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Longitudinal Wealth Data and Multiple Imputation
An Evaluation Study
Online Appendix

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This Online Appendix provides addtional Tables and Figures; see main article for explanation.

Keywords: Panel data, SOEP survey, evaluation, simulation, missing at random, item non-response

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Appendix A
Alternative specification

As described in section 5.1, for the basic MICE and MICE with row-and-column imputation we chose to impute values using predictive mean matching. However, it might be the case that predictive mean matching performs worse than a standard regression design, if the missing at random assumption is violated, as potential donors with observed values similar to the missing ones might be rare in the upper tail of the wealth distribution (differential non-response at the top). Therefore, for this robustness check we repeat the multiple imputation using MICE, MICE-RC and MICE-RCA assuming DNR2 and choosing a standard regression instead of predictive mean matching. The results have been computed identically to section 6. Overall, for all assets the results are very similar to the results using predictive mean matching. We conclude that in our simulation set-up and under differential non-response at the top, the results for MICE do not improve, if a standard regression imputation is used.

(Appendix Table A1 follows on next page)

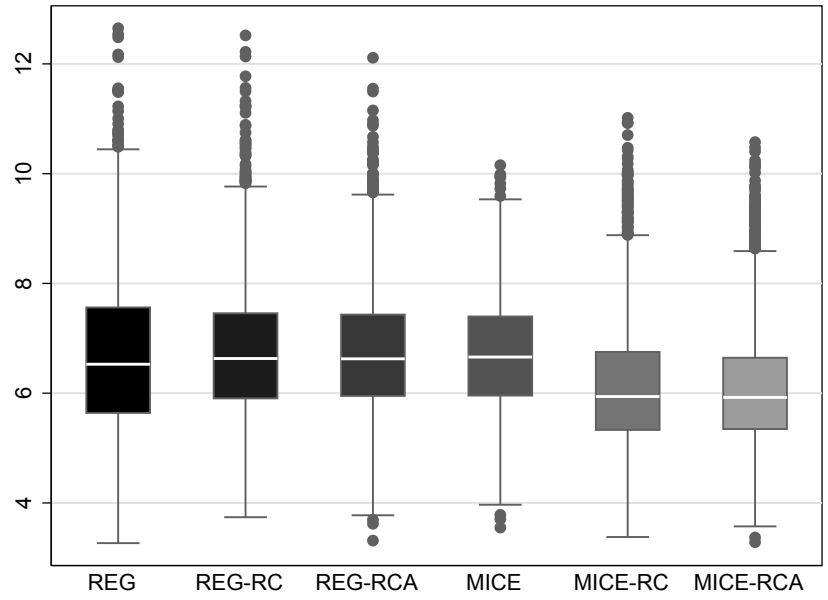
Table A1
*Overall performance of imputation methods under DNR2, for **MICE** is a **standard regression design** instead of predictive mean matching applied*

	Wave-Specific Evaluation			
	2002	2007	2012	Overall Average Distance
Variable: Home Market Value				
REG	5.79	5.92	5.71	5.81
REG-RC	5.40	4.88	5.00	5.09
REG-RCA	5.06	4.43	4.83	4.77
MICE	5.78	5.56	5.54	5.63
MICE-RC	5.00	4.55	4.53	4.69
MICE-RCA	**4.61**	**4.08**	**4.36**	**4.35**
Variable: Financial Assets				
REG	11.04	6.16	6.73	7.98
REG-RC	10.50	6.05	6.68	7.74
REG-RCA	10.59	5.87	6.72	7.73
MICE	10.90	6.24	6.74	7.96
MICE-RC	**10.47**	4.89	5.67	7.01
MICE-RCA	10.63	**4.68**	**5.59**	**6.97**
Variable: Consumer Credits				
REG	7.28	6.93	6.48	6.90
REG-RC	7.68	6.67	**5.96**	**6.77**
REG-RCA	7.80	**6.63**	6.05	6.83
MICE	8.31	7.55	7.03	7.63
MICE-RC	**7.61**	7.00	6.29	6.97
MICE-RCA	7.76	6.94	6.30	7.00

Bold figures indicate the smallest average distance among the six imputation variants.

