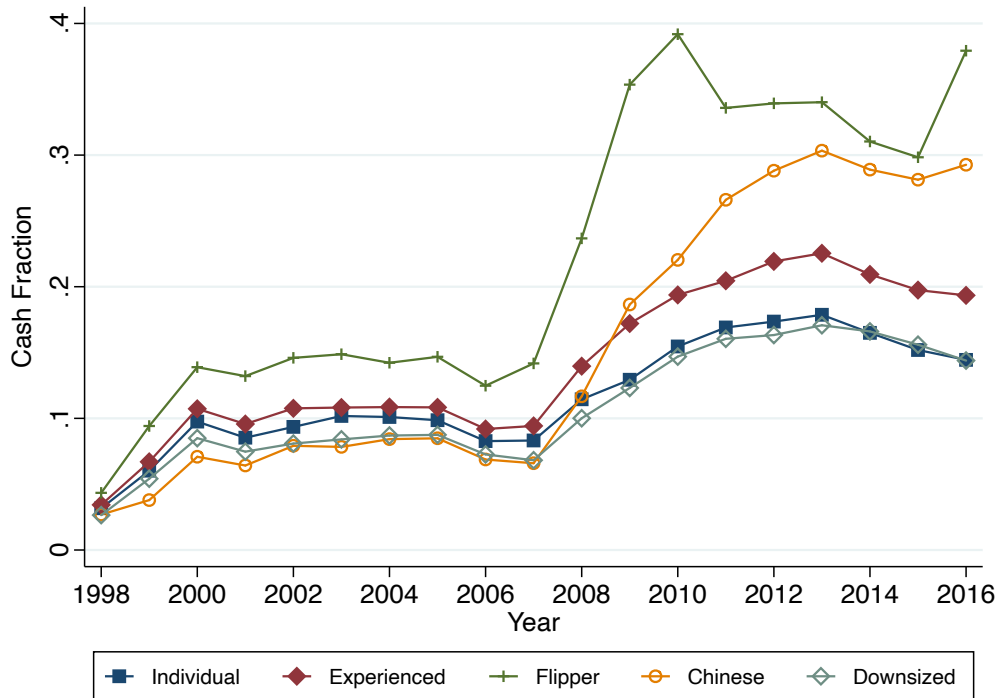


Online Appendix to
“Cash is King? Understanding Financing Risk in
Housing Markets”

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Figure A1: Cash Fraction Among Buyer Group in the National Sample w/o LA^a



^aSource: CoreLogic. The figure plots the fraction of all-cash purchases among each buyer group. The national sample without LA includes transactions from the top 100 U.S. cities, excluding Los Angeles. Different buyer groups are defined as follows: **individual** refers to individual buyers; **experienced** buyer indicates buyers who purchased any house in their county in the past; **downsized** buyer is the buyer whose previous house has more bedrooms, more bathrooms, and larger building square footage than the current house (since downsized buyers must have purchased houses before, they are also experienced buyers); **flipper** buyer is the buyer who sold the house within two years after purchasing the house; **Chinese** buyer means that the last name of the house owner belongs to the list of Chinese last names.

Table A1: Summary Statistics for the National Sample w/o LA^a

	All (1)	Cash (2)	Mortgage (3)
sales price (in 2010 dollar)	\$298,092	\$299,858	\$297,820
building square footage	1924	1952	1920
effective year built	1985	1987	1984
#bedrooms	2.68	2.33	2.73
#total rooms	3.29	2.58	3.40
#bathrooms	2.25	2.10	2.28
#parking spaces	0.41	0.34	0.42
single family house	0.82	0.68	0.85
duplex	0.02	0.02	0.02
condo	0.13	0.22	0.12
institutional buyer	0.047	0.221	0.021
individual buyer	0.953	0.779	0.979
experienced buyer	0.240	0.294	0.232
flipper	0.087	0.155	0.077
Chinese	0.028	0.036	0.027
observations	20459465	2732374	17727091

^aThe table reports the mean values of transaction-specific variables and house characteristics, as well as dummies for buyer types. The sample includes arms-length transactions of residential properties in the top U.S. cities without LA from 1998 to 2016, excluding sales of foreclosed properties. Column 2 reports the mean of each variable among all-cash transactions, whereas column 3 reports the mean among mortgage transactions. Sales price is real transaction price, deflated by Consumer Price Index. Effective year built is the first year when the building was assessed with its current components. Experienced, downsized, flipper, and Chinese buyers are defined in Figure 4's footnote.

