	125.6	83.1
2005		100.2	149.5	84.7
2006		103.9	173.0	86.5
2007		106.9	189.8	88.1
2008		105.4	131.7	91.0
2009		101.9	94.2	91.7
2010		100.0	100.0	93.1
2011		98.5	91.3	95.7
2012		93.5	77.1	98.6
2013		86.4	88.4	99.8
2014		82.1	104.8	100.1
2015		78.8	115.6	100.1
2016		78.9	96.3	100.0
2017		77.1	117.1	101.2
1995-2016	%	1%	63%	50%
change				
1995-2008	%	35%	123%	37%
change				

TABLE N.4. The evolution of the price index for housing and shares: 1995-2017. Analytical house prices indicators (Real House Price Indexes) and Monthly Monetary and Financial Statistics (Shares Price Index). Data extracted on 14 Sep 2018 16:00 UTC (GMT) from OECD.Stat.



FIGURE N.3. The role of asset prices and the households saving rate. Real House Price Indexes and Shares Price Index from OECD.Stat as described in Table N.4.

Appendix O: Robustness Analyses

Alternative mortality rates

O.1. The application of mortality rates by refined age groups

To check whether our main results are robust to the use of more refined mortality multipliers we make use of tabulations containing finer disaggregation by geographical location and age classes (every 5 years, from under 5 to 100 years old and above) which were provided to us for a subset of years, namely for 1995 and for the post-2012 period. Multipliers in 1995 were lower in the north of the country compared to the south and the islands. By 2016 it was the opposite. Theoretically, not accounting for such heterogeneity may bias downward the increasing trend in wealth concentration, given that the northern areas are the wealthiest.

We conduct this robustness exercise on the estate tabulations where no imputations are carried out. Figure O.1 shows that the main results for top 1% are robust in the presence of such refinements confirming that the use of more coarse age groups has a negligible effect on the application of the mortality multiplier method.

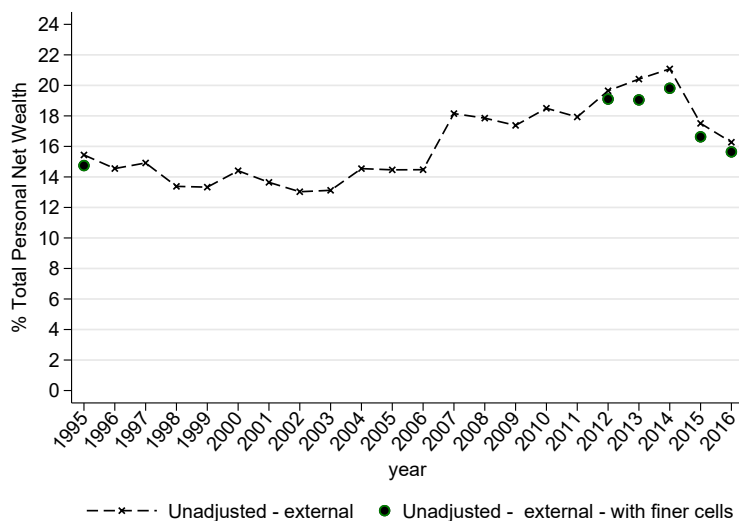
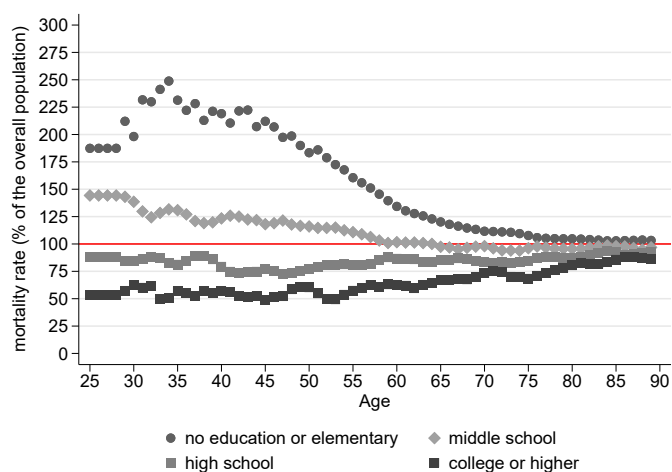
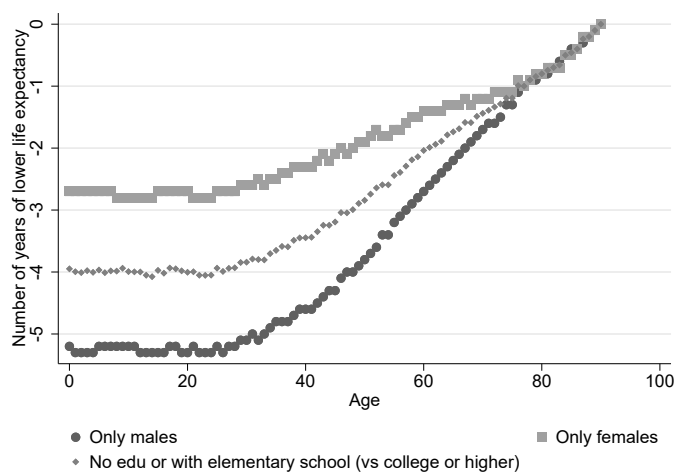


FIGURE O.1. Top 1% derived using mortality multipliers based on more refined age groups and geographical areas. The graph compares the unadjusted series with no imputation and external wealth total to a top 1% derived using more refined mortality multipliers and making use of estate tabulations containing finer disaggregation by geographical location and age classes (every 5 years, from under 5 to 100 years old and above). The refined tabulations were only available for a subset of years, namely for 1995 and for the post-2012 period. Tabulations were also differentiated across three main macro areas: North, South and Islands, and Center.

O.2. The application of mortality rates by wealth level of education groups



(a) Mortality rates by age and education groups (% of the population)



(b) Number of years of lower life expectancy (low vs high education groups)

FIGURE O.2. Mortality rates and life expectancy by age and education groups: 2012. Data on mortality rates and life expectancy from ISTAT. Elaboration of the authors.

Age group	Mortality rate in population - percent	No. education or elementary (%)	Middle School (%)	High school (%)	College or higher (%)
All					
20	0.0005	208.8	119.9	92.2	67.6
40	0.0013	196.9	118.8	77.5	61.7
50	0.0034	150.6	106.6	83.9	64.3
60	0.0090	115.9	98.6	87.2	70.6
70	0.0252	106.1	95.3	85.9	75.9
80	0.0948	102.7	95.7	91.4	86.6
Females					
20	0.0003	243.7	108.2	99.6	75.3
40	0.0010	181.7	116.0	81.8	73.8
50	0.0025	134.2	102.4	86.9	75.5
60	0.0061	106.7	99.2	90.9	79.9
70	0.0180	103.6	94.3	86.1	80.4
80	0.0780	102.3	93.5	89.8	85.5
Males					
20	0.0006	193.8	125.0	89.0	64.3
40	0.0016	206.0	120.4	74.9	54.5
50	0.0044	159.8	108.9	82.3	58.1
60	0.0118	120.5	98.4	85.4	65.9
70	0.0324	107.4	95.8	85.7	73.4
80	0.1117	103.0	97.3	92.5	87.4

TABLE O.1. 2012 Mortality rates by education level as a share of overall population. Data on mortality rates from ISTAT. Elaboration of the authors.

subectionWealth concentration with alternative imputation decisions

Imputations are always surrounded with considerable uncertainty. In this paper we rely on a number of assumptions based on the observed wealth holdings aggregated by the four large macro-categories of assets available in the digitized tax records. These imputations could not be carried out asset by asset based on micro-level evidence and can appear controversial. For the benchmark series, we make the following imputations: (i) we first multiply up the estate distribution using mortality multipliers; (ii) we then append an estimate of the wealth of the missing population based on household survey data; and finally (iii) we distribute the remaining wealth gap with respect to the NA according to the relative distribution of asset classes in the identified wealth from tax records complemented with that of the missing population from survey data.

