Teachers Teaching Teachers: The Role of Workplace Peers on Financial Decisions Internet Appendix

This internet appendix is divided into two sections. The first section provides a detailed description of the estimation procedure of Shue (2013) discussed in Section 4.3. The second section provides supplementary figures and tables.

A. Residual Distances between Peers

If peers influence a teacher's refinancing decision through social interactions, teachers who share common off-periods should exhibit abnormally similar refinancing behavior relative to teachers with no overlap in off-periods. To test this premise, we follow the procedure of Shue (2013) and compare the mean absolute distance in residuals for the refinancing outcomes of overlapping versus non-overlapping teacher pairs. The estimation consists of the following steps:

Step 1— Obtain residuals for each teacher-month by estimating:

$$\mathbb{1}\left(Refi_{ijt}\right) = \alpha + BX_{it} + \widetilde{r}_{it},\tag{IA.A.1}$$

where $\mathbb{1}(Refi_{ijt})$ is a 0/1 indicator for refinancing, and X_{it} represents controls for other determinants of refinancing, individual characteristics, peer characteristics, the commonality between teacher and peer characteristics, and campus-month controls. The residual \tilde{r}_{it} captures the unexplained component of refinancing. For teachers who own more than one property, we average the residuals at the teacher-month level.

Step 2— For all possible pairs of teachers in a campus-month, compute the following absolute distances among residuals:

$$Distance_{ijt} = \begin{bmatrix} |\tilde{r}_{it} - \tilde{r}_{jt-1}| \\ |\tilde{r}_{it} - \tilde{r}_{jt-2}| \\ |\tilde{r}_{it} - \tilde{r}_{jt-2}| \end{bmatrix}.$$
 (IA.A.2)

Step 3— Regress the absolute distances on a 0/1 indicator for whether the pair of teachers share common off-periods (i.e., the pair of teachers are classified as peers).

$$Distance_{ijt} = \alpha + \beta \mathbb{1}(Peer)_{ijt} + \epsilon_{ijt}.$$
 (IA.A.3)

If $\beta < 0$, then peers sharing an off-period make more similar mortgage refinancing decisions than those with differing off-periods. Moreover the distance ratio $\hat{\delta} = -\frac{\beta}{\alpha}$ quantifies the magnitude of the peer effect.

To evaluate the statistical significance of this result, we generate the distribution of each coefficient under the null of no peer effects, following Shue (2013). Specifically, we randomize the set of peers for each teacher-year observation while preserving the total number of peers for each observation. We assign this set of randomized peers to each monthly observation of the teacher-year, and re-estimate Step 3 (β_{random}). A distribution under the null is formed by repeating this process 10,000 times for each specification. Table IA.11 reports the *p*-values associated with the likelihood of β_{random} under the null hypothesis of randomized peer groups being less than the true coefficient β from Step 3.

B. Additional Tables and Figures



Figure IA.1

Data Matching Procedure

This figure illustrates the process used to map teacher employment records to county deed records. First, the TEA payroll records are matched with the electoral records of registered voters based on name, date of birth, and gender, in order to obtain teachers' addresses (Phase 1). Then, we use these addresses and last names to match the resulting teacher voter records with county deed records (Phase 2). We require an exact match between the address number prefix, ZIP code, and individual's last name; we also require that the Levenshtein ratio between the address name listed on the county and voting records exceeds 0.9.

A: Registered voters per campus



Figure IA.2 Cumulative Distribution Functions

This figure shows the cumulative distribution function (CDF) for the main variables considered in the sample selection process. The continuous line considers the full sample of teachers whereas the dashed line considers those teachers in the final sample. Panel A shows the CDF for the percentage of registered voters per campus. Panel B shows the CDF for the average peer group size across campuses. Panel C shows the CDF for the number of minutes of off-period overlap across teachers. Panel D shows the CDF for the class length across campus-years.

