



Bank Size and Household Financial Sentiment: Surprising Evidence from University of Michigan Surveys of Consumers

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- Financial institutions and markets exist, in large part, to improve the economic and financial conditions of firms and households.
 - Banks in particular are considered to have special abilities to provide credit, deposit, and other financial services more efficiently than other institutions and markets.
 - Some of the banking literature emphasizes banks' special abilities to gather private information and serve **publicly traded firms**.
 - Results are mixed.
 - E.g., James, 1987; Billett, Flannery, and Garfinkel, 2006.
 - Other banking literature emphasizes the relative abilities of banks of different sizes to serve **small businesses**, which are generally more informationally opaque and difficult to serve.
 - Finds that small banks have comparative advantages over large banks in relationship lending.
 - E.g., Cole, Goldberg, and White, 2004; Berger, Miller, Petersen, Rajan, and Stein, 2005.

- In contrast to the vast literature on the specialness and importance of banks in serving firms, there is a void in the literature on the abilities of banks of different sizes in serving **households**.
- We take on this challenge with the first study on the comparative advantages of small and large banks in improving household welfare.
 - We analyze household survey responses about personal and national economic and financial conditions, which we summarize as **household financial sentiment**.
 - We analyze the comparative advantages of large and small banks in boosting this sentiment.

- We argue that the effects of banks on household sentiment is economically consequential and just as important to study as the specialness of banks in serving firms.
 - Consumer spending accounts for about 70% of U.S. Gross Domestic Product (GDP), so household financial sentiment has important macroeconomic implications.
 - E.g., Batchelor and Dua, 1998.
 - Many small businesses also rely on owners, family, and friends for critical funding, so poor household sentiment may also adversely impact financially constrained small businesses.
 - E.g., Berger and Udell, 1998.
 - Public confidence in the financial system stems largely from how effectively banks and other intermediaries provide households with access to safe, secure, and affordable financial services.
 - FDIC, 2015.

Motivation (cont.)

- We measure household financial sentiment using individual household responses to the University of Michigan Surveys of Consumers from 2000-2014.
 - The households are asked about their personal finances, outlooks for the economy, and perspectives on buying conditions for durables.
 - Their answers are analyzed in different combinations to capture the households' financial sentiment.
- The survey responses are matched with information on banks in the households' counties from Call Reports and Summary of Deposits, as well as information about their counties.
- We test whether small versus large banks are better able to boost households' financial sentiment, controlling for other bank, time, and county characteristics.

- We extend the bank specialness literature by analyzing the extent to which banks of different sizes are best able to serve households by improving household financial sentiment.
- We are also the first to match the household-level responses to the Michigan Surveys with financial market data.
- We are among the first to explore determinants of the individual survey responses.
 - Most research using the Michigan data employs responses aggregated to the national level as macroeconomic explanatory variables.
 - In contrast, we use responses at the household level as dependent variables and employ county-level banking data to form the key independent variable.
- We add to the findings on the real economic effects of banking.

Bank Specialness

- Campbell and Kracaw, 1980; Diamond, 1984; Fama, 1985; James, 1987; Billett, Flannery, and Garfinkel, 2006; Maskara and Mullineaux, 2011; Li and Ongena, 2015; Saheruddin, 2017; Berger, Zhang, and Zhao, 2019.