One must wonder to what extent the benchmark estimates are driven by specific imputation choices in steps (ii) and (iii). To address this concern we discuss two alternative imputation scenarios. First, we derive a series that imputes the wealth gap by relying exclusively on the identified asset distribution based on tax records, without allowing for the wealth of the missing population; second, we derive a series where step (ii) is based exclusively on values reported in the household survey data, rather than relying on adjusted values to account for underreporting.⁶¹ Both

61. As mentioned earlier in the paper, to account for underreporting of assets in the household survey data, we proportionally adjust non-housing asset values using the ratio of total value between the National Accounts and the SHIW, asset class by asset class.

approaches attach more weight to wealth reported in the tax records, which is on average more concentrated than what would appear if one takes into consideration smaller wealth holdings that cannot come to the notice of the tax authority. Hence, the alternative set of imputations, when compared to our benchmark series, generally suggest higher wealth concentration at the top and a lower share for the bottom 50% of the population. Hence, the alternative set of imputations, when compared to our benchmark series, generally imply higher wealth concentration at the top and a lower share for the bottom 50% of the population (figures O.3(a)- O.3(d)). In this respect, our benchmark series is likely to provide conservative estimates of wealth concentration at the top.

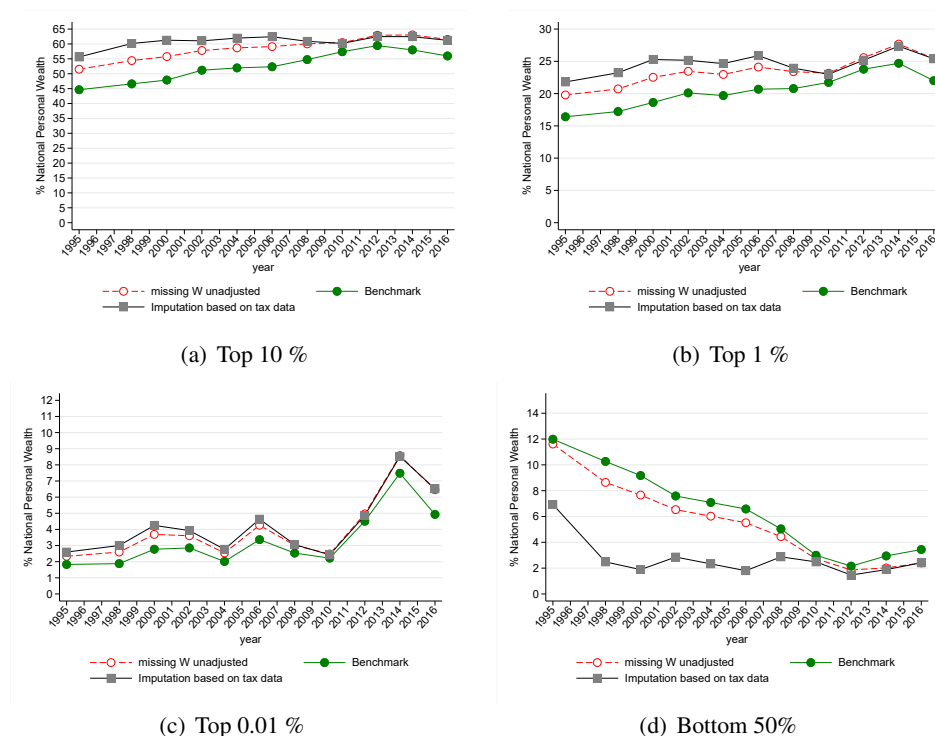


FIGURE O.3. Wealth shares with alternative imputation procedures



FIGURE O.4. Proportional distribution of assets by types and wealth ranges: benchmark approaches compared to alternative assumptions in 2016. The graph shows a simplified representation, for each class of assets, of the proportions of total assets held across the wealth groups (ranked across total net wealth). These proportional factors are used to impute missing assets and liabilities and matching aggregates with the relevant series of the household's sector balance sheets. The figure presents, for the year 2016, three alternative imputation factors. In the benchmark approach we impute wealth using the relative distribution derived from the estimated distribution of wealth of the living allowing for the wealth of the missing population from the SHIW, adjusted for potential underreporting. In an alternative approach we allow for the wealth of the missing population from the SHIW taking the information on the SHIW as given, making no adjustments. In the third alternative approach, the relative distribution of each asset class, are derived from the estimated distribution of wealth of the living, directly from inheritance tax data without allowing for the wealth of the missing population.

O.3. Estimates with no imputations

We derive estimates of wealth shares without resorting to imputations of any kind, that is, by applying the mortality method to the reported estates on the inheritance tax records. As mentioned in the main text of the paper, estimates for the UK in Atkinson and Harrison (1978) and Alvaredo et al. (2018), for instance, followed this path. Importantly, this can be done using both *internal* and *external* wealth totals. Typically, researchers use external data (e.g., the National Accounts) on total wealth that bear no relation to tax data. However, when the population coverage of inheritance tax records is particularly high (like in the case of Italy or the UK), one can also rely on the multiplied-up estates as well as the estimated wealth of the missing population to derive an internal measure for total wealth (as in Alvaredo et al., 2018; Atkinson and Harrison, 1978).

In the main text we presented the results for the top 1% share. Here, additional wealth shares are reported in Figures O.5(a)-O.5(d). The role of imputations appears stronger when the external total is used, especially in those years where the underlying inheritance tax data are much less complete (i.e., between 2001 and 2006). The derivation of the bottom 50% share appears to be particularly sensitive to imputations and the use of an external total.

