Internet Appendix for "Racial Disparities in Mortgage Lending: New Evidence based on Processing Time"

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Contents

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In this Internet Appendix, we provide additional results for baseline regressions in Section A, for regressions across purchaser types in Section B, for subprime lenders in Section C, and for low- and full-doc loans in Section D.

A Baseline Regression Results using HMDA Data

A.1 Originated Home Purchase Loans

Table A1 reports the results for originated home purchase loans from the baseline regression of processing time on borrower's racial/ethnic background, controlling for other loan and borrower characteristics available in the HMDA data and county-month fixed effects. The results for the whole sample period and two subperiods of 2001-2003 and 2004-2006 are reported.

A.2 Originated Refinance Loans

Table A2 reports the results for refinance loans from the baseline regression of processing time on borrower's racial/ethnic background. The application process for refinances is typically simpler and the processing time shorter because the borrower is not required to move to new residences. Foote et al. (2019) show a dramatic decline in the average processing time for refinances between 1995 and 1998, but no such pattern for purchase loans. Fuster et al. (2019) also find that FinTech lenders shorten the processing time more for refinances than for home purchase loans. During our sample period, the average processing time is 35.7 days for refinance loans and 40.2 days for home purchase loans.

The estimates from the refinance sample point to important differences compared to the purchase sample. First, the differences in processing time between Black and white borrowers are smaller in the refinance sample. Second, the decline in processing time from the period 2001-2003 to the period 2004-2006 is weaker for refinance loans. These findings are consistent with the time-series plots and indicate that the changes in the mortgage market have less of

an impact on refinance loans than on home purchase loans. Similar to the sample of home purchase loans, we also observe in the sample of refinance loans that the processing time for Black and Hispanic borrowers is longer when controlling for lender fixed effects, which is consistent with the explanation that within-lender variations contribute to most of the disparities in processing time.

A.3 Denied Loans

Table A3 reports the results for denied home purchase (Panel A) and denied refinance loans (Panel B) separately from the baseline regression of processing time. For home purchase loan applications (Panel A), we find that, in the period 2001-2003, a slower processing time for minority borrowers than for white borrowers (1.53, 0.55, and 2.0 days longer for Black, Hispanic, and Asian borrowers, respectively) without controlling for lender fixed effects, but the differences become negligible after controlling for lender fixed effects. In the period 2004-2006, the processing time becomes faster for Black and Hispanic borrowers (3.65 and 3.40 days shorter for Black and Hispanic borrowers without lender fixed effects, respectively) but stays slower for Asian borrowers. The faster processing time for Black and Hispanic borrowers in the latter part of the sample echoes the increased speed for the approved applications, as we show in Table A1. Note that faster rejection of a loan application can be caused by more stringent lender screening standards or a higher fraction of less creditworthy applicants. Next, we turn to the sample of denied refinance applications (Panel B). In contrast to the sample of approved refinances, the processing time for denied refinance applications is shorter for Black and Hispanic borrowers in both 2001-2003 and 2004-2006. The processing time for Asian borrowers is longer in both periods. Further, we do not find the phenomenon of fast rejection in the 2004-2006 sample of home purchase loans.

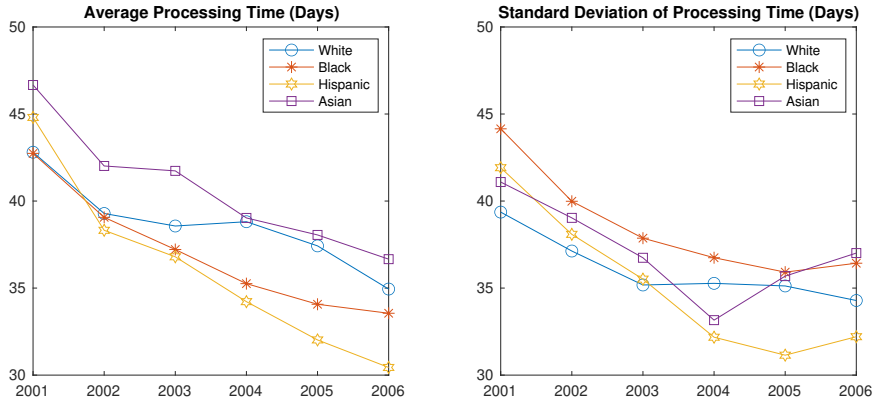
B Additional Results Across Purchaser Types