B: Average peer group size across campuses



C: Number of minutes of off-period overlap across teachers



D: Class length across campus-years





Figure IA.3



This figure illustrates the degree of commonality for individual characteristics among peer groups relative to pseudo-peer groups. Commonality is defined as the mean absolute difference between a teacher and her peer group with respect to the characteristics considered: annual compensation (Panel A), years of tenure at the current school (Panel B), total years of teaching experience (Panel C), and current age as of September 1 of the current school year (Panel D). The observed degree of commonality in our peer groups are indicated by the dashed vertical blue line, while the histogram and kernel density estimate report the distribution of commonality from randomly generated peer groups. Each plot reports the percent of pseudo-peer groups falling further into the corresponding tail of the distribution. Pseudo-peer groups are formed by randomly drawing peers from the pool of all other individuals within a teacher's campus but outside her peer group.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Employment											
Pay (\$)	45,048	45,199 (-0.505)	45,863 $(-2.548)^{**}$	45,759 $(-2.252)^{**}$	46,015 $(-3.048)^{***}$	46,039 $(-3.033)^{***}$	45,836 (-2.338)**	46,227 $(-3.227)^{***}$	47,104 (-3.038)***	46,788 $(-2.321)^{**}$	45,879 (-0.921)
Tenure (Years)	7.22	7.17 (0.281)	7.15 (0.379)	6.99 (1.233)	7.24 (-0.11)	7.20 (0.102)	7.13 (0.42)	7.65 (-2.063)**	7.86 (-1.64)	7.40 (-0.421)	6.14 (2.067)**
Ethnicity			· · · ·			. ,	. ,	. ,	· · ·	· · · ·	. ,
Caucasian	0.667	0.676 (-0.369)	0.704 (-1.451)	0.725 $(-2.278)^{**}$	0.745 $(-3.072)^{***}$	0.747 $(-3.023)^{***}$	0.743 $(-2.785)^{***}$	0.750 $(-2.827)^{***}$	$0.764 (-1.774)^*$	0.758 (-1.486)	0.755 (-1.198)
Hispanic	0.199	0.199 (-0.02)	0.162 (1.666)*	0.145 (2.456)**	0.142 (2.581)***	0.136 $(2.762)^{***}$	0.135 $(2.718)^{***}$	0.132 (2.623)***	0.118 (1.698)*	0.125 (1.396)	0.134 (1.019)
African American	0.119	0.109 (0.682)	0.117 (0.12)	0.113 (0.342)	0.099 (1.287)	0.103 (1.012)	0.107 (0.689)	0.107 (0.682)	0.106 (0.373)	0.105 (0.365)	0.098'
Other	0.013	0.013 (0.113)	0.013 (-0.255)	(0.013) (0.049)	0.011 (1.617)	(1.475)	0.011 (1.378)	0.008 (3.44)***	0.009 (1.545)	(0.009) (1.219)	(0.010) (0.76)
Other Char.		(01220)	(0.200)	(01010)	()	()	()	(0.2.2)	(()	(0110)
Bachelor's Degree	0.752	0.751	0.735	0.735	0.731	0.733	0.739	0.731	0.707	0.720	0.740
		(0.132)	$(2.103)^{**}$	$(2.098)^{**}$	$(2.591)^{***}$	$(2.395)^{**}$	(1.567)	$(2.406)^{**}$	$(2.768)^{***}$	$(1.79)^*$	(0.532)
Advanced Degree	0.239	0.241	0.255	0.254	0.259	0.258	0.252	0.261	0.287	0.280	0.260
N D	0.000	(-0.221)	(-2.029)**	(-2.003)**	$(-2.586)^{***}$	(-2.368)**	(-1.596)	(-2.488)**	(-2.951)***	(-2.33)**	(-0.972)
No Degree	0.009	(0.009)	(0.010)	(0.010)	0.009	(0.010)	(0.009)	(0.009)	(0.526)	(1.466)	(1.000)
Are (Vears)	42.04	(0.230)	(-0.331)	(-0.372)	(-0.114)	(-0.145)	(0.050)	(0.211) 43.22	(0.000)	(1.400)	(1.21) 41.2
Age (Tears)	42.04	(0.624)	(-1.348)	(-0.87)	$(-2.239)^{**}$	$(-2.176)^{**}$	$(-1.847)^*$	$(-5.482)^{***}$	$(-4.716)^{***}$	$(-3.159)^{***}$	(1.581)
Female	0.777	0.777	0.697	0.691	0.689	0.684	0.695	0.691	0.679	0.673	0.666
		(-0.139)	$(12.559)^{***}$	$(13.801)^{***}$	$(13.591)^{***}$	$(14.69)^{***}$	$(12.809)^{***}$	$(13.112)^{***}$	$(9.014)^{***}$	$(8.437)^{***}$	$(7.353)^{***}$
Technical Class	0.167	0.169	0.241	0.238	0.236	0.238	0.239	0.238	0.245	0.25	0.25
		(-0.238)	$(-12.532)^{***}$	$(-13.415)^{***}$	$(-13.587)^{***}$	$(-14.285)^{***}$	$(-13.372)^{***}$	$(-12.838)^{***}$	$(-7.579)^{***}$	$(-7.276)^{***}$	$(-5.972)^{***}$
N (Teacher-Years)	1,433,597	1,175,004	704,335	555,948	470,922	422,431	376,666	293,401	67,063	51,914	33,008
N (Teachers)	324,801	283,377	199,377	173,771	146,916	136,148	127,382	95,095	23,527	20,609	14,369
N (Campuses) N (Districts)	5,269	4,261	3,881	3,281	2,627	2,531	2,508	2,490	2,120	1,778	1,610
N (Districts)	480	390	383	302	300	504	304	504	293	299	292