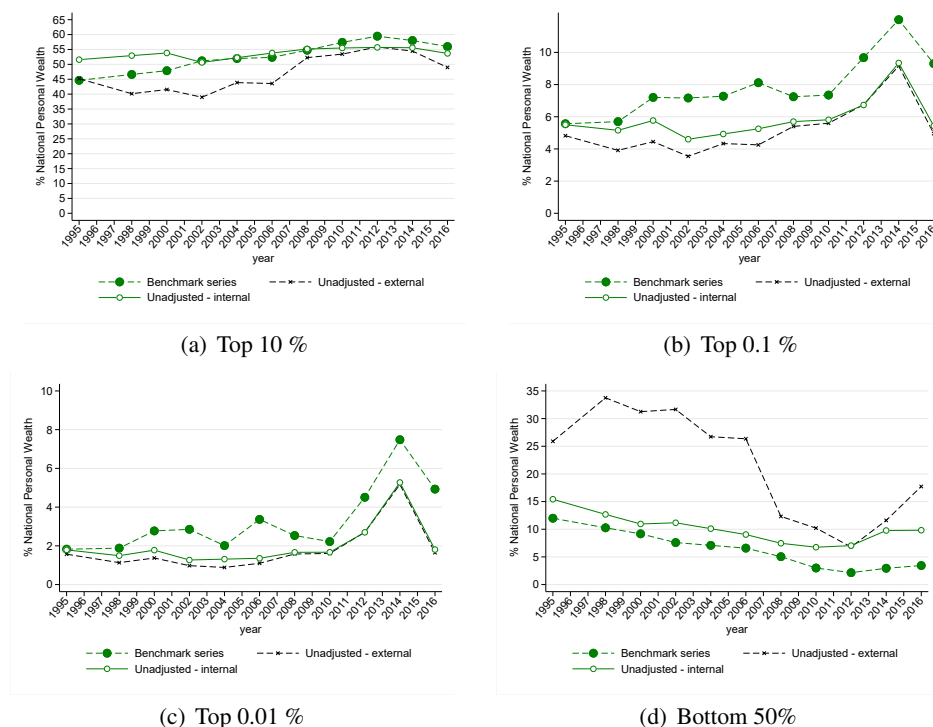


FIGURE O.5. Wealth shares without imputations vs. benchmark series

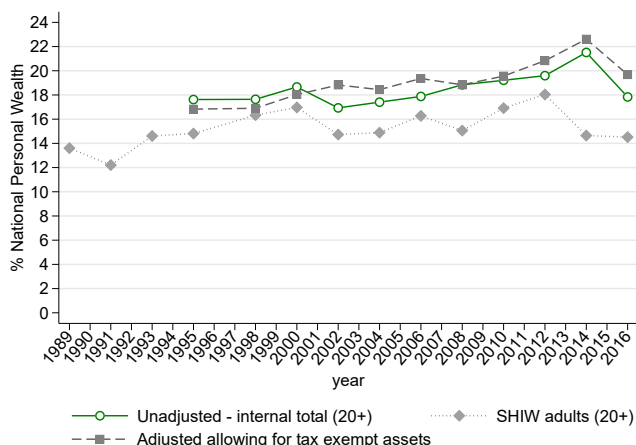


FIGURE O.6. The Top 1% without imputations vs. SHIW.

O.4. External total: Total net wealth excluding likely unreported tax exempt assets

This is obtained by subtracting an estimate of unreported tax-exempt assets from the total net wealth from the households sector. To derive a measure of unreported tax-exempt assets we use the tax code and practice in filing. In particular, the missing tax-exempt financial assets are derived as follows: 100% of insurance technical reserves value (e.g. private pensions, life insurance and accumulated reserves for severance payments are non-taxable assets according to the inheritance and gift tax legislation), 50% of Italian government securities (e.g. the government bonds are tax exempt and the tax authority suggest to include them in the tax form, and they are typically reported if bonds are included within an investment fund together with other securities), 90% of notes and coins (e.g. we assume that most of cash holding is not reported, as generally done by the tax authority who assumes that 10% of total estate is held in cash to compute tax liability). During the months when inheritance and gift tax was abolished (October 2001 to October 2006), we assume that 100% of above-mentioned assets are not reported.

O.5. Internal total: total net wealth identified from tax returns corrected for the wealth of the missing population

The internal measure of total net wealth is computed by adding an estimate of the wealth of the missing population (i.e. those not represented by the inheritance tax information, scaled-up according to the mortality multiplier method) to the net wealth of the identified population. The estimation of the wealth of the missing

population is described in Appendix H.1.

Appendix P: The distribution of wealth left at death and lifetime wealth transfers

In this section we provide evidence about the distribution of estates left at death and about the the inheritances and lifetime gifts received by heirs. We rely on the benchmark wealth distribution of the entire population reconciled with the national household's balance sheet as derived in the paper with total wealth holdings by gender, location, and age groups. Each wealth group is multiplied with the relevant mortality rate (as estimated by the national statistical office - ISTAT). Such exercise represents a reverse engineering of the mortality multiplier method, estimating the entire deceased population and its wealth holdings every year.

To derive information about the recipient distribution we assume that every estate is split equally between two heirs. We also add the lifetime donations to the total estate value as reported on tax records allowing us to obtain the distribution of lifetime wealth transfers.

We also report measures of top shares and the relevant percentile thresholds for both estates and lifetime wealth transfers.

