The Housing Wealth Effect: The Crucial Roles of Demographics, Wealth Distribution and Wealth Shares

Supplemental Appendix A
Log Difference OLS Regressions

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This supplemental appendix contains tables and figures based on OLS regression models run using the log difference of the consumption, income and wealth variables (instead of the IV regressions used in the text). Only those tables and figures that differ from the versions appearing in the text are presented here.

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Table 3 – Panel Data Wealth Effect Regressions

	Model 1	Model 2	Model 3	Model 4	Model 5
Income	0.608 ***	0.615 ***	0.535 ***	0.536 ***	0.537 ***
	(0.073)	(0.072)	(0.073)	(0.073)	(0.074)
Housing Wealth	0.187 ***	0.093 ***	-0.633 **	-3.284 ***	-3.313 ***
	(0.020)	(0.028)	(0.263)	(0.512)	(0.497)
Stock Wealth	0.021 ***	-0.087 ***	0.334 ***	-2.953 ***	-2.926 ***
	(0.004)	(0.031)	(0.111)	(0.639)	(0.634)
Total Wealth		0.195 ***		5.628 ***	5.590 ***
		(0.054)		(1.043)	(1.027)
Young Percent			-0.044	-0.062	-0.072
			(0.049)	(0.050)	(0.049)
Old Percent			-0.526 ***	-0.615 ***	-0.604 ***
			(0.066)	(0.063)	(0.062)
Poverty Rate			0.124 **		0.119 **
			(0.056)		(0.057)
Young × Housing Wealth			1.245 ***	4.515 ***	4.782 ***
			(0.390)	(0.619)	(0.586)
Old × Housing Wealth			1.111 *	6.306 ***	6.378 ***
			(0.615)	(1.245)	(1.230)
Poverty × Housing Wealth			0.764 *		-0.464
			(0.418)		(0.578)
Young × Stock Wealth			-0.684 ***	3.521 ***	3.810 ***
			(0.223)	(0.716)	(0.666)
Old × Stock Wealth			-0.313	5.615 ***	5.765 ***
			(0.194)	(1.493)	(1.498)
Poverty × Stock Wealth			-0.174		-1.292 **
			(0.143)		(0.503)
Young × Total Wealth				-7.118 ***	-7.630 ***
				(1.192)	(1.107)
Old × Total Wealth				-10.324 ***	-10.574 ***
				(2.479)	(2.483)
Poverty × Total Wealth					2.139 **
					(0.944)
Constant	-0.007 ***	-0.005 ***	0.100 ***	0.141 ***	0.131 ***
	(0.001)	(0.001)	(0.028)	(0.028)	(0.028)
Observations	1,275	1,275	1,275	1,275	1,275
Adjusted R-square	0.374	0.380	0.440	0.453	0.458

Notes: Standard errors (clustered by state) are shown in parentheses below the estimates. The Wald Chi-square statistic tests for the joint significance of all of the coefficients except the constant term.
*** Coefficient significant at the 1% level.
** Coefficient significant at the 5% level.
* Coefficient significant at the 10% level.

The dependent variable is log difference of real, per capita consumption (where consumption is proxied by state-level retail sales). Wealth variables are expressed in log differences of real, per capita values. Young Percent is the percent of the adult population ages 20-34; Old Percent is the percentage of the adult population ages 55 and up; Poverty is the poverty rate.

