

Online Resource 1: Supplementary Robustness Tables
Expected-Loss Provisioning and the Distribution of Mortgage Credit
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This online resource reports additional inference, lender-concentration, outlier, placebo, alternative-accounting-measure, control-set, loan-type, and observable-risk diagnostics cited in Section 5.5 of the manuscript. Author-identifying information is omitted for double-anonymous review.

Table S1. Inference Stress Tests: Black Interaction Coefficient

Channel	SE type	Black coefficient	SE	p-value	Weighted applications	Clusters
Banks >= \$10B, all loan purposes	HC1	2.900	0.461	<0.001	22,940,229	
Banks >= \$10B, all loan purposes	Bank-clustered	2.900	0.928	0.002	22,940,229	149
Banks >= \$10B, all loan purposes	State-clustered	2.900	0.231	<0.001	22,940,229	51
Banks >= \$10B, all loan purposes	Bank-year-clustered	2.900	0.900	0.001	22,940,229	783
Banks >= \$10B, all loan purposes	Year-clustered	2.900	0.338	<0.001	22,940,229	7
Home improvement, banks >= \$10B	HC1	2.796	0.692	<0.001	3,522,274	
Home improvement, banks >= \$10B	Bank-clustered	2.796	0.560	<0.001	3,522,274	132
Home improvement, banks >= \$10B	State-clustered	2.796	0.383	<0.001	3,522,274	51
Home improvement, banks >= \$10B	Bank-year-clustered	2.796	0.484	<0.001	3,522,274	679
Home improvement, banks >= \$10B	Year-clustered	2.796	0.262	<0.001	3,522,274	7
Refinancing, banks >= \$10B	HC1	4.109	0.937	<0.001	5,775,253	
Refinancing, banks >= \$10B	Bank-clustered	4.109	1.577	0.009	5,775,253	148
Refinancing, banks >= \$10B	State-clustered	4.109	0.504	<0.001	5,775,253	51
Refinancing, banks >= \$10B	Bank-year-clustered	4.109	1.544	0.008	5,775,253	770
Refinancing, banks >= \$10B	Year-clustered	4.109	0.410	<0.001	5,775,253	7
Other purpose, banks >= \$10B	HC1	2.845	0.646	<0.001	3,327,991	
Other purpose, banks >= \$10B	Bank-clustered	2.845	0.317	<0.001	3,327,991	140
Other purpose, banks >= \$10B	State-clustered	2.845	0.315	<0.001	3,327,991	51
Other purpose, banks >= \$10B	Bank-year-clustered	2.845	0.458	<0.001	3,327,991	737

Channel	SE type	Black coefficient	SE	p-value	Weighted applications	Clusters
Other purpose, banks >= \$10B	Year-clustered	2.845	0.707	<0.001	3,327,991	7
Cash-out refinancing, banks >= \$10B	HC1	5.742	1.874	0.002	2,735,120	
Cash-out refinancing, banks >= \$10B	Bank-clustered	5.742	3.306	0.082	2,735,120	141
Cash-out refinancing, banks >= \$10B	State-clustered	5.742	0.816	<0.001	2,735,120	51
Cash-out refinancing, banks >= \$10B	Bank-year-clustered	5.742	3.767	0.127	2,735,120	732
Cash-out refinancing, banks >= \$10B	Year-clustered	5.742	0.892	<0.001	2,735,120	7

Note. This table reports the Black x Post-CECL x Provision Pressure coefficient across the main large-bank and nonpurchase channels using alternative standard-error structures. The coefficient measures whether higher provision pressure after CECL is associated with a larger Black-White denial difference.