Year	Range of Estates - 2016 €	Number of decedents	Net estate (billion 2016 €)	Total number of decedents	Total net estates (billion - 2016 €)	Overall Mean estates - 2016 €	Net Share of total decedents (%)	Share of total net estate (%)
1995	<0-50k	317362	11.01	593181	85.65	144386	53.50	12.85
1995	50k-300k	247916	40.72	593181	85.65	144386	41.79	47.54
1995	300k-500k	14788	8.67	593181	85.65	144386	2.49	10.12
1995	500k-1mln	8894	9.40	593181	85.65	144386	1.50	10.98
1995	1mln-1.5mln	2396	4.75	593181	85.65	144386	0.40	5.54
1995	1.5mln-5mln	1566	6.66	593181	85.65	144386	0.26	7.78
1995	5mln-10mln	188	1.98	593181	85.65	144386	0.03	2.31
1995	>10mln	71	2.47	593181	85.65	144386	0.01	2.88
1998	<0-50k	207826	3.67	574742	100.16	174272	36.16	3.66
1998	50k-300k	330630	51.44	574742	100.16	174272	57.53	51.35
1998	300k-500k	13856	7.73	574742	100.16	174272	2.41	7.72
1998	500k-1mln	14431	13.21	574742	100.16	174272	2.51	13.19
1998	1mln-1.5mln	3310	5.19	574742	100.16	174272	0.58	5.19
1998	1.5mln-5mln	4213	12.51	574742	100.16	174272	0.73	12.49
1998	5mln-10mln	419	4.15	574742	100.16	174272	0.07	4.14
1998	>10mln	56	2.27	574742	100.16	174272	0.01	2.26
2000	<0-50k	194004	3.22	567956	105.46	185689	34.16	3.06
2000	50k-300k	331050	50.49	567956	105.46	185689	58.29	47.87
2000	300k-500k	18789	9.80	567956	105.46	185689	3.31	9.30
2000	500k-1mln	16141	14.44	567956	105.46	185689	2.84	13.69
2000	1mln-1.5mln	3333	5.33	567956	105.46	185689	0.59	5.59
2000	1.5mln-5mln	4050	11.27	567956	105.46	185689	0.71	10.68
2000	5mln-10mln	395	3.75	567956	105.46	185689	0.07	3.55
2000	>10mln	195	7.17	567956	105.46	185689	0.03	6.80
2002	<0-50k	319359	8.03	572441	111.70	195123	55.79	7.19
2002	50k-300k	204739	35.22	572441	111.70	195123	35.77	31.53
2002	300k-500k	12971	7.63	572441	111.70	195123	2.27	6.83
2002	500k-1mln	21166	19.35	572441	111.70	195123	3.70	17.32
2002	1mln-1.5mln	9874	15.14	572441	111.70	195123	1.72	13.46
2002	1.5mln-5mln	3316	12.98	572441	111.70	195123	0.58	11.62
2002	5mln-10mln	736	5.72	572441	111.70	195123	0.13	5.12
2002	>10mln	280	7.64	572441	111.70	195123	0.05	6.84
2004	<0-50k	251842	5.73	552729	119.59	216363	45.56	4.79
2004	50k-300k	228531	36.91	552729	119.59	216363	41.35	30.87
2004	300k-500k	32350	14.91	552729	119.59	216363	5.85	12.47
2004	500k-1mln	26072	21.04	552729	119.59	216363	4.72	15.59
2004	1mln-1.5mln	5336	7.78	552729	119.59	216363	0.97	6.51
2004	1.5mln-5mln	7842	20.36	552729	119.59	216363	1.42	17.03
2004	5mln-10mln	466	4.06	552729	119.59	216363	0.08	3.39
2004	>10mln	289	8.80	552729	119.59	216363	0.05	7.36
2006	<0-50k	257481	5.57	573215	142.73	249007	44.92	3.90
2006	50k-300k	232777	38.73	573215	142.73	249007	40.61	27.13
2006	300k-500k	33783	15.28	573215	142.73	249007	5.89	10.71
2006	500k-1mln	29704	22.91	573215	142.73	249007	5.18	16.05
2006	1mln-1.5mln	6108	7.91	573215	142.73	249007	1.07	5.54
2006	1.5mln-5mln	12014	30.70	573215	142.73	249007	2.10	21.51
2006	5mln-10mln	1024	9.50	573215	142.73	249007	0.18	6.65
2006	>10mln	324	12.14	573215	142.73	249007	0.06	8.50
2008	<0-50k	252846	4.38	622628	143.48	230448	40.61	3.05
2008	50k-300k	265354	40.52	622628	143.48	230448	42.62	28.24
2008	300k-500k	50045	20.56	622628	143.48	230448	8.04	14.33
2008	500k-1mln	33935	24.82	622628	143.48	230448	5.45	17.30
2008	1mln-1.5mln	10622	13.99	622628	143.48	230448	1.71	9.75
2008	1.5mln-5mln	8087	20.81	622628	143.48	230448	1.30	14.50
2008	5mln-10mln	1437	9.64	622628	143.48	230448	0.23	6.72
2008	>10mln	303	8.77	622628	143.48	230448	0.05	6.11
2010	<0-50k	257585	3.61	644018	148.43	230481	40.90	2.43
2010	50k-300k	275381	41.53	644018	148.43	230481	42.76	27.98
2010	300k-500k	53348	21.43	644018	148.43	230481	8.28	14.44
2010	500k-1mln	35389	25.63	644018	148.43	230481	5.50	17.27
2010	1mln-1.5mln	11598	14.95	644018	148.43	230481	1.80	10.07
2010	1.5mln-5mln	9237	24.19	644018	148.43	230481	1.43	16.30
2010	5mln-10mln	1099	8.12	644018	148.43	230481	0.17	5.47
2010	>10mln	382	8.96	644018	148.43	230481	0.06	6.04
2012	<0-50k	249436	3.06	649959	155.12	238660	38.38	1.97
2012	50k-300k	286235	41.77	649959	155.12	238660	44.04	26.93
2012	300k-500k	54788	21.68	649959	155.12	238660	8.43	13.98
2012	500k-1mln	37114	26.19	649959	155.12	238660	5.71	16.88
2012	1mln-1.5mln	11527	15.00	649959	155.12	238660	1.77	9.67
2012	1.5mln-5mln	9291	24.24	649959	155.12	238660	1.43	15.62
2012	5mln-10mln	1175	8.36	649959	155.12	238660	0.18	5.39
2012	>10mln	393	14.82	649959	155.12	238660	0.06	9.56
2014	<0-50k	251649	2.11	643520	145.40	225945	39.11	1.45
2014	50k-300k	278141	41.42	643520	145.40	225945	43.22	28.49
2014	300k-500k	57369	21.87	643520	145.40	225945	8.91	15.04
2014	500k-1mln	34460	23.26	643520	145.40	225945	5.35	16.00
2014	1mln-1.5mln	12874	16.27	643520	145.40	225945	2.00	11.19
2014	1.5mln-5mln	7828	20.42	643520	145.40	225945	1.22	14.04
2014	5mln-10mln	744	5.19	643520	145.40	225945	0.12	3.57
2014	>10mln	455	14.85	643520	145.40	225945	0.07	10.22
2016	<0-50k	278249	2.74	693499	153.92	221950	40.12	1.78
2016	50k-300k	294515	44.51	693499	153.92	221950	42.47	28.92
2016	300k-500k	62025	23.09	693499	153.92	221950	8.94	15.00
2016	500k-1mln	37904	25.61	693499	153.92	221950	5.47	16.64
2016	1mln-1.5mln	11910	15.42	693499	153.92	221950	1.72	10.02
2016	1.5mln-5mln	7684	20.09	693499	153.92	221950	1.11	13.05
2016	5mln-10mln	814	5.60	693499	153.92	221950	0.12	3.64
2016	>10mln	398.7314	16.86	693499.1	153.92	221950.2	0.06	10.95

TABLE P.1. The distribution of estates left at death - adjusted values. The distribution of adjusted estates left at death is derived as following: the benchmark wealth distribution of the entire population reconciled with the national household's balance sheet by gender, location, and age groups is multiplied with the relevant mortality rate (as estimated by the national statistical office - ISTAT) and regrouped.

Year	Top 10%	Top 5%	Top 1%	Top 0,5%	Top 0,1%	Top 0,05%	P90 threshold €	- P95 threshold €	- P99 threshold €	- P99,5 threshold €	- P99,9 threshold €	- P99,95 threshold €
1995	48.39	37.73	19.78	14.76	7.05	5.12	188667	299331	865998	1219635	3426113	4910411
1996												
1997	50.56	39.15	19.82	14.15	6.66	4.71	230163	402861	1281408	1799230	3932584	6936825
1998												
1999	50.98	39.77	21.54	16.40	9.63	7.43	248140	444833	1296900	1839390	5179823	8779146
2000												
2001	45.31	36.04	18.01	13.78	7.32	5.58	277822	649257	1371110	3328562	6126571	9971991
2002												
2003	48.94	37.78	19.36	14.32	6.99	5.01	403163	651821	1820066	2616092	6908456	10505874
2004												
2005	48.43	37.31	19.20	14.27	7.27	5.41	422591	747787	2208263	3441876	9121988	11719842
2006												
2007	52.08	39.99	20.19	15.13	7.28	5.62	476400	778170	2129876	3006054	6938158	10376772
2008												
2009	51.57	39.45	19.70	14.44	6.78	4.91	495874	812631	2298047	3182074	8420347	11220129
2010												
2011	54.29	42.48	23.21	18.06	10.28	8.30	487874	786592	2133580	3521896	7956618	12507688
2012												
2013	52.23	40.63	22.21	17.38	10.34	8.35	479088	761284	1937881	3193375	8394550	13951072
2014												
2015	51.33	40.23	22.69	18.11	11.39	9.58	483950	779373	2026294	3158932	7748275	11747059
2016												

TABLE P.2. Top estates shares - adjusted values. The distribution of adjusted estates left at death is derived as following: the benchmark wealth distribution of the entire population reconciled with the national household's balance sheet by gender, location, and age groups is multiplied with the relevant mortality rate (as estimated by the national statistical office - ISTAT) and regrouped.