Comparative Advantages/Disadvantages of Small Banks versus Large Banks

- **Small Bank Comparative Advantages (Relationship Lending and Trust):** e.g., Petersen and Rajan, 1994; Berger and Udell, 1995; Berlin and Mester, 1999; Haynes, Ou, and Berney, 1999; Boot and Thakor, 2000; Berger and Udell, 2002; Stein, 2002; Cole, Goldberg, and White, 2004; Scott, 2004; Berger, Miller, Petersen, Rajan, and Stein, 2005; Liberti and Mian, 2009; Canales and Nanda, 2012; Berger, Cerqueiro, and Penas, 2015; Kysucky and Norden, 2016; Berger, Bouwman, and Kim, 2017.
- **Large Bank Comparative Advantages (Economies of Scale and Safety):** e.g., Hunter and Timme, 1986, 1991; Berger, Hanweck, and Humphrey, 1987; O'Hara and Shaw, 1990; Hunter, Timme, and Yang, 1990; Noulas, Ray, and Miller, 1990; Berger and Humphrey, 1991; Bauer, Berger, and Humphrey, 1993; McAllister and McManus, 1993; Mitchell and Onvural, 1996; Berger and Mester, 1997; Martinez-Peria and Schmukler, 2001; Stroh and Rumble, 2006; Laeven and Levine, 2007; Deng and Elyasiani, 2008; LePetit, Nys, Rous, and Tarazi, 2008; Feng and Serlitis, 2010; Iyer and Puri, 2012; Wheelock and Wilson, 2012, 2016; Dijkstra, 2013; Iyer, Puri, and Ryan, 2013; Osili and Paulson, 2014; Hughes and Mester, 2013, 2015; Gandhi and Lustig, 2015; Oliveira, Schiozer, and Barros, 2015; Brown, Guin and Morkoetter, 2016; Goetz, Laeven, and Levine, 2016; Berger, El Ghouli, Guedhami, and Roman, 2018.

Household Sentiment and Surveys of Consumers

- **Surveys of Consumers:** Gaski and Etzel, 1986; Batchelor and Dua, 1998; Souleles, 2004; Lemmon and Portniaguina, 2006; Toussaint-Comeau and McGranaham, 2006; Lahiri and Zhao, 2016.

Real Economic Effects of the Banking Industry

- **Banking Industry Regulation, Deregulation, and Structure:** Jayaratne and Strahan, 1996; Allen, 2004; Morgan, Rime, and Strahan, 2004; Demyanyk, 2008; Huang, 2008; Levine, Levkov, and Rubinstein, 2008; Beck, Levine, and Levkov, 2010; Duchin and Sosyura, 2014; ; Gilje, Loutskina, and Strahan, 2016 Berger, Bouwman, and Kim, 2017; Berger and Roman, 2017.

- Based on the small business finance research, it might be expected that small banks would have comparative advantages over large banks in improving household financial sentiment.
 - Small banks may be better able to use relationships to boost household financial sentiment, similar to their relationships with small businesses (*Relationship Channel*).
 - Households may trust small banks more than large banks based on other survey data from U. Chicago/Northwestern U. (*Trust Channel*).

Hypothesis H1: Small banks have comparative advantages over large banks in improving household financial sentiment.

- It is alternatively possible that large banks have comparative advantages in dealing with households.
 - Large banks may have economies of scale that allow them to offer superior deposit and loan rates (*Economies of Scale Channel*).
 - Large banks may also be perceived as safer, relieving household concerns about continuity of services (*Safety Channel*).

Hypothesis H2: Large banks have comparative advantages relative to small banks in improving household financial sentiment.

- Our empirical analysis addresses which of the two hypotheses empirically dominates the other overall.
- We also examine which hypothesis dominates for different demographic categories of age, education, gender, home ownership, and income.
- We also test whether these comparative advantages/disadvantages differ by banking markets and national economic conditions.
- After establishing which hypothesis dominates, we investigate which of the underlying channels appear to be operational.

- Our key endogenous variables measuring household financial constraints and demographics are collected monthly from the University of Michigan Surveys of Consumers from 2000:M1 to 2014:M12.
- We obtain commercial bank balance sheet and income data from quarterly Call Reports from 2000:Q1 to 2014:Q4.
- We convert these data to the county level of the survey respondents based on the FDIC's Summary of Deposits (SoD) database (the counties are anonymized to protect respondent identities).
- We collect county-level characteristics from the U.S. Census Bureau.
- We have 61,320 respondent-county-quarter observations from 2000:Q1 to 2014:Q4.
- We also collect deposit and loan rates from RateWatch, deposit and loan quantities from Call Reports, and mortgage loan application outcomes from HMDA for the channels analyses.