Table IA.1 Summary Statistics (All Sub-samples)

This table reports summary statistics for the sample through the progression of each sample selection restriction. Specifically, each column considers the sample: (1) before any filters are applied, (2) after dropping campus-years without Zillow coverage in the surrounding area, (3) after dropping campus-years with insufficient schedule data, (4) after dropping campus-years with a common off-period, (5) after dropping campuses without 70% registered voters, (6) after dropping campus-years in which the average peer group size makes up more than 75% of the total campus size, (7) after dropping campuses with an average peer group size of more than 50 teachers, (8) after dropping teachers who are not registered voters, (9) after dropping teacher-years not associated to a property record, (10) after dropping teachers who purchased or refinanced their homes using an adjustable-rate mortgage and teacher-years for which the savings of refinancing cannot be estimated, and (11) the final sample, after dropping teachers who purchase their homes prior to January 2001. The *t*-statistic from a difference-in-means test between the full population of teachers (in Column 1) and each restricted sample is reported in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Table IA.2Correlation Matrix of Independent Variables

	Peer Refinances	Savings	1(Pos. Savings)	1(Underwater)	Percent Underwater	Loan Age	Tenure	Age	Technical Class	Advanced Degree	Ethnicity	1(Female)
Peer Refinances (%)	1											
Savings (\$)	0.052	1										
1(Positive Savings)	0.041	0.723	1									
1(Underwater)	0.005	0.270	0.229	1								
Percent Underwater	0.008	0.230	0.205	0.709	1							
Loan Age (Months)	-0.023	0.027	0.063	-0.236	-0.141	1						
Tenure	0.008	-0.069	-0.066	-0.075	-0.042	0.129	1					
Age	0.001	-0.046	-0.044	-0.090	-0.057	0.155	0.488	1				
Technical Class	-0.012	0.013	0.020	0.013	0.015	0.014	-0.056	-0.043	1			
Advanced Degree	-0.002	-0.007	-0.010	-0.025	-0.011	0.040	0.157	0.242	-0.009	1		
Ethnicity	0.008	0.001	-0.002	-0.035	-0.081	0.012	-0.006	0.048	-0.007	-0.050	1	
1(Female)	-0.011	-0.002	0.003	0.016	0.021	-0.007	-0.032	0.014	0.008	0.037	-0.023	1

This table reports the correlation matrix of the main independent variables. A detail definition of all variables is available in Data Appendix B.

	Emplo	yment Chara	cteristics			Demographics		
	Age (1)	Pay (2)	Grad Degree (3)	Female (4)	White (5)	Black (6)	Asian (7)	Hispanic (8)
Peer Group Average	$0.003 \\ (0.34)$	0.030^{***} (2.80)	0.001 (0.17)	0.025^{***} (2.91)	$0.018 \\ (1.53)$	$0.016 \\ (1.08)$	-0.013 (-1.63)	0.011 (0.79)
Campus Average	0.145^{***} (13.82)	$\begin{array}{c} 0.413^{***} \\ (41.82) \end{array}$	0.152^{***} (13.01)	$0.174^{***} \\ (17.82)$	0.505^{***} (42.63)	0.523^{***} (34.01)	0.043^{***} (3.23)	0.528^{***} (35.72)
$egin{array}{c} N \ R^2 \end{array}$	$58,289 \\ 0.018$	$58,289 \\ 0.163$	$58,289 \\ 0.019$	$58,289 \\ 0.030$	$58,289 \\ 0.252$	$58,289 \\ 0.272$	58,289 0.001	$58,289 \\ 0.269$

Table IA.3 Teacher Characteristics and Group Characteristics

This table shows OLS regressions of a teacher's characteristic on the average of her peer group (*Peer Group Average*) and the average of all teachers within the campus but outside the teacher's peer group (*Campus Average*), using all teachers in the TEA records. All variables are standardized. Reported t-statistics in parentheses are heteroscedasticity-robust and clustered by campus. ***p<0.01, **p<0.05, *p<0.1.

Table IA.4 Robustness for Table 2: Alternative Measures of Peer Refinances

	(1)	(2)	(3)
Peer Refinances	8.664***	15.304***	12.049***
	(3.60)	(5.03)	(4.16)
Savings $(\$, \times 10,000)$	59.519***	71.412***	64.312***
	(6.76)	(5.36)	(6.35)
1(Underwater)	-110.941***	-115.631***	-109.721***
	(-8.39)	(-7.02)	(-8.21)
Percent Underwater	-75.288	-305.494	-186.690
	(-0.51)	(-1.63)	(-1.16)
Loan Age (Months)	-4.708***	-5.839^{***}	-5.017^{***}
	(-8.78)	(-8.52)	(-8.68)
Teacher Characteristics	yes	yes	yes
Peer Characteristics	yes	$district \times year$	yes
Teacher-Peer Commonalities	yes	$district \times year$	yes
$Campus \times Month FE$	yes	yes	yes
Time Slot FE	no	no	$\operatorname{district} \times \operatorname{year}$
N	358,404	358,404	$356,\!495$
R^2	0.201	0.251	0.221