Year	Range of net wealth transfers - 2016 €	Number of heirs	Net wealth transfers (billion - 2016 €)	Total number of heirs	Total net wealth transfers (billion - 2016 €)	Overall Mean net wealth transfers - 2016 €	Share of total heirs (%)	Share of total net wealth transfers (%)
1995	<0-50k	636947	11.20	1186362	86.04	72526	53.69	13.01
1995	50k-300k	512540	45.85	1186362	86.04	72526	43.20	53.28
1995	300k-500k	17880	6.80	1186362	86.04	72526	1.51	7.90
1995	500k-1mln	12591	8.27	1186362	86.04	72526	1.06	9.61
1995	1mln-1.5mln	2755	2.80	1186362	86.04	72526	0.23	3.26
1995	1.5mln-5mln	3274	7.25	1186362	86.04	72526	0.28	8.42
1995	5mln-10mln	271	1.74	1186362	86.04	72526	0.02	2.03
1995	>10mln	104	2.14	1186362	86.04	72526	0.01	2.49
1998	<0-50k	669754	13.44	1149484	100.62	87539	58.27	13.35
1998	50k-300k	427121	47.32	1149484	100.62	87539	37.16	47.03
1998	300k-500k	28104	10.63	1149484	100.62	87539	2.44	10.56
1998	500k-1mln	15127	10.25	1149484	100.62	87539	1.32	10.19
1998	1mln-1.5mln	5999	7.37	1149484	100.62	87539	0.52	7.32
1998	1.5mln-5mln	2822	6.75	1149484	100.62	87539	0.25	6.71
1998	5mln-10mln	481	2.88	1149484	100.62	87539	0.04	2.86
1998	>10mln	77	1.98	1149484	100.62	87539	0.01	1.97
2000	<0-50k	627421	12.29	1135912	105.95	93277	55.23	11.60
2000	50k-300k	457284	50.63	1135912	105.95	93277	40.26	47.79
2000	300k-500k	25141	9.68	1135912	105.95	93277	2.21	10.48
2000	500k-1mln	16786	11.10	1135912	105.95	93277	1.48	10.48
2000	1mln-1.5mln	5661	6.65	1135912	105.95	93277	0.50	6.28
2000	1.5mln-5mln	2926	6.61	1135912	105.95	93277	0.26	6.24
2000	5mln-10mln	538	3.82	1135912	105.95	93277	0.05	3.60
2000	>10mln	156	5.17	1135912	105.95	93277	0.01	4.88
2002	<0-50k	768241	13.03	1144882	112.26	98054	67.10	11.61
2002	50k-300k	293630	34.19	1144882	112.26	98054	25.65	30.46
2002	300k-500k	41106	15.52	1144882	112.26	98054	3.59	13.82
2002	500k-1mln	34539	24.45	1144882	112.26	98054	3.02	21.78
2002	1mln-1.5mln	461	0.50	1144882	112.26	98054	0.04	0.45
2002	1.5mln-5mln	6205	16.17	1144882	112.26	98054	0.54	14.40
2002	5mln-10mln	556	4.31	1144882	112.26	98054	0.05	9.36
2002	>10mln	143	4.09	1144882	112.26	98054	0.01	3.64
2004	<0-50k	680669	13.33	1105457	119.64	108229	61.57	11.14
2004	50k-300k	344777	44.27	1105457	119.64	108229	31.19	37.00
2004	300k-500k	42420	15.95	1105457	119.64	108229	3.84	13.33
2004	500k-1mln	24840	17.04	1105457	119.64	108229	2.25	14.24
2004	1mln-1.5mln	6915	7.95	1105457	119.64	108229	0.63	6.64
2004	1.5mln-5mln	9052	11.20	1105457	119.64	108229	0.46	9.36
2004	5mln-10mln	539	3.72	1105457	119.64	108229	0.05	3.11
2004	>10mln	244	4.80	1105457	119.64	108229	0.02	4.02
2004	6.26e+08	2	1.38	1105457	119.64	108229	0.00	1.16
2006	<0-50k	529715	6.29	1146431	142.97	124710	46.21	4.40
2006	50k-300k	526647	55.88	1146431	142.97	124710	45.94	39.08
2006	300k-500k	41979	15.83	1146431	142.97	124710	3.66	11.08
2006	500k-1mln	34058	24.12	1146431	142.97	124710	2.97	16.87
2006	1mln-1.5mln	5805	7.79	1146431	142.97	124710	0.51	5.45
2006	1.5mln-5mln	7023	17.89	1146431	142.97	124710	0.61	12.52
2006	5mln-10mln	871	5.41	1146431	142.97	124710	0.08	3.78
2006	>10mln	333	9.75	1146431	142.97	124710	0.03	6.82
2008	<0-50k	672373	12.52	1245257	144.05	115682	53.99	8.69
2008	50k-300k	480886	58.21	1245257	144.05	115682	38.62	40.41
2008	300k-500k	44711	16.63	1245257	144.05	115682	3.59	11.54
2008	500k-1mln	30293	19.86	1245257	144.05	115682	2.43	13.79
2008	1mln-1.5mln	10622	12.70	1245257	144.05	115682	0.85	8.82
2008	1.5mln-5mln	5614	14.56	1245257	144.05	115682	0.45	10.11
2008	5mln-10mln	418	3.13	1245257	144.05	115682	0.03	2.17
2008	>10mln	339	6.44	1245257	144.05	115682	0.03	4.47
2010	<0-50k	696525	12.18	1288036	149.12	115771	54.08	8.17
2010	50k-300k	497949	60.93	1288036	149.12	115771	38.66	40.86
2010	300k-500k	44302	17.12	1288036	149.12	115771	3.44	11.48
2010	500k-1mln	30953	20.19	1288036	149.12	115771	2.40	13.54
2010	1mln-1.5mln	10816	12.87	1288036	149.12	115771	0.84	8.63
2010	1.5mln-5mln	6636	16.33	1288036	149.12	115771	0.52	10.95
2010	5mln-10mln	707	5.57	1288036	149.12	115771	0.05	3.74
2010	>10mln	148	3.93	1288036	149.12	115771	0.01	2.64
2012	<0-50k	689239	10.61	1299918	155.88	119917	53.02	6.81
2012	50k-300k	509743	61.21	1299918	155.88	119917	39.21	39.27
2012	300k-500k	53937	20.20	1299918	155.88	119917	4.15	12.96
2012	500k-1mln	32677	23.13	1299918	155.88	119917	2.51	14.84
2012	1mln-1.5mln	6474	8.08	1299918	155.88	119917	0.50	5.18
2012	1.5mln-5mln	6945	17.17	1299918	155.88	119917	0.53	11.01
2012	5mln-10mln	536	4.10	1299918	155.88	119917	0.04	2.63
2012	>10mln	366	11.39	1299918	155.88	119917	0.03	7.31
2014	<0-50k	687837	9.40	1287039	146.32	113684	53.44	6.42
2014	50k-300k	511415	63.32	1287039	146.32	113684	39.74	43.27
2014	300k-500k	43983	16.48	1287039	146.32	113684	3.42	11.27
2014	500k-1mln	32177	22.54	1287039	146.32	113684	2.50	15.41
2014	1mln-1.5mln	4697	5.67	1287039	146.32	113684	0.36	3.88
2014	1.5mln-5mln	6621	13.94	1287039	146.32	113684	0.47	9.53
2014	5mln-10mln	749	5.37	1287039	146.32	113684	0.06	3.67
2014	>10mln	160	9.60	1287039	146.32	113684	0.01	6.56
2016	<0-50k	731780	10.14	1386998	154.91	111686	52.76	6.55
2016	50k-300k	563924	67.66	1386998	154.91	111686	40.66	43.68
2016	300k-500k	49674	18.70	1386998	154.91	111686	3.58	12.07
2016	500k-1mln	20322	20.39	1386998	154.91	111686	2.09	13.17
2016	1mln-1.5mln	5921	7.06	1386998	154.91	111686	0.43	4.56
2016	1.5mln-5mln	5870	14.00	1386998	154.91	111686	0.42	9.03
2016	5mln-10mln	536	3.79	1386998	154.91	111686	0.04	2.45
2016	>10mln	261	13.16	1386998	154.91	111686	0.02	8.50
2016	>10mln	198	12.12	1386998	155.92	112413	0.01	7.77