- Our main dependent variable is the *Index of Consumer Sentiment (ICS)*, which combines answers to the following five survey questions about personal finances, outlooks for the economy, and perspectives on buying conditions for durables.
 - **Q1:** "We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?" (*PAGO*)
 - **Q2:** "Now looking ahead – do you think that a year from now you (and your family living there) will be better off financially, or worse off, or just about the same as now?" (*PEXP*)
 - **Q3:** "Now turning to business conditions in the country as a whole – do you think that during the next twelve months we'll have good times financially, or bad times, or what?" (*BUS12*)
 - **Q4:** "Looking ahead, which would you say is more likely – that in the country as a whole we'll have continuous good times during the next five years or so, or that we will have periods of widespread unemployment or depression, or what?" (*BUS5*)
 - **Q5:** "About the big things people buy for their homes – such as furniture, a refrigerator, stove, television, and things like that. Generally speaking, do you think now is a good or bad time for people to buy major household items?" (*DUR*)

- For each survey question, a positive, neutral, or negative answer is recorded, and their relative scores ($X_1 \dots X_5$) are coded as 200, 100, and 0, respectively.
- The *ICS* for each household in a given month is calculated by summing the five relative scores, dividing by the 1966 base period total of 6.7558, and adding a constant of 2.0 to correct for sample design changes from the 1950s.

$$ICS = \frac{X_1 + X_2 + X_3 + X_4 + X_5}{6.7558} + 2.0.$$

- Higher values of *ICS* represent more positive household financial sentiment.

- As a robustness check, we alternatively use the *Index of Consumer Expectations (ICE)*, constructed from the responses to three rather than five survey questions.
- We also use the responses to the five questions individually.
- In the interest of brevity, these are not discussed today.

- Our main independent variable is *Small Bank Share*, the share of small bank branches in the county of the respondent.
 - We use branches rather than deposits to compute *Small Bank Share* because branches better represent bank supply, while deposits more reflect customer demand.
 - Using *Small Bank Share* instead of the actual bank serving the client is also used in the small business lending literature when the banks and clients cannot be directly matched.
 - E.g., Berger, Goulding, and Rice (2014), Berger, Cerqueiro, and Penas (2015), Berger, Bouwman, and Kim (2017).
- We define small banks as those with gross total assets (GTA) below \$1 billion in real 2014:Q4 dollars, which corresponds to the usual research definition of “community banks” (e.g., DeYoung, Hunter, and Udell, 2004).
 - We also use alternative cutoffs of \$3 billion, \$5 billion, and \$10 billion, and all of the results continue to hold.

- We estimate models of the following form:

$$\begin{aligned} \text{Household Financial Sentiment}_{j,i,t} = & \beta \times \text{Small Bank Share}_{i,t-4} + \gamma \times \text{Respondent Characteristics}_{j,t} \\ & + \delta \times (\text{Small Bank Share}_{i,t-4} \times \text{Respondent Characteristics}_{j,t}) \\ & + \theta \times \text{Controls}_{i,t-4} + \mu_t + \nu_i + \varepsilon_{i,t}. \end{aligned}$$

- The main measure of *Household Financial Sentiment*_{*i,t*} is ICS.
- The coefficients on *Small Bank Share*_{*i,t*} and *Small Bank Share*_{*i,t*} × *Respondent Characteristics*_{*j,t*} capture the comparative advantages/disadvantages of small banks in improving household financial sentiment for various demographic groups.
- Positive coefficients would suggest small bank comparative advantages, and negative coefficients would suggest large bank comparative advantages.
- Bank and county characteristics include:
 - Proxies for bank CAMELS examination ratings – Capital Adequacy, Asset Quality, Management Quality, Earnings, Liquidity, and Sensitivity To Market Risk.
 - Other characteristics – Bank Age, BHC Indicator, Foreign Ownership, Fee Income, Deposits Ratio, Herfindahl-Hirschman Index, Metro.