Panel A: Number of peer refinances scaled by average peer group size

This table shows OLS regressions like those in Table 2 using alternate definitions for *Peer Refinances*. In Panel A, the number of peer refinances is scaled by the average peer group size of all teachers in the campus (instead of by peer group size). In Panel B, *Peer Refinances* consists of a 0/1 indicator for peer refinancing in the trailing three-month period. In Panel C, only refinances done by peers in the last two months are considered (instead of three months). In Panel D, *Peer Refinances*, is decomposed into 3 separate monthly lags of peer refinances. Reported are the effects of a one standard deviation change in *Peer Refinances* for Panels A, C, and D. *t*-statistics in parentheses are heteroscedasticity-robust and double-clustered by campus and month. ***p<0.01, **p<0.05, *p<0.1.

	(1)	(2)	(3)
1(Peer Refinances)	23.451***	36.865^{***}	26.422***
	(3.88)	(4.68)	(3.85)
Savings $(\$, \times 10,000)$	59.557***	71.619***	64.422***
	(6.75)	(5.36)	(6.34)
1(Underwater)	-110.956***	-115.587***	-109.718***
	(-8.37)	(-7.01)	(-8.19)
Percent Underwater	-74.878	-304.678	-185.565
	(-0.51)	(-1.62)	(-1.15)
Loan Age (Months)	-4.708***	-5.836***	-5.014***
	(-8.73)	(-8.53)	(-8.66)
Teacher Characteristics	yes	yes	yes
Peer Characteristics	yes	$district \times year$	yes
Teacher-Peer Commonalities	yes	$district \times year$	yes
$Campus \times Month FE$	yes	yes	yes
Time Slot FE	no	no	$district \times year$
N	358,404	358,404	356,495
R^2	0.201	0.251	0.221

Panel B: Indicator for peer refinancing in the trailing 3-month period

Panel C: Peer refinances considering a trailing 2-month period

	(1)	(2)	(3)
Peer Refinances	10.800***	17.657***	13.974***
	(4.54)	(5.73)	(4.86)
Savings $(\$, \times 10,000)$	59.453***	71.310***	64.240***
	(6.75)	(5.36)	(6.35)
1(Underwater)	-110.919***	-115.489***	-109.654***
	(-8.39)	(-7.03)	(-8.21)
Percent Underwater	-75.880	-307.023	-187.278
	(-0.52)	(-1.64)	(-1.16)
Loan Age (Months)	-4.712***	-5.844***	-5.021***
	(-8.75)	(-8.52)	(-8.70)
Teacher Characteristics	yes	yes	yes
Peer Characteristics	yes	$district \times year$	yes
Teacher-Peer Commonalities	yes	$\operatorname{district} \times \operatorname{year}$	yes
$Campus \times Month FE$	yes	yes	yes
Time Slot FE	no	no	$district \times year$
N	$358,\!404$	358,404	356,495
R^2	0.201	0.251	0.221

	(1)	(2)	(3)
Monthly Peer Refinances $[t-1]$	13.633***	23.584***	17.620***
	(3.12)	(4.36)	(3.49)
Monthly Peer Refinances $[t-2]$	12.848^{***}	20.766^{***}	17.049^{***}
	(3.08)	(4.21)	(3.64)
Monthly Peer Refinances $[t-3]$	5.966*	13.179^{***}	8.521**
	(1.82)	(3.19)	(2.30)
Savings $(\$, \times 10,000)$	59.420***	71.220***	64.189^{***}
	(6.76)	(5.36)	(6.35)
1(Underwater)	-110.996^{***}	-115.676^{***}	-109.768^{***}
	(-8.39)	(-7.03)	(-8.21)
Percent Underwater	-75.629	-307.098	-186.867
	(-0.52)	(-1.64)	(-1.16)
Loan Age (Months)	-4.715***	-5.855***	-5.026***
	(-8.75)	(-8.52)	(-8.67)
Teacher Characteristics	yes	yes	yes
Peer Characteristics	yes	$\operatorname{district} \times \operatorname{year}$	yes
Teacher-Peer Commonalities	yes	$district \times year$	yes
$Campus \times Month FE$	yes	yes	yes
Time Slot FE	no	no	$district \times year$
N	358,404	358,404	356,495
R^2	0.201	0.251	0.221