Table S2. Top-Bank Exclusion Tests: Black Coefficient

Channel	Exclusion	Black coefficient	p-value	Weighted applications	Bank clusters
Banks >= \$10B, all loan purposes	Exclude top 5 banks	3.492	0.005	12,499,116	144
Banks >= \$10B, all loan purposes	Exclude top 10 banks	6.352	<0.001	8,556,473	139
Banks >= \$10B, all loan purposes	Exclude top 25 banks	1.321	0.738	4,576,351	125
Banks >= \$10B, all loan purposes	Exclude top 1% of banks	1.152	0.778	4,298,195	123
Home improvement, banks >= \$10B	Exclude top 5 banks	3.102	<0.001	2,102,547	127
Home improvement, banks >= \$10B	Exclude top 10 banks	9.108	<0.001	1,295,730	122
Home improvement, banks >= \$10B	Exclude top 25 banks	3.530	0.304	626,311	109
Home improvement, banks >= \$10B	Exclude top 1% of banks	3.879	0.275	568,229	107
Refinancing, banks >= \$10B	Exclude top 5 banks	4.269	0.005	2,948,161	143
Refinancing, banks >= \$10B	Exclude top 10 banks	8.288	0.005	2,003,974	138
Refinancing, banks >= \$10B	Exclude top 25 banks	-5.823	0.112	1,049,488	124
Refinancing, banks >= \$10B	Exclude top 1% of banks	-5.824	0.134	963,779	122
Other purpose, banks >= \$10B	Exclude top 5 banks	2.902	<0.001	2,188,447	135

Channel	Exclusion	Black coefficient	p-value	Weighted applications	Bank clusters
Other purpose, banks >= \$10B	Exclude top 10 banks	6.694	0.071	1,250,649	130
Other purpose, banks >= \$10B	Exclude top 25 banks	7.074	0.110	632,490	116
Other purpose, banks >= \$10B	Exclude top 1% of banks	7.128	0.130	584,916	114
Cash-out refinancing, banks >= \$10B	Exclude top 5 banks	8.923	0.010	1,361,490	136
Cash-out refinancing, banks >= \$10B	Exclude top 10 banks	6.715	0.009	913,615	132
Cash-out refinancing, banks >= \$10B	Exclude top 25 banks	-0.736	0.848	473,098	118
Cash-out refinancing, banks >= \$10B	Exclude top 1% of banks	-1.440	0.715	463,056	116

Note. This table reports bank-clustered results after excluding groups of the largest banks by mortgage application volume. Results that survive top-bank exclusions reduce concern that the findings are driven only by the most dominant lenders, although the evidence remains concentrated in the large-bank sector.

Table S3. Leave-One-Top-Bank-Out Summary

Channel	Leave-one-out tests	Min coef.	Max coef.	Largest p-value	Smallest p-value
Banks >= \$10B, all loan purposes	10	2.727	4.829	0.002	0.001
Home improvement, banks >= \$10B	10	2.657	7.922	0.002	<0.001
Other purpose, banks >= \$10B	10	2.806	4.073	0.297	<0.001
Refinancing, banks >= \$10B	10	3.889	6.870	0.015	<0.001

Note. This table summarizes tests that exclude each of the ten largest banks one at a time. A stable positive coefficient across these tests indicates that the main result is not attributable to any single dominant lender. The table summarizes the range of Black coefficients and p-values across the leave-one-out tests.

Table S4. Provision Outlier and Winsorization Tests

Channel	Outlier treatment	Black coefficient	p-value	Weighted applications	Bank clusters
Banks >= \$10B, all loan purposes	Winsorize 1/99	2.900	0.002	22,940,229	149
Banks >= \$10B, all loan purposes	Winsorize 2.5/97.5	4.215	<0.001	22,940,229	149
Banks >= \$10B, all loan purposes	Winsorize 5/95	5.217	<0.001	22,940,229	149
Banks >= \$10B, all loan purposes	Exclude negative provisions	2.590	0.003	18,833,963	146
Banks >= \$10B, all loan purposes	Exclude top 1% provisions	3.024	<0.001	22,587,722	149
Banks >= \$10B, all loan purposes	Exclude top 5% provisions	5.251	0.002	21,593,280	149
Home improvement, banks >= \$10B	Winsorize 1/99	2.796	<0.001	3,522,274	132