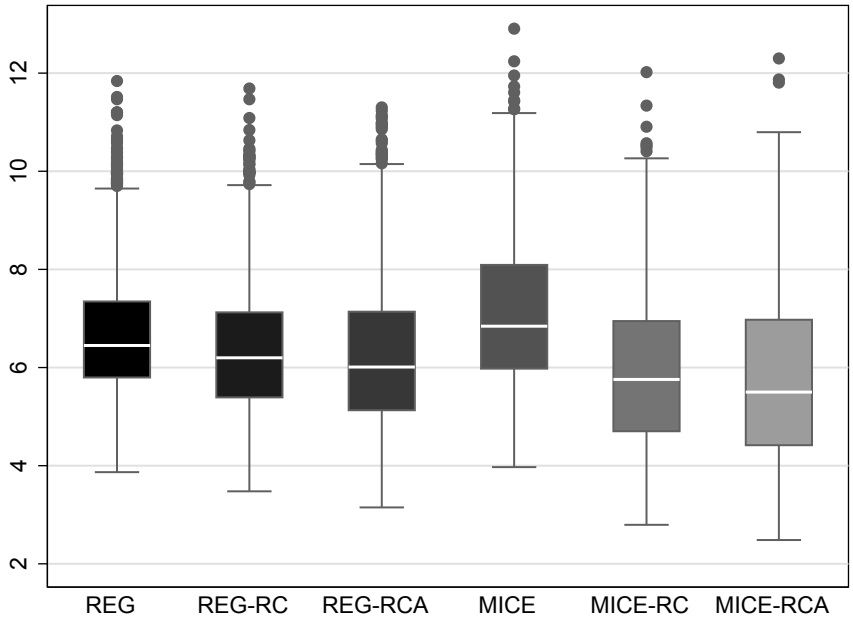
Appendix B
Figures

(Appendix figures B1 and B2 follow on next page)



	REG	REG-RC	REG-RCA	MICE	MICE-RC	MICE-RCA
Mean	6.75	6.78	6.76	6.69	6.15	6.11
Std. dev	0.63	0.44	0.42	0.36	0.41	0.39

Figure B1. Boxplots for the distances to optimal imputations by imputation methods under Differential Non-Response 1 (DNR1)



	REG	REG-RC	REG-RCA	MICE	MICE-RC	MICE-RCA
Mean	6.67	6.36	6.25	7.12	5.89	5.77
Std. dev	0.46	0.46	0.52	0.50	0.51	0.57

Figure B2. Boxplots for the distances to optimal imputations by imputation methods under Differential Non-Response 2 (DNR2)

Appendix C
Covariates used in imputations

Below is a list of all covariates used in the imputations using regressions with Heckman correction for sample selection and MICE. For the regressions the choice of variables is based on **frick07**; **frick10** for MICE all of the variables below have been included as it is one large imputation that handles missing values for all assets simultaneously. The variables include (1) a set of covariates determining the non-response (variables of the non-response model under the MAR assumption mentioned in section 4.1.), (2) covariates that are considered good predictors for the variable we want to impute (3) economic variables that are possibly related to the outcome variable (according to economic theory) and (4) variables that are good predictors of the covariates included in the rest the groups of variables. However, the last group is especially important in the first iterations and the more association between the imputation variables is expected. Generally, we hereby follow the guidelines laid out in **barcelo06** for the independent variables in the prediction equations. We additionally include dummies indicating non-response in other assets and other waves (for the respective asset).

As in the regressions using Heckman correction, in MICE we include lagged and/or lead variables of the assets we impute. Theoretically, for MICE we could build one giant model covering all assets in all waves. While all would be imputed in one step, we chose to code a sequence of MICE procedures, which imputes all assets (in one chain) and draws the respective lagged and/or lead variables from the results of the other waves, as it is easier to check the properties of models in between imputations. To set this up, we first cross-sectionally impute all of the 2007 variables in one step drawing lag and lead variables from the 2002 and 2012 variables (unless they are missing as well). This completes the set of lead variables for the imputation of the 2002 variables. After this, we run the 2007 imputations again and may use the partially imputed 2002 variables as covariates. The procedure for the 2012 assets is carried out in a similar manner, drawing from the already imputed 2002 and 2007 variables.

(Appendix table C1 follows on next page)