Besides the purchaser types considered in the paper, we report additional results for other purchaser types in the Internet Appendix. Figure A1 plots the time-series pattern for lender-affiliated purchasers (Panel A) and for the unspecified type "Other" (Panel B). As shown in Panel A of the figure, the decline in processing time for lender-affiliated purchasers is more evenly spread across borrower groups, which is a different pattern from commercial banks. Hispanic borrowers see the greatest increase in processing speed, and Black borrowers experience a moderate increase in processing speed relative to white borrowers. Demiroglu and James (2012) show that mortgage screening is positively associated with the incentive alignment between the lender and sponsor (i.e. "skin in the game"). When lenders sell loans to affiliated purchasers, their incentives are better aligned, and thus the problem of lax screening is less severe. For the purchaser type "Other" depicted in Panel B of the figure, we observe a clear separation between Black/Hispanic borrowers and white/Asian borrowers with a faster processing time for Black/Hispanic borrowers throughout the sample period and even faster during the later years. The standard deviations for Black and Hispanic borrowers are also lower than for white and Asian borrowers throughout the sample period and become even lower during the later part of the sample period.

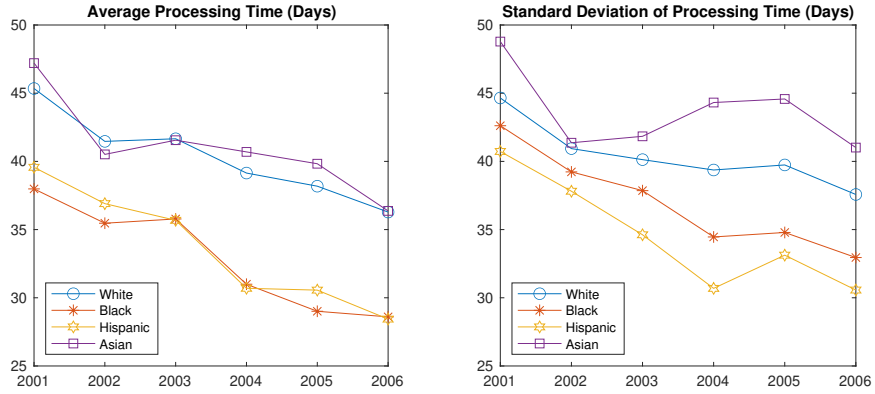
B.1 Regression Results using HMDA Data: "Unsold" and "Other"

Table A4 reports the results of a regression of processing time for purchaser types "Unsold" and "Other" based on the HMDA data. The regression results from the samples of "Other" purchaser type are similar to those for the sample of lender-affiliated institutions in that both results show similar trends of reduced processing time for Black and Hispanic borrowers. The potential explanations are different for the Affiliated and Other types: the Affiliated type is still slow in processing loans from Black borrowers during 2004-2006, consistent with the "skin in the game" argument, while the Other type is fast in processing loans from

FIGURE A1: Processing Time for Originated Mortgage from Other Purchaser Types



A. Affiliated



B. Others

NOTE: This figure presents the time series of processing time for home purchase mortgage loans that were approved and originated between 2001 and 2006. Panels A and B plot the average processing time (left panels) and the standard deviation (right panels) for home purchase loans purchased by banks and originated by affiliated and other purchasers, respectively.

Black borrowers during 2001-2003. The processing time for Asian borrowers is usually not much slower relative to white borrowers, but we find significant differences in the sample for the "Other" type during 2004-2006 without lender fixed effects, which indicates that Asian borrowers tend to select certain slow lenders in this type.