Table 4 – Estimated Wealth Effects, Elasticities and Derivatives

	Model 1	Model 2	Model 3	Model 4	Model 5
Housing Wealth Effect (HWE)	0.056 ***	0.055 ***	0.057 ***	0.050 ***	0.055 ***
Stock Wealth Effect (SWE)	0.006 ***	0.005 ***	0.001	-0.001	-0.001
Difference	0.051 ***	0.050 ***	0.057 ***	0.050 ***	0.056 ***
Housing Wealth Elasticity	0.187 ***	0.181 ***	0.191 ***	0.165 ***	0.181 ***
Stock Wealth Elasticity	0.021 ***	0.018 ***	0.003	-0.002	-0.004
Difference	0.167 ***	0.163 ***	0.188 ***	0.167 ***	0.185 ***
Wealth Effect Derivatives					
d HWE / d Young Percent			0.375	0.380	0.390
d HWE / d Old Percent			0.335	0.478	0.465
d HWE / d Poverty Rate			0.230		0.155
d SWE / d Young Percent			-0.182	-0.092	-0.089
d SWE / d Old Percent			-0.083	0.002	0.006
d SWE / d Poverty Rate			-0.046		-0.035

Notes: Standard errors (clustered by state) are shown in parentheses below the estimates.
*** Estimated value significant at the 1% level.
** Estimated value significant at the 5% level.
* Estimated value significant at the 10% level.

Housing and stock wealth effects are expressed in dollar terms and calculated at the sample mean values for all variables. Housing and stock wealth elasticities and wealth effect derivatives are calculated at sample means for all variables as well.

Table 5 – Factors Affecting Estimated Housing and Stock Wealth Effects

State	HWE	SWE	Cons. / HW	Cons. / SW	Young Percent	Old Percent	Poverty Rate	HW / TW	SW / TW	Total Wealth
SD	0.113	0.002	0.548	0.288	0.300	0.336	0.130	0.347	0.653	82,818
ND	0.104	0.000	0.505	0.266	0.313	0.328	0.120	0.339	0.661	81,647
AR	0.085	0.001	0.371	0.368	0.296	0.339	0.177	0.466	0.534	66,822
MS	0.083	-0.015	0.340	0.404	0.322	0.309	0.212	0.495	0.505	64,275
IA	0.081	0.001	0.405	0.215	0.291	0.341	0.104	0.340	0.660	90,098
WV	0.076	-0.001	0.337	0.360	0.276	0.350	0.176	0.479	0.521	70,626
NE	0.075	0.003	0.432	0.222	0.305	0.322	0.106	0.337	0.663	87,016
OK	0.074	0.001	0.375	0.310	0.307	0.322	0.152	0.426	0.574	70,442
LA	0.073	-0.013	0.346	0.362	0.326	0.293	0.198	0.474	0.526	70,930
AL	0.071	-0.010	0.322	0.383	0.308	0.317	0.170	0.499	0.501	76,693
KY	0.070	-0.007	0.350	0.351	0.310	0.308	0.164	0.470	0.530	73,702
FL	0.066	0.006	0.279	0.253	0.276	0.373	0.134	0.473	0.527	109,229
TN	0.065	-0.008	0.327	0.365	0.308	0.307	0.157	0.494	0.506	80,978
KS	0.063	0.003	0.372	0.188	0.310	0.315	0.113	0.333	0.667	91,326
MO	0.063	0.003	0.348	0.196	0.301	0.323	0.125	0.358	0.642	100,264
SC	0.063	-0.018	0.292	0.402	0.320	0.300	0.149	0.532	0.468	83,130
NM	0.062	-0.013	0.278	0.302	0.317	0.296	0.198	0.501	0.499	85,708
TX	0.062	-0.003	0.421	0.336	0.347	0.265	0.167	0.420	0.580	73,066
IN	0.059	0.001	0.364	0.307	0.312	0.305	0.112	0.436	0.564	83,972
AZ	0.057	-0.002	0.269	0.272	0.324	0.310	0.150	0.499	0.501	96,209
NC	0.055	-0.004	0.296	0.325	0.320	0.299	0.138	0.496	0.504	87,872
ID	0.054	-0.003	0.299	0.277	0.314	0.300	0.129	0.474	0.526	88,820
OH	0.053	0.003	0.320	0.238	0.301	0.316	0.120	0.415	0.585	92,230
GA	0.052	-0.016	0.311	0.346	0.341	0.260	0.143	0.490	0.510	86,760
MT	0.052	0.004	0.308	0.237	0.280	0.327	0.148	0.433	0.567	96,315
MI	0.051	0.002	0.320	0.226	0.308	0.302	0.124	0.407	0.593	97,727
PA	0.051	0.003	0.276	0.209	0.282	0.345	0.109	0.428	0.572	102,995
UT	0.050	-0.009	0.275	0.303	0.394	0.246	0.093	0.505	0.495	88,639
WI	0.049	0.004	0.328	0.221	0.304	0.312	0.097	0.393	0.607	101,515
DE	0.048	0.000	0.290	0.221	0.315	0.306	0.092	0.441	0.559	124,287
ME	0.048	0.002	0.295	0.308	0.280	0.326	0.116	0.496	0.504	99,727
NV	0.048	-0.009	0.288	0.349	0.322	0.286	0.105	0.526	0.474	101,637
OR	0.047	0.000	0.275	0.246	0.294	0.314	0.119	0.474	0.526	110,717
IL	0.044	0.000	0.257	0.214	0.319	0.298	0.124	0.445	0.555	108,790
NY	0.039	0.001	0.216	0.172	0.308	0.310	0.149	0.439	0.561	114,358
MN	0.038	0.004	0.307	0.169	0.313	0.296	0.099	0.355	0.645	124,178
DC	0.037	-0.003	0.153	0.105	0.362	0.283	0.188	0.425	0.575	150,173
RI	0.037	0.006	0.216	0.225	0.305	0.325	0.105	0.498	0.502	109,141