Table C1
Set-up of covariates used in regressions

Variable	Describtion	Owner-occupied property	Financial assets	Consumer debt
How dwelling was acquired	3 dummies: acquired by purchase, inheritance or newly built?	X	-	-
Age	Age of the respondent. Missing values were estimated on the basis of the age of other household members and the relationship to the head of household	X[b]	X[b]	X[b]
Age of house	7 dummies: Year of construction: before 1918, 1918-1948, 1949-1971, 1972-1980, 1981-1990, 1991-2000, 2001 and later	X	-	-
Savings account	Dummy: Household holds savings account (yes=1)	-	-	X
Capia02	4 dummies for the categorical CAPI-information on the market value of owner-occupied property (150.000, 200.000, 400.000, 400.000)	X	-	-
Capic02	4 dummies for the categorical CAPI-information on the value of financial assets (5.000, 20.000, 100.000, 100.000)	-	X	-
Capig02	4 dummies for the categorical CAPI-information on the value of consumer credits (5.000, 10.000, 50.000, 50.000)	-	-	X[b]
Children	Dummy: children younger than sixteen in the household (yes=1)	-	X	X
Civil servant	Dummy: civil servant (yes=1)	X[a]	X[a]	X[a]
Condition of house	2 dummies. Dwelling is in a good condition (yes=1); Dwelling needs major refurbishment (yes=1)	X	-	-
Credit	Dummy: household raised a consumer credit (yes=1)	-	-	X
Credit value	Monthly amount of loan repayment	-	-	X
Debts owner-occupied property	Debts related to owner-occupied property (edited/imputed; the first of the imputed versions is taken)	X[b]	-	-
Dishwasher	Dummy: Dishwasher in the household (yes=1)	X	-	-
District type	10 dummies on categorical information of the district's size	X	-	-
Dividend	Dividend income in the household, metric information are logarithmized, categorical information are recoded into 6 dummies, one for each category (250, 1.000, 2.500, 5.000, 10.000, 10.000)	-	X	-
Dwelling satisfaction	Satisfaction with the dwelling. For those without a valid info, the mean of all other household members was used or (if no household member gave a valid information to this satisfaction question) a random number between 0 and 10 was taken	X	-	-

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Variable	Describtion	Owner-occupied property	Financial assets	Consumer debt
Education	Years of education. Those who are still in education are assigned the minimum of seven years.	X	X	-
Enterprise	Dummy: household owns a commercial enterprise (yes=1)	X	-	X
Equipment	2 dummies: household with garden / balcony	X	-	-
Estimated rent	Estimation of monthly rent by owners if they had to rent their dwelling	X[b]	-	-
Financial worries	Dummy: At least some concerns about finances (yes=1)	-	X	-
Household income	Annual post-government household income in euros	X[b]	X[b]	-
Inheritance	Dummy: Household received inheritance/other windfall profits in the previous year (yes=1)	-	X	-
Dissatisfaction with life	Dummy: Individual is unhappy with his/her life (life satisfaction <6)	X[a]	X[a]	X[a]
Satisfaction with life	Dummy: Individual is happy with his/her life (life satisfaction ≥)	X[a]	X[a]	X[a]
Missing	Dummies for all those variables where missing values exist: missing or valid information	X	X	X
Monthly savings	Dummy: Household has monthly savings (yes=1)	-	-	X
New car	Dummy: Purchase of a new car in the last 12 months (yes=1)	-	-	X
No debt owner-occupied property	Dummy: Debts for owner-occupied property (no debt=1)	X	X	-
No partner	Dummy: no partner within the household (yes=1)	-	-	X
No paym. to others	Dummy: no payments/support to persons outside the household (yes=1)	-	X	-
Occupancy	Year moved into dwelling	-	-	X[b]
Owner	Dummy: Does the person have own property (yes=1)	-	X	X
Partner's filter	Dummy: Does the partner possess the respective wealth component (yes=1)	-	X	X
Partner's value	Partner's value of the respective wealth component	-	X[b]	X[b]
Paym. dwelling(m)	Monthly loan payments for owner-occupied property in euros	-	X[b]	-
Old-age provisions	5 dummies: Interest in building-up private old-age provision (very strong/strong/medium/less/not at all)	-	X	-
Public sector	Dummy: Individual works in the public sector (yes=1)	-	-	X
Region	97 dummies: *Raumordnungsregion*	X	-	-
Rent income	Dummy: Household receives income from renting & leasing (yes =1)	X	-	-

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Variable	Describtion	Owner-occupied property	Financial assets	Consumer debt
Rent income (met)	Household income from renting & leasing in the previous year in euros	-	-	X[b]
Rent level	6 dummies identifying regional level of rent	X	-	-
Residential area	3 dummies on type of residential area: “predominantly old houses / predominantly new houses / other”	X	-	-
Self-employed	Dummy: individual is self-employed (yes=1)	-	-	X
Sex	Dummy: female = 1	-	X	-
Size housing unit	Size of the housing unit in square meters. For missing values, the mean of those with the same number of rooms resp. the same number of household members (if the information on the amount of rooms was also missing) was imputed	X[b]	-	X[b]
Size of household	3 dummies for size of household (one person / two or three / 4+ persons)	-	X	X
Fixed interest securities	Dummy: Household owns stocks (yes=1)	-	X	-
Type of house	8 dummies: Type of house (farm house, one- or two-family house, one- or two-family row house, 3-4 unit building, 5-8 unit building, 9- or more unit building, other)	X	-	-
Value owner-occupied property	Market value of owner-occupied property (edited/imputed; the first of the imputed versions is taken)	-	-	X[b]
West	Dummy: West Germany (yes=1)	-	X	-