$$\begin{aligned} \text{Household Financial Sentiment}_{j,i,t} = & \beta \times \text{Small Bank Share}_{i,t-4} + \gamma \times \text{Respondent Characteristics}_{j,t} \\ & + \delta \times (\text{Small Bank Share}_{i,t-4} \times \text{Respondent Characteristics}_{j,t}) \\ & + \theta \times \text{Controls}_{i,t-4} + \mu_t + \nu_i + \varepsilon_{i,t}. \end{aligned}$$

- All regressions include year-quarter dummies μ_t (one for every date) and county-fixed effects ν_i .
 - These are very strong controls – control for constant differences across time and counties, so that our key coefficients include only the effects of small bank share differences from what they would otherwise be predicted to be for that time period and county.
- Heteroscedasticity-robust standard errors are clustered at the county-level.

Main Regression Results

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	<i>Index of Consumer Sentiment (ICS)</i>						
Independent Variables							
<i>Small Bank Share</i>	-9.594*** (-2.666)	-10.294*** (-2.819)	-11.322*** (-3.054)	-8.460** (-2.220)	-14.099*** (-3.478)	-9.840*** (-2.730)	-15.082*** (-3.497)
Interactions with Respondent Characteristics							
<i>Small Bank Share</i> × Senior		3.016 (1.272)					2.305 (0.961)
<i>Small Bank Share</i> × Male			3.773* (1.857)				3.912* (1.934)
<i>Small Bank Share</i> × College				-2.437 (-1.151)			-2.822 (-1.269)
<i>Small Bank Share</i> × Homeowner					5.877** (2.373)		6.068** (2.320)
<i>Small Bank Share</i> × High Income						0.449 (0.222)	-0.322 (-0.142)
Respondent Characteristics	YES	YES	YES	YES	YES	YES	YES
Bank & County Characteristics	YES	YES	YES	YES	YES	YES	YES
Year-Quarter FE	YES	YES	YES	YES	YES	YES	YES
County FE	YES	YES	YES	YES	YES	YES	YES
Clusters by County	YES	YES	YES	YES	YES	YES	YES
Observations	61,320	61,320	61,320	61,320	61,320	61,320	61,320
Adjusted R-squared	0.128	0.128	0.128	0.128	0.128	0.128	0.128

- The negative, statistically significant coefficients on *Small Bank Share* suggest that **large banks** have comparative advantages in boosting household sentiment.
 - **Hypothesis H2** empirically dominates **Hypothesis H1** for all demographic groups.
 - Results are also economically significant. In full specification (7), moving *Small Bank Share* from zero to 100 percent with all respondent characteristics set to zero, decreases ICS by a predicted 15.082 (relative to the mean of 83.321).
 - I.e., households are about 20% happier when surrounded by large banks than small banks.

- There is a potential endogeneity problem.
 - Large banks may avoid entering counties with poor economic outlooks, increasing *Small Bank Share*, causing a spurious negative relation between *ICS* and *Small Bank Share*.
- To mitigate such potential bias, we employ two instrumental variable (IV) approaches.
 - First, we use *Church / Population*, the number of churches over population (in 1000s) in the county in 1980 as the instrument for *Small Bank Share*.
 - Small bank owners may be less likely to sell their banks to larger banks in counties with high *Church / Population* due to stronger community ties (e.g., Karlan, 2005).
 - Second, we follow Williams (2018) and use data on *Divested Deposits to Small Banks*, the deposits in the branches that are forced to be divested by merging banks that go to small banks in the market.
 - The extra deposits may help small banks become larger and decrease *Small Bank Share*.

Instrumental Variable (IV) Analysis (cont.)