Table 5 – Factors Affecting Estimated Housing and Stock Wealth Effects

State	HWE	SWE	Cons. / HW	Cons. / SW	Young Percent	Old Percent	Poverty Rate	HW / TW	SW / TW	Total Wealth
WY	0.037	0.003	0.306	0.233	0.303	0.294	0.108	0.428	0.572	102,442
VA	0.036	-0.007	0.232	0.258	0.327	0.277	0.099	0.508	0.492	112,649
WA	0.036	-0.005	0.220	0.236	0.315	0.285	0.106	0.509	0.491	121,400
CA	0.035	-0.015	0.161	0.240	0.347	0.267	0.144	0.589	0.411	132,668
VT	0.034	0.002	0.268	0.238	0.295	0.302	0.095	0.464	0.536	114,618
MA	0.032	0.001	0.197	0.180	0.313	0.308	0.102	0.469	0.531	146,918
HI	0.031	-0.007	0.165	0.278	0.320	0.300	0.102	0.620	0.380	149,082
MD	0.030	-0.005	0.207	0.215	0.314	0.281	0.090	0.506	0.494	129,027
NH	0.030	0.005	0.338	0.311	0.301	0.289	0.067	0.471	0.529	115,250
NJ	0.028	0.001	0.193	0.173	0.293	0.313	0.086	0.472	0.528	148,834
CO	0.026	0.001	0.253	0.198	0.328	0.260	0.105	0.435	0.565	125,780
CT	0.025	0.003	0.171	0.197	0.290	0.317	0.081	0.528	0.472	156,059
AK	0.010	-0.014	0.329	0.288	0.361	0.187	0.095	0.448	0.552	97,818
Total	0.053	-0.002	0.301	0.266	0.312	0.304	0.127	0.457	0.543	101,517

Notes: Cell entries are averages of the variable over the years 1985-2009; the years 1981-1984 are excluded from the analysis because of lags used for instrumenting. Note that the average housing and stock wealth effects over the entire sample are not the same as the housing and stock wealth effects calculated at the sample means of the variables, and thus the totals presented in this table correctly differ from the values shown in Table 4.