For all dependent metric variables the respective logarithms are used.
X: Independent variable used in respective regression model.
[a] Variable is used only as selection variable in the Heckman selection model [b] The logarithm of the variable is used

Appendix D
Results for individual evaluation criteria, means over all simulation data sets

(Appendix tables D1 – D3 follos on next page)

Table D1
Mean results all evaluation criteria, assumption: missing at random (MAR)

	Mean	Coeff. of Var.	KS-distance	Gini coeff.	MLD	p99/p50
Financial Assets						
Wave 2002						
REG	−0.048	−0.234	0.100	−0.0269	−0.0839	−7.33
REG-RC	−0.028	−0.142	0.095	−0.0303	−0.1048	−6.75
REC-RCA	−0.043	−0.237	0.093	−0.0314	−0.1120	−6.08
MICE	−0.064	−0.274	0.105	−0.0274	−0.1351	−4.29
MICE-RC	−0.035	−0.140	0.082	−0.0320	−0.1400	−5.76
MICE-RCA	−0.050	−0.237	0.081	−0.0330	−0.1470	−5.31
Wave 2007						
REG	0.021	−0.383	0.144	−0.0583	−0.2924	−23.86
REG-RC	0.146	0.012	0.141	−0.0247	−0.1540	−9.83
REC-RCA	0.132	0.059	0.140	−0.0230	−0.1265	−9.54
MICE	−0.103	−0.188	0.081	−0.0153	−0.0652	−5.35
MICE-RC	0.035	−0.018	0.083	−0.0132	−0.0806	−6.02
MICE-RCA	0.020	0.026	0.081	−0.0113	−0.0510	−4.89
Wave 2012						
REG	−0.002	−0.781	0.131	−0.0632	−0.3297	−22.14
REG-RC	0.127	−0.055	0.128	−0.0270	−0.1718	−8.68
REC-RCA	0.131	−0.054	0.130	−0.0254	−0.1568	−8.62
MICE	−0.083	0.251	0.078	−0.0108	−0.0506	−3.90
MICE-RC	0.014	0.275	0.063	−0.0073	−0.0596	−1.71
MICE-RCA	0.018	0.276	0.065	−0.0060	−0.0452	−1.50
Home Market Value						
Wave 2002						
REG	0.018	0.044	0.088	0.0089	0.0227	0.02
REG-RC	0.036	0.007	0.101	0.0032	0.0104	0.13
REC-RCA	0.035	0.014	0.103	0.0051	0.0115	0.14
MICE	0.009	−0.062	0.110	−0.0044	−0.0042	0.03
MICE-RC	0.027	−0.055	0.071	−0.0079	−0.0094	0.15
MICE-RCA	0.027	−0.048	0.073	−0.0060	−0.0084	0.14

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	Mean	Coeff. of Var.	KS-distance	Gini coeff.	MLD	p99/p50
Wave 2007						
REG	0.016	0.014	0.084	0.0038	0.0163	−0.23
REG-RC	0.021	0.016	0.082	0.0021	0.0047	0.07
REC-RCA	0.022	0.015	0.083	0.0027	0.0066	0.04
MICE	0.001	−0.061	0.094	−0.0067	−0.0094	−0.21
MICE-RC	0.010	−0.017	0.058	−0.0065	−0.0133	0.12
MICE-RCA	0.010	−0.018	0.060	−0.0059	−0.0113	0.08
Wave 2012						
REG	0.007	−0.022	0.073	0.0041	0.0135	−0.13
REG-RC	0.021	0.005	0.074	0.0095	0.0150	0.32
REC-RCA	0.019	−0.005	0.075	0.0097	0.0159	0.18
MICE	−0.015	−0.032	0.080	−0.0055	−0.0087	0.08
MICE-RC	0.003	−0.026	0.051	−0.0021	−0.0074	0.23
MICE-RCA	0.000	−0.034	0.051	−0.0020	−0.0065	0.11
Consumer Credits						
Wave 2002						
REG	−0.076	0.094	0.110	−0.0012	−0.0137	−1.53
REG-RC	−0.051	0.277	0.100	−0.0015	−0.0368	0.23
REC-RCA	−0.044	0.283	0.110	−0.0021	−0.0417	0.48
MICE	−0.190	−0.338	0.130	−0.0559	−0.2546	−6.95
MICE-RC	−0.129	−0.178	0.110	−0.0440	−0.2166	−4.46
MICE-RCA	−0.122	−0.179	0.110	−0.0447	−0.2222	−4.19
Wave 2007						
REG	−0.711	−1.043	0.111	−0.1121	−0.3591	−24.40
REG-RC	−0.408	−0.831	0.096	−0.0965	−0.3079	−17.34
REC-RCA	−0.396	−0.854	0.096	−0.0985	−0.3149	−18.17
MICE	−0.463	−0.631	0.104	−0.0873	−0.2578	−16.05
MICE-RC	−0.266	−0.575	0.076	−0.0776	−0.2434	−12.47
MICE-RCA	−0.254	−0.598	0.077	−0.0794	−0.2497	−13.11
Wave 2012						
REG	−0.177	−0.462	0.095	−0.0281	−0.0566	−6.50
REG-RC	−0.142	−0.686	0.094	−0.0529	−0.2179	−10.54
REC-RCA	−0.141	−0.730	0.094	−0.0525	−0.2037	−11.75