Table A2: Cash Regressions for the National Sample w/o LA^a

	dependent variable: dummy for cash purchase	
	(1)	(2)
institutional buyer	0.431** (0.002)	0.428** (0.002)
experienced	0.025** (0.000)	0.026** (0.000)
flipper	0.056** (0.001)	0.056** (0.001)
Chinese	0.060** (0.001)	0.058** (0.001)
tract×year×month fixed effects	yes	yes
house characteristics	no	yes
assessed value in 2016	no	yes
observations	19851526	19851526
adjusted R^2	0.234	0.246

^aThe dependent variable is the dummy for whether properties are purchased by all-cash. The sample includes arms-length transactions of residential properties in the top U.S. cities without LA from 1998 to 2016, excluding sales of foreclosed properties. See Appendix for the definition of each variable and the list of variables included in house characteristics. Robust standard errors clustered at the census tract level in parentheses. + denotes significance at a 10% level, * denotes significance at a 5% level, and ** denotes significance at 1% level.

Table A3: Buyer's Prior Cash Purchase Regressions^a

	dependent variable: buyer's prior cash purchase			
	(1)	(2)	(3)	(4)
ln(#prior transactions of buyer)	0.035** (0.003)	0.035** (0.003)	0.035** (0.003)	0.036** (0.003)
downsized	0.008+ (0.005)	0.009 (0.006)	0.009 (0.006)	0.013+ (0.007)
flipper	0.043** (0.007)	0.043** (0.007)	0.042** (0.007)	0.037** (0.008)
Chinese	0.074** (0.006)	0.074** (0.006)	0.071** (0.006)	0.072** (0.007)
ln(buyer's prior purchase price)	-0.031** (0.003)	-0.031** (0.003)	-0.031** (0.003)	-0.030** (0.004)
experienced seller		0.004 (0.005)	0.003 (0.005)	0.003 (0.006)
tract-year log price			0.032* (0.015)	
tract-year cash fraction			0.157** (0.026)	
tract × year × month	no	no	no	yes
house characteristics	yes	yes	yes	yes
time-varying assessed values	yes	yes	yes	yes
listing characteristics	yes	yes	yes	yes
house uniqueness	yes	yes	yes	yes
observations	31142	31142	31142	31142
adjusted R^2	0.047	0.047	0.048	0.054

^aThe dependent variable is the buyer's prior cash purchase, which is the dummy for all-cash purchase in the buyer's previous transaction. The sample includes arms-length transactions of residential properties from 2005 to 2016 in Los Angeles County transaction data merged with Multiple Listing Service data, excluding sales of foreclosed properties and institutional buyers. See Appendix for the definition of each variable and the list of variables included in house characteristics. All columns use only buyers with any previous transactions during 1990-2016, and exclude buyers who purchased their previous house recently (within a year) or whose previous house was nearby (located within 10 miles from their current house). Robust standard errors clustered at the census tract level in parentheses. + denotes significance at a 10% level, * denotes significance at a 5% level, and ** denotes significance at 1% level.

Table A4: Price Regressions for Individual Buyers in 2005-2016 LA MLS-Deed Data with TOM as a Control^a

	dependent variable: ln(sales price in 2010 dollars)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
cash	-0.031** (0.002)	-0.030** (0.004)	-0.038** (0.004)	-0.037** (0.008)	-0.037** (0.009)	-0.031** (0.006)	-0.020** (0.006)	-0.036** (0.005)	-0.038+ (0.022)
TOM/100	-0.027** (0.001)	-0.030** (0.002)	-0.023** (0.003)	-0.028** (0.004)	-0.013* (0.005)	-0.017** (0.004)	-0.008* (0.004)	-0.029** (0.003)	-0.017** (0.002)
tract×year×month	yes	yes	yes	yes	yes	yes	yes	yes	yes
buyer characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes
seller characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes
house characteristics	yes	yes	no	yes	yes	yes	yes	yes	yes
time-varying assessed value	yes	yes	yes	yes	yes	yes	yes	yes	yes
listing characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes
house uniqueness	yes	yes	yes	yes	yes	yes	yes	yes	yes
house fixed effects	no	no	yes	yes	no	no	no	no	no
buyer fixed effects	no	no	no	no	yes	no	no	no	no
seller fixed effects	no	no	no	no	no	no	yes	no	no
buyer's prior purchase price	no	no	no	no	no	no	no	yes	yes
IV estimation	no	no	no	no	no	no	no	no	yes
observations	451964	36650	36650	14386	14386	21072	21072	31142	31142
adjusted R^2	0.867	0.886	0.954	0.852	0.894	0.894	0.926	0.877	0.671