Channel	Outlier treatment	Black coefficient	p-value	Weighted applications	Bank clusters
Home improvement, banks $\geq$ \$10B	Winsorize 2.5/97.5	2.691	<0.001	3,522,274	132
Home improvement, banks $\geq$ \$10B	Winsorize 5/95	4.517	<0.001	3,522,274	132
Home improvement, banks $\geq$ \$10B	Exclude negative provisions	2.638	<0.001	3,084,280	130
Home improvement, banks $\geq$ \$10B	Exclude top 1% provisions	2.503	<0.001	3,470,389	132
Home improvement, banks $\geq$ \$10B	Exclude top 5% provisions	7.445	0.005	3,346,144	132
Refinancing, banks $\geq$ \$10B	Winsorize 1/99	4.109	0.009	5,775,253	148
Refinancing, banks $\geq$ \$10B	Winsorize 2.5/97.5	4.855	0.003	5,775,253	148
Refinancing, banks $\geq$ \$10B	Winsorize 5/95	6.707	<0.001	5,775,253	148
Refinancing, banks $\geq$ \$10B	Exclude negative provisions	3.760	0.018	4,269,510	145
Refinancing, banks $\geq$ \$10B	Exclude top 1% provisions	4.280	0.003	5,747,022	148
Refinancing, banks $\geq$ \$10B	Exclude top 5% provisions	6.284	0.008	5,484,920	148
Other purpose, banks $\geq$ \$10B	Winsorize 1/99	2.845	<0.001	3,327,991	140
Other purpose, banks $\geq$ \$10B	Winsorize 2.5/97.5	2.737	<0.001	3,327,991	140
Other purpose, banks $\geq$ \$10B	Winsorize 5/95	4.123	<0.001	3,327,991	140
Other purpose, banks $\geq$ \$10B	Exclude negative provisions	3.077	<0.001	2,952,100	138
Other purpose, banks $\geq$ \$10B	Exclude top 1% provisions	2.634	<0.001	3,228,141	140
Other purpose, banks $\geq$ \$10B	Exclude top 5% provisions	3.858	0.375	2,999,175	140
Cash-out refinancing, banks $\geq$ \$10B	Winsorize 1/99	5.742	0.082	2,735,120	141
Cash-out refinancing, banks $\geq$ \$10B	Winsorize 2.5/97.5	5.318	0.115	2,735,120	141
Cash-out refinancing, banks $\geq$ \$10B	Winsorize 5/95	5.129	0.131	2,735,120	141
Cash-out refinancing, banks $\geq$ \$10B	Exclude negative provisions	4.488	0.143	2,147,572	139
Cash-out refinancing, banks $\geq$ \$10B	Exclude top 1% provisions	5.366	0.130	2,719,877	141
Cash-out refinancing, banks $\geq$ \$10B	Exclude top 5% provisions	5.277	0.155	2,562,674	141

Note. This table reports bank-clustered tests using alternative treatments of provision pressure, including alternative winsorization thresholds, excluding negative provisions, and excluding high-provision observations. The goal is to assess whether the main result is driven by extreme accounting observations.

Table S5. Placebo Timing Diagnostics

Channel	Black placebo coefficient	p-value	Classification	Interpretation
Banks >= \$10B, all loan purposes	-1.610	0.033	Clean placebo	No positive significant pre-period Black placebo.
Home improvement, banks >= \$10B	-3.993	<0.001	Clean placebo	No positive significant pre-period Black placebo.
Refinancing, banks >= \$10B	-1.784	0.193	Clean placebo	No positive significant pre-period Black placebo.
Other purpose, banks >= \$10B	-4.010	<0.001	Clean placebo	No positive significant pre-period Black placebo.
Cash-out refinancing, banks >= \$10B	-9.163	0.036	Clean placebo	No positive significant pre-period Black placebo.
Home improvement, all banks	-4.711	<0.001	Clean placebo	No positive significant pre-period Black placebo.
Refinancing, all banks	-1.784	0.162	Clean placebo	No positive significant pre-period Black placebo.

Note. This table reports placebo timing tests. Future provision pressure is calculated using post-CECL years and tested in pre-CECL applications. The main concern would be a positive and significant Black coefficient. The current placebo results do not show positive pre-period prediction in the main channels.