B.2 Regression Results using the Merged HMDA-CoreLogic Data Across Purchaser Types

Table A5 reports the results of a regression of processing time and loan delinquency for each purchaser type. Strikingly, for the GSE type, the difference in processing time between Black and white borrowers is 6.355 days, whereas the estimate from all merged PLS loans in the sample is 0.657. The delinquency gap between Black and white borrowers for the GSE type is 3.9% compared to 6.0% for all PLS loans. On the other hand, the estimates from all other purchaser types are similar to those from all loans except that the PLSP type has an even smaller difference in processing time and a larger delinquency gap between Black and white borrowers. These findings also provide an explanation for the time-series patterns of processing time for these purchaser types in that they behave more like the PLSP type during the period 2004-2006. The relation between processing time and loan delinquency varies by purchaser type, strongest for the PLSP type, with 3.5 bps reduction in delinquency for one day increase in processing time, and insignificant for the GSE type, which is consistent with the notion that the PLSP type is more likely to have lax lending standards relative to the GSE type.

C Additional Results: Subprime Lenders

Table A6 reports the results from a regression of processing time and delinquency based on the merged HMDA-CoreLogic data. The results on processing time show that the differences between Black and white borrowers are much smaller than reported in Table A1, unsurprisingly because the merged HMDA-CoreLogic data contains mortgage loans that are privately securitized. The differences between Hispanic and white borrowers are small based on the HMDA data, and also small in the merged data. One interesting observation is that Asian borrowers have a slightly longer processing time than white borrowers in the merged data, but not in the HMDA data. We also compare to the results in Table A4 for the PLSP

type during 2004-2006 and find the estimates are quite close, which ensures that our results based on the HMDA data are robust to the expanded set of control variables. Comparing the estimates of the periods 2001-2003 to 2004-2006, we find that the processing time for Black and Hispanic borrowers decreases more than for white borrowers.

D Additional Results: Low- and Full-doc Loans

Table A7 reports the results from a regression of processing time and delinquency based on the merged HMDA-CoreLogic data on borrowers' racial/ethnic background, controlling for other loan and borrower characteristics, local economic conditions and fixed effects on the lender, the county of property, and the year of loan origination for low-doc (full-doc) loans in Panel A (Panel B). First, we find the patterns that are found in the entire merged data present in both the low-doc and full-doc samples. Second, consistent with the argument of lax screening, we find that the delinquency gap between Black and white borrowers is about 7.2% in the low-doc sample and 5.2% in the full-doc sample, and the difference in processing time is higher in the full-doc sample. We further find that for Black borrowers, the contrast in processing time between FRMs and non-traditional mortgages and between fast OTS and slow OTS loans is more pronounced in the low-doc loan sample relative to the full-doc loan sample.

We also find interesting results on the Hispanic borrowers. As reported in the summary statistics, Hispanic borrowers are over-represented in low documentation loans. However, the delinquency rate for Hispanic borrowers is lower than the for white borrowers in the low-doc sample. On the other hand, the delinquency gap between Hispanic and white borrowers is insignificant in the full-doc sample. These findings indicate that lax screening is less evident among Hispanic borrowers.

References

Demiroglu, C. and C. James (2012): "How Important is Having Skin in the Game? Originator-Sponsor Affiliation and Losses on Mortgage-backed Securities," *Review of Financial Studies*, 25, 3217–3258.

Foote, C. L., L. Loewenstein, and P. S. Willen (2019): "Technological Innovation in Mortgage Underwriting and the Growth in Credit, 1985–2015," Federal Reserve Bank of Boston Research Department Working Papers No. 19–11. https://doi.org/10.29412/res.wp.2019.11.

Fuster, A., M. Plosser, P. Schnabl, and J. Vickery (2019): "The Role of Technology in Mortgage Lending," *Review of Financial Studies*, 32, 1854–1899.