Variables are defined as follows:

HWE = Average housing wealth effect
SWE = Average stock wealth effect
Cons. / HW = Average consumption-to-housing wealth ratio
Cons. / SW = Average consumption-to-stock wealth ratio
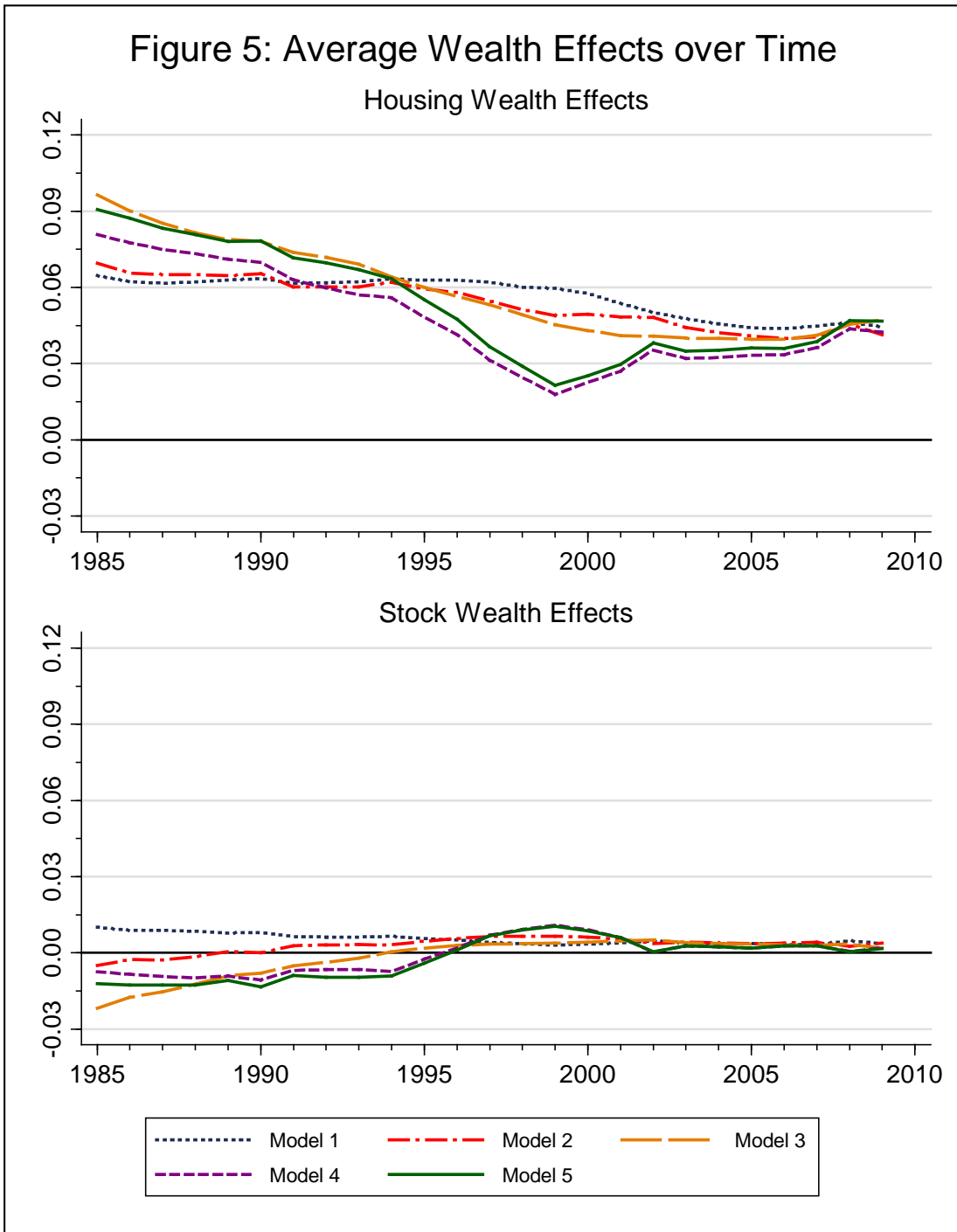Young Percent = Average percent of the adult population ages 20-34
Old Percent = Average percent of the adult population ages 55 and up
Poverty Rate = Average poverty rate
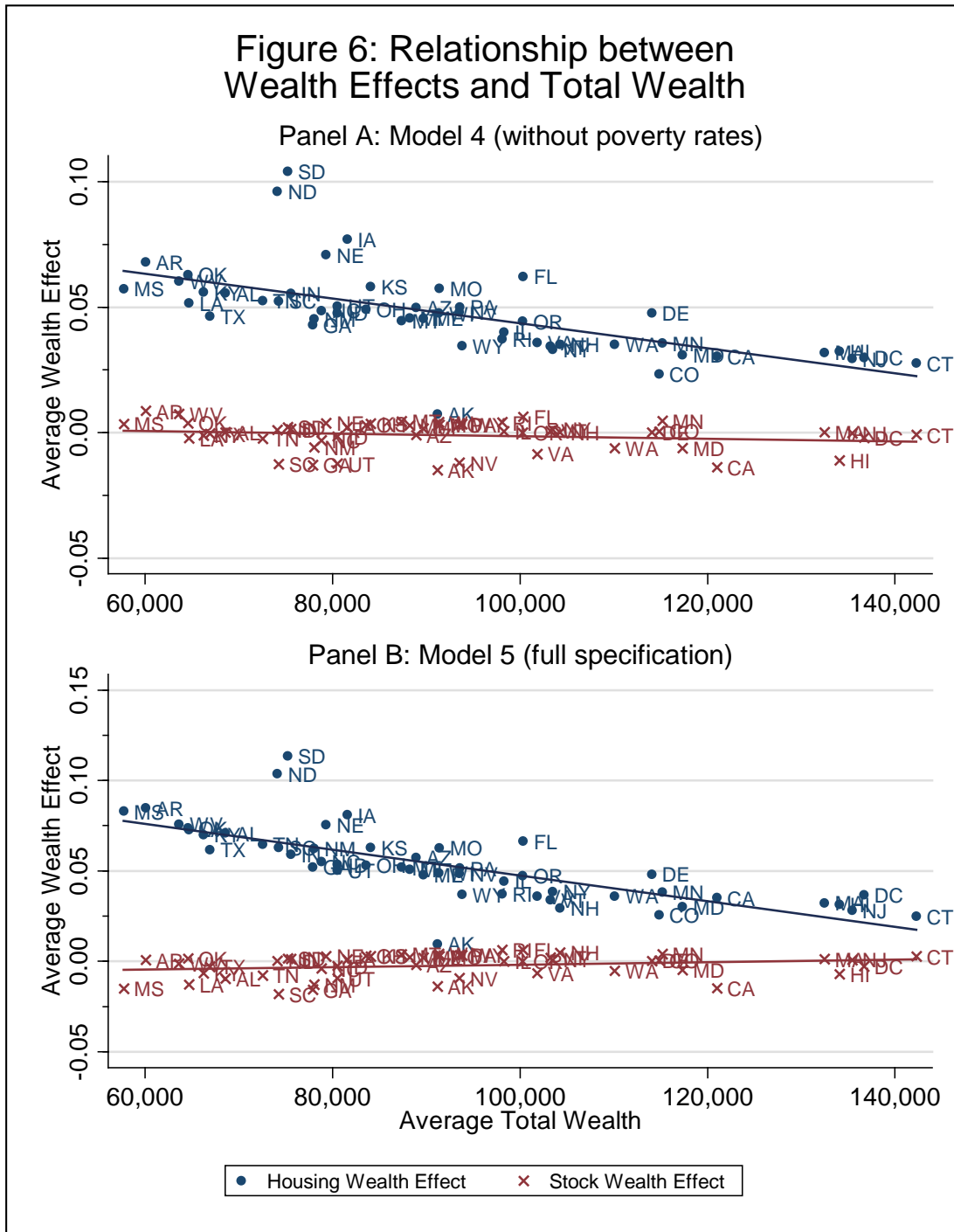HW / TW = Average housing wealth-to-total wealth ratio
SW / TW = Average stock wealth-to-total wealth ratio
Total Wealth = Average real, per capita total wealth
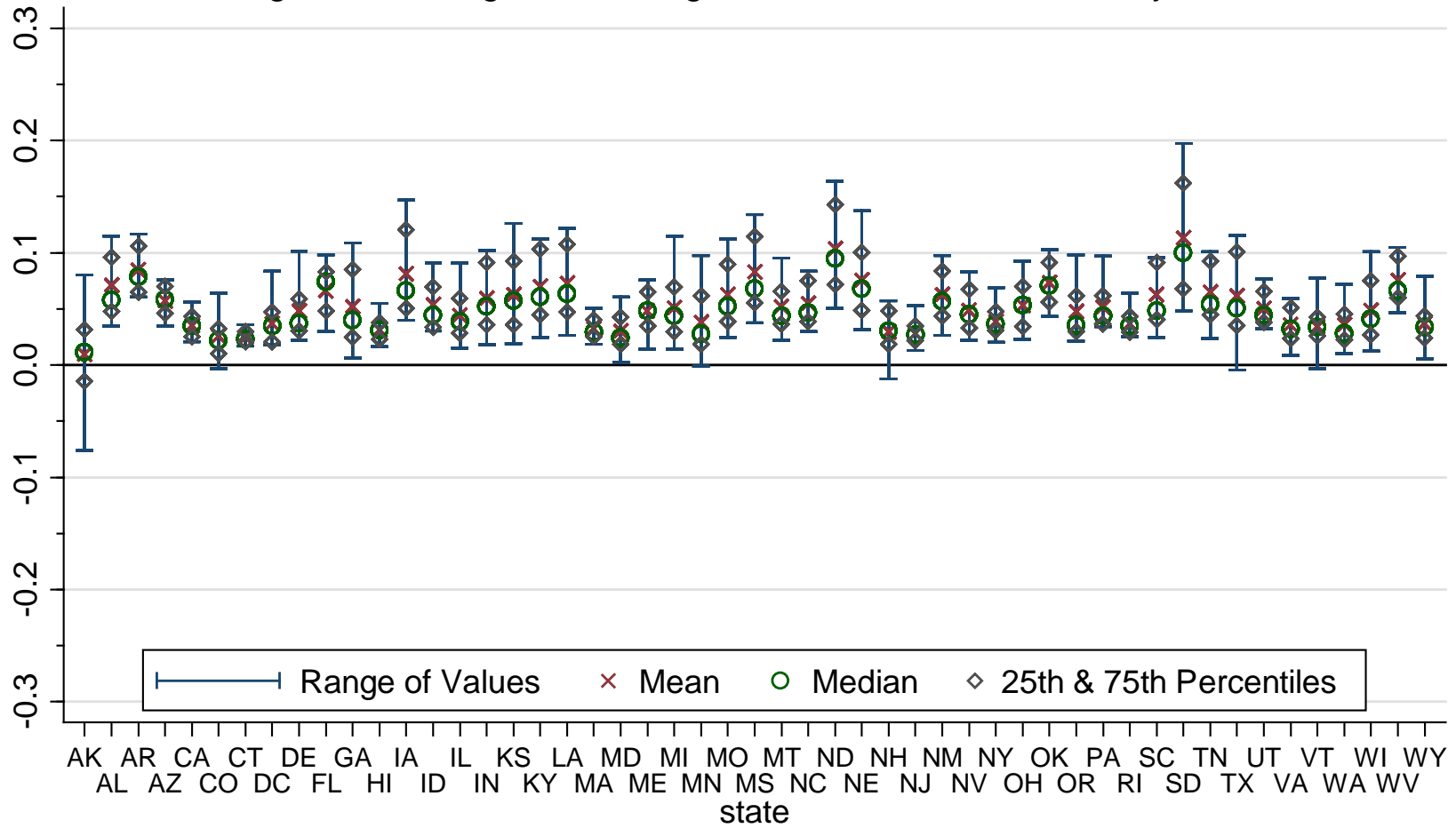
Figure 5: Average Wealth Effects over Time