2nd Stage Regression Results Compared to OLS

Model	OLS	IV 2nd Stage	IV 2nd Stage
		Instrument = <i>Church/Population</i>	Instrument = <i>Divested Deposits to Small Banks</i>
Dependent Variable	(1) <i>Index of Consumer Sentiment (ICS)</i>	(2) <i>Index of Consumer Sentiment (ICS)</i>	(3) <i>Index of Consumer Sentiment (ICS)</i>
Independent Variables			
<i>Small Bank Share</i>	-12.473*** (-4.502)	-44.489*** (-4.080)	-100.136*** (-2.929)
<i>Small Bank Share × Senior</i>	2.017 (0.870)	1.154 (0.135)	19.972 (1.430)
<i>Small Bank Share × Male</i>	3.949** (2.034)	29.223*** (3.228)	32.867** (2.395)
<i>Small Bank Share × College</i>	-2.021 (-0.963)	9.913 (1.253)	13.968 (0.565)
<i>Small Bank Share × Homeowner</i>	6.279*** (2.584)	4.281 (0.395)	1.322 (0.088)
<i>Small Bank Share × High Income</i>	-0.898 (-0.424)	7.219 (0.909)	11.323 (1.285)
Respondent Characteristics	YES	YES	YES
Bank & County Characteristics	YES	YES	YES
State FE	YES	YES	NO
County FE	NO	NO	YES
Year-Quarter FE	YES	YES	YES
Clusters by County	YES	YES	YES
Observations	61,320	61,316	61,320
Adjusted R-squared	0.128	0.123	0.825

- We use State FEs instead of County FEs because Church/Pop does not vary by county, and also show the OLS this way.
- Our main results hold up in our IV analyses.
 - However, the IV coefficients are much larger than the OLS coefficient, a common finding in the literature.

Alternative *Small Bank Share*

	(1)	(2)	(3)	(4)
	Small Bank Share			
GTA Cutoff (\$):	\$1Bn	\$3Bn	\$5Bn	\$10Bn
Dependent Variable:	<i>Index of Consumer Sentiment (ICS)</i>			
Independent Variables				
<i>Small Bank Share</i>	-15.082***	-13.917***	-12.351***	-16.591***
	(-3.497)	(-3.550)	(-3.219)	(-4.349)
Interactions with Respondent Characteristics				
<i>Small Bank Share</i> × <i>Senior</i>	2.305	3.525	2.635	2.190
	(0.961)	(1.572)	(1.201)	(1.046)
<i>Small Bank Share</i> × <i>Male</i>	3.912*	3.370*	2.821	2.761
	(1.934)	(1.690)	(1.411)	(1.451)
<i>Small Bank Share</i> × <i>College</i>	-2.822	-2.775	-3.180	-1.458
	(-1.269)	(-1.287)	(-1.483)	(-0.707)
<i>Small Bank Share</i> × <i>Homeowner</i>	6.068**	5.907**	5.713**	6.126***
	(2.320)	(2.410)	(2.417)	(2.649)
<i>Small Bank Share</i> × <i>High Income</i>	-0.322	-0.734	-0.686	-1.252
	(-0.142)	(-0.340)	(-0.322)	(-0.598)
Respondent Characteristics	YES	YES	YES	YES
Bank & County Characteristics	YES	YES	YES	YES
Year-Quarter FE	YES	YES	YES	YES
County FE	YES	YES	YES	YES
Clusters by County	YES	YES	YES	YES
Observations	61,320	61,320	61,320	61,320
Adjusted R-squared	0.128	0.128	0.128	0.128

- We redefine *Small Bank Share* using alternative cutoffs of \$3 billion, \$5 billion, and \$10 billion in GTA instead of \$1 billion in our main analysis, replicated in column (1).
- Results continue to show that large banks have comparative advantages in improving households' financial sentiment.

- We also calculate proxies for access to small and large banks in a county, *Small Bank Access* and *Large Bank Access*.
 - These are calculated as the ratios of small and large bank branches over the county's total population (in 1000s).
 - These measure **absolute advantages** of small and large banks in boosting household financial sentiment.
 - Small banks may be associated with negative household sentiment while large banks may be associated with positive sentiment, or large banks may have less negative effects or more positive effects than small banks.