TABLE A1: Baseline Regression Results: Home Purchase Loans

	2001-2006		2001-2003		2004-2006	
	(a)	(b)	(a)	(b)	(a)	(b)
Black	1.804***	3.412***	2.561***	4.996***	1.235***	2.416***
	(.5176)	(.3739)	(.7646)	(.4635)	(.417)	(.3202)
Hispanic	−1.239***	.6613**	−.5449	1.502***	−1.717***	.118
	(.3975)	(.2622)	(.5168)	(.3329)	(.3933)	(.2757)
Asian	.317	−.0744	−.2866	−.4846	.7219	.1984
	(.5658)	(.2639)	(.5829)	(.3024)	(.6217)	(.3061)
PLS	−6.842***	−1.402**			−8.064***	−2.528***
	(2.338)	(.6353)			(2.955)	(.7412)
Bank	.5074	−1.161	3.512*	1.683**	−1.576	−2.902**
	(1.522)	(.9814)	(2.053)	(.6503)	(1.858)	(1.09)
Affiliated	−4.638**	−.8226	−3.669	−.1968	−5.629*	−.5617
	(2.276)	(.9292)	(2.514)	(.6247)	(2.949)	(1.512)
MC	1.237	−.8014	43.7***	2.186	−1.268	−1.992**
	(3.748)	(.6857)	(12.92)	(2.863)	(3.477)	(.8439)
Unsold	−3.495*	−1.089*	−2.059	−.7259	−4.894*	−1.02
	(1.759)	(.6133)	(1.463)	(.5028)	(2.448)	(.8407)
Other	−1.914	−.9255	−.7835	.6568	−3.05	−2.216**
	(1.927)	(.628)	(1.825)	(.4018)	(2.778)	(.9314)
High cost	−10.31***	−3.967***			−10.1***	−4.125***
	(1.52)	(.9432)			(1.434)	(.9228)
Rate spread	−.8159***	.0356			−.7871**	.0084
	(.2902)	(.1744)			(.2909)	(.1572)
log(loan amount)	3.678***	3.282***	4.266***	3.446***	2.776***	2.828***
	(.3584)	(.2719)	(.3983)	(.3129)	(.465)	(.3805)
Jumbo	−.9391	−1.201***	−2.457***	−2.533***	.4854	−.5225**
	(.6815)	(.3172)	(.7721)	(.4065)	(.5183)	(.2507)
log(income)	−.9233***	−1.104***	−1.144***	−1.19***	−.7993***	−.8624***
	(.3052)	(.1075)	(.2435)	(.1562)	(.2002)	(.0982)
Coapplicant	5.889***	4.139***	5.727***	4.132***	5.94***	3.851***
	(.4099)	(.2524)	(.4616)	(.3242)	(.4601)	(.3135)
Preapproval	15.01***	10.69***			15.01***	12.45***
	(2.037)	(1.929)			(2.028)	(2.054)
Female	.0199	−.0825	−.1241	−.1295	.0524	−.0691
	(.2361)	(.0623)	(.2108)	(.0796)	(.2618)	(.0854)
R^2	0.084	0.201	0.072	0.188	0.094	0.218
Obs.	22383172	22382874	10483349	10483101	11899823	11899464

NOTE: This table reports loan-level regression results for all mortgage loans in the confidential HMDA data that are originated between 2001 and 2006 for the purchase of owner-occupied single-family homes, condos, and co-ops. The county by origination month fixed effects are included in model specification (a) and (b), and the lender fixed effects are added in model specification (b). See Table 1 in the paper for detailed information on the key variables. Standard errors are clustered by lender and month, and the t-statistics are reported in parentheses. Significance level: *($p < .10$); **($p < .05$); and ***($p < .01$).