Notes: The time path of the average housing and stock wealth effects are shown for each of the five models presented in Table 3 (each year's value is the average across states). Model 1 is a traditional constant elasticity framework. Model 2 allows housing and stock wealth elasticities to vary based on the composition of total wealth. Model 3 includes demographic effects (age and poverty rates) but not wealth compositions. Model 4 includes both age demographics and wealth compositions but not poverty rates. Model 5 includes all demographic wealth composition effects.

Figure 6: Relationship between Wealth Effects and Total Wealth

Panel A: Model 4 (without poverty rates)
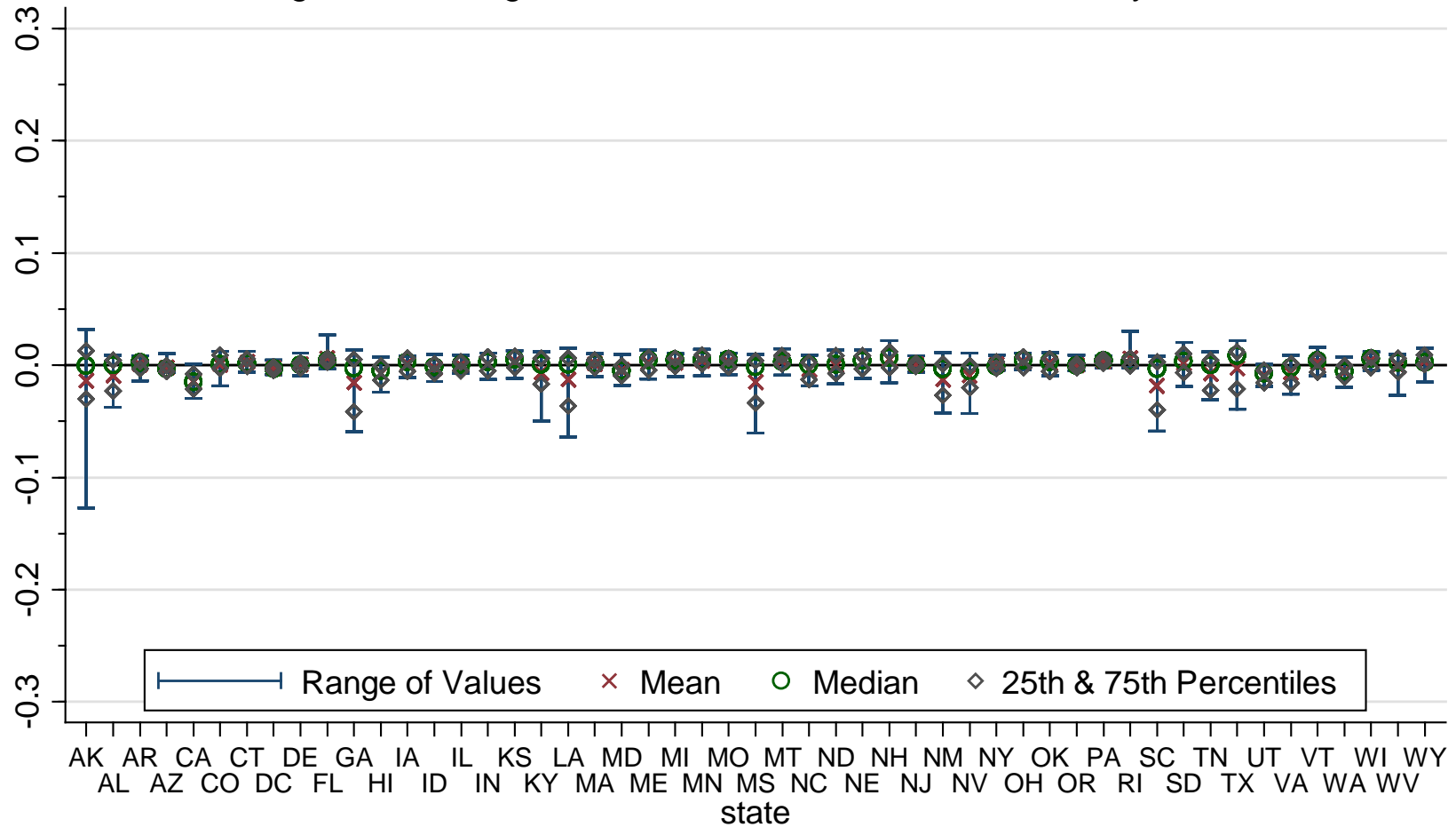
Panel B: Model 5 (full specification)