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		Chi-square test stat.		Cross-wave correlation		
MICE	0.021	−0.410	0.088	0.0065	0.0237	1.46
MICE-RC	0.016	−0.657	0.087	−0.0255	−0.1404	−2.59
MICE-RCA	0.016	−0.704	0.087	−0.0249	−0.1258	−3.62

	Chi-square test stat.	Cross-wave correlation
Financial Assets		
	336.57	0.139
	370.21	−0.227
	333.63	−0.235
	102.52	0.117
	143.00	−0.256
	126.25	−0.263
Home Market Value		
	902.44	−0.121
	901.46	−0.281
	918.06	−0.284
	341.59	−0.018
	570.30	−0.192
	501.67	−0.194
Consumer Credits		
	222.00	0.020
	172.60	−0.176
	168.77	−0.175
	277.46	0.028
	191.79	−0.248
	186.67	−0.246

Table D2
Mean results all evaluation criteria, assumption: differential non-response 1 (DNR1)

	Mean	Coeff. of Var.	KS-distance	Gini coeff.	MLD	p99/p50
Financial Assets						
Wave 2002						
REG	0.216	0.160	0.131	0.0112	0.0852	−9.45
REG-RC	0.211	−0.270	0.131	−0.0168	−0.0110	−9.21
REC-RCA	0.207	−0.340	0.130	−0.0148	−0.0075	−8.21
MICE	0.222	−0.273	0.119	−0.0085	−0.0166	−3.84
MICE-RC	0.220	−0.316	0.118	−0.0216	−0.0587	−6.08

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	Mean	Coeff. of Var.	KS-distance	Gini coeff.	MLD	p99/p50
MICE-RCA	0.216	−0.378	0.116	−0.0194	−0.0545	−5.44
Wave 2007						
REG	−0.416	−0.316	0.136	−0.0224	−0.1161	−55.74
REG-RC	0.113	−0.648	0.132	−0.0377	−0.1347	−15.61
REC-RCA	0.108	−0.609	0.129	−0.0345	−0.0993	−14.61
MICE	0.180	−0.254	0.105	−0.0122	0.0199	−2.39
MICE-RC	0.216	−0.130	0.117	−0.0219	−0.0644	−6.56
MICE-RCA	0.211	−0.089	0.114	−0.0185	−0.0290	−5.29
Wave 2012						
REG	−0.486	−1.216	0.109	−0.0496	−0.2343	−51.85
REG-RC	0.039	−0.765	0.108	−0.0345	−0.1272	−15.31
REC-RCA	0.041	−0.755	0.108	−0.0337	−0.1150	−14.93
MICE	0.202	−0.158	0.102	−0.0027	0.0672	−0.67
MICE-RC	0.203	−0.071	0.095	−0.0085	−0.0052	−1.19
MICE-RCA	0.204	−0.066	0.095	−0.0079	0.0066	−1.03
Home Market Value						
Wave 2002						
REG	0.100	0.154	0.111	0.0289	0.0380	0.10
REG-RC	0.094	0.089	0.125	0.0160	0.0182	−0.22
REC-RCA	0.092	0.088	0.125	0.0182	0.0205	−0.19
MICE	0.089	0.039	0.139	0.0190	0.0206	−0.05
MICE-RC	0.080	0.036	0.100	0.0067	0.0053	−0.32
MICE-RCA	0.078	0.035	0.100	0.0088	0.0076	−0.31
Wave 2007						
REG	0.109	0.164	0.114	0.0317	0.0469	0.85
REG-RC	0.103	0.133	0.113	0.0283	0.0345	0.77
REC-RCA	0.106	0.142	0.119	0.0282	0.0364	0.74
MICE	0.105	0.107	0.133	0.0303	0.0359	0.76
MICE-RC	0.095	0.115	0.095	0.0245	0.0274	0.77
MICE-RCA	0.098	0.123	0.101	0.0244	0.0293	0.74
Wave 2012						
REG	0.105	0.097	0.104	0.0305	0.0424	0.71
REG-RC	0.106	0.061	0.114	0.0273	0.0323	0.77
REC-RCA	0.107	0.045	0.119	0.0268	0.0331	0.71
MICE	0.099	0.083	0.124	0.0281	0.0325	0.64
MICE-RC	0.093	0.043	0.091	0.0206	0.0211	0.64
MICE-RCA	0.094	0.028	0.096	0.0200	0.0219	0.58