Small Bank Access and Large Bank Access

Test:	(1)	(2)	(3)	(4)
GTA Cutoff (\$):	\$1Bn	\$3Bn	\$5Bn	\$10Bn
Dependent Variable:	<i>Index of Consumer Sentiment (ICS)</i>			
Independent Variables				
Small Bank Access	-29.598*	-24.603*	-22.943*	-29.517**
	(-1.957)	(-1.763)	(-1.649)	(-2.164)
<i>Small Bank Access × Senior</i>	8.394	9.883*	9.019*	9.400*
	(1.453)	(1.847)	(1.721)	(1.829)
<i>Small Bank Access × Male</i>	10.751**	9.135**	8.094*	7.498*
	(2.263)	(1.997)	(1.799)	(1.722)
<i>Small Bank Access × College</i>	10.507**	11.271**	11.316**	13.369***
	(1.983)	(2.254)	(2.307)	(2.785)
<i>Small Bank Access × Homeowner</i>	1.616	1.321	0.418	0.238
	(0.255)	(0.227)	(0.074)	(0.043)
<i>Small Bank Access × High Income</i>	2.458	1.936	2.255	2.231
	(0.490)	(0.414)	(0.497)	(0.503)
Large Bank Access	10.211	12.581	11.062	19.501
	(0.618)	(0.730)	(0.641)	(1.136)
<i>Large Bank Access × Senior</i>	13.172**	11.537	13.859*	13.832*
	(1.967)	(1.590)	(1.875)	(1.853)
<i>Large Bank Access × Male</i>	-3.128	-3.802	-2.750	-2.710
	(-0.571)	(-0.662)	(-0.469)	(-0.450)
<i>Large Bank Access × College</i>	22.635***	24.332***	25.832***	21.832***
	(3.842)	(3.801)	(3.926)	(3.276)
<i>Large Bank Access × Homeowner</i>	-18.506**	-22.401***	-23.248***	-26.054***
	(-2.474)	(-2.811)	(-2.868)	(-3.178)
<i>Large Bank Access × High Income</i>	6.374	8.521	8.790	10.018
	(1.073)	(1.308)	(1.296)	(1.425)
Respondent Characteristics	YES	YES	YES	YES
Bank & County Characteristics	YES	YES	YES	YES
Year-Quarter FE	YES	YES	YES	YES
County FE	YES	YES	YES	YES
Clusters by County	YES	YES	YES	YES
Observations	61,320	61,320	61,320	61,320
Adjusted R-squared	0.128	0.128	0.128	0.128

- We replace *Small Bank Share* with *Small Bank Access* and *Large Bank Access* to measure the absolute abilities of small and large banks to improve household financial sentiment.
- Most of the comparative advantages for large banks are due to negative effects of small banks, with some positive effects for large banks, especially for college graduates.

- Results are robust to several other robustness tests:
 - Hold for alternative proxies for household financial constraints.
 - Hold for alternative control variables
 - Hold for alternative estimation methods.
 - Hold for subsamples of counties with different banking market characteristics:
 - High and low market concentration (HHI), number of bank branches, number of young bank branches, and degree of regulation at the state level.
 - Hold for subsamples of time periods with different national economic conditions:
 - Financial crises and normal times, high and low unemployment growth, high and low GDP growth, high and low economic policy uncertainty (EPU), and high and low monetary policy uncertainty concentration.

- The empirical analysis clearly favors **Hypothesis H2** – large banks rather than small banks have comparative advantages in improving household financial sentiment.
- We next try to determine which one or both of the two potential channels underlying this hypothesis – the *Economies of Scale Channel* and/or the *Safety Channel* – are consistent with some additional data on:
 - Bank deposit rates and quantities.
 - Bank loan and loan commitment rates.
 - Bank household mortgage loan application approvals, quantities, and spreads.
- The data for the tests use RateWatch, Call Reports, and HMDA data.
 - The data are from individual small and large banks, so the analyses are at the bank level, rather than the county level.