^aThe dependent variable is the logarithm of real sales price (in 2010 dollar). The sample includes arms-length transactions of residential properties from 2005 to 2016 in Los Angeles County transaction data merged with Multiple Listing Service data, excluding sales of foreclosed properties and institutional buyers. We use TOM/100 which is the time on market divided by 100, so that the coefficient on TOM can be shown in three decimal places. Table 2 provides the list of variables included in seller characteristics, buyer characteristics, and listing characteristics. See Appendix for the definition of each variable and the list of variables included in house characteristics. Column 1 of this table is the same as column 5 of Table 6. Columns 1-9 include yearly assessment values available for 2005-2016. Columns 2-3 include only properties with repeated transactions during the sample period. Columns 4-5 include only buyers with two or more transactions during the sample period. Columns 6-7 include only sellers with two or more transactions during the sample period. Column 9 reports the instrumental variable regression where the instrument is the dummy for all-cash purchase in the buyer's previous transaction. Column 8 uses the same sample as column 9. Robust standard errors clustered at the census tract level in parentheses. + denotes significance at a 10% level, * denotes significance at a 5% level, and ** denotes significance at 1% level.

Table A5: Price Regressions for Individual Buyers in 2005-2016 LA MLS-Deed Data with TTC as a Control^a

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
dependent variable: ln(sales price in 2010 dollars)									
cash	-0.031** (0.002)	-0.031** (0.004)	-0.038** (0.004)	-0.036** (0.008)	-0.040** (0.009)	-0.031** (0.006)	-0.020** (0.006)	-0.036** (0.005)	-0.041+ (0.024)
TTC/100	-0.002 (0.002)	-0.009 (0.005)	-0.006 (0.006)	0.002 (0.010)	-0.027* (0.011)	0.001 (0.006)	-0.006 (0.006)	-0.010 (0.006)	-0.011* (0.005)
tract×year×month	yes	yes	yes	yes	yes	yes	yes	yes	yes
buyer characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes
seller characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes
house characteristics	yes	yes	no	yes	yes	yes	yes	yes	yes
time-varying assessed value	yes	yes	yes	yes	yes	yes	yes	yes	yes
listing characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes
house uniqueness	yes	yes	yes	yes	yes	yes	yes	yes	yes
house fixed effects	no	no	yes	no	no	no	no	no	no
buyer fixed effects	no	no	no	no	yes	no	no	no	no
seller fixed effects	no	no	no	no	no	no	yes	no	no
buyer's prior purchase price	no	no	no	no	no	no	no	yes	yes
IV estimation	no	no	no	no	no	no	no	no	yes
observations	451964	36650	36650	14386	14386	21072	21072	31142	31142
adjusted R^2	0.866	0.885	0.953	0.851	0.894	0.893	0.926	0.877	0.669

^aThe dependent variable is the logarithm of real sales price (in 2010 dollar). The sample includes arms-length transactions of residential properties from 2005 to 2016 in Los Angeles County transaction data merged with Multiple Listing Service data, excluding sales of foreclosed properties and institutional buyers. We use TTC/100 which is the time-to-close divided by 100, so that the coefficient on TTC can be shown in three decimal places. Table 2 provides the list of variables included in seller characteristics, buyer characteristics, and listing characteristics. See Appendix for the definition of each variable and the list of variables included in house characteristics. Column 1 of this table is the same as column 5 of Table 6. Columns 1-9 include yearly assessment values available for 2005-2016. Columns 2-3 include only properties with repeated transactions during the sample period. Columns 4-5 include only buyers with two or more transactions during the sample period. Columns 6-7 include only sellers with two or more transactions during the sample period. Column 9 reports the instrumental variable regression where the instrument is the dummy for all-cash purchase in the buyer's previous transaction. Column 8 uses the same sample as column 9. Robust standard errors clustered at the census tract level in parentheses. + denotes significance at a 10% level, * denotes significance at a 5% level, and ** denotes significance at 1% level.