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	Mean	Coeff. of Var.	KS-distance	Gini coeff.	MLD	p99/p50
Consumer Credits						
Wave 2002						
REG	0.313	0.449	0.131	0.0422	0.2105	0.32
REG-RC	0.306	0.510	0.128	0.0310	0.1536	0.47
REC-RCA	0.312	0.514	0.127	0.0318	0.1498	0.08
MICE	0.374	−0.065	0.169	0.0154	0.0326	−1.19
MICE-RC	0.356	0.057	0.154	0.0089	0.0186	−1.18
MICE-RCA	0.361	0.056	0.154	0.0091	0.0144	−1.17
Wave 2007						
REG	−0.122	−2.203	0.145	−0.0766	−0.2927	−41.76
REG-RC	0.107	−1.504	0.157	−0.0522	−0.1940	−23.13
REC-RCA	0.105	−1.492	0.154	−0.0512	−0.1874	−22.46
MICE	0.361	−0.200	0.155	0.0087	0.0962	−0.37
MICE-RC	0.368	−0.136	0.149	0.0046	0.0517	−0.87
MICE-RCA	0.366	−0.122	0.147	0.0060	0.0580	−0.47
Wave 2012						
REG	0.118	0.034	0.136	−0.0295	−0.0354	−15.98
REG-RC	0.186	0.169	0.144	−0.0224	−0.0728	−11.58
REC-RCA	0.186	0.160	0.145	−0.0219	−0.0597	−12.14
MICE	0.222	0.075	0.134	0.0120	0.0783	−3.44
MICE-RC	0.240	0.168	0.132	0.0040	−0.0026	−3.73
MICE-RCA	0.240	0.150	0.133	0.0046	0.0103	−3.96

	Chi-square test stat.	Cross-wave correlation
Financial Assets		
	418.87	0.213
	447.85	−0.216
	443.89	−0.216
	398.90	0.181
	426.31	−0.287
	426.77	−0.286
Home Market Value		
	1139.16	−0.176
	1152.72	−0.360
	1161.64	−0.365
	785.63	−0.066
	961.66	−0.291
	1028.53	−0.295

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	Mean	Coeff. of Var.	KS-distance	Gini coeff.	MLD	p99/p50
Consumer Credits						
		197.20			−0.054	
		194.76			−0.183	
		192.60			−0.177	
		205.39			−0.023	
		172.28			−0.343	
		172.46			−0.337	

Table D3
Mean results all evaluation criteria, assumption: differential non-response 2 (DNR2)

	Mean	Coeff. of Var.	KS-distance	Gini coeff.	MLD	p99/p50
Financial Assets						
Wave 2002						
REG	−0.462	0.887	0.319	0.0467	0.0748	3.86
REG-RC	−0.515	0.475	0.248	−0.0121	−0.0524	0.05
REC-RCA	−0.546	0.407	0.253	−0.0117	−0.0567	0.13
MICE	−0.403	0.123	0.232	−0.0570	−0.2091	−3.71
MICE-RC	−0.413	0.160	0.135	−0.0622	−0.2028	−3.79
MICE-RCA	−0.443	0.102	0.140	−0.0619	−0.2081	−3.91
Wave 2007						
REG	−0.690	1.240	0.297	0.0850	0.3024	6.04
REG-RC	−0.647	0.801	0.243	0.0442	0.1427	2.78
REC-RCA	−0.657	0.795	0.241	0.0436	0.1672	2.71
MICE	−0.544	0.340	0.189	−0.0077	−0.0068	−5.20
MICE-RC	−0.471	0.453	0.133	−0.0051	−0.0339	−4.88
MICE-RCA	−0.481	0.447	0.131	−0.0055	−0.0102	−5.18
Wave 2012						
REG	−0.603	1.117	0.275	0.0825	0.3098	7.37
REG-RC	−0.661	0.544	0.230	0.0355	0.1420	3.15
REC-RCA	−0.662	0.595	0.232	0.0363	0.1540	3.05
MICE	−0.594	0.441	0.217	0.0026	0.0285	−0.63
MICE-RC	−0.560	0.228	0.144	−0.0082	−0.0335	−2.27
MICE-RCA	−0.560	0.290	0.144	−0.0073	−0.0212	−2.87
Home Market Value						
Wave 2002						