Group:	Small Banks		Large Banks		Difference in Means (Large-Small)	
	(1) N	(2) Mean	(3) N	(4) Mean	(5) Difference	(6) t-Stat
100K Deposits						
03MCD100K	117,368	0.8405	147,319	1.0170	0.1765***	35.2
06MCD100K	131,979	1.1025	181,450	1.1529	0.0504***	10.2
12MCD100K	133,964	1.3650	186,114	1.3857	0.0207***	4.0
24MCD100K	113,860	1.4060	157,762	1.3574	-0.0486***	-10.4
36MCD100K	98,619	1.5033	136,795	1.4290	-0.0741***	-16.6
48MCD100K	81,478	1.6379	116,458	1.5388	-0.0991***	-21.9
60MCD100K	82,120	1.8850	121,472	1.8257	-0.0593***	-12.7
SAV100K	71,442	0.2131	108,317	0.1800	-0.0331***	-30.5
250K Deposits						
03MCD250K	65,420	0.2380	79,011	0.1896	-0.0484***	-55.0
06MCD250K	72,195	0.3636	103,503	0.3047	-0.0588***	-51.9
12MCD250K	72,489	0.5419	104,931	0.4527	-0.0892***	-64.6
24MCD250K	69,051	0.7862	99,742	0.6713	-0.1149***	-68.2
36MCD250K	64,869	1.0170	93,337	0.8750	-0.1419***	-70.3
48MCD250K	55,320	1.2127	80,988	1.0534	-0.1592***	-65.7
60MCD250K	55,206	1.4332	82,571	1.2898	-0.1434***	-53.4

Group:	Small Banks		Large Banks		Difference in Means (Large-Small)	
	(1) N	(2) Mean	(3) N	(4) Mean	(5) Difference	(6) t-Stat
Insured Deposits/ GTA	431,993	0.6373	34,029	0.4779	-0.1594***	-97.9
Uninsured Deposits / GTA	431,993	0.3184	34,029	0.3616	0.0432***	29.4

- Large banks pay statistically significantly better rates on relatively safe deposits (short-term \$100K CDs), consistent with the *Economies of Scale Channel*.
- Small banks pay statistically significantly better rates on relatively risky deposits (long-term \$100K and all \$250K), presumably to make up for their greater risk, supporting the *Safety Channel*.
- Customers put relatively more of their uninsured deposits in large banks, supporting the *Safety Channel*.

Variable	Small Banks		Large Banks		Difference in Means (Large-Small)	
	(1) N	(2) Mean	(3) N	(4) Mean	(5) Difference	(6) <i>t</i> -Stat
Mortgages						
1 Year ARM @ 175K - Rate	17,464	5.7430	39,053	5.2927	-0.4503***	-31.2
3 Year ARM @ 175K - Rate	20,069	5.9506	46,053	5.2891	-0.6615***	-51.0
5 Year ARM @ 175K - Rate	17,304	6.0738	48,334	5.2438	-0.8301***	-60.7
15 Yr Fxd Mtg @ 175K - Rate	37,941	5.6743	97,794	5.3298	-0.3445***	-36.8
30 Yr Fxd Mtg @ 175K - Rate	27,562	5.8727	85,392	5.8119	-0.0608***	-6.5
Credit Cards						
Credit Cards - Annual Fee	4,922	6.6522	26,892	3.5051	-3.1471***	-16.8
Credit Cards - Cash Adv Fee	8,061	2.7212	47,654	2.4210	-0.3001***	-10.6
Credit Cards - Intro Rate	3,348	1.8031	22,053	1.5556	-0.2476***	-4.9
Credit Cards - MasterCard	4,329	13.0926	22,610	12.5937	-0.4990***	-7.3
Credit Cards - Visa	8,219	12.7194	53,821	12.3491	-0.3703***	-9.8
Credit Cards - Gold	4,803	12.1544	30,880	11.2691	-0.8853***	-17.8
Credit Cards - Platinum	3,671	10.1306	36,566	9.6647	-0.4658***	-12.5
Home Equity Loans						
H.E. Loan Up to 80% LTV @ 20K - 60 Mo Term	61,860	6.8602	159,965	6.6153	-0.2449***	-27.4
H.E. Loan Up to 80% LTV @ 20K - 120 Mo Term	35,653	6.5079	143,275	6.8697	0.3618***	22.7
H.E. Loan Up to 80% LTV @ 20K - 180 Mo Term	19,427	7.2371	114,179	7.2596	0.0225***	1.3
H.E. Loan 81-90% LTV @ 20K - 60 Mo Term	31,461	7.0865	102,164	7.1914	0.1049***	7.9
H.E. Loan 81-90% LTV @ 20K - 120 Mo Term	17,645	6.5543	91,083	7.4409	0.8866***	35.5
H.E. Loan 81-90% LTV @ 20K - 180 Mo Term	9,202	7.1281	72,243	7.8175	0.6894***	16.8
H.E. Loan 91-100% LTV @ 20K - 120 Mo Term	5,483	6.3536	50,961	8.3069	1.9532***	33.8
H.E. Loan 91-100% LTV @ 20K - 180 Mo Term	3,216	6.7420	41,128	8.6531	1.9111***	20.6