Panel D: Separate monthly lags of peer refinances

	(1)	(2)	(3)
Peer Refinances	10.726***	19.046***	14.240***
	(4.84)	(5.94)	(5.09)
Savings $(\$, \times 10,000)$	46.495***	55.856^{***}	50.334^{***}
	(6.87)	(5.53)	(6.49)
1(Underwater)	-111.431***	-116.196***	-110.252***
	(-8.41)	(-7.06)	(-8.24)
Percent Underwater	-80.387	-314.644*	-192.814
	(-0.55)	(-1.67)	(-1.20)
Loan Age (Months)	-4.695***	-5.829***	-5.005***
	(-8.87)	(-8.60)	(-8.76)
Teacher Characteristics	yes	yes	yes
Peer Characteristics	yes	$district \times year$	yes
Teacher-Peer Commonalities	yes	$district \times year$	yes
$Campus \times Month FE$	yes	yes	yes
Time Slot FE	no	no	district imes year
N	358,404	358,404	$356,\!495$
R^2	0.201	0.251	0.221

Table IA.5Robustness for Table 2: Alternative Measures of Savings

This table shows OLS regressions like those in Table 2 using an alternate definitions of savings which assumes a mortgage loan term of 30 years (instead of 13 years). Reported are the effects of a one standard deviation change in *Peer Refinances*, and *t*-statistics in parentheses are heteroscedasticity-robust and double-clustered by campus and month. ***p<0.01, **p<0.05, *p<0.1.

	(1)	(2)	(3)
Peer Refinances	10.735***	24.453***	14.251***
	(4.48)	(6.21)	(4.86)
Savings $(\$, \times 10,000)$	59.474***	84.294***	64.147^{***}
	(6.68)	(4.74)	(6.09)
1(Underwater)	-110.905***	-119.767^{***}	-109.700***
	(-8.33)	(-6.11)	(-8.18)
Percent Underwater	-77.134	-435.527^{**}	-187.976
	(-0.53)	(-2.05)	(-1.17)
Loan Age (Months)	-4.726***	-6.862***	-5.036***
	(-8.47)	(-7.64)	(-8.43)
Teacher Characteristics	yes	yes	yes
Peer Characteristics	yes	$district \times year$	yes
Teacher-Peer Commonalities	yes	$district \times year$	yes
$Campus \times Month FE$	yes	yes	yes
Time Slot FE	no	no	${\rm district} \! \times \! {\rm year}$
N	$358,\!404$	358,404	$356,\!495$
R^2	0.201	0.282	0.221

Table IA.6 Robustness for Table 2: Additional Controls Based on Non-Property Owning Teachers

This table shows OLS regressions like those in Table 2 including additional controls for *Peer* and *Commonality* characteristics based on non-property owning teachers with overlapping off-periods. Reported are the effects of a one standard deviation change in *Peer Refinances.* t-statistics in parentheses are heteroscedasticity-robust and double-clustered by campus and month. ***p<0.01, **p<0.05, *p<0.1.

	(1)	(2)	(3)
Peer Refinances	8.929***	13.736***	10.968***
	(5.65)	(6.69)	(6.49)
Savings $(\$, \times 10,000)$	66.763^{***}	76.755^{***}	70.505^{***}
	(4.83)	(4.28)	(4.67)
1(Underwater)	-110.178^{***}	-111.167^{***}	-109.859^{***}
	(-9.24)	(-7.66)	(-8.84)
Percent Underwater	-51.704	-191.490	-158.230
	(-0.42)	(-1.27)	(-1.21)
Loan Age (Months)	-4.335***	-4.994***	-4.549***
	(-10.16)	(-9.32)	(-9.91)
Teacher Characteristics	yes	yes	yes
Peer Characteristics	yes	$\operatorname{district} \times \operatorname{year}$	yes
Teacher-Peer Commonalities	yes	$\operatorname{district} \times \operatorname{year}$	yes
$Campus \times Month FE$	yes	yes	yes
Time Slot FE	no	no	$district \times year$
N	575,274	575,274	571,825
R^2	0.155	0.193	0.169

Table IA.7Robustness for Table 2: Sample With Censored Observations

This table shows OLS regressions like those in Table 2 using a larger sample. Specifically we add back into the sample those teachers who were excluded because they entered their home prior to January 2001. For these observations, we assume a mortgage origination date of January 2001. We include an indicator variable that identifies the additional observations, 1 (*Censored*), and interact this variable with the estimate of savings. Reported are the effects of a one standard deviation change in *Peer Refinances*, and *t*-statistics in parentheses are heteroscedasticity-robust and double-clustered by campus and month. ***p<0.01, **p<0.05, *p<0.1.