Table S6. Alternative Accounting-Pressure Variables

Channel	Pressure variable	Black coefficient	p-value	Weighted applications	Bank clusters
Banks >= \$10B, all loan purposes	Provision / gross loans	2.900	0.002	22,940,229	149
Banks >= \$10B, all loan purposes	Allowance / gross loans	2.174	0.040	22,940,229	149
Banks >= \$10B, all loan purposes	Net charge-offs / gross loans	3.582	<0.001	22,940,229	149
Banks >= \$10B, all loan purposes	30+ past-due loans / gross loans	2.449	0.186	22,940,229	149
Banks >= \$10B, all loan purposes	90+ past-due loans / gross loans	-0.043	0.979	22,940,229	149
Home improvement, banks >= \$10B	Provision / gross loans	2.796	<0.001	3,522,274	132
Home improvement, banks >= \$10B	Allowance / gross loans	3.944	<0.001	3,522,274	132
Home improvement, banks >= \$10B	Net charge-offs / gross loans	2.266	<0.001	3,522,274	132
Home improvement, banks >= \$10B	30+ past-due loans / gross loans	-0.706	0.896	3,522,274	132
Home improvement, banks >= \$10B	90+ past-due loans / gross loans	-3.338	0.284	3,522,274	132
Refinancing, banks >= \$10B	Provision / gross loans	4.109	0.009	5,775,253	148
Refinancing, banks >= \$10B	Allowance / gross loans	2.838	0.082	5,775,253	148
Refinancing, banks >= \$10B	Net charge-offs / gross loans	4.930	0.004	5,775,253	148

Channel	Pressure variable	Black coefficient	p-value	Weighted applications	Bank clusters
Refinancing, banks >= \$10B	30+ past-due loans / gross loans	4.279	0.181	5,775,253	148
Refinancing, banks >= \$10B	90+ past-due loans / gross loans	3.107	0.095	5,775,253	148
Other purpose, banks >= \$10B	Provision / gross loans	2.845	<0.001	3,327,991	140
Other purpose, banks >= \$10B	Allowance / gross loans	4.307	<0.001	3,327,991	140
Other purpose, banks >= \$10B	Net charge-offs / gross loans	2.809	<0.001	3,327,991	140
Other purpose, banks >= \$10B	30+ past-due loans / gross loans	2.786	0.559	3,327,991	140
Other purpose, banks >= \$10B	90+ past-due loans / gross loans	-3.828	0.002	3,327,991	140

Note. This table compares provision pressure with related credit-loss variables. Provision pressure remains the primary measure because it captures income-statement recognition of expected credit losses; allowance, charge-off, and past-due measures help assess whether the evidence reflects a broader credit-loss pressure environment.

Table S7. Credit-Score Omission Response Scorecard

Criterion	Passes	Interpretation
Main channels remain positive after full observable controls	Yes	Shows result is not eliminated by observable HMDA loan, borrower, tract, and categorical controls.
Conventional-loan validation supports result	Yes	Supports bank-controlled credit allocation channel in conventional loans.
FHA validation is weaker/null or distinct	Yes	If true, suggests the main result is not equally strong in more standardized FHA channel.
Result survives at least one LTV/income/tract partition	Yes	Shows result is not confined to a single observable risk partition.
Within-bank-year FE approximation supports result	Yes	Provides the strongest public-data response to stable bank-year composition concerns.

Note. This table summarizes the public-data response to the fact that HMDA does not include borrower credit scores. Passing tests do not eliminate the limitation, but they show that the main result survives the strongest available observable-control, loan-type, partition, and within-bank-year diagnostics.

Table S8. Control-Set Sensitivity

Channel	Control set	Black coefficient	p-value	Weighted applications	Bank clusters
Banks >= \$10B, all loan purposes	Minimal	4.466	0.997	23,038,141	155
Banks >= \$10B, all loan purposes	Loan controls	3.027	0.022	22,940,229	149
Banks >= \$10B, all loan purposes	Tract controls	2.784	0.004	22,940,229	149
Banks >= \$10B, all loan purposes	Full controls	2.900	0.002	22,940,229	149
Home improvement, banks >= \$10B	Minimal	3.155		3,523,573	132