TABLE P.3. The distribution of wealth transfers (inheritances and lifetime gifts received) - adjusted values. To derive information about the recipient distribution we assume that every estate is split equally between two heirs. We also add the lifetime donations to the total estate value as reported on tax records allowing us to obtain the distribution of lifetime wealth transfers.

Year	Top 10%	Top 5%	Top 1%	Top 0,5%	Top 0,1%	Top 0,05%	P90 threshold €	- P95 threshold €	- P99 threshold €	- P99,5 threshold €	- P99,9 threshold €	- P99,95 threshold €
1995	50.97	41.26	21.18	15.95	7.55	5.49	86711	143594	416439	673344	1620057	2341860
1996												
1997	52.23	41.43	20.51	14.76	6.79	4.83	128353	202366	598034	864435	2001049	2632706
1998												
1999	53.71	42.42	22.72	17.35	9.95	7.78	136078	215826	605686	890445	2324111	3833119
2000												
2001	48.68	38.99	19.38	14.82	7.88	5.96	158396	319040	782482	1643411	3558413	4963096
2002												
2003	52.58	40.87	20.83	15.41	7.52	5.35	166613	314231	869589	1312613	3406076	5185166
2004												
2005	52.03	40.37	20.66	15.35	7.83	5.78	218503	384304	1126302	1757324	3809167	5708285
2006												
2007	57.23	43.96	22.25	16.60	8.26	6.15	193122	355122	1022158	1451169	3414227	4939156
2008												
2009	57.76	43.96	22.13	16.19	7.77	5.57	215334	385691	1046669	1521209	3739253	5380164
2010												
2011	59.05	46.04	25.22	19.57	11.14	8.98	216156	384024	1037778	1585622	3806864	5953672
2012												
2013	57.98	44.97	24.46	19.21	11.43	9.19	205893	372894	946984	1569814	4075464	5746254
2014												
2015	58.08	45.10	25.33	20.22	12.64	10.58	205543	359268	946646	1465016	3658285	5460986
2016												

TABLE P.4. Top wealth transfers shares (inheritances and lifetime gifts received) - adjusted values. To derive information about the recipient distribution we assume that every estate is split equally between two heirs. We also add the lifetime donations to the total estate value as reported on tax records allowing us to obtain the distribution of lifetime wealth transfers.

Appendix Q: Wealth held in trusts

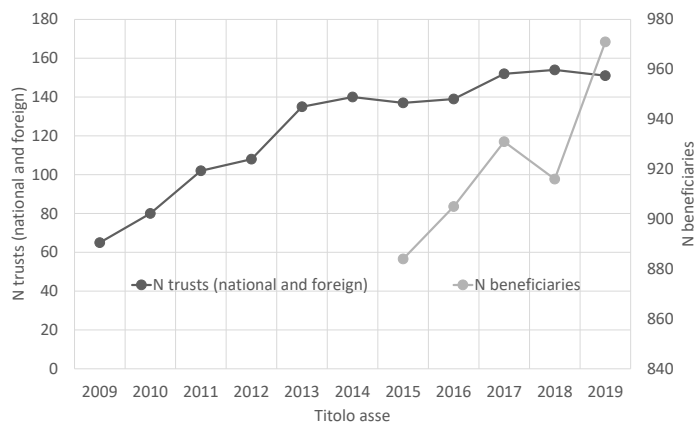
In Italy, incomes accrued to “opaque” trusts (i.e. national and foreign trusts operating in Italy whose beneficiaries are not identified) are taxed annually under Corporate Income Tax (CIT) directly at the trust level. Incomes accrued to “transparent” trusts (i.e. national or foreign trusts whose resident beneficiaries are identified) are passed-through to the beneficiaries and taxed under Personal Income Tax at the individual level. However, in both cases some forms of investment incomes might be subject to substitute taxation (i.e. withdrawn at the source), and not captured neither in CIT or PIT tax returns.

The number of trusts operating in Italy and required to file a tax record increased from 65 in 2009 to 151 in 2019 (14 of which were foreign trusts) according to data accessed at the Ministry of Economy and Finance. Using the universe of income tax files, we can observe the capital incomes accrued to “transparent” trusts (i.e. national or foreign trusts whose resident beneficiaries are identified) that are passed-through (i.e. imputed) to the beneficiaries and taxed under Personal Income Tax at the individual level. Moreover, we could also observe capital incomes accrued to “opaque” trusts (i.e. national and foreign trusts operating in Italy whose beneficiaries are not identified) which are taxed annually under Corporate Income Tax (CIT) directly at the trust level. Capital incomes from transparent trusts account on average for 89% of total capital incomes from trusts observed in tax records. Total capital incomes from trusts are then capitalized to derive a total wealth value in the range of €166 and 332 million for the year 2016 and between €263 and 526 million.⁶² Such estimated wealth values account for between 0.002% and 0.004% of total net personal wealth in 2016 for additional details on capital incomes from trusts and the estimates of wealth held in trusts).