TABLE A2: Baseline Regression Results: Refinance Loans

	2001-2006		2001-2003		2004-2006	
	(a)	(b)	(a)	(b)	(a)	(b)
Black	.2431	1.369***	−.1577	1.807***	.5933***	1.096***
	(.3232)	(.1875)	(.5588)	(.2668)	(.1849)	(.1108)
Hispanic	1.06**	1.617***	1.308*	2.159***	.8087***	1.176***
	(.4657)	(.3035)	(.7033)	(.3987)	(.2735)	(.1747)
Asian	.2856	.0644	.2586	−.0884	.3667	.2789
	(.4086)	(.2888)	(.5676)	(.3922)	(.2488)	(.2044)
PLS	−5.136***	−2.122**			−4.68***	−1.434***
	(1.644)	(1.004)			(1.565)	(.3122)
Bank	−2.136	−.8187	−2.829	.263	−1.177	−1.241**
	(1.298)	(.6536)	(1.809)	(.6463)	(.8493)	(.485)
Affiliated	−3.711*	−1.049	−4.823*	−1.43	−2.255	.5236
	(1.896)	(1.034)	(2.636)	(1.083)	(1.622)	(1.218)
MC	−4.036***	−.5412	−2.007	1.706	−3.73***	−1.557***
	(1.392)	(.7068)	(3.927)	(3.464)	(1.193)	(.4545)
Unsold	−2.511**	−2.849***	−2.341	−2.919**	−2.693***	−2.413***
	(1.229)	(.9685)	(1.562)	(1.436)	(.8458)	(.5136)
Other	−4.87***	−1.186*	−5.102***	−.5198	−4.309***	−1.608***
	(1.352)	(.6008)	(1.655)	(.6423)	(1.088)	(.5205)
High cost	−5.643***	−1.078			−5.703***	−1.914***
	(1.01)	(.6737)			(.976)	(.4283)
Rate spread	.2368	.6196***			.1929	.4521***
	(.1813)	(.1188)			(.1809)	(.1073)
log(loan amount)	2.18***	2.087***	2.398***	2.081***	1.562***	1.649***
	(.3819)	(.2596)	(.4631)	(.2855)	(.2962)	(.248)
Jumbo	1.303***	.5921*	2.054***	.616	.9837**	.597**
	(.4176)	(.3108)	(.6728)	(.5381)	(.3839)	(.2404)
log(income)	.132	−.2001**	.1246	−.2433**	.2063	−.0253
	(.168)	(.0948)	(.2227)	(.1167)	(.1342)	(.099)
Coapplicant	.3934**	−.1589	.6913***	−.1185	−.0618	−.3626***
	(.1766)	(.133)	(.2479)	(.1764)	(.1687)	(.1013)
Female	.07	.013	.2269	.0442	−.1052	−.0376
	(.1489)	(.0856)	(.2337)	(.1358)	(.0714)	(.0379)
R^2	0.109	0.214	0.090	0.217	0.063	0.162
Obs.	36730820	36730551	23245303	23245103	13485517	13485197

NOTE: This table reports loan-level regression results for all refinance mortgage loans in the confidential HMDA data that are originated between 2001 and 2006 for owner-occupied single-family homes, condos, and co-ops. The county by origination month fixed effects are included in model specification (a) and (b), and the lender fixed effects are added in model specification (b). See Table 1 in the paper for detailed information on the key variables. Standard errors are clustered by lender and month, and the t-statistics are reported in parentheses. Significance level: *($p < .10$); **($p < .05$); and ***($p < .01$).

TABLE A3: Baseline Regression Results: Denied Loan Applications

Panel A: Denied applications for purchase loans						
	2001-2006		2001-2003		2004-2006	
	(a)	(b)	(a)	(b)	(a)	(b)
Black	-1.311	$-.9365^{**}$	1.53^{**}	.0638	-3.646^{**}	-1.862^{***}
	(1.022)	(.3631)	(.7202)	(.206)	(1.473)	(.5336)
Hispanic	-1.796^{**}	-1.782^{***}	.5455	$-.3972^{*}$	-3.397^{***}	-2.711^{***}
	(.8116)	(.4217)	(.3759)	(.1965)	(1.236)	(.6264)
Asian	2.019^{***}	$.9618^{**}$	1.999^{**}	.2873	1.749^{**}	1.084^{*}
	(.6276)	(.4016)	(.7692)	(.3149)	(.7743)	(.5397)
R^2	0.106	0.275	0.139	0.317	0.073	0.260
OBs.	3966553	3965745	1810828	1810085	2155725	2154871
Panel B: Denied applications for refinance loans						
	2001-2006		2001-2003		2004-2006	
	(a)	(b)	(a)	(b)	(a)	(b)
Black	-2.296^{***}	-1.542^{***}	-2.989^{***}	-2.142^{***}	-1.969^{***}	-1.281^{***}
	(.4969)	(.2592)	(.6675)	(.3708)	(.5827)	(.2973)
Hispanic	$-.9166^{*}$	-1.301^{***}	-1.709^{***}	-1.151^{***}	$-.3808$	-1.216^{***}
	(.4903)	(.3595)	(.5207)	(.4079)	(.6654)	(.4435)
Asian	1.44^{***}	$.7069^{***}$	.7726	$.69^{*}$	2.017^{**}	$.7723^{**}$
	(.5184)	(.2653)	(.6832)	(.3532)	(.7795)	(.3725)
R^2	0.073	0.231	0.076	0.233	0.047	0.266
Obs.	11042393	11041586	4634902	4634252	6407491	6406591