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	Mean	Coeff. of Var.	KS-distance	Gini coeff.	MLD	p99/p50
REG	−0.052	0.107	0.108	0.0245	0.0388	0.26
REG-RC	−0.050	0.047	0.091	0.0077	0.0120	0.14
REC-RCA	−0.047	0.054	0.087	0.0116	0.0160	0.22
MICE	−0.073	−0.015	0.087	0.0013	0.0066	0.01
MICE-RC	−0.061	−0.011	0.069	−0.0072	−0.0069	−0.04
MICE-RCA	−0.058	−0.006	0.065	−0.0035	−0.0029	0.02
Wave 2007						
REG	−0.064	0.117	0.110	0.0280	0.0464	0.45
REG-RC	−0.046	0.062	0.081	0.0131	0.0185	0.38
REC-RCA	−0.042	0.071	0.076	0.0159	0.0234	0.36
MICE	−0.078	0.007	0.096	0.0033	0.0087	0.08
MICE-RC	−0.049	0.025	0.065	0.0020	0.0032	0.21
MICE-RCA	−0.045	0.034	0.060	0.0047	0.0081	0.17
Wave 2012						
REG	−0.046	0.085	0.095	0.0252	0.0391	0.45
REG-RC	−0.039	0.024	0.078	0.0163	0.0207	0.45
REC-RCA	−0.042	0.003	0.076	0.0168	0.0226	0.40
MICE	−0.068	0.013	0.082	0.0031	0.0071	0.13
MICE-RC	−0.047	−0.013	0.061	0.0023	0.0012	0.19
MICE-RCA	−0.050	−0.034	0.059	0.0027	0.0028	0.15
Consumer Credits						
Wave 2002						
REG	−0.418	0.006	0.199	−0.0470	−0.0980	−0.44
REG-RC	−0.540	−0.083	0.203	−0.0776	−0.1766	−3.07
REC-RCA	−0.538	−0.050	0.204	−0.0789	−0.1846	−3.09
MICE	−0.612	−0.320	0.201	−0.1340	−0.3744	−8.57
MICE-RC	−0.625	−0.295	0.172	−0.1287	−0.3512	−7.85
MICE-RCA	−0.622	−0.267	0.174	−0.1301	−0.3596	−7.69
Wave 2007						
REG	−0.735	−0.090	0.177	−0.0166	0.0136	−3.38
REG-RC	−0.629	0.099	0.171	−0.0083	0.0037	−2.23
REC-RCA	−0.625	0.112	0.170	−0.0089	0.0063	−2.22
MICE	−0.925	−0.133	0.213	−0.0319	−0.0588	−6.11
MICE-RC	−0.759	0.014	0.177	−0.0197	−0.0520	−3.76
MICE-RCA	−0.755	0.025	0.175	−0.0204	−0.0499	−3.63
Wave 2012						
REG	−0.562	0.040	0.156	−0.0155	0.0335	−4.73

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		Chi-square test stat.		Cross-wave correlation		
REG-RC	−0.485	0.132	0.141	−0.0169	−0.0291	−4.01
REC-RCA	−0.487	0.118	0.145	−0.0146	−0.0118	−3.91
MICE	−0.681	0.027	0.186	−0.0092	0.0101	−3.31
MICE-RC	−0.581	0.053	0.149	−0.0146	−0.0559	−2.97
MICE-RCA	−0.583	0.051	0.151	−0.0120	−0.0379	−2.92

	Chi-square test stat.	Cross-wave correlation
Financial Assets		
	2009.71	0.063
	1436.30	−0.328
	1425.01	−0.334
	469.17	0.024
	272.81	−0.330
	273.08	−0.336
Home Market Value		
	283.69	−0.108
	221.85	−0.294
	203.01	−0.296
	489.29	0.008
	252.18	−0.206
	207.75	−0.206
Consumer Credits		
	304.44	0.022
	295.77	−0.259
	290.35	−0.266
	311.75	0.089
	307.64	−0.243
	305.22	−0.251