	(1)	(2)	(3)
Peer Refinances	9.585***	16.416***	12.699***
	(4.31)	(5.29)	(4.42)
Savings $(\$, \times 10,000)$	60.535***	72.382***	64.796^{***}
	(6.46)	(5.33)	(6.04)
1(Had ARM)	114.451^{***}	117.710^{***}	115.769^{***}
	(25.54)	(21.53)	(24.39)
$Savings \times 1(Had ARM)$	-34.812***	-33.379**	-34.039***
	(-3.11)	(-2.40)	(-2.78)
1(Underwater $)$	-115.182***	-122.908***	-114.621***
	(-9.16)	(-8.09)	(-8.86)
Percent Underwater	-14.956	-198.280	-87.142
	(-0.11)	(-1.20)	(-0.62)
Loan Age (Months)	-5.197***	-6.315^{***}	-5.519***
	(-9.74)	(-9.52)	(-9.58)
Teacher Characteristics	yes	yes	yes
Peer Characteristics	yes	$district \times year$	yes
Teacher-Peer Commonalities	yes	$\operatorname{district} \times \operatorname{year}$	yes
$Campus \times Month FE$	yes	yes	yes
Time Slot FE	no	no	$district \times year$
N	406,119	406,119	404,021
R^2	0.188	0.233	0.206

Table IA.8Robustness for Table 2: Sample With Teachers With ARMs

This table shows OLS regressions like those in Table 2 using a larger sample. Specifically we add back into the sample those teachers who were excluded because they had adjusted-rate mortgages (ARMs). We include an indicator variable that identifies the additional observations, $\mathbb{1}(Had \ ARM)$, and interact this variable with the estimate of savings. Reported are the effects of a one standard deviation change in *Peer Refinances*, and *t*-statistics in parentheses are heteroscedasticity-robust and double-clustered by campus and month. ***p<0.01, **p<0.05, *p<0.1.

Table IA.9 Robustness for Table 2: Subsamples Based on Percentage of Campus Matched to (Non-ARM) Mortgage Records Image: Subsamples Based on Percentage of Campus Matched to (Non-ARM)

	(1)		(:	2)	(,	(3)		
	Below Median	Above Median	Below Median	Above Median	Below Median	Above Median		
Peer Refinances	6.373*	13.313***	23.664***	23.124***	11.635***	18.787***		
Savings ($, \times 10,000$)	(1.86) 75.769*** (5.66)	(4.45) 47.233^{***} (5.08)	(4.47) 114.065*** (4.27)	(5.72) 62.529^{***} (4.46)	(2.91) 90.399*** (5.40)	(4.70) 49.920^{***} (4.69)		
1(Underwater $)$	-115.286***	-107.587***	-115.254***	-124.087***	-109.286***	-111.042***		
Percent Underwater Loan Age (Months)	(-7.38) 34.571 (0.19) -4.750*** (-9.35)	(-7.44) -132.971 (-0.78) -4.747*** (-7.38)	(-5.43) -365.944 (-1.20) -7.463*** (-8.11)	(-6.18) -316.258 (-1.63) -6.019*** (-6.90)	(-6.64) -208.743 (-1.07) -5.380*** (-8.81)	(-7.15) -132.198 (-0.77) -5.114*** (-7.10)		
Teacher Characteristics	yes	yes	yes	yes	yes	yes		
Peer Characteristics	yes	yes	$district \times year$	$district \times year$	yes	yes		
Teacher-Peer Commonalities	yes	yes	$district \times year$	$district \times year$	yes	yes		
$Campus \times Month FE$	yes	yes	yes	yes	yes	yes		
Time Slot FE	no	no	no	no	$district \times year$	$district \times year$		
$\frac{N}{R^2}$	$\frac{180,217}{0.242}$	$178,187 \\ 0.159$	$180,217 \\ 0.321$	$ 178,187 \\ 0.213 $	$179,499 \\ 0.272$	$176,996 \\ 0.180$		

This table shows OLS regressions like those in Table 2 using subsamples of the data. Specifically, the sample is divided into two mutually exclusive groups based on the median value of the percent of teachers in the campus matched to a (non-ARM) mortgage record. Reported are the effects of a one standard deviation change in *Peer Refinances*, and *t*-statistics in parentheses are heteroscedasticity-robust and double-clustered by campus and month. ***p<0.01, **p<0.05, *p<0.1.

Table IA.10Cox Proportional Hazard Model

	(1)	(2)	(3)
Peer Refinances	1.026***	1.031***	1.032***
	(3.15)	(3.38)	(3.34)
Savings $(\$, \times 10,000)$	1.715***	1.720^{***}	1.718^{***}
	(16.57)	(16.68)	(16.68)
1(Underwater)	0.995	1.012	1.013
	(-0.07)	(0.15)	(0.16)
Percent Underwater	0.531	0.464	0.463
	(-0.58)	(-0.69)	(-0.69)
Teacher Characteristics	yes	yes	yes
Peer Characteristics	yes	yes	yes
Teacher-Peer Commonalities	yes	yes	yes
Campus×Year Refi Control	yes	no	no
Campus×Month Refi Control	no	yes	yes
Time Slots FE	no	no	yes
N	309,644	301,390	299,882

This table shows hazard ratios of Cox Proportional Hazard model regressions in which the dependent variable is a 0/1 indicator of refinances, and the main variable of interest is *Peer Refinances*, a variable that captures the number of peers having undertaken a mortgage refinance in the previous 3-month period, scaled by the size of the peer group. Similar to the main analysis, the regressions include controls for other determinants of refinancing, teacher characteristics, and teacher-peer commonality. Depending on the specification, a campus-year refinancing index, a campus-month refinancing index, or time-slot controls are also included. Reported are the effects of a one standard deviation change in *Peer Refinances*, and z-statistics in parentheses are heteroscedasticity-robust and double-clustered by campus and month. ***p<0.01, **p<0.05, *p<0.1.