NOTE: This table reports loan-level regression results for all denied loan applications in the confidential HMDA data that are originated between 2001 and 2006 for refinance or purchase of owner-occupied single-family homes, condos, and co-ops. The county by origination month fixed effects are included in model specification (a) and (b), and the lender fixed effects are added in model specification (b). See Table 1 in the paper for detailed information on the key variables. Standard errors are clustered by lender and month, and the t-statistics are reported in parentheses. Significance level: $^{*}(p < .10)$; $^{**}(p < .05)$; and $^{***}(p < .01)$.

TABLE A4: Processing Time Regressions: "Unsold" and "Other" Purchaser Types

	Unsold				Other			
	2001-2003		2004-2006		2001-2003		2004-2006	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
Black	2.809***	4.485***	.731	2.236***	−2.382***	3.844***	.3508	1.836***
	(.790)	(.665)	(.549)	(.487)	(.859)	(.4212)	(.6418)	(.326)
Hispanic	−.465	1.035**	−1.128*	.875***	−2.708***	1.693***	−1.515**	−.2975
	(.630)	(.463)	(.564)	(.290)	(.6895)	(.3302)	(.7163)	(.2146)
Asian	−.224	−.093	.417	.298	1.146	.7161**	2.888**	1.467***
	(.623)	(.411)	(.376)	(.285)	(.8797)	(.3405)	(1.171)	(.3865)
R^2	0.084	0.145	0.095	0.174	0.096	0.297	0.142	0.354
Obs.	4093024	4092645	3762557	3762031	2156148	2155901	2210716	2210434

NOTE: This table reports loan-level regression results for home purchase loans by purchaser type of "Unsold" or "Other" in the confidential HMDA data that are originated between 2001 and 2006 for the purchase of owner-occupied single-family homes, condos, and co-ops. The county by origination month fixed effects are included in model specification (a) and (b), and the lender fixed effects are added in model specification (b). See Table 1 in the paper for detailed information on the key variables. Standard errors are clustered by lender and month, and the t-statistics are reported in parentheses. Significance level: $^{*}(p < .10)$; $^{**}(p < .05)$; and $^{***}(p < .01)$.

TABLE A5: Regression Results Based on the Merged HMDA-CoreLogic Data Across Purchaser Types

	GSE	PLSP	Bank	Affiliate	MC	Unsold	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Processing time			
Black	6.355***	−0.190	0.525**	0.812***	0.604***	0.881***	0.736***
	(2.011)	(0.143)	(0.222)	(0.244)	(0.157)	(0.160)	(0.096)
Hispanic	−1.568	−0.267*	0.032	0.012	−0.018	0.015	−0.202*
	(1.647)	(0.144)	(0.202)	(0.263)	(0.154)	(0.180)	(0.117)
Asian	1.636	0.012	0.985***	0.957**	0.933***	0.485*	0.409**
	(2.290)	(0.252)	(0.377)	(0.451)	(0.276)	(0.292)	(0.166)
R^2	0.221	0.145	0.192	0.209	0.188	0.179	0.214
				Delinquency			
Black	0.039***	0.082***	0.067***	0.051***	0.072***	0.058***	0.057***
	(0.013)	(0.005)	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)
Hispanic	−0.001	−0.008**	−0.006*	−0.002	−0.001	−0.007***	−0.005**
	(0.008)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)
Asian	0.013	−0.001	−0.003	−0.005	0.002	0.001	−0.006***
	(0.013)	(0.006)	(0.005)	(0.005)	(0.004)	(0.003)	(0.002)
R^2	0.139	0.093	0.093	0.108	0.098	0.092	0.077
Fixed effects	Y	Y	Y	Y	Y	Y	Y
Other controls	Y	Y	Y	Y	Y	Y	Y
Obs.	11978	148665	94064	87050	186041	224809	596596