Appendix E
Results for relative bias of standard errors

(Appendix table E1 – E3 follow on next page)

Table E1
Relative Bias of standard errors, home market value

	2002	2007	2012	Overall
Assumption: Missing at Random				
REG	−0.17	−4.75	−0.48	−1.80
REG-RC	0.30	−3.09	0.24	−0.85
REG-RCA	0.03	−3.02	0.00	−1.00
MICE	3.97	2.11	3.03	3.04
MICE-RC	2.47	−0.41	1.59	1.22
MICE-RCA	2.20	−0.19	1.39	1.13
Assumption: Differential Non-Response 1				
REG	0.55	−4.49	−0.06	−1.33
REG-RC	0.33	−3.97	0.14	−1.17
REG-RCA	0.34	−4.35	0.05	−1.32
MICE	3.45	−0.65	2.36	1.72
MICE-RC	1.43	−2.70	0.78	−0.16
MICE-RCA	1.47	−3.11	0.70	−0.31
Assumption: Differential Non-Response 2				
REG	0.95	−3.13	−0.02	−0.74
REG-RC	0.70	−2.18	0.82	−0.22
REG-RCA	0.81	−2.07	1.02	−0.08
MICE	2.61	−1.02	2.13	1.24
MICE-RC	1.92	−0.94	1.65	0.88
MICE-RCA	1.98	−0.78	1.95	1.05

Note: Bold figures indicate that the relative bias exceeds 5 percent.

Table E2
Relative Bias of standard errors, financial assets

	2002	2007	2012	Overall
Assumption: Missing at Random				
REG	3.13	3.19	**11.32**	**5.88**
REG-RC	1.74	−2.49	1.17	0.14
REG-RCA	2.37	−2.58	1.01	0.27
MICE	**5.07**	**6.26**	**5.14**	**5.49**
MICE-RC	2.65	0.65	1.25	1.52
MICE-RCA	3.27	0.65	1.09	1.67
Assumption: Differential Non-Response 1				
REG	−3.97	**7.07**	**23.91**	**9.00**
REG-RC	−1.08	1.62	**10.43**	3.66
REG-RCA	−0.65	1.49	**10.47**	3.77
MICE	1.72	2.02	2.73	2.16
MICE-RC	0.07	**−5.27**	−1.33	−2.18
MICE-RCA	0.09	**−5.41**	−1.29	−2.20
Assumption: Differential Non-Response 2				
REG	−0.44	−0.55	−0.04	−0.34
REG-RC	−0.05	−0.43	0.40	−0.03
REG-RCA	0.15	−0.45	0.26	−0.01
MICE	0.47	0.44	0.87	0.59
MICE-RC	0.19	−0.27	0.64	0.19
MICE-RCA	0.40	−0.28	0.53	0.22

Note: Bold figures indicate that the relative bias exceeds 5 percent.

Table E3
Relative Bias of standard errors, consumer credits

	2002	2007	2012	Overall
Assumption: Missing at Random				
REG	**−4.96**	**−24.64**	−0.23	**−9.94**
REG-RC	**−6.39**	**−26.15**	−0.41	**−10.98**
REG-RCA	**−6.39**	**−26.15**	−0.41	**−10.98**
MICE	0.07	**−19.10**	0.73	**−6.10**
MICE-RC	−1.80	**−21.16**	0.15	**−7.60**
MICE-RCA	−1.84	**−21.48**	0.11	**−7.73**
Assumption: Differential Non-Response 1				
REG	**16.52**	**35.72**	4.79	**19.01**
REG-RC	**10.21**	**20.94**	2.41	**11.19**
REG-RCA	**10.15**	**20.98**	2.50	**11.21**
MICE	9.29	−2.02	**5.57**	4.28
MICE-RC	6.04	−5.04	3.53	1.51
MICE-RCA	6.00	−5.00	3.51	1.50
Assumption: Differential Non-Response 2				
REG	1.35	**−19.96**	−3.53	**−7.38**
REG-RC	0.99	**−24.52**	−4.06	**−9.20**
REG-RCA	1.22	**−24.29**	−4.04	**−9.04**
MICE	3.38	**−24.67**	−1.40	**−7.56**
MICE-RC	2.07	**−26.82**	−2.02	**−8.92**
MICE-RCA	2.40	**−26.48**	−2.05	**−8.71**

Note: Bold figures indicate that the relative bias exceeds 5 percent.