	(1)	(2)	(3)
Step 3 Coefficients			
1(Peer)	-8.63	-19.24	-13.26
Constant	306.21	355.48	331.31
	0.0000	0.05.41*	0.0400
Distance Ratio	0.0282	0.0541^{+}	(1.0400)
	(0.83)	(-1.68)	(-1.23)
	[0.041]	[<0.001]	[<0.001]
Step 1 Specification			
Determinants of Refinancing	yes	yes	yes
Teacher Characteristics	yes	yes	yes
Peer Characteristics	yes	$district \times year$	yes
Teacher-Peer Commonalities	yes	$district \times year$	yes
$Campus \times Month FE$	yes	yes	yes
Time Slot FE	no	no	$\operatorname{district} \times \operatorname{year}$

Table IA.11Peer Influence in Mortgage Refinancing

This table shows the results of the multi-step procedure of Shue (2013). The details of the procedure are described in Internet Appendix A. A 0/1 indicator for refinancing is regressed on a set of determinants of refinancing, teacher characteristic controls, teacher-peer commonality controls, and campus-month fixed effects. *district* × *year* denotes the interaction of district-year fixed effects with the corresponding control. The table reports the coefficients of the estimation of equation (IA.A.3), along with the distance ratio. The absolute distances in equation (IA.A.2) are regressed on a 0/1 indicator for common off-periods (i.e., peers). Reported are *t*-statistics in parentheses which are heteroscedasticity-robust and double-clustered by campus and month. In addition, reported in brackets are *p*-values estimated by generating the distribution of each coefficient under the null of no peer effects, following Shue (2013). Specifically, the set of peers for each teacher-year observation are randomized peers to each monthly observation of the teacher-year, and re-estimate equation (IA.A.3) (β_{random}). A distribution under the null is formed by repeating this process 10,000 times for each specification. The *p*-values represent the likelihood of β_{random} under the null hypothesis of randomized peer groups being less than the true coefficient β from equation (IA.A.3). ***p<0.01, **p<0.05, *p<0.1.

Table IA.12First Stage Regressions

	(1)	(2)	(3)
Avg. Peer Savings	0.225***	0.290***	0.241***
	(10.26)	(11.88)	(11.33)
Savings $(\$, \times 10,000)$	0.199^{***}	0.245^{***}	0.200***
	(7.81)	(9.08)	(8.10)
1(Underwater)	0.221***	0.216***	0.177^{***}
	(4.72)	(4.59)	(4.07)
Percent Underwater	-1.076	-0.219	-0.459
	(-1.47)	(-0.30)	(-0.68)
Loan Age (Months)	0.009***	0.010***	0.008***
	(12.36)	(13.53)	(12.93)
Teacher Characteristics	yes	yes	yes
Peer Characteristics	yes	$district \times year$	yes
Teacher-Peer Commonalities	yes	$district \times year$	yes
$Campus \times Month FE$	yes	yes	yes
Time Slot FE	no	no	$district \times year$
N	376,624	376,624	374,809
R^2	0.608	0.669	0.650

This table reports the first stage of the 2SLS IV regressions of Table 3. Specifically, in Column 1 we estimate:

$$PeerRefinances_{ijt-1:3} = \beta PeerSavings_{ijt} + \gamma \mathbf{X}_{ijt} + \lambda \mathbf{W}_{ijt} + \eta \mathbf{Z}_{ijt} + \delta c \left(\mathbf{W}_{ijt}, \mathbf{Z}_{ijt} \right) + \phi_{jt} + \varepsilon_{ijt}.$$

The dependent variable, *Peer Refinances*, instrumented for in the second stage, is the number of a teacher's peers who have undertaken a mortgage refinance in the previous 3-month period, scaled by the size of the teacher's peer group. We use the average net savings conditional on refinancing of a teacher's peer group, *Peer Savings*, as an instrumental variable to estimate *Peer Refinances*. **X** is a vector of other determinants of refinancing, such as the estimated savings of refinancing. **W** is a vector of teacher characteristics; **Z** is a vector of mean characteristics for a teacher's peer group; $c(\mathbf{W}, \mathbf{Z})$ is a vector representing the commonality between **W** and **Z**. Finally, ϕ_{jt} is a campus-month fixed effect. The variables *Peer Savings* and *Peer Refinances* have been standardized. Details for all variables are found in Data Appendix B. *district* × *year* denotes the interaction of district-year fixed effects with the corresponding control. Reported *t*-statistics in parentheses are heteroscedasticity-robust and double-clustered by campus and month. ***p<0.01, **p<0.05, *p<0.1.