NOTE: This table reports loan-level regression results based on the merged HMDA-CoreLogic data. The dependent variable is processing time (top panel) and delinquency (bottom panel). We include borrower and loan characteristics, local economic conditions, and lender, origination year, and county fixed effects in the regression. Standard errors are clustered by lender and loan cohort, and the t-statistics are reported in parentheses. Significance level: $^{*}(p < .10)$; $^{**}(p < .05)$; and $^{***}(p < .01)$. See Table 1 in the paper for detailed information on the key variables.

TABLE A6: Regression Results Based on the Merged HMDA-CoreLogic Data

	All			Subprime lenders		
	2001-2006	2001-2003	2004-2006	2001-2006	2001-2003	2004-2006
			Processing Time			
Black	0.657***	1.332***	0.490***	0.451***	0.825***	0.349***
	(0.075)	(0.155)	(0.081)	(0.074)	(0.160)	(0.080)
Hispanic	0.002	0.791***	−0.169	0.279***	0.828***	0.134
	(0.097)	(0.197)	(0.108)	(0.100)	(0.210)	(0.111)
Asian	0.614***	0.473*	0.644***	0.541***	0.721**	0.531***
	(0.128)	(0.268)	(0.144)	(0.116)	(0.289)	(0.125)
FICO	−0.015***	−0.020***	−0.014***	−0.018***	−0.024***	−0.015***
	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)
Lowdoc	−0.845***	−1.140***	−0.723***	−0.478***	−0.544***	−0.367***
	(0.066)	(0.133)	(0.073)	(0.061)	(0.127)	(0.068)
LTV	−0.050***	−0.041***	−0.051***	−0.034***	−0.014**	−0.037***
	(0.003)	(0.007)	(0.003)	(0.002)	(0.006)	(0.003)
DTI	0.001	0.016**	−0.006*	0.000	0.009	−0.009***
	(0.003)	(0.007)	(0.003)	(0.003)	(0.007)	(0.003)
R^2	0.188	0.195	0.193	0.111	0.124	0.113
			Delinquency			
Black	0.060***	0.044***	0.063***	0.062***	0.047***	0.065***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
Hispanic	−0.010***	−0.009***	−0.010***	−0.009***	−0.007***	−0.010***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Asian	−0.004**	−0.006***	−0.004*	−0.003	−0.003	−0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
FICO	−0.001***	−0.000***	−0.001***	−0.001***	−0.001***	−0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lowdoc	0.023***	0.011***	0.023***	0.023***	0.012***	0.024***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
LTV	0.001***	0.000***	0.002***	0.002***	0.001***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
DTI	0.000***	0.000***	0.000***	0.000***	0.000**	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R^2	0.084	0.069	0.088	0.087	0.076	0.092
Fixed effects	Y	Y	Y	Y	Y	Y
Other controls	Y	Y	Y	Y	Y	Y
Obs.	1345535	266822	1078245	809688	163264	646224

NOTE: This table reports loan-level regression results based on the merged HMDA-CoreLogic data. The dependent variable is processing time (top panel) and delinquency (bottom panel). We include borrower and loan characteristics, local economic conditions, and lender, origination year, and county fixed effects in the regression. Standard errors are clustered by lender and loan cohort, and the t-statistics are reported in parentheses. Significance level: $^{*}(p < .10)$; $^{**}(p < .05)$; and $^{***}(p < .01)$. See Table 1 in the paper for detailed information on the key variables.