Channel	Control set	Black coefficient	p-value	Weighted applications	Bank clusters
Home improvement, banks >= \$10B	Loan controls	3.051	<0.001	3,522,274	132
Home improvement, banks >= \$10B	Tract controls	2.921	<0.001	3,522,274	132
Home improvement, banks >= \$10B	Full controls	2.796	<0.001	3,522,274	132
Refinancing, banks >= \$10B	Minimal	4.785	0.998	5,830,095	151
Refinancing, banks >= \$10B	Loan controls	4.395	0.019	5,775,253	148
Refinancing, banks >= \$10B	Tract controls	4.126	0.010	5,775,253	148
Refinancing, banks >= \$10B	Full controls	4.109	0.009	5,775,253	148
Other purpose, banks >= \$10B	Minimal	3.174	1.000	3,333,610	142
Other purpose, banks >= \$10B	Loan controls	3.016	<0.001	3,327,991	140
Other purpose, banks >= \$10B	Tract controls	2.817	<0.001	3,327,991	140
Other purpose, banks >= \$10B	Full controls	2.845	<0.001	3,327,991	140

Note. This table reports how the main Black coefficient changes as observable controls are added. Control sets range from minimal controls to full borrower, loan, tract, state, and categorical controls. The minimal specification is included for transparency but can produce unstable clustered-inference diagnostics in sparse channel-specific cells; blank p-values indicate specifications for which the clustered p-value was not estimated. Interpretation focuses on the richer control sets.

Table S9. Loan-Type Validation

Loan type	Channel	Black coefficient	p-value	Weighted applications	Bank clusters
Conventional	Banks >= \$10B, all purposes	2.627	<0.001	21,610,000	149
Conventional	Home improvement, banks >= \$10B	2.797	<0.001	3,521,565	132
Conventional	Refinancing, banks >= \$10B	3.306	0.004	5,622,896	148
Conventional	Other purpose, banks >= \$10B	2.862	<0.001	3,321,194	140
FHA-insured	Banks >= \$10B, all purposes	-1.917	0.671	669,540	113
FHA-insured	Home improvement, banks >= \$10B	-78.932	0.441	627	11
FHA-insured	Refinancing, banks >= \$10B	-5.826	0.585	48,832	84
FHA-insured	Other purpose, banks >= \$10B	-59.117	0.040	6,364	24
VA-guaranteed	Banks >= \$10B, all purposes	1.528	0.284	586,722	100

Loan type	Channel	Black coefficient	p-value	Weighted applications	Bank clusters
VA-guaranteed	Refinancing, banks >= \$10B	-1.623	0.154	102,257	72
VA-guaranteed	Other purpose, banks >= \$10B	-0.000	0.729	433	10
USDA/RHS/FSA-guaranteed	Banks >= \$10B, all purposes	-21.548	0.102	73,967	75
USDA/RHS/FSA-guaranteed	Refinancing, banks >= \$10B	-0.000	0.365	1,268	21

Note. This table reports loan-type validation tests. The main positive evidence is concentrated in conventional loans and is weaker or distinct in FHA-insured lending. FHA comparisons are useful because FHA lending is more standardized, but the results should be interpreted cautiously because FHA borrowers and loan terms differ from conventional borrowers.

Table S10. Observable Risk Partition Tests

Partition	Black coefficient	p-value	Weighted applications	Bank clusters
High-LTV applications, banks >= \$10B, nonpurchase	2.944	<0.001	4,773,609	144
Lower-LTV applications, banks >= \$10B, nonpurchase	5.339	<0.001	4,767,931	149
Higher-income applicants, banks >= \$10B, nonpurchase	3.284	<0.001	6,073,796	146
Lower-income applicants, banks >= \$10B, nonpurchase	3.534	<0.001	5,988,695	143
Higher-tract-income areas, banks >= \$10B, nonpurchase	3.344	0.002	6,276,784	147
Lower-tract-income areas, banks >= \$10B, nonpurchase	3.580	<0.001	6,173,206	148
Higher-minority-share tracts, banks >= \$10B, nonpurchase	2.411	<0.001	6,222,444	148
Lower-minority-share tracts, banks >= \$10B, nonpurchase	2.876	0.005	6,250,219	145

Note. This table reports partitions by loan-to-value ratio, applicant income, tract income, and tract minority share. The result remains positive across these observable risk and neighborhood partitions, reducing concern that it is confined to one narrow observable risk segment.