Table IA.13

raner A. High peer savings			
	(1)	(2)	(3)
Peer Refinances	20.766***	47.770***	31.042***
	(5.18)	(5.98)	(5.02)
Savings $(\$, \times 10,000)$	85.983***	115.517***	95.171 ^{***}
	(6.99)	(6.26)	(6.77)
1(Underwater)	-161.107***	-178.985***	-166.807***
	(-10.21)	(-9.96)	(-10.02)
Percent Underwater	7.567	-454.606*	-112.744
	(0.05)	(-1.91)	(-0.64)
Loan Age (Months)	-6.626***	-8.303***	-7.108***
	(-9.13)	(-8.51)	(-9.28)
Teacher Characteristics	yes	yes	yes
Peer Characteristics	yes	$district \times year$	yes
Teacher-Peer Commonalities	yes	$district \times year$	yes
Campus×Month FE	yes	yes	yes
Time Slot FE	no	no	district imes year
N	130,702	130,702	130,296
R^2	0.220	0.312	0.256

Peer Effects on the Decision to Refinance: Subsamples Based on a Teacher's Peers Average Savings

This table shows OLS regressions in which the dependent variable is a 0/1 indicator of refinances and the main variable of interest is *Peer Refinances*, a variable that captures the number of peers having undertaken a mortgage refinance in the previous 3-month period, scaled by the size of the peer group. The sample is divided into two mutually exclusive groups based on the median value of the teacher's peers average savings. Panel A shows the estimation results in the subsample with the highest peer savings and Panel B shows the estimation results in the subsample with the lowest peer savings. Details for all variables are found in Data Appendix B. *district* × *year* denotes the interaction of district-year fixed effects with the corresponding control. Reported are the effects of a one standard deviation change in *Peer Refinances*, and *t*-statistics in parentheses are heteroscedasticity-robust and double-clustered by campus and month. ***p<0.01, **p<0.05, *p<0.1.

Panel A: High peer savings

	(1)	(2)	(3)
Peer Refinances	1.831	14.886***	5.935
	(0.51)	(2.76)	(1.31)
Savings $(\$, \times 10,000)$	24.422***	15.816	23.433**
	(2.86)	(1.23)	(2.36)
1(Underwater)	-69.065***	-72.316***	-65.476***
	(-5.80)	(-3.61)	(-4.97)
Percent Underwater	-187.456	-304.892	-274.535
	(-0.91)	(-1.62)	(-1.44)
Loan Age (Months)	-3.213***	-4.003***	-3.457***
	(-6.87)	(-6.45)	(-6.95)
Teacher Characteristics	yes	yes	yes
Peer Characteristics	yes	$district \times year$	yes
Teacher-Peer Commonalities	yes	$district \times year$	yes
$Campus \times Month FE$	yes	yes	yes
Time Slot FE	no	no	${\rm district}\!\times\!{\rm year}$
N	$144,\!952$	144,952	144,493
R^2	0.207	0.277	0.235

Panel B: Low peer savings

Table IA.14Robustness for Table 7: Placebo Test

	(1)	(2)	(3)
1(Peer)	5.489 (0.74)	5.907 (0.69)	$5.032 \\ (0.64)$
Teacher Characteristics	yes	yes	yes
Peer Characteristics	yes	$district \times year$	yes
Teacher-Peer Commonalities	yes	$district \times year$	yes
$Campus \times Month FE$	yes	yes	yes
Time Slot FE	no	no	${\rm district} \times {\rm year}$
N	54,914	54,914	54,866
R^2	0.150	0.333	0.152

This table shows the results of a placebo test in which OLS regressions like those in Panel A of Table 7 are estimated using a different dependent variable. The dependent variable is a 0/1 indicator for whether the refinancing teacher's previous lender is the same as the other teacher's existing lender. Teacher-pairs are formed by matching each teacher electing to refinance with all other teachers in the same campus-month. 1(Peer) is a 0/1 indicator for whether the teacher-pair are classified as peers. Similar to the main analysis, the regressions include controls for other determinants of refinancing, teacher characteristics, teacher-peer commonality, and campus-month fixed effects. *district* × *year* denotes the interaction of district-year fixed effects with the corresponding control. Reported *t*-statistics in parentheses are heteroscedasticity-robust and double-clustered by campus and month. ***p<0.01, **p<0.05, *p<0.1.