Table A6: Price Regressions for Individual Buyers in 1998-2016 LA Deed Data^a

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	dependent variable: ln(sales price in 2010 dollars)								
cash	-0.047** (0.002)	-0.046** (0.002)	-0.050** (0.002)	-0.068** (0.003)	-0.059** (0.003)	-0.036** (0.003)	-0.023** (0.003)	-0.051** (0.005)	-0.062* (0.028)
tract×year×month	yes	yes	yes	yes	yes	yes	yes	yes	yes
house characteristics	yes	yes	no	yes	yes	yes	yes	yes	yes
assessed value in 2016	yes	yes	no	yes	yes	yes	yes	yes	yes
buyer characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes
seller characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes
time-varying assessed value	no	no	no	no	no	no	no	no	no
listing characteristics	no	no	no	no	no	no	no	no	no
house uniqueness	no	no	no	no	no	no	no	no	no
house fixed effects	no	no	yes	no	no	no	no	no	no
buyer fixed effects	no	no	no	no	yes	no	no	no	no
seller fixed effects	no	no	no	no	no	no	no	no	no
buyer's prior purchase price	no	no	no	no	no	no	no	yes	no
IV estimation								yes	yes
1st stage F-stat									234.23
observations	1260285	563577	563577	302478	302478	228841	228841	77466	77466
adjusted R ²	0.887	0.895	0.943	0.892	0.904	0.915	0.938	0.904	0.366

^aThe dependent variable is the logarithm of real sales price (in 2010 dollar). The sample includes arms-length transactions of residential properties from 1998 to 2016 in Los Angeles County, excluding sales of foreclosed properties and institutional buyers. Columns 2-3 include only properties with repeated transactions during the sample period. Columns 4-5 include only buyers with two or more transactions during the sample period. Columns 6-7 include only sellers with two or more transactions during the sample period. Columns 8-9 include only buyers with any previous transaction during 1990-2016, but exclude buyers who purchased their previous house within a year or whose previous house was located within 10 miles from their current house. All columns include census tract×year×month fixed effects. Column 9 reports the instrumental variable regression where the instrument is the dummy for all-cash purchase in the buyer's previous transaction. The buyer's prior purchase price is the quality adjusted price (in 2010 dollar) in the buyer's previous transaction. Robust standard errors clustered at the census tract level in parentheses. + denotes significance at a 10% level, * denotes significance at a 5% level, and ** denotes significance at 1% level.

Table A7: Price Regressions for the National Sample in 1998-2016 Deed Data, including Institutional Buyers^a

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
cash									
	-0.059** (0.001)	-0.057** (0.001)	-0.066** (0.001)	-0.088** (0.001)	-0.118** (0.002)	-0.060** (0.001)	-0.029** (0.001)	-0.058** (0.005)	-0.046* (0.021)
tract × year × month	yes	yes	yes	yes	yes	yes	yes	yes	yes
house characteristics	yes	yes	no	yes	yes	yes	yes	yes	yes
assessed value in 2016	yes	yes	no	yes	yes	yes	yes	yes	yes
buyer characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes
seller characteristics	yes	yes	yes	yes	yes	yes	yes	yes	yes
time-varying assessed value	no	no	no	no	no	no	no	no	no
listing characteristics	no	no	no	no	no	no	no	no	no
house uniqueness	no	no	no	no	no	no	no	no	no
house fixed effects	no	no	yes	no	no	no	no	no	no
buyer fixed effects	no	no	no	no	yes	no	no	no	no
seller fixed effects	no	no	no	no	no	no	yes	no	no
buyer's prior purchase price	no	no	no	no	no	no	no	yes	yes
IV estimation									yes
observations	19851526	11458194	11458194	4015229	4015229	6391079	6391079	136893	136893
adjusted R ²	0.868	0.874	0.918	0.847	0.874	0.852	0.908	0.883	0.235

^aThe dependent variable is the logarithm of real sales price (in 2010 dollar). The sample includes arms-length transactions of residential properties from 1998 to 2016 in the top 100 U.S. cities, excluding Los Angeles. The sample also includes both individual buyers and institutional buyers. The sample excludes sales of foreclosed properties. Columns 2-3 include only properties with repeated transactions during the sample period. Columns 4-5 include only buyers with two or more transactions during the sample period. Columns 6-7 include only sellers with two or more transactions during the sample period. Columns 8-9 include only buyers with any previous transaction during 1990-2016, but exclude buyers who purchased their previous house within a year or whose previous house was located within 10 miles from their current house. All columns include census tract × year × month fixed effects. Column 9 reports the instrumental variable regression where the instrument is the dummy for all-cash purchase in the buyer's previous transaction. The buyer's prior purchase price is the quality adjusted price (in 2010 dollar) in the buyer's previous transaction. Robust standard errors clustered at the census tract level in parentheses. + denotes significance at a 10% level, * denotes significance at a 5% level, and ** denotes significance at 1% level.