TABLE A7: Regression Results Based on the Merged HMDA-CoreLogic Data for Low- and Full-Doc Loans

	All	Loan type				Originate-to-sell	
		FRM	Hybrid	IO	Balloon	Fast	Slow
Panel A: Low-Documentation Loans							
				Processing time			
Black	0.563***	1.590***	0.468***	0.643**	0.243	−0.012	1.236***
	(0.114)	(0.408)	(0.118)	(0.279)	(0.248)	(0.172)	(0.183)
Hispanic	0.145	−0.115	0.189	0.155	0.274	0.121	0.338*
	(0.125)	(0.357)	(0.122)	(0.223)	(0.253)	(0.166)	(0.183)
Asian	0.674***	0.626	0.694***	1.442***	0.920**	0.453	1.165***
	(0.153)	(0.612)	(0.154)	(0.366)	(0.441)	(0.281)	(0.287)
R^2	0.205	0.287	0.198	0.221	0.226	0.223	0.226
				Delinquency			
Black	0.072***	0.052***	0.074***	0.052***	0.076***	0.078***	0.065***
	(0.004)	(0.005)	(0.005)	(0.006)	(0.009)	(0.006)	(0.004)
Hispanic	−0.016***	−0.013***	−0.016***	−0.010***	−0.002	−0.025***	−0.012***
	(0.002)	(0.003)	(0.002)	(0.004)	(0.006)	(0.003)	(0.002)
Asian	−0.009***	−0.009**	−0.009***	0.013**	−0.000	−0.015***	−0.008**
	(0.003)	(0.005)	(0.003)	(0.006)	(0.009)	(0.005)	(0.003)
R^2	0.109	0.124	0.109	0.121	0.119	0.132	0.121
Obs.	514664	47962	450280	79293	48412	113343	161369
Panel B: Full-Documentation Loans							
				Processing time			
Black	0.721***	1.266***	0.617***	0.552***	0.408*	0.509***	0.939***
	(0.080)	(0.241)	(0.084)	(0.211)	(0.241)	(0.132)	(0.148)
Hispanic	−0.174*	0.019	−0.214**	−0.614***	0.005	−0.164	−0.181
	(0.096)	(0.297)	(0.095)	(0.211)	(0.264)	(0.146)	(0.169)
Asian	0.655***	1.154*	0.561***	0.363	1.763**	−0.319	1.077***
	(0.185)	(0.667)	(0.193)	(0.337)	(0.767)	(0.329)	(0.367)
R^2	0.186	0.240	0.181	0.218	0.230	0.213	0.212
				Delinquency			
Black	0.052***	0.039***	0.055***	0.041***	0.065***	0.057***	0.043***
	(0.002)	(0.003)	(0.002)	(0.003)	(0.006)	(0.003)	(0.002)
Hispanic	−0.001	−0.006**	0.000	0.011***	0.029***	−0.005	0.000
	(0.002)	(0.003)	(0.002)	(0.003)	(0.007)	(0.003)	(0.003)
Asian	0.000	−0.003	0.001	0.008**	0.029***	−0.001	0.000
	(0.002)	(0.004)	(0.002)	(0.004)	(0.011)	(0.004)	(0.003)
R^2	0.076	0.101	0.075	0.093	0.104	0.098	0.086
Obs.	830024	108493	692873	121002	49199	182753	265924
Fixed effects	Y	Y	Y	Y	Y	Y	Y
Other controls	Y	Y	Y	Y	Y	Y	Y

NOTE: This table reports loan-level regression results based on the merged HMDA-CoreLogic data separately for low-doc and full-doc loans. The dependent variable is processing time (top section of each panel) and delinquency (bottom section of each panel). We include borrower and loan characteristics, local economic conditions, and lender, origination year, and county fixed effects in the regression. Standard errors are clustered by lender and loan cohort, and the t-statistics are reported in parentheses. Significance level: *($p < .10$); **($p < .05$); and ***($p < .01$). See Table 1 in the paper for detailed information on the key variables.