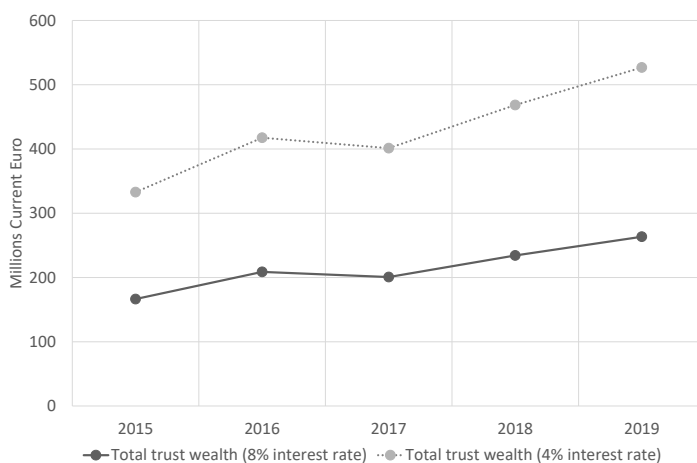
62. Two main rates of returns are used in the capitalization exercise, 4% and 8%, similar to what done in Saez and Zucman (2016). Previous works by Kopczuk and Saez (2004) and Alvaredo et al. (2018) used an interest rate of 7.5% and of 5.6% for the U.S. and the UK respectively.

Year	Personal Income Tax - PIT - Capital incomes imputed from transparent trusts (section I-B)		Corporation Income Tax - CIT - Capital incomes from opaque trusts (distributed and retained)		% capital incomes in transparent trusts	Tot wealth in trusts (8% rate) - million Euro	Tot wealth in trusts (4% rate) - million Euro	Tot personal net wealth (billion Euro)	% of personal net wealth (8% rate)	% of personal net wealth (4% rate)
	N benefi- ciaries	Total capi- tal income (Euro)	N trusts	Tot net capital income (gross minus losses) - Euro						
2009			65	195,174						
2010			80	361,490						
2011			102	-176,484						
2012			108	-757,201						
2013			135	9,031						
2014			140	1,669,782						
2015	884	12,773,041	137	542,436	95.93%	166.44	332.89	8734.79	0.0019%	0.0038%
2016	905	15,023,143	139	1,676,874	89.96%	208.75	417.50	8655.97	0.0024%	0.0048%
2017	931	13,913,434	152	2,136,442	86.69%	200.62	401.25	8673.82	0.0023%	0.0046%
2018	916	16,258,526	154	2,474,701	86.79%	234.17	468.33			
2019	971	18,504,380	151	2,567,016	87.82%	263.39	526.78			

TABLE Q.1. Estimates of personal wealth held in trusts - evidence from the tax records. Data extracted from corporate income tax (CIT) declarations of trusts (both national and foreign) operating in Italy and by personal income tax (PIT) declarations of national residents benefiting from national and foreign trusts. The imputed capital incomes in the tax records is capitalized with alternative interest rates to derive estimates of wealth held in trusts.



(a) Number of national and foreign trusts operating in Italy



(b) Estimated personal wealth held in trusts

FIGURE Q.1. Number of trusts and estimates of personal wealth held in trusts - evidence from the tax records. Data extracted from corporate income tax (CIT) declarations of trusts (both national and foreign) operating in Italy and by personal income tax (PIT) declarations of national residents benefiting from national and foreign trusts. The imputed capital incomes in the tax records is capitalized with alternative interest rates to derive estimates of wealth held in trusts.

Appendix R: Detailed treatment of assets in the tax records and in our benchmark series

	Housing and Land	Cash and deposits	Bonds and debt securities
Reported on tax records	YES. Reported at cadastral value (validated with official cadastral records by the tax agency).	YES. Savings and current account deposits self-reported at balance value as officially documented by financial institution statements. Cash, however, may be heavily underreported.	YES, although government bonds are tax exempt and may not be always fully reported.
Included in the benchmark series?	YES. Final estimate aligned with household sector balance sheets: at Market value	YES. Final estimate aligned with household sector balance sheets: At balance value	YES. Final estimate aligned with household sector balance sheets: at Market value
Imputations for the missing population using survey data (i.e. the missing population is identified as the adults without real estates and with wealth levels below the reporting threshold)	No imputations as all individuals dying with real estates are assumed to be captured by the tax records (consistently with tax legislation).	Individual Cash and deposits value in the survey (SHIW), reported by the missing population is appended to the tax-based data (the reported value is scaled up by the ratio between the aggregate value in the household sector balance sheets and that reported in SHIW)	Individual Debt securities value in the survey (SHIW) reported by the missing population is appended to the tax-based data (the reported value is scaled up by the ratio between the aggregate value in the household sector balance sheets and that reported in SHIW)
Main imputation methodology of the missing wealth gap w.r.t. the household sector balance sheets (i.e. after imputing the wealth of the missing population)	The very small difference between the value of housing and land in the household sector balance sheets and that identified from inheritance tax data is distributed to the whole adult population in proportion of the "housing and land assets" reported in each age, gender, and location cell	The difference between the value of cash and deposits in the household sector balance sheets and that identified from adjusted inheritance tax data (with missing wealth holders imputed from survey data) is distributed to the whole adult population in proportion of the total "other assets" reported in each age, gender, and location cell.	The difference between the value of debt securities in the household sector balance sheets and that identified from adjusted inheritance tax data (with missing wealth holders imputed from survey data) is distributed to the whole adult population in proportion of the total "financial assets" reported in each age, gender, and location cell.

TABLE R.1. Treatment of assets: Housing and Land, Cash and deposits, Bonds and debt securities

	Life insurance and private pension assets	Fund shares and equities in incorporated and unincorporated businesses.	Liabilities
Reported on tax records	NO. Tax exempt assets and hence not reported on tax records	YES. Mutual fund shares and listed shares reported at market value (validated by tax agencies using official ownership certificates). Shares in limited corporations' and quasi-corporations reported at book value (this asset class is mostly tax exempt but reporting remains mandatory).	YES. At value reported on tax records as validated by Tax agencies (verified deductible expenses may be cumulated with the total value of liabilities)
Included in the benchmark series?	YES. Final estimate aligned with household sector balance sheets: at reserve value	YES. Final estimate aligned with the sum of two asset classes of the household sector balance sheets ('Mutual Fund Shares' and 'Shares and other equity'): at Market value.	YES. Final estimate aligned with household sector balance sheets.
Imputations for the missing population using survey data (i.e., the missing population is identified as the adults without real estates and with wealth levels below the reporting threshold)	Individual values of life insurance and pension assets value in the survey (SHIW) (estimated using the reported values of annual payments and contributions into pensions (funds and life insurance)) are appended to the tax-based data (the reported value is scaled up by the ratio between the aggregate value in the household sector balance sheets and that reported in SHIW)	Individual values of business shares and other equities in the survey (SHIW) reported by the missing population are appended to the tax-based data (the reported value is scaled up by the ratio between the aggregate value in the household sector balance sheets and that reported in SHIW)	Individual Liabilities value in the survey (SHIW) reported by the missing population is appended to the tax-based data (the reported value is scaled up by the ratio between the aggregate value in the household sector balance sheets and that reported in SHIW)
Main imputation methodology of the missing wealth gap w.r.t. the household sector balance sheets (i.e., after imputing the wealth of the missing population)	The difference between the value of life insurance and pension assets in the household sector balance sheets and that identified from survey data is distributed to the whole adult population in proportion of the total "financial assets" reported in each age, gender, and location cell.	The difference between the sum of 'Shares and Other Equity' and 'Mutual Fund Shares' assets in the household sector balance sheets and that identified from adjusted inheritance tax data (with missing wealth holders imputed from survey data) is distributed to the whole adult population in proportion of the total "financial assets" reported in each age, gender, and location cell. The value of 'Fixed capital' such as plant, machinery, equipment, inventories, and goodwill of small personal businesses of producer households was also imputed in the same way.	The difference between the value of liabilities in the household sector balance sheets and that identified from adjusted inheritance tax data (with missing wealth holders imputed from survey data) is distributed to the whole adult population in proportion of the total "liabilities (plus deductible expenses)" reported in each age, gender, and location cell.

