Banks' Image: Evidence from Financial Advertising*

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Abstract

How do banks strategically craft their image to highlight strengths and maximize value? This paper examines financial advertising using over a decade of TV commercial video data. We categorize persuasive elements into four types: pricing advantages, service quality, trust-building, and emotional appeal. Banks with strong local market shares emphasize service and inspiration, while productive banks focus on pricing. High-rate banks target rate-sensitive depositors, whereas low-rate banks highlight trust and emotion. Banks also tailor ads to local demographics, increasing minority representation in targeted areas. Using a border discontinuity design, we show that advertising intensity and style strongly impact deposit quantities, spreads, and loan origination. Higher advertising expenses correlate with higher deposit spreads, while different persuasive elements affect demand for various financial products. These findings reveal how advertising aligns with operational strengths, market positions, and demographics to boost franchise value and competitiveness.

*Usual disclaimers apply. All errors are our own. The conclusions drawn from the Nielsen data are those of the researchers and do not reflect the views of Nielsen. Nielsen is not responsible for, had no role in, and was not involved in analyzing and preparing the results reported herein.

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1. Introduction

A major development in our understanding of financial intermediaries in the recent decade is the rich heterogeneities across these institutions in their market share, asset holdings, business operations, productivity, and among others. These heterogeneities are key features that robustly connect to the operations and competition of financial intermediaries, and the economy as a whole (Egan, Hortaçsu and Matvos, 2017; Drechsler, Savov and Schnabl, 2017; Egan, Lewellen and Sunderam, 2022; d'Avernas et al., 2023). However, in order for financial intermediaries to maintain heterogeneity in equilibrium as a way to enhance value, they need to engage in strategic communication with their customers. This is particularly crucial for financial intermediaries since their products are often perceived as largely homogeneous. How do banks communicate with their customers, and what can we learn from these activities?

In this paper, we systematically analyze financial advertising using data on TV advertising coverage and content for more than a decade. There are two motivations behind our analysis. First, advertising is an important operational decision for financial intermediaries. Banks, on average, allocate 9.5% of their annual budget to advertising efforts based on surveys on CMOs. In addition, financial advertising strongly correlates with deposit quantity, deposit spread, and loan origination, along with many other important dimensions of banks studied in the literature, such as productivity, funding stability, market power, and transmission of monetary policy. Second, a key novelty we bring to the literature is to provide evidence on how banks actively communicate with consumers about how they differ from other banks, and how these strategic communications connect to the heterogeneities documented using the ex-post differences among many dimensions in banks. This is an important perspective to complement the interpretations that banks intentionally differentiate themselves on financial markets.

Our analysis uses a unique dataset of financial advertisements from Nielsen Ad Intel, which contains information on advertisements aired on national and local TV from 2003 to 2019. We use two parts of the data: the advertising creatives (video clips) and the airtime schedules. The creatives data contain 46,718 video clips of advertisements, which we use to extract the content of the advertisements. This dataset also identifies the advertising institu-

tion. The schedule data contain the airtime schedules of each advertisement creative, which we use to capture the specific advertising strategies of financial institutions, particularly the geographic targeting of advertisements across different designated marketing areas (DMAs).

We merge this advertising data with a comprehensive set of financial intermediaries data, including bank balance sheet data from U.S. Call Reports, branch-level deposit data from the Federal Deposit Insurance Corporation's (FDIC) Summary of Deposits (SOD) data, mortgage data from the Home Mortgage Disclosure Act (HMDA) data, and small business lending data from the Community Reinvestment Act (CRA) dataset and the Small Business Administration (SBA) dataset. These data are used to construct a broad set of characteristics of financial intermediaries and their business activities.

The persuasive elements in the advertisements are then quantified using textual data. For each advertisement video, we classify elements into four broad categories. The first category is pricing-related information, including interest rates, loan options, affordability, and special offers. The second category is service quality, including the application and approval process, customer service, and mobile and online applications. The third category relates to establishing trust with potential customers, including the discussion of financial responsibility, expert advice, and financial literacy. The fourth category is emotional appeal, including testimonials used to establish trust, lifestyle and aspirations such as homeownership advantages and successful small business stories. In addition, we also identify information that is extracted using visual and vocal elements of advertisements. We identify the facial attributes of the actors in the advertising video, including race, gender, and facial emotions.

We start by documenting key stylized facts to highlight the relevance and importance of financial advertising in the business operation of banks. First, we show that banks actively use advertising in their operations, with commercials having short life cycles and exhibiting significant geographic variation. Second, financial advertising is strongly tied to key components of bank balance sheets. Advertising strongly correlates with deposit growth, mortgage origination, and small business loan origination but shows no significant relationship with institution-related items such as wholesale funding, real estate, or commercial and industrial loans. Third, financial advertising shows strong correlations with important bank characteristics, such as deposit and asset productivity, funding stability, and market power. Banks

with higher advertising spend demonstrate higher deposit and asset productivity, stronger market power, and greater stability in retail deposit flows, while exhibiting no measurable impact on wholesale funding stability. Finally, advertising affects how banks respond to monetary policy. Banks with high advertising experience larger deposit outflows during Fed fund rate hikes but maintain higher overall deposit levels. Advertising also allows banks to charge higher deposit spreads when the Fed fund rate rises. Banks with higher advertising intensity contract their liabilities and loans more in response to rate hikes. These patterns are consistent with the notion of bank deposit channel and franchise value.

We then take a step further and decompose the information in each commercial video into several themes and styles. Banks' commercials exhibit significant diversity in their persuasive themes, with 38% on customer service and support, 31% on building trust via providing financial literacy information, 22% on highlighting cost advantages and value, and 9% on emotional appeals. Furthermore, banks also tailor their advertising styles for different types of financial products. Service quality dominates deposit advertising, while pricing and emotional appeals are more prominent in mortgage commercials. This diversity underscores the strategic differentiation in how banks design their advertisements to align with product-specific objectives and target audiences.

Our first set of analyses focuses on cross-sectional differences in advertising content across financial institutions. These analyses are organized around a central curiosity: is strategic advertising a concrete mechanism through which banks maintain their franchise value, attract customers, and compete with other financial institutions while maintaining their heterogeneous features? Our analysis thus is organized as revisiting the recent literature on bank heterogeneity, but from the perspective of financial advertisement.

Our findings reveal substantial heterogeneity in financial advertising strategies across banks with various important characteristics. First, banks with higher market shares prioritize service quality and life inspiration themes over pricing information, leveraging their established presence to attract broadly. This aligns with d'Avernas et al. (2023), who highlight the superior liquidity services but low deposit rates in the deposit business of large bank. On the other hand, high-productivity banks focus on pricing information, consistent with their advantageous rate-setting technologies and sophisticated pricing strategies (Egan,

Lewellen and Sunderam, 2022). Third, high-rate banks target rate-sensitive depositors by emphasizing competitive pricing information, while low-rate banks prioritize trust building and emotional appealing themes to retain loyal and sticky customers, reflecting the distinct behaviors of high- and low-rate banks documented in Zhang, Muir and Kundu (2024).

Additionally, banks with high service quality, measured by service charges, branch networks, and consumer complaints, highlight their value-added services and trust-building themes in their advertising, distinguishing themselves by targeting customers who value enhanced services and personalized banking experience (Jiang, Yu and Zhang, 2022; Zhang, Muir and Kundu, 2024). Lastly, we find that banks strategically adapt their advertising to reflect local demographic compositions, increasing minority representation in advertising targeted at communities with larger minority populations. These findings collectively underscore the strategic use of financial advertising by banks. By aligning their advertising messages with operation strengths, market positions, and customer demographics, banks effectively use advertising as a tool to build and sustain their franchise value and competitive edge in the financial market.

Our second part of the empirical analysis examines the causal relationship between bank advertising and consumer demand for financial products. We demonstrate that both advertising spending and styles significantly influence consumer demand for deposits, mortgages, and small business loans. To ensure robust and credible results, we employ two complementary empirical approaches: a within-county estimation strategy and a border discontinuity design. First, the within-county estimation strategy focuses on variations in advertising spending among banks operating within the same county. This strategy controls for county-year fixed effects to account for local economic opportunities and bank-county fixed effects to absorb differences in banks' baseline market presence. This setup allows us to isolate the impact of advertising on financial product demand within a controlled local environment.

To further address potential endogeneity concerns and identify the causal effects of advertising, we implement a border discontinuity design. This method leverages the natural geographic discontinuities at the borders of DMAs, where consumers on either side of a border share similar observable characteristics and product choices but are exposed to different levels of advertising due to DMA-specific targeting (Shapiro, 2018, 2020). By comparing the

performance of the same bank across counties separated by DMA borders, we are able to identify the causal effects of advertising on consumer demand.

Both approaches yield qualitatively and quantitatively consistent results, demonstrating that advertising significantly impacts financial product demand. For example, a one percent increase in deposit advertising spending corresponds to a 0.17-0.26 basis point increase in deposit growth rates. Similar positive effects are observed in mortgage origination, with a one percent increase in advertising leading to a 0.05-0.06 percent increase in the volume of mortgage origination.

Importantly, the style of advertising plays a crucial role—trust-building messages prove most effective for deposits, while service quality emphasis drives mortgage origination. Additionally, banks with higher advertising expenditures maintain higher deposit spreads on average, though this effect varies by advertising style—pricing-focused advertising is associated with contemporaneous decreases in deposit spread, while advertising emphasizing service quality and emotional appeals allow banks to retain depositors and charge higher spreads.

Consistent with our findings in motivating empirical evidence and bank heterogeneity, these empirical findings support the notion that financial institutions use advertising not only to attract customers but also to build their deposit franchise and strengthen market power. On top of this, by actively tailoring advertising styles to specific products and customer preferences, banks maximize the effectiveness of financial advertising, thereby reinforcing their competitive position and franchise value.

Our paper relates to several strands of literature. First, it contributes to the growing literature on understanding banks' evolving business models and the divergence of heterogeneous banks. A central focus in this literature is the distinction between large and small banks, which differ significantly in their funding structure (Brady and Bassett, 2002; Park and Pennacchi, 2008; Egan, Hortaçsu and Matvos, 2017) and business strategies (Berger et al., 2005; Cole, Goldberg and White, 2004; Haynes et al., 1999; d'Avernas et al., 2023). Other dimensions of heterogeneity include differences in deposit rates (Iyer, Kundu and Paltalidis, 2023; Zhang, Muir and Kundu, 2024), the likelihood of bank-run due to uninsured deposits (Egan, Hortaçsu and Matvos, 2017; Benmelech, Yang and Zator, 2023), capital

structure distinctions between traditional banks and shadow banks (Jiang et al., 2020), and variations in deposit and asset productivity (Egan, Lewellen and Sunderam, 2022). As highlighted in recent literature (Jiang, Yu and Zhang, 2022; Haendler, 2022; Koont, 2023; Zhang, Muir and Kundu, 2024), one key driver of the divergence in banking sector is technological advancement in banking, where high-rate banks compete on prices and hold shorter-term assets with higher credit risk by operating primarily online and attracting less sticky depositors, and in contrast, low-rate banks maintain physical branches and charge higher prices through the retention of relatively more sticky depositors. A key contribution of our paper to this literature is offering a novel perspective on understanding the heterogeneity of banks' characteristics through their advertising strategies. We provide evidence that banks actively communicate their distinct features to consumers and, importantly, we demonstrate that these strategic communications align with the heterogeneity observed in ex-post differences across various dimensions of banking.

Our paper also connects to the literature on how banks generate and sustain value over time. A key driver of bank value identified in the literature is the franchise value of deposit businesses (Chen et al., 2022; Egan, Lewellen and Sunderam, 2022; Drechsler et al., 2024), closely tied to banks' ability to attract and retain customers, maintain pricing power, and differentiate their services. The financial stability of the banking system depends on the relative value of bank assets and liabilities (Egan, Hortaçsu and Matvos, 2017; Minton, Stulz and Taboada, 2019; Ma and Scheinkman, 2020; Gelman, Goldstein and MacKinlay, 2023), making franchise value critical not only for individual institutions but also for systemic stability (Drechsler et al., 2024; Haddad, Hartman-Glaser and Muir, 2023; Jiang et al., 2024; Koont, Santos and Zingales, 2024). Additionally, franchise value plays a central role in the transmission of monetary policy and banks' exposure to interest rate risk (Drechsler, Savov and Schnabl, 2017, 2021) who emphasize the deposit market power channel as measured by deposit market concentration (HHI). Our paper contributes to this literature by providing a new dimension on the micro-foundations of bank franchise value, where advertising is an important tool through which banks can build and sustain their franchise value. We show how banks actively use advertising to communicate their unique characteristics—such as competitive pricing, superior service quality, and customer focus—to mitigate risks, strengthen

customer relationships, and reinforce market power, thereby contributing to their overall valuation and financial stability.

This paper relates to a growing literature studying advertising in financial markets, including studies on advertising mortgages (Gurun, Matvos and Seru, 2016; Grundl and Kim, 2019; Kim, Jiang and Thomadsen, 2023; Jiang and Kim, 2024), insurance (Shapiro, 2020), credit card (Bertrand et al., 2010), mutual funds (Roussanov, Ruan and Wei, 2021; Hastings, Hortaçsu and Syverson, 2017), and banking (Honka, Hortaçsu and Vitorino, 2017; Célérier and Tak, 2023; Mendes, 2024). This paper extends this body of work by offering the first deep look into advertising styles and themes in financial advertising, and by documenting how banks use advertising to actively and strategically highlight their unique characteristics. We also document how these advertising strategies shape consumer demand across various financial products offered by banks, including deposits, mortgages, and business loans.

2. Data and Sample Description

2.1. Data on Financial Advertising

We obtain advertising data from Nielsen's Ad Intel dataset. Nielsen Ad Intel includes individual advertising occurrences across the United States in 210 designated marketing areas (DMAs) for a variety of media types. We focus on advertisements occurring on national TV and local TV from 2003 to 2019. These data include two parts: (i) data on advertising creatives, sometimes also referred to as "impressions", in the form of video clips (the "*Creatives*" data); and (ii) advertisement airtime schedules that track the appearance of each creative on different channels, different geographic regions, and specific times (the "*Schedule*" data). While the schedule data have been recently used in the marketing literature (Shapiro, 2020, 2018; Argente et al., 2021), our paper is the first to use the creatives data in academic research.

The creatives data contain 46,718 video clips of advertisements, downloaded through Nielsen's Ad Intel platform by limiting to financial products (i.e., with a product code of B120 or B150). Each of the video clips is associated with a unique video ID, which allows us to track it in the schedules data. These creatives are also tagged by Nielsen, confirmed

by our manual checking, with their advertising financial institution, which we use to connect to information on financial institutions described below. We will process the advertisement video in Section 3.

The schedule data contain the airtime schedules of each advertisement creative. Most important to us are the air date and time, the duration and the spending of the advertisement, the channel/program on which the advertisement was aired, and the DMAs in which the advertisement was aired. These data are used to capture the specific advertising strategies of financial institutions, including the geographic targeting of advertisements.

[Insert Table 2 Here.]

In Table 2 Panel (a), we present the summary statistics of the advertising data. The data contain 46,718 unique advertisements from 2,250 unique financial institutions. The advertisements are aired in 210 unique DMAs. The average duration of the advertisements is 27 seconds, with a median of 30 seconds. The average air months of an advertisement creative is 13 months, the median of 4 months. The average number of advertisements aired in a DMA is 732 each year. Most of the advertisements are aired on local TV, with 97% of the advertisements aired on local TV and 19% on national TV. The average spending of an advertisement is $1,000, with a median of $500. The average number of airings of an advertisement is 1,000, with a median of 500. The average number of airings in a DMA is 1,000, with a median of 500. The average number of airings in a channel is 1,000, with a median of 500.

2.2. Data on Financial Intermediaries

We link the advertising data to a broad set of financial intermediaries data that are widely used in the literature. These data include the Federal Reserve's bank balance sheet data, the Federal Deposit Insurance Corporation's (FDIC) Summary of Deposits (SOD) data, the Home Mortgage Disclosure Act (HMDA) data, and small business lending data from the Community Reinvestment Act (CRA) dataset and the Small Business Administration (SBA) dataset.

We obtain bank balance sheet data from U.S. Call Reports provided by Wharton Research Data Services (WRDS). We use data from 1986 to 2021. The data contain quarterly information extracted from the income statements and balance sheets of all U.S. commercial banks and their bank holding companies. This bank-level information is then linked to branch-level deposit information from FDIC's SoD. The data cover the universe of U.S. bank branches at an annual frequency from 1993 to 2023. We augment these deposit data with retail deposit rates extracted from Ratewatch, which collects weekly branch-level deposit rates by product. The data cover 54% of all U.S. branches as of 2013. We also supplement the bank balance sheet data with the advertising expenses from Compustat for publicly listed U.S. bank holding companies, using the linkage file provided by the Federal Reserve Bank of New York.[1]

On the lending side, we obtain US mortgage market data using the Home Mortgage Disclosure Act (HMDA) data. The HMDA covers the near universe of U.S. mortgage applications, including both originated and rejected applications. The HMDA data are available from 1990 to 2021. The HMDA data contains detailed loan-level information on the borrower, the loan, the property, and the lender. We use the HMDA data to construct the mortgage outcomes, including the number of applications, the number of originations, the amount of originations, and the origination rate for each financial institution. It is worth noting that these financial institutions may be beyond the banking sector, including non-bank lenders and credit unions.

We also obtain small business lending data from the CRA dataset and the SBA dataset. Though these data are known to be imperfect, they have been widely used by finance research to study lending activities by banks. The CRA data contain information on business loans originated by banks, but are only available for loans with commitment amounts below $1 million originated by banks with more than $1 billion in assets. The SBA data contains information on small business loans guaranteed by the SBA. These data are used to construct the small business lending outcomes, including the number of applications, the number of originations, the amount of originations, and the origination rate for each financial

[1]We access the data as of March 2024 at https://www.newyorkfed.org/research/banking_research/crsp-frb, which contains PERMCO-RSSD links from June 30, 1986 to September 30, 2023.

institution.

These banking data are linked together through a combination of unique identifiers, including the Federal Reserve's RSSD ID, the FDIC's certificate number, and the HMDA's respondent ID. The data are then merged with the advertising data using the financial institution's name through a fuzzy-matching algorithm.

Table 2 Panel (b) presents the summary statistics of the financial intermediaries data. The data contain 26,280 unique financial institutions from 1986 to 2021, of which 13,751 are banks with available data on Call Reports. The data represent a bank holding company-year panel combining multiple datasets. Any unavailable data for any bank-year observation is recorded as missing. The average total assets of a bank, sourced from the U.S. Call Report, is 9,207 million dollars, with a median value of 498 million dollars. For the sample of publicly listed bank holding companies from Compustat, the average amount of advertising expenses is 18 million dollars, with a median value of 0.69 million. In comparison, the average amount of non-interest expense from the U.S. Call Report is 707 million dollars. Using the data from FDIC Summary of Deposits, banks have deposits of 1,080 million dollars, operate 13 branches, and exhibits an average deposit Herfindahl-Hirschman Index (HHI) of 0.22 on average. Additionally, the average amount of mortgage originations from HMDA and small business loans from CRA is 256 million dollars and 342 million dollars, respectively.

2.3. Motivating Evidence: Advertising in Financial Business Operations

Although there is emerging literature documenting the importance of financial advertising in theoretical, experimental, or product-specific settings (Mullainathan, Schwartzstein and Shleifer, 2008; Bertrand et al., 2010; Gurun, Matvos and Seru, 2016), skepticism remains about the importance of advertising in the financial sector. We first provide some stylized facts to show the importance of financial advertising in the banking sector.

Life Cycle and Geographic Coverage of Bank Advertising. Do banks actively use advertising in their business operations? To answer this question, we start by documenting the fact that bank commercials have relatively short life cycles, and banks use different commercials in different DMAs in Figure 1.

[Insert Figure 1 Here.]

Panel (a) of Figure 1 shows the distribution of tenure for each creative video. 49% of creative videos were only shown on TV for less than three months. The median and average tenure of financial commercials is four and twelve months, respectively. Such a pattern is robust for the sample of standard thirty-second commercials, both banks and non-banks, and different types of banks (such as banks with different sizes, deposit rates, and HHIs).

Panel (b) of Figure 1 illustrates the geographic coverage of bank advertising. The dark blue line indicates the annual average number of DMAs where banks run advertising. The light blue line shows the average number of DMAs each commercial covers. The dark blue line is persistently higher than the light blue line. Such a pattern highlights the fact that banks run different commercials in different regions.

Taken together, Figure 1 documents the stylized facts that banks constantly update the content of their TV commercials, with the median life cycle of a creative being four months; banks actively use different commercials in different markets.

Advertising and Bank Balance Sheet. In this section, we examine the relationship between financial advertising and components of bank balance sheets, from both liability and asset sides. Such an exercise highlights that financial advertising is not a sideshow or a product market decision that is isolated from banks' financial market decisions. Instead, financial advertising deeply connects with banks' key business, such as deposits and loans, as financial intermediaries.

We use a bank holding company(b)-quarter(t) panel, which is constructed by combining Compustat Bank Fundamentals Quarterly, quarterly U.S. Call Reports, HMDA, and CRA loan data sets. We estimate the specification below:

$$Y_{bt} = \beta \ln(\text{Ad})_{b,t-1} + \alpha_b + \eta_t + \epsilon_{bt}, \tag{1}$$

where Y_{bt} is the bank balance sheet components such as growth rates of total liabilities, deposits, wholesale funding, real estate loans, commercial and industrial loans, total assets, change in deposit spread, and amounts of mortgage and small business loan origination of

bank b at t; $\ln(\text{Ad})_{b,t-1}$ is lagged quarterly advertising expense by bank b at $t-1$; α_b are bank fixed effects and η_t are time fixed effects. We cluster standard errors at the bank level. We use a sample with non-missing and positive advertising expenses. Table 4 presents the results.

[Insert Table 4 Here.]

Panel (a) of Table 4 presents the results for bank liabilities such as deposits and wholesale funding. Column (1) indicates a significant positive relationship between bank advertising and the growth rate of total deposits. On average, a 1% increase in advertising is associated with a 0.02% additional growth rate in deposits. Conversely, there is no significant relationship between advertising and bank wholesale funding, as shown in Column (3). Such a null result is consistent with the fact that financial advertising is largely consumer-oriented, which targets retail depositors, while banks' wholesale funding comes from institutions such as other banks, whose decisions are not swayed by advertising. Column (2) shows an insignificant relationship between advertising and deposit spread. The deposit spread is the change in the Fed funds rate minus the change in the annualized deposit rate (computed as total domestic deposit expense divided by total domestic deposits) over a quarter. As we illustrate later, such a near-zero overall effect is driven by differential effects of different themes of advertising, where advertising on pricing leads to a decline in deposit spread, and advertising on service and emotional appeal leads to an increase in deposit spread.

Panel (b) of Table 4 shows the results for bank assets such as mortgage and small business loans. Similar to what we find in Panel (a), advertising has a strong positive association with the demand for retail-oriented financial products such as mortgages (column (1)) and small business loans (column (2)) but near-zero correlation with institutional products such as real estate loans (column (3)) commercial and industrial loans (column (4)). In terms of magnitude, a 1% increase in advertising is associated with 0.8% and 0.6% rises in the total dollar amount of mortgage and small business loan origination next quarter, respectively.

The results in Table 4 establish the relevance of financial advertising in banks' business operations. Financial advertising strongly correlates with key components of bank balance sheets, especially those related to consumer financial products.

Advertising, Bank Funding Stability, Productivity, and Market Power. In this section, we connect financial advertising to several important dimensions of bank characteristics studied in the literature. These include bank deposit and asset productivity (Egan, Lewellen and Sunderam, 2022), bank funding stability (Gelman, Goldstein and MacKinlay, 2023; Doerr, 2024), and bank market power and franchise value (Drechsler, Savov and Schnabl, 2017, 2021; Drechsler et al., 2024).

We use the same bank holding company (b)-quarter (t) panel and estimate the following specifications:

$$Y_{bt} = \beta \left(\frac{\text{Ad Expense}}{\text{Non-Interest Expense}} \right)_{b,t-1} + \gamma X_{b,t-1} + \eta_t + \epsilon_{bt}, \tag{2}$$

where Y_{bt} is bank characteristics such as productivity, funding stability, or market power of bank b at t; $\left(\frac{\text{Ad Expense}}{\text{Non-Interest Expense}} \right)_{b,t-1}$ is the advertising expense scaled by total non-interest expense; $X_{b,t-1}$ is a list of lagged bank controls, including the log of the bank's total assets, the bank's Z-Score (the bank's ROA plus its equity ratio divided by its standard deviation of ROA), the bank's ROA, the bank's equity to assets ratio, the bank's deposits to assets ratio and the bank's deposit and mortgage market concentration HHI, following Gelman, Goldstein and MacKinlay (2023) and Egan, Lewellen and Sunderam (2022); η_t are time fixed effects. We use a sample with non-missing and positive advertising expenses. Standard errors are clustered at the bank level using wild bootstrap. Such a specification exploits the cross-sectional variation of banks because some measures, such as the volatility of deposit growth rate across years, are cross-sectional by nature. Table 5 displays the results.

[Insert Table 5 Here.]

Columns (1) and (2) in Table 5 show that banks with higher advertising expenses have higher deposit and asset productivity, as measured in Egan, Lewellen and Sunderam (2022). Such a finding is consistent with both customer-based and technology-based explanations of dispersion in bank productivity. Banks actively use advertising to strengthen their market power, target customers with different demographics, build trust, and differentiate themselves from competitors.

Columns (3) and (4) show the relationship between bank advertising and funding stability. We use the volatility of the annual growth rates of deposits and wholesale funding as the banks' funding stability measures, following Gelman, Goldstein and MacKinlay (2023) and Doerr (2024). Such a bank-level volatility measure is calculated as the standard deviation of changes in logs within a bank over time. Column (3) indicates a strong negative correlation between advertising and deposit flow stability, which is consistent with the notion that banks use advertising to attract customers, increase deposit stickiness, and thus mitigate risks. Column (4) shows that there is no significant relationship between advertising and the stability of wholesale funding. This null result on stability echoes the null result in Table 4 on the level of wholesale funding—since banks' wholesale funding comes from institutions, one should expect there is no significant correlation between retail-oriented advertising and wholesale funding.

Columns (5) and (6) indicate that financial advertising is positively correlated with the bank deposit power market. Following Drechsler, Savov and Schnabl (2017) and Drechsler, Savov and Schnabl (2021), we use the deposit spread and the beta of interest expense to measure market power. The deposit spread is the difference between the Fed funds rate and the bank deposit rate, a "markup" that banks charge on deposits. The deposit rate is computed as quarterly total domestic deposit expense divided by quarterly total domestic deposits and then annualized (multiplied by four). Column (5) documents a significant positive relationship between advertising and deposit spread, namely banks with higher advertising expenses tend to have higher deposit spreads and therefore higher deposit market power. In terms of magnitude, a one percentage point increase in advertising expense is associated with an 8 bps increase in deposit spread, whose mean value is 46 bps. Our second measure of deposit market power is interest expense beta, which is the sensitivity of bank's interest expenses to changes in the Fed funds rate. The interest expense beta is calculated by regressing the change in its interest expense (divided by assets) on contemporaneous and lagged changes in the Fed funds rate and then summing the coefficients. Intuitively, a bank with high market power has a low interest expense beta, while a bank with low market power, such as one funded mostly by wholesale deposits, has a beta close to 1 and charges almost no spread (Drechsler, Savov and Schnabl, 2021). Column (6) documents an insignificant

relationship between advertising and interest expense beta. Such a pattern suggests that the variation in bank deposit market power can come from many other sources, such as branches, salaries, and technology, and cannot be fully explained by advertising alone.

To summarize, the empirical evidence suggests that financial advertising contributes to banks' franchise value as banks with higher advertising expenses tend to have higher deposit and asset productivity, higher funding stability, and higher deposit market power. Such findings suggest that advertisement is an important way through which banks invest in building a deposit franchise, which gives them market power.

Advertising and Transmission of Monetary Policy. To further establish its economic relevance, we now link financial advertising to the transmission of monetary policy. Following Drechsler, Savov and Schnabl (2017), we estimate the following specifications on the same bank holding company (b)-quarter (t) panel:

$$\begin{aligned} Y_{bt} =& \beta^{\text{Ad}} \ln(\text{Ad})_{b,t-1} + \gamma^{\text{Ad}} \Delta\text{FF}_t \times \ln(\text{Ad})_{b,t-1} \\ &+ \beta^{\text{HHI}} \text{Deposit-HHI}_{b,t-1} + \gamma^{\text{HHI}} \Delta\text{FF}_t \times \text{Deposit-HHI}_{b,t-1} \\ &+ \alpha_b + \eta_t + \epsilon_{bt}, \end{aligned} \tag{3}$$

where Y_{bt} is balance sheet components such as deposits and loans of bank b at t; ΔFF_t is the change in the Fed funds target rate at t; $\ln(\text{Ad})_{b,t-1}$ is lagged quarterly advertising expense of bank b at $t-1$; $\text{Deposit-HHI}_{b,t-1}$ is the lagged bank-level deposit concentration of bank b at $t-1$, α_b are bank fixed effects and η_t are time fixed effects. We use a sample with non-missing and positive advertising expenses. We cluster standard errors at the bank level.

The coefficient of interest is γ^{Ad}, which captures how financial advertising may affect the transmission of monetary policy shocks ΔFF_t to the outcome variables Y_{bt}. To isolate the effect of financial advertising from deposit market concentration studied by Drechsler, Savov and Schnabl (2017), we control for deposit market concentration $\text{Deposit-HHI}_{b,t-1}$ and its interaction term with Fed fund rate change $\Delta\text{FF}_t \times \text{Deposit-HHI}_{b,t-1}$. Table 6 shows the results.

[Insert Table 6 Here.]

Panel (a) of Table 6 presents the results for bank liabilities such as the growth rate of deposits, change in deposit spread, and the growth rate of total liabilities. Columns (1) and (2) show that when the Fed funds rate rises, banks that advertise more experience greater deposit outflows. However, such an interactive effect cannot offset the large positive baseline effect of advertising, namely banks that advertise more do collect more deposits on average. At the same time, as Columns (3) and (4) indicate, banks with higher advertising expenses are able to charge higher deposit spreads (measured as the Fed funds rate minus deposit interest expense divided by total deposits) when the Fed funds rate rises. Columns (5) and (6) show that rises in Fed funds rate have a significant contractive effect on bank total liabilities, for banks of high advertising intensity.

Panel (b) of Table 6 presents results for loans and securities. Columns (1) and (2) confirm that total loans decline in line with total liabilities as Fed funds rate rises. Such a pattern holds for total assets, as shown in Columns (5) and (6). Results on securities in Columns (3) and (4) are insignificant. This finding can be explained by the fact that advertising is mainly consumer-oriented, which affects consumer-related bank balance sheet items (e.g., deposits and loans) instead of items related to institutions or capital markets (e.g., securities).

The results in Table 6 are consistent with the notion of bank deposits channel and bank franchise value. Banks use advertising to invest in their deposit franchise, through which banks sustain market power over retail deposits. Such an investment in franchise value by advertising can function by differentiating their products, increasing customer stickiness via establishing trust, lowering the willingness of depositors to switch banks, and increasing consumer awareness or attentiveness. Banks exploit this market power by charging higher deposit spreads when the Fed funds rate rises. Consistent with the predictions by the bank deposits channel, banks with higher advertising expenses and thus higher franchise value contract their balance sheet more in response to an increase in the Fed funds rate. These findings highlight the economic relevance of financial advertising and motivate our empirical study of advertising as one important dimension of bank heterogeneity in the following sections.

3. Methodology to Quantify Advertising Content

In this section, we describe the method used to quantify the content of the advertising videos empirically. Our goal is to quantify the content along two dimensions: the category of the products, and the main advertising persuasive information and features used in the video. We also describe the method used to extract some additional attributes of the advertising creative and the actors in the video.

As outlined in Hu and Ma (2021), video content has three informational dimensions: visual, verbal, and vocal. In most of our analysis, we first focus on the verbal dimension—namely what is said in each advertisement clip. This allows us to avoid the challenges posed by lower resolutions of video clips in earlier years. We then discuss visual and vocal dimensions as additional measures.

3.1. Extracting Information and Advertising Categories

We first extract the text from the advertising videos' sound tracks using speech-to-text model Whisper provided by OpenAI. On average, each video contains 53 words. These text data are then used to identify the product categories through a LLM query submitted to ChatGPT. Specifically, we ask ChatGPT to classify the text into one of the following categories: mortgage and real estate, personal credit, banking services, investment and brokerage, retirement financial services, business loan, and insurance.

In Panel (a) of Table 2, we also presents the distribution of the product categories in the advertising videos. The most common product category is banking services (49%). The mortgage and real estate product and business loan product accounts for 15% and 3% of the advertisement. The "Others" category includes products not covered in our analysis, such as insurance, retirement planning, brokerage accounts, among others. We also find that one financial institution may offer different products in different advertisements. For example, a bank may advertise both mortgage and business loan products.

3.2. Quantifying Advertising Persuasive Information and Features

We then quantify the persuasive elements of advertisements using textual data. This task is approached with a joint objective: first, we draw from the marketing literature, where frameworks for coding advertising information and styles are emerging (Liaukonyte, Teixeira and Wilbur, 2015; Guitart and Stremersch, 2021; Tsai and Honka, 2021; Jiang and Kim, 2024); second, we leverage insights from the finance literature, which has identified key dimensions along which financial intermediaries differ, potentially influencing consumer behavior (d'Avernas et al., 2023; Jiang, Yu and Zhang, 2022; Zhang, Muir and Kundu, 2024).

Table 1 presents the categories of financial advertising persuasive information. We classify the persuasive information into four broad categories: financial information, service quality, financial education and advice, and emotional appeal. Each broad category is further divided into detailed subcategories. This classification balances the need for a comprehensive understanding of the advertising content with the need for a parsimonious set of categories that can be reliably coded.

Financial information The financial information category intends to capture the financial benefits of the product, including interest rates, loan options, affordability, and special offers.

> *"You can get an introductory rate of 2.99% APR on a home equity flex line. It's the lowest rate in years, making this the best time to buy, expand, or remodel."*
>
> *"While others just talk about their lending, we're taking action. Right now, our fixed-rate commercial loans have rates as low as 3.5%. It's time to get back to business."*
>
> *"Open a premium checking account and get $300 when you set up direct deposit."*

Service quality The service quality category includes information on the application and approval process, customer service, and mobile and online applications.

> *"We'll make your construction loan process quick and easy. And when you're ready to move in, your final home loan can be ready, too."*

"A local bank that's committed to our community and invested in its future. You'll get access to banking experts, a partner in the mortgage process, convenient locations, an advisor for your business, and so much more. It all starts when you open your account."

"You're going to love our new mobile app. Bank from your computer, tablet, or phone with the same look and feel and only one user ID and password. Pay quickly by taking a picture of a paper bill or pay anyone anywhere. It's all so easy with a mobile app."

Trust building The trust building category includes information on financial responsibility, expert advice, and financial education.

"Are you in good hands? At any minute, you could be a victim of fraud. Fraud could mean lower credit scores and higher interest rates when you apply for a credit card. It's a problem waiting to happen. Check your credit score. "

"Yes, no matter what you want or where you want to go, having good FICO credit scores could be the key to having it all. It's true, if you have credit, you have FICO scores, the scores most lenders use to determine your interest rates on mortgages, credit cards, car loans, and more. Generally, the higher your FICO scores, the lower your monthly payments."

"It's easy to get lost in the economic uncertainty, the volatility, the ambiguity. This moment calls for more and we deliver more with specialized expertise, proven strategies rooted in data and analytics, and insights born from over 130 years of successfully navigating economic turbulence, giving you new clarity, inspiring confidence, and helping you uncover new paths forward. "

Emotional appeal The emotional appeal category includes testimonials, lifestyle and aspirations, and homeownership advantages.

"There is nothing like a home in Maine and a bank that makes you feel at home. We have money to lend for dreams like yours with real people you can talk to and

smart solutions right here. We're strong and sound with the mortgage you need for the home of your dreams. Catch a great rate at VAT Savings when you're here, your home. Equal Housing Lender, member FDIC. There's a confidence in there."

"We share our world with billions of people, each going through unique experiences, hopefully accomplishing just what they set out to do. But we can't do it alone. We have a better chance of achieving our dreams with a great partner. For those times, trust us. Now in your corner and proud to be part of this community."

"Most ideas don't begin in a bank. But we'll join you wherever you break ground on your dreams. We exist where ideas exist. You have the dream. We have the team."

Table 1. Categories of Financial Advertising Persuasive Information

Broad Persuasive Information	**Detailed Persuasive Information**
Financial Information	Interest Rates and Loan Options Financial Benefits Affordability and Payment Plans Special Offers or Incentives
Service Quality	Easy Application and Approval Process Customer Service and Support Mobile and Online Applications
Trust Building	Financial Literacy Financial Responsibility Expert Advice and Consultation
Emotional Appeal	Testimonials and Success Stories Lifestyle and Aspirations Homeownership Advantages

We use the ChatGPT model to classify the text into these categories. In our prompt submitted to the model, we query the GPT with the name of the financial institution and the transcript of the advertisement video, and in response, GPT generates a string of text containing the probability distribution of the list of categories in Table 1. Figure A.3 shows

the prompts format used to query GPT. We provide the list of persuasive elements of advertisements and require the probabilities of all categories should sum up to one. To make sure the response of GPT is reliable, we fixed the random seed and set the temperature to 0 to make GPT's outputs more deterministic. We also ask GPT to provide the confidence level of its answer on a scale between 0 and 1 and an explanation for each answer, which allows for manual verification of the reasoning behind the scores.

3.3. Visual and Vocal Features

We also categorize some major visual and vocal features of the advertising videos. We identify the facial attributes of the actors in the advertising video, including race, gender, age, and emotion.

To achieve these analysis, first, each video was extracted into image frames using a fixed frame rate of one frame per second. These frames were then processed using the DeepFace Framework, which involved several steps. Faces were detected using the Retinaface model, and the VGG-Face model was employed to extract facial embeddings. The DeepFace attribute model was used to classify facial attributes such as age, gender, and race. The race classification categories included Asian, White, Middle Eastern, Indian, Latino/Hispanic, and Black. For the purposes of empirical analysis, we consolidated Asian, Middle Eastern, and Indian into a single "Asian" category, though we maintained these distinctions when evaluating the model's performance. Next, faces from the same video were grouped as individual actors using Hierarchical Agglomerative Clustering. This step allows us to consistently identify and label the same actor in the video. We aggregated the facial attributes for each actor, considering only high-quality frames and model predictions with high confidence. Finally, we aggregated these attributes at the video level, providing a comprehensive demographic profile of the actors within each video.

In the Internet Appendix, we provide extensive analysis to assess the performance of our empirical framework. We compare the racial share of advertisement extracted from our framework with other sources of data (Table A.1). Then we manually labeled 400 videos with true labels of race and gender. In the step of aggregating into video-person level information, we apply two filters, including (1) keeping high-quality frame and (2) high confidence model

prediction. For these 400 video, after these two filters, there are 270 videos with high-quality race and gender information. The performance of our model are reported in Table A.2 and Table A.3.

3.4. Distribution of Financial Advertising Styles

With these processed data, we can now describe the styles of financial advertisements. Figure 2 shows the distribution of the financial advertising persuasive content by creatives.[2] In Panel (a), we provide the distribution across broadly categorized themes, while in Panel (b), we provide more detailed categorizations. The most common advertising theme is through highlighting the service (38%), followed by advisory statements (31%) and information on pricing and financial benefit (22%). Within service, the most common subcategory is customer service and support, dominating the category. Within advisory statements, the subcategories of financial literacy knowledge, expert advice, and discussion of financial responsibilities are equally important. Emotional appeals are less common, scoring 9% in the overall content distribution. But it is worth noting that additional emotional appeals from the context and the visual content of the advertisement may not be captured in the text data.

[Insert Figure 2 Here.]

We also find that financial institutions use different persuasive themes in different advertisements, and these heterogeneities are presented in Figure 3. Specifically, Figure 3 shows that different financial products put different weight on persuasive themes in their advertisements. The banking deposit product is more likely to highlight service quality, while the mortgage sector is more likely to highlight pricing and financial benefits.

[Insert Figure 3 Here.]

[Insert Table 3 Here.]

We confirm this finding by estimating the share of different persuasive themes for different financial products using a bank-creative-year panel in Table 3, in which we control for a set

[2]We also present the distribution weighted by airtime, and the pattern remains similar.

of bank-year fixed effects. By including bank-year fixed effects, we are effectively comparing across multiple creatives by the same bank that focuses on different products. Absorbing bank-year level variations allows us to control for forces such as managerial style or influence of the advertisement agencies hired at the bank level. We find consistent evidence that even within the same bank in the same year, there are large heterogeneities of persuasive themes in the advertisements of different financial products. For instance, deposit products are more likely to highlight service quality, while mortgage products are more likely to highlight pricing and use emotional appeals.

4. Heterogeneous Strategies of Financial Advertising

In this section, we provide analysis on how financial advertising with different styles are used by different financial institutions. A key motivation behind our analysis is the development in theories and empirics of financial intermediaries regarding heterogeneities in banks' business strategies and operations. Our analysis thus is organized as a revisiting of the literature on bank heterogeneity, but from the perspective of financial advertising. We describe heterogeneities in financial advertising strategies by various important characteristics of banks.

These analyses are organized around a central theme: we believe the perspective of examining financial advertising will allow us to provide a concrete mechanism on how banks actively and strategically use financial advertising to maintain their franchise value, attract customers, and compete with other financial institutions while maintaining their heterogeneous features.

We consider a bank-county-creative-year panel, in which each observation represents a creative used by bank b in county c in year t. The dependent variable is the share of specific themes of the specific creative, and the key independent variables are indicators of bank characteristics. We estimate the following model:

$$\%Ad\ Theme_{b,c,v,t} = \beta D(Bank)_{b,c,t-1} + \eta_{ct} + \epsilon_{bcvt}, \tag{4}$$

The key set of controls for identification are the county-year fixed effects η_{ct}, which absorb

changes in market opportunities, regional demographic changes, local preferences, and other variations at the county-time level. In other words, we compare advertising strategies of banks with different characteristics in the same county. The standard errors are clustered at the county level.

When applicable, we separately consider advertising strategies for the liability side (deposit business) and asset side (mortgage and business loans). We consider a broad set of bank characteristics, including bank local market power as captured using local market shares, productivity in both the liability and asset side, deposit rate setting behaviors, service charge heterogeneities, and local customer demographic characteristics.

4.1. Financial Advertising and Local Market Share

Our first set of analysis examines how the financial advertising strategies of banks vary with their local market power, and we consider differences between banks with above-median or below-median market shares in the county in the respective business, i.e., deposits or loans.

[Insert Table 7 Here.]

Table 7 presents the results: across all product categories, banks with higher local market shares more heavily stress their service quality and incorporate life inspirations in their advertising. Meanwhile, they are less likely to incorporate information on pricing or to actively incorporate trust in the institution. In terms of magnitude, when compared to banks with lower market shares, high-market-share banks' deposit and banking product advertisements have 4.2 pp lower weights on the pricing component. This is roughly 17% of the unconditional mean of 24.54%. Meanwhile, banks with higher market shares put higher weights on advertising their service quality. This is particularly pronounced in the deposit services and business loan services. For the deposit services, while banks greatly highlight their service quality in the advertisement with an unconditional mean of 43.51%, we find that high-market-share banks even emphasize more on service quality advertising, with 3.3% higher weights. In the business loan category, high-market-share banks have 5.43% higher weights on service quality advertising, which is 15.2% of the unconditional mean of 35.72%. This focus on service quality is consistent with the findings by d'Avernas et al. (2023) on

the heterogeneity of deposit business. They argue that customers of large banks tend to value superior liquidity services more highly and exhibit lower sensitivity to deposit rates. This aligns with our observation that high-market-share banks prioritize advertising service quality over pricing.

Across all product categories, banks with higher local market shares more heavily incorporate life inspirations in their advertising. These life inspirations include success stories of a small business obtaining credit, or an inspiring lifestyle as a homeowner. One rationale behind this finding is that banks with higher local market power can better capture increased demand in banking services, thus incentivizing general borrowing or depositing activities can benefit than those banks which can only capture less of the demand. For banks with less local presence, it makes more sense for them to focus on discussing their own products. This difference can be seen most clearly in advertising mortgage products: high-market-share banks are 7.78 pp more likely to include life inspiration contents in their advertisement, a 27.6% increase from the sample mean of 28.20. The impact is even stronger in the business loan category, although the category has a much lower baseline level of use of inspirational life content.

4.2. Financial Advertising and Bank Productivity

The next dimension that we explore is whether banks use different advertising strategies when they have heterogeneous productivity in raising deposits and making loans. We measure bank productivity following the productivity measures modeled and empirically captured in Egan, Lewellen and Sunderam (2022).[3] Using these productivity measures, we examine differences in advertising themes between banks with above-median and below-median productivity levels within the same county, focusing on how advertising themes vary according to their respective business.

[Insert Table 8 Here.]

Table 8 shows the results. Consistent patterns emerge from both the liability (i.e., deposit) and asset (i.e., mortgage and business loan) sides of the business. Banks with high

[3]We thank the authors for generously sharing their data.

productivity significantly emphasize information on pricing and emotional inspirations in their advertising, while low-productivity banks place greater emphasis on service quality. On the liability side, high-productivity banks allocate 4.63 pp more weights to pricing information than their low-productivity counterparts, representing a 14.6% increase from the unconditional mean of 31.61%. Conversely, high-productivity banks reduce their focus on advertising service quality by 5.69 pp, equivalent to 14.6% of the unconditional mean of 38.89%. These patterns are even more pronounced in the asset side business, with 14.82 pp (40.2%) higher weights on pricing information and 24.56 pp (62.8%) lower weights on service quality for the high-productivity banks. This suggests that high-productivity banks employ higher rate-setting technologies, aligning with the findings in Egan, Lewellen and Sunderam (2022) that high-productivity banks appear to use more sophisticated and decentralized pricing strategies in setting deposit and loan rates.

In terms of trust-building and emotional appeal, high-productivity banks are more likely to incorporate these themes into their advertisements. Specifically, in asset-related advertising, high-productivity banks are 4.63 pp more likely to include trust building themes and 5.12 pp more likely to feature life inspiration themes, representing 38.0% and 43.3% of the unconditional means of 12.16% and 11.81%, respectively. These patterns indicate that high-productivity banks not only leverage their operational efficiency but also work to establish an image of trustworthiness and aspirational appeal. This strategy aligns with the argument in Egan, Lewellen and Sunderam (2022) that variation in productivity is driven by differences across banks in both production technologies and customer demographics.

These results have strong implications on understanding potential sources of productivity differences across banks. Our findings suggest that banks with higher productivity are more likely to emphasize pricing information in their advertising, which is consistent with the idea that high-productivity banks have more advantageous business technologies and are more efficient in setting rates. As indicated in Egan, Lewellen and Sunderam (2022), these advantages could arise from better information technology, more sophisticated rate-setting technologies, or more efficient branch networks and higher market power.

4.3. Financial Advertising and Deposit Rate

Next, we examine how financial advertising strategies differ between banks that offer high versus low deposit rates. Our analysis focuses on three core retail deposit products using the data from Ratewatch: interest checking accounts with less than $2,500, $25,000 money market deposit accounts, and $10,000 12-month CDs. These products represent the primary types of retail deposits in banks' core offerings, including checking, savings, and small time deposits. To incorporate the information across different deposit rates, following the methodology in Zhang, Muir and Kundu (2024), we first rank banks based on each of the three deposit rates separately each year, and then take an average of the three rankings. We define high-rate banks as those with above-median average rankings and low-rate banks as those with below-median average rankings.

[Insert Table 9 Here.]

Table 9 shows the results for the advertising strategies of deposit business. High-rate banks tend to emphasize pricing information in their advertising for deposit products, with 3.75 pp higher weights than low-rate banks, representing 11.9% of the unconditional mean of 31.55%. This emphasis is intuitive, as high-rate banks seek to attract rate-sensitive depositors by highlighting their competitive pricing. This finding is consistent with Zhang, Muir and Kundu (2024), which suggests that high-rate banks attract depositors who are responsive to rates.

In contrast, low-rate banks are more likely to incorporate trust-building and emotional appealing themes in their advertising. Specifically, low-rate banks are 0.86 pp more likely to include trust-building themes and 3.16 pp more likely to include life inspiration themes, equivalent to 4.8% and 29.7% of the unconditional means of 18.06% and 10.65%, respectively. This suggests that low-rate banks attract customers by fostering trust and long-term relationships, aligning with the argument in Zhang, Muir and Kundu (2024) which argues that low-rate banks rely on sticky depositors and maintain physical branches to support their local community presence.

4.4. Financial Advertising and Service Quality

Our next set of analysis examines how financial advertising strategies differ between banks with high versus low service quality in their deposit products. We measure a bank's service quality using three key indicators: service charges on deposit products, branch network, and consumer complaints. Service charges are calculated as the total service charges on domestic deposits, including fees such as monthly maintenance, overdraft, check-cashing, and ATM fees, scaled by deposits. Following Egan, Hortaçsu and Matvos (2017) and Zhang, Muir and Kundu (2024), we define the branch network as the number of branches scaled by total deposits, reflecting a bank's physical presence and the extent of services it provides to depositors. Finally, consumer complaints can serve as a more direct measure of service quality. We compute the measure of consumer complaints as the number of complaints received in a given year per dollar of deposits, using the data from the Consumer Financial Protection Bureau's (CFPB) Consumer Complaint Database. Banks with fewer complaints are expected to offer a higher level of service (Egan, Hortaçsu and Matvos, 2017; Egan, Lewellen and Sunderam, 2022). Given the nature of these measures and their relevance to customer interactions, we focus our analysis on advertising strategies within the deposit business.

[Insert Table 10 Here.]

In Table 10, we show that high-service-quality banks are significantly more likely to emphasize service quality and trust building themes across all three measures of service quality. Banks with higher service charges place 4.51 pp more weight on service quality in their advertising, representing 11.5% of the unconditional mean of 31.4%. They also allocate 1.55 pp more to trust-building themes, equivalent to 8.4% of the unconditional mean of 18.5%. In contrast, high-service-charge banks are less likely to emphasize pricing information in their advertisements, with a reduction of 8.72 percentage points, or 27.8% of the unconditional mean of 41.41%.

Similar effects can be observed with the other two measures of service quality. For example, banks with a broader branch network are also more likely to emphasize service quality (4.60 pp, or 11.6%) and trust building (2.19 pp, or 11.7%) in their advertisements,

while reducing the weight on pricing information (7.53 pp, or 24.4%). A comparable pattern is seen when using consumer complaints as a measure of service quality.

These patterns suggest that high-service-quality banks focus on highlighting their value-added services and building trust to differentiate themselves from competitors. This divergence in advertising focus supports the idea that banks with higher service quality target customers who value the enhanced services and personalized banking experience. By emphasizing service quality and trust building themes, these banks likely aim to attract customers who see value in a premium banking experience, even at a higher cost (Jiang, Yu and Zhang, 2022; Zhang, Muir and Kundu, 2024).

4.5. Financial Advertising and Customer Demographic Characteristics

Our analysis so far shows that banks actively use financial advertising to highlight distinct advantages based on various heterogeneities. These advertising strategies suggest that banks are not only aware of their unique strengths but also strategically make choices about how they communicate these advantages to attract specific customer segments.

One important factor that may further support this argument is the demographic characteristics of their customer base. Banks might adjust their advertising to better connect with the specific customer base, such as population composition of the communities. In this section, we further explore this idea by exploiting the geographic variations of financial advertisements within the same bank in each year.

More specifically, we analyze how the racial attributes of the actors in advertising video vary according to the demographic characteristics of the counties in which banks operate. Now we consider differences between counties with above or below 80 percent quantiles of the share of Black or African American and Hispanic population for the same bank in the respective business, i.e., deposits or loans. The choice of 80 percent quantiles is because the top 20 percent counties roundly accounts for half of the population. The key set of controls for identification is the bank-year fixed effects, which absorbs all time-varying differences between banks.

[Insert Table 11 Here.]

Table 11 presents the results: across two business categories, in counties with a higer percentage of Black and Hispanic residents, banks are more likely to feature more Black and Hispanic actors in their advertisements, respectively. Specifically, the representation of Black and Hispanic actors in deposit-related advertising is 1.01 pp and 0.19 pp higher, equivalent to 4.9% and 16.2% relative to the unconditional mean. For asset-related advertising, the increase is 0.31 pp (or 1.3%) for Black actors and 0.05 pp (or 4.7%) for Hispanic actors.

These patterns suggest that banks target their advertising to align with the demographic composition of their local markets, potentially as a strategy to enhance relatability and appeal to specific customer groups. By featuring actors representative of the local population, banks may be seeking to foster a sense of trust within these communities.

Summary This section reveals advertising strategies employed by banks based on their unique characteristics and market positions. Overall, these heterogeneous strategies underscore the adaptive and targeted nature of financial advertising, with banks strategically aligning their messages to their technology strengths and customer demographics.

5. Financial Advertising and Demand for Financial Products

In this section, we document the real impact of financial advertising. We show that bank advertising spending and advertising styles significantly affect the demand for various financial products, including deposits, mortgages, and small business loans. We use two complementary empirical setups. We first employ a within-county estimation strategy, which exploits within-county variations by comparing different banks operating in the same county. To further establish causal interpretation, we then implement a border discontinuity design, which leverages the discontinuities in local advertising at DMA borders, generated by the local TV market delineation.

5.1. Within-County Estimation

We apply a within-county estimation strategy to a bank (b)-county (c)-year (t) panel. We estimate the following specifications:

$$Y_{bct} = \beta \ln(\text{Ad})_{bct} + \alpha_{bc} + \eta_{ct} + \epsilon_{bct}, \tag{5}$$

where Y_{bct} is the outcome variables for various financial products, such as the growth rate of deposits, change in deposit spread, and mortgage and small business loan origination, of bank b in county c at t; $\ln(\text{Ad})_{bct}$ is the log amount of product-specific advertising spending by b in county c at t, which is calculated according to which DMA county c belongs to; α_{bc} are bank-county fixed effects, which absorb all level differences in demand for bank b's products across counties; η_{ct} are county-year fixed effects, which absorb variations such as changes in local lending opportunities, economic conditions, and demographics. Our results are robust to including bank-year fixed effects. We focus on a sample where banks have positive advertising spending in a county. Therefore, the estimated coefficients capture the intensive margin effects of advertising on demand for financial products. Standard errors are clustered at the county level. Such a specification exploits the within-county variation by comparing different banks with the differential intensity of advertising, but operating in the same county.

In some specifications, we also include $\ln(\text{Ad})_{-b,ct}$, the log amount of product-specific advertising spending for all other banks in county c at t, excluding the focal bank b. This leave-one-out advertising measure captures the potential spillover effect of other banks' advertising on the demand for the focal bank's financial products. We also interact advertising spending with the estimated probability of advertising styles. We add these interaction terms (i.e., $\ln(\text{Ad}) \times \Pr(\text{Style})_{bct}$) to the specifications in order to examine the differential effects of different advertising styles on demand for financial products. Table 12 displays the results.

[Insert Table 12 Here.]

Panel (a) of Table 12 presents results on deposits. Columns (1) to (3) show a strong positive relationship between deposit advertising and deposit growth rate. In terms of mag-

nitude, a one percent increase in deposit advertising spending is associated with an additional 0.17 basis point growth rate of deposits with a mean growth rate of four percentage points. Among all the advertising styles, building trust with depositors seems to be the most effective strategy, as indicated in Column (3), with the largest coefficient. Columns (4) to (6) show that banks that spend more on advertising tend to charge higher deposit spread, on average. Such a finding is consistent with our bank-level motivating empirical evidence in that banks with higher advertising expenses tend to have higher deposit spread. However, different advertising styles are associated with changes in deposit spread in distinct ways. For example, when banks mention more pricing in commercials, there tend to be contemporaneous declines in deposit spread. On the contrary, banks highlight service quality and emotional appeals to attract depositors and charge higher deposit spreads. We also find that advertising by other banks in the same county significantly lowers the deposit spread charged by the focal bank. This pattern is consistent with the notion that banks use advertising to strengthen their market power, invest in their franchise value, and gain an edge in local market competition.

Panel (b) of Table 12 presents results on loans. Columns (1) to (3) document a significant positive relationship between mortgage advertising and the dollar amount of mortgage origination. A one percent increase in mortgage advertising spending is associated with a 0.06 percent increase in mortgage origination. Emphasizing service quality, such as ease of application, and building trust with customers seem to be the most effective approach to increase mortgage origination. Columns (4) to (6) show that financial advertising has similar effects on small business loan origination. In terms of advertising style, highlighting pricing, such as rate advantage, is the most effective strategy.

5.2. Identification: Border Discontinuity Design

We now establish the causal relationship between financial advertising and demand for financial products using a border discontinuity design.

Identifying the causal effects of advertising can be difficult due to various forms of endogeneity. While advertising is a firm choice, equilibrium forces may cause advertising to be correlated with the demand or performance in a county for reasons other than a treatment

effect of advertising. Firms might also use rules of thumb based on targeting past or expected demand of the product market rather than perceived treatment effects, leading to concerns about reverse causality.

To address the endogeneity concerns, we exploit the exogenous variation from the geography discontinuities at the borders of DMA markets by taking advantage of the discrete nature of local television markets (Shapiro, 2018, 2020). More specially, consumers who live on the opposite sides of DMA borders face opposite levels of advertising, because of market factors elsewhere in their DMA. But they have similar observable characteristics and choice sets of products. Therefore, we adapt the border discontinuity design by controlling for unobservable geographic characteristics with bank-border-year fixed effects. We also control for bank-county fixed effects to further absorb any unobservables that are related to the banks' specific demand in one county. Such an empirical strategy allows us to identify the causal effect of advertising on demand for financial products.

[Insert Figure 4 Here.]

As an example, Figure 4 shows the Pittsburgh and Johnstown-Altoona DMAs in the state of Pennsylvania. The border region used in the border discontinuity design is highlighted in bold. Therefore, we are comparing how demand for financial products provided by the same bank on the Pittsburgh and Johnstown-Altoona side of the border changes, when the two sides of the border receive a different advertising exposure by the same bank.

More specially, consider a bank (b)-county (c)-border ($d(c)$)-year (t) panel. Let $d(c)$ stand for the border group to which county c belongs. We estimate the causal effect of advertising on the demand for financial products using border regression discontinuity design (Shapiro, 2018, 2020) based on the following specifications:

$$Y_{bct} = \beta \ln(\text{Ad})_{bct} + \alpha_{bc} + \eta_{bd(c)t} + \epsilon_{bcd(c)t}, \tag{6}$$

where Y_{bct} is the outcome variables for various financial products, such as the growth rate of deposits, change in deposit spread, and mortgage and small business loan origination, of bank b in county c at t; $\ln(\text{Ad})_{bct}$ is the log amount of product-specific advertising spending

by b in county c at t, which is calculated according to which DMA county c belongs to; α_{bc} are bank-county fixed effects, which absorb all level differences in demand for bank b's products across counties; $\eta_{bd(c)t}$ are bank-border-year fixed effects, which account for time-varying bank-specific local demand shocks. By adding these two sets of fixed effects, we are effectively comparing the demand for financial products provided by the same bank across different counties within a border group with differential exposure to advertising. Therefore, the identifying assumption is that, without differential advertising intensity and styles, the same bank would have similar trends in demand for financial products in every county within a border group.

We focus on a sample where banks have positive advertising spending in a county. Therefore, the estimated coefficients capture the intensive margin effects of advertising on demand for financial products. Note that the same bank (b)-county (c)-year (t) observation could repetitively appear in the sample several times with different borders ($d(c)$) since a county may belong to several borders at the same time. Standard errors are clustered at the bank-county level and border-year level.

Similar to the implementation in within-county estimation, we also include $\ln(\text{Ad})_{-b,ct}$, the log amount of product-specific advertising spending for all other banks in county c at t, excluding the focal bank b. This leave-one-out advertising measure captures the potential spillover effect of other banks' advertising on demand for the focal bank's financial products. We also interact advertising spending with the estimated probability of advertising styles. We add these interaction terms (i.e., $\ln(\text{Ad}) \times \Pr(\text{Style})_{bct}$) to the specifications in order to examine the differential effects of different advertising styles on demand for financial products. Table 13 displays the results.

[Insert Table 13 Here.]

Panel (a) of Table 13 shows how deposit advertising affects deposit outcomes. Columns (1) to (3) reveal a strong positive effect of deposit advertising on deposit growth rates. Specifically, a 1% increase in deposit advertising spending is associated with an additional 0.26 basis points increase in the deposit growth rate, relative to a sample of 3 percentage points. Commercials that focus on trust building and service quality have the largest effects

on attracting depositors. Columns (4) to (6) indicate that banks with higher advertising expenditures tend to charge higher deposit spreads on average, aligning with prior evidence that advertising-intensive banks are able to maintain higher deposit spreads. However, the impact of advertising styles on deposit spread varies. For instance, commercials emphasizing pricing are associated with contemporaneous decreases in deposit spread, whereas advertising focusing on service quality and emotional appeals allows banks to retain depositors and charge higher spreads. This finding again supports the idea that banks actively use advertising to build their deposit franchise, from which banks obtain market power and charge high deposit spreads.

Panel (b) of Table 13 shows how loan advertising affects mortgage and small business loan origination. Columns (1) to (3) show that mortgage advertising has a significant positive effect on the dollar amount of mortgage origination. Quantitatively, a one percent rise in mortgage advertising spending corresponds to a 0.05% increase in mortgage origination. Banks that emphasize service quality and build trust with their customers attract higher mortgage origination. Columns (4) to (6) demonstrate positive but insignificant effects on small business loan origination. One potential reason for such a null result is banks may use other marketing strategies instead of TV commercials to approach their small business loan customers.

6. Conclusion

This paper investigates the role of financial advertising in shaping banks' strategic position, competitive advantage, and franchise value. By analyzing over a decade of TV advertising data, we uncover how banks actively use advertising to communicate their unique characteristics, align with their operational strengths, market positions, and customer demographics. Our findings provide new insights into understanding bank heterogeneity and its impact through the lens of strategic advertising strategies.

First, we document substantial heterogeneity in advertising strategies across banks, reflecting differences in market share, productivity, deposit rates, service quality, and customer demographics. Banks with higher market shares emphasize service quality and life inspiration themes, while high-productivity banks focus on pricing advantages. High-rate banks

target rate-sensitive depositors with competitive pricing, whereas low-rate banks highlight trust-building and emotional appeal. Banks with high service quality highlight value-added services. Additionally, banks adapt advertising to local demographics, increasing minority representation in targeted communities. These heterogeneous approaches demonstrate how banks tailor their advertising strategies to differentiate themselves in a highly competitive market.

Second, using robust empirical approaches—including within-county estimation and border discontinuity design—we establish the causal impact of advertising on consumer demand for financial products. Advertising intensity and style significantly influence deposit growth, mortgage origination, and small business loans. Trust-building messages prove particularly effective for deposits, while service quality emphasis drives mortgage origination. Moreover, banks with higher advertising expenditures maintain higher average deposit spreads. These findings underscore the role of advertising in sustaining market power and enhancing franchise value.

At a broader level, our findings underscore the macroeconomic implications of financial advertising and banks' strategic operations. Advertising not only shapes consumer behavior and market competition but also serves as a tool for banks to enhance their deposit franchise value, pricing power, and adaptability to evolving market dynamics. These strategic choices amplify differences in market power and financial stability across institutions, potentially shaping how banks respond to macroeconomic shocks and participate in the transmission of monetary policy. Future research could further explore interconnected roles of advertising and bank strategies in systemic financial stability, examining issues such as monetary policy transmission and the distribution of deposits across banks during times of financial stress. Furthermore, as digital marketing grows in prominence, studying the interplay between traditional advertising, digital outreach, and consumer behavior could shed light on new channels of influence in the financial sector. By integrating these perspectives, future work can provide deeper insights into the macroeconomic implications of financial advertising.

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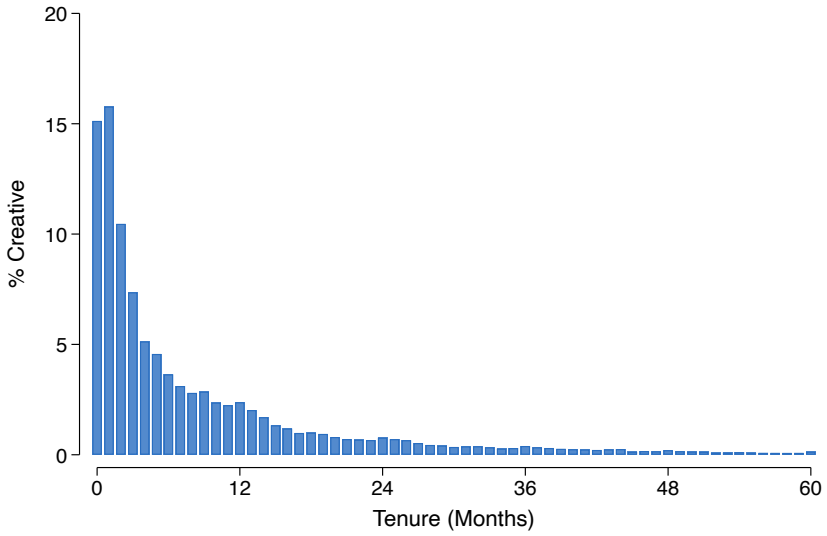
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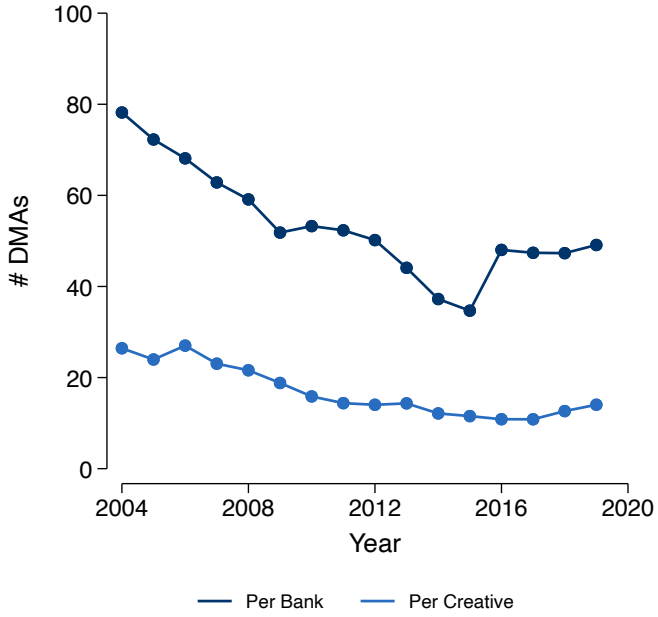
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Figure 1. Distribution of Tenure and Geographic Coverage of Financial Advertising

Panel (a): Tenure



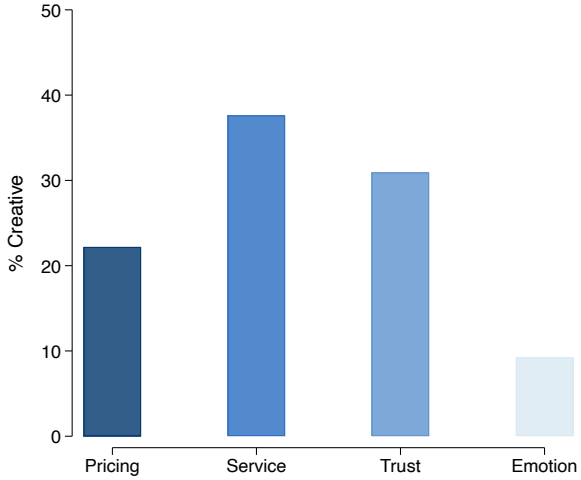
Panel (b): Geographic Coverage



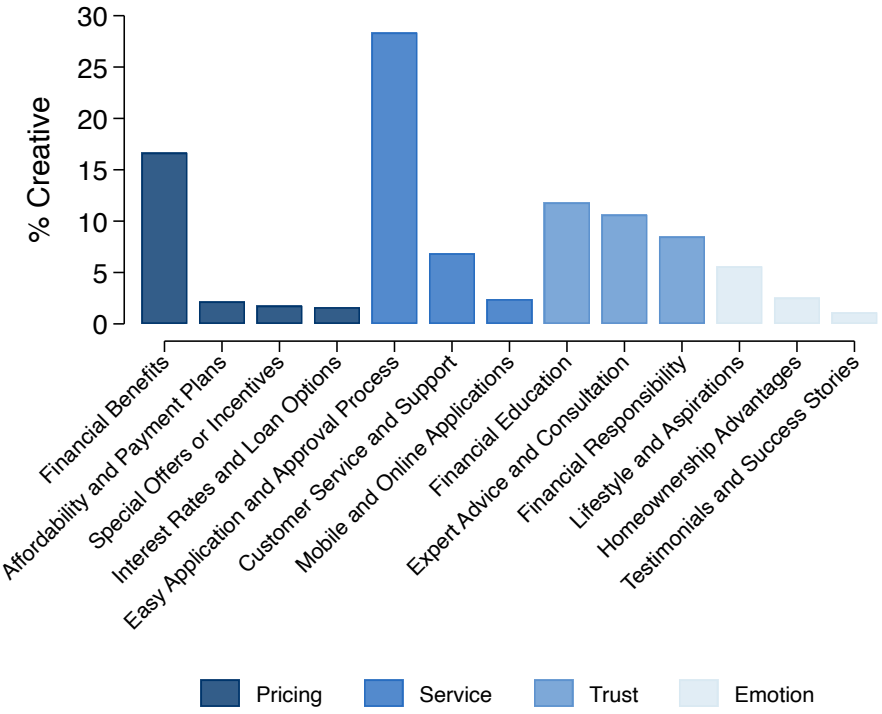
Notes. This figure shows the distribution of tenure of financial advertising in Panel (a) and geographic coverage of financial advertising in Panel (b). In Panel (a), the tenure is measured in terms of the total number of months the advertising aired on television. In Panel (b), the dark blue line is the average number of DMAs where a bank has any financial advertising in a given year, and the light blue line is the average number of DMAs for a specific financial advertising.

Figure 2. Overall Distribution of the Advertising Theme

Panel (a): Broad Theme

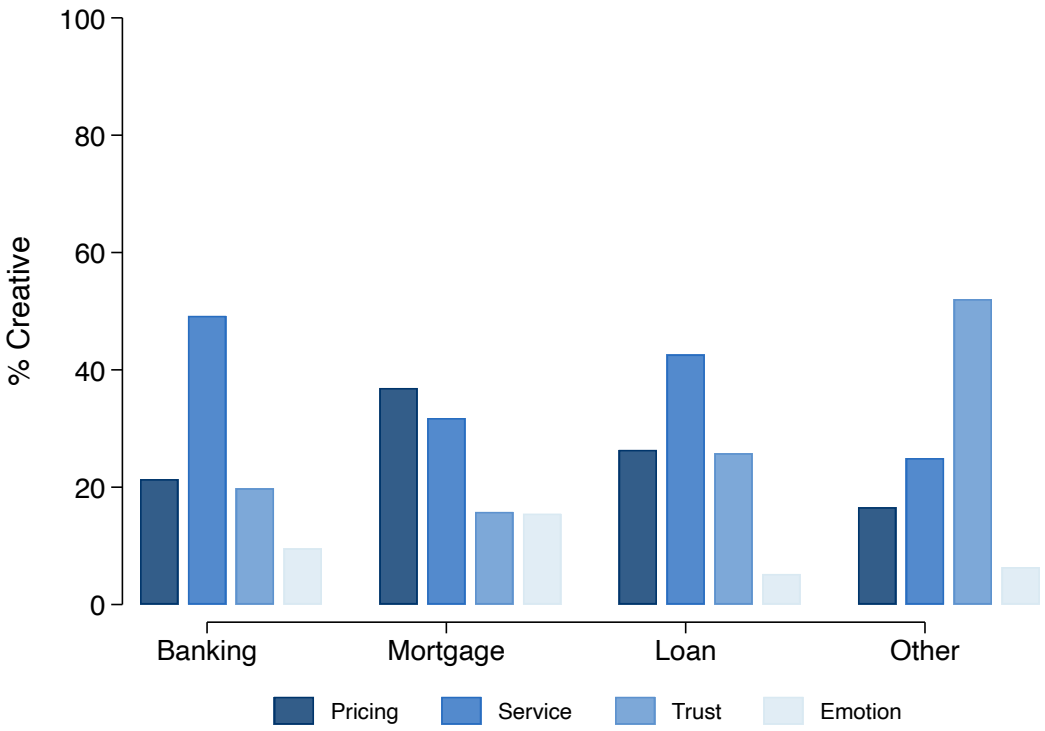


Panel (b): Detailed Theme