- The loan and loan commitment rates suggest that:
 - Large banks give statistically significantly better rates on most loans (mortgages, credit cards, safe, short-term home equity lines), consistent with the *Economies of Scale Channel*.
 - Small banks give statistically significantly better rates on relatively risky loan commitments (long-term and riskier home equity lines), presumably to make up for their greater risk, supporting the *Safety Channel*.

Channels Analysis (cont.): Mortgage Approvals, Amounts, Spreads (HMDA)

Motivation & Hypotheses
Empirical Work
Conclusions

Dependent Variable:	(1) <i>Approved Application</i>	(2) <i>Ln (Loan amount)</i>	(3) <i>Loan Spread</i>
Independent Variables			
<i>Small Bank</i>	-0.028*** (-11.365)	-0.253*** (-17.154)	0.184*** (7.281)
Bank Characteristics	YES	YES	YES
Borrower Characteristics	YES	YES	YES
Year FE	YES	YES	YES
County FE	YES	YES	YES
Clusters by County	YES	YES	YES
Observations	23,514,180	19,718,830	1,598,689
Adjusted R-squared	0.030	0.164	0.263

- Small banks reject more mortgage applications, and give lower loan amounts and charge higher spreads when they do approve.
- These results support the *Economies of Scale Channel*, in which large banks rather than small banks are more efficient in providing residential mortgage services to households.

- We provide statistically and economically significant evidence that large banks have comparative advantages over small banks in improving household financial sentiment.
 - Results apply across all demographic groups, market types, and time periods.
 - Results are robust to many different measurements and econometric methods.
- Both of the hypothesized channels through which large banks may have comparative advantages – the *Economies of Scale Channel* and the *Safety Channel* – appear to be operative.
- These findings may be surprising in that they appear to conflict with results in the literature that small banks have comparative advantages in dealing with small businesses.
 - The difference likely stems from emphases on different banking features:
 - Small businesses may tend to favor small banks for better relationships and/or trust.
 - Households may tend to favor large banks for better prices (from economies of scale) and safety.

- We contribute to the research literatures on:
 - Bank specialness.
 - Comparative advantages of small and large banks.
 - Household sentiment and the Michigan Surveys.
 - Real economic effects of banks.
- Results suggest for the first time that large banks have special abilities to improve household sentiment.
 - This may benefit the real economy through increased consumer spending and may also support some small businesses.

- Regulators may take into account the previously unknown social benefits of large banks for households and, by extension the real economy, when they consider policies that affect bank consolidation and *Small Bank Share*:
 - State and national restrictions on bank mergers and size.
 - E.g., Riegle-Neal 10% cap on national deposits that can be acquired through bank M&As.
 - Post-crisis regulations that become effective at certain size thresholds, potentially deterring M&As that create large banks.
 - We acknowledge the potential negative effects of reducing *Small Bank Share* in terms of reduced small business credit availability.
- Regulators may consider reducing compliance costs on both small and large banks.
 - Some costs are relatively fixed, so small banks that cannot spread them over many assets, possibly making these banks less efficient at serving households.
 - We acknowledge the potential costs of this in terms of greater risk in the banking system.