TABLE R.2. Treatment of assets: Life insurance and private pension assets, Shares and other equities, Liabilities

	Wealth held in Trusts	Financial Assets held in offshore accounts	Valuables and durable goods	Public pension assets
Reported on tax records	NO.	YES. In practice, however, offshore accounts are for a large part excluded as they are often used as tools to minimize tax liability.	YES. Valuables, boats and aircrafts should be self-reported. However, cars are excluded as they are exempt from inheritance tax.	NO.
Included in the benchmark series?	NO. However, we estimate the total value of wealth held in trusts amounting up to 0.005% of total personal wealth. (see Appendix Q)	NO. Alternative series including estimates of financial assets held by Italian residents in offshore accounts are presented in the paper (see Appendix M)	YES for valuables, NO for durable goods. Alternative series including estimates of consumer durables are presented in the paper (see section 7.2)	NO. The estimation of total public pension assets and its distribution are beyond the scope of the paper (see detailed discussion in section 2)
Imputations for the missing population using survey data (i.e. the missing population is identified as the adults without real estates and with wealth levels below the reporting threshold)	None	None. The total estimated value of financial assets held offshore are assumed to be held above the 99th percentile of the wealth distribution, thus not owned by the missing population (at the bottom of the distribution).	Individual reported holdings of durable goods and vehicles in the survey (SHIW) for each age, gender, location, and wealth range cell, are added to the wealth distribution identified using the tax-based data after full imputations of all assets.	None
Main imputation methodology of the missing wealth gap w.r.t. the household sector balance sheets (i.e. after imputing the wealth of the missing population)	None	We assume that that 95% of total estimated value of offshore financial assets are undeclared. This estimate is then distributed almost entirely (up to 95%) to the top 1 percent (50% of which being allocated to the richest top 0.01% group alone)	None	None

TABLE R.3. Treatment of assets: Wealth held in Trusts, Financial Assets held in offshore accounts, Valuables and durable goods, Public pension assets

Appendix S: Wealth Inequality - Gini Coefficient: Age Adjustment

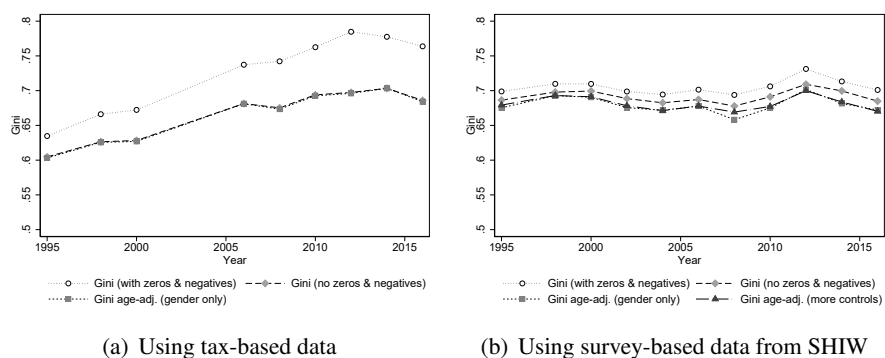


FIGURE S.1. Wealth Inequality: Adjusting for Age. The graph compares the age-adjusted Gini coefficient on individual wealth to unadjusted measures. In order to isolate the net effect of age on inequality we used a multivariate regression model as suggested in Almas et al. (2012). The adjustment procedure proposed by Almas et al. (2012) rely on calculations of the Gini coefficients without negatives and substituting all zeros with 1. We apply this exercise to our tax-based data (where we can only condition on gender) as well as to the survey data (where we can use a richer set of controls such as gender, type of work, sector of work, and education). The graph also shows, as memorandum item, the actual Gini coefficient when we include zeros and negatives obtained using the *sgini* STATA command (however these values cannot be directly compared to the age-adjusted Gini coefficient).

Tax-based data				Survey-based data (SHIW)			
No negative values and all zeros set =1		memorandum item		No negative values and all zeros set =1		memorandum item	
Gini individual adults	Age-adjusted Gini - gender as control variable	Gini on net wealth individual adults		Gini individual adults	Age-adjusted Gini - gender as control variable	Age-adjusted Gini multiple controls	Gini on net wealth individual adults
1995	0.604664	0.60318	0.634702	0.686407	0.675407	0.679247	0.698887
1998	0.626416	0.625614	0.666122	0.697914	0.692873	0.693015	0.709756
2000	0.628296	0.626984	0.672303	0.699417	0.690472	0.691148	0.709724
2006	0.68144	0.681181	0.737292	0.687247	0.677941	0.677835	0.701433
2008	0.675226	0.673399	0.742224	0.677851	0.658159	0.669152	0.69385
2010	0.693984	0.692613	0.762512	0.691145	0.67513	0.677256	0.70613
2012	0.697412	0.69608	0.784706	0.709156	0.701588	0.699917	0.731235
2014	0.703418	0.703297	0.777488	0.699623	0.681551	0.683731	0.713276
2016	0.685899	0.684215	0.763752	0.684899	0.672182	0.670274	0.701013

TABLE S.1. Gini Coefficients: Age-adjusted vs. Unadjusted Figures. The table compares the age-adjusted Gini coefficient on individual wealth to unadjusted measures. In order to isolate the net effect of age on inequality we used a multivariate regression model as suggested in Almas et al. (2012). The adjustment procedure proposed by Almas et al. (2012) rely on calculations of the Gini coefficients without negatives and substituting all zeros with 1. We apply this exercise to our tax-based data (where we can only condition on gender) as well as to the survey data (where we can use a richer set of controls such as gender, type of work, sector of work, and education). The table also shows, as memorandum item, the actual Gini coefficient when we include zeros and negatives obtained using the *sgini* STATA command (however these values cannot be directly compared to the age-adjusted Gini coefficient).

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