Notes: Figure shows the relationship between each state's average housing and stock wealth effects and average total wealth within that state (averaged across over the years of the analysis, 1985-2009, within each state). Panel A calculates the average housing and stock wealth effects using the parameter estimates from Model 4, which does not include the poverty rate. Panel B calculates the wealth effects using the parameter estimates from Model 5 (the full specification).

Figure 7A: Range of Housing Wealth Effects over Time by State

Notes: For each state, figure shows the range of calculated housing wealth effects over the years of the analysis (1985-2009), as well as the mean, median, 25th percentile and 75th percentile of these values.

Figure 7B: Range of Stock Wealth Effects over Time by State

Notes: For each state, figure shows the range of calculated stock wealth effects over the years of the analysis (1985-2009), as well as the mean, median, 25th percentile and 75th percentile of these values.

Table A1 – State Fixed Effect Coefficients for Table 3 - Model 5

State		State		State	
AK	Omitted	KY	0.058 *** (0.008)	NY	0.057 *** (0.008)
AL	0.064 (0.009)	LA	0.044 (0.009)	OH	0.068 *** (0.008)
AR	0.070 (0.010)	MA	0.058 *** (0.007)	OK	0.061 *** (0.009)
AZ	0.060 *** (0.008)	MD	0.044 *** (0.006)	OR	0.062 *** (0.008)
CA	0.038 *** (0.006)	ME	0.074 *** (0.008)	PA	0.079 *** (0.009)
CO	0.037 *** (0.005)	MI	0.059 *** (0.007)	RI	0.070 *** (0.008)
CT	0.065 *** (0.008)	MN	0.061 *** (0.007)	SC	0.054 *** (0.008)
DC	0.027 (0.010)	MO	0.072 *** (0.008)	SD	0.074 *** (0.009)
DE	0.062 *** (0.007)	MS	0.054 *** (0.010)	TN	0.058 *** (0.008)
FL	0.093 *** (0.011)	MT	0.067 *** (0.009)	TX	0.029 *** (0.007)
GA	0.033 *** (0.005)	NC	0.053 *** (0.007)	UT	0.039 *** (0.005)
HI	0.056 *** (0.007)	ND	0.073 *** (0.009)	VA	0.046 *** (0.006)
IA	0.080 *** (0.009)	NE	0.077 *** (0.008)	VT	0.057 *** (0.007)
ID	0.056 *** (0.007)	NH	0.062 *** (0.006)	WA	0.045 *** (0.006)
IL	0.057 *** (0.007)	NJ	0.064 *** (0.007)	WI	0.066 *** (0.007)
IN	0.061 *** (0.007)	NM	0.046 *** (0.009)	WV	0.078 *** (0.011)
KS	0.064 *** (0.008)	NV	0.059 *** (0.006)	WY	0.048 *** (0.007)

Notes: Standard errors (clustered by state) are shown in parentheses below the estimates.
     *** Coefficient significant at the 1% level.
     ** Coefficient significant at the 5% level.
     * Coefficient significant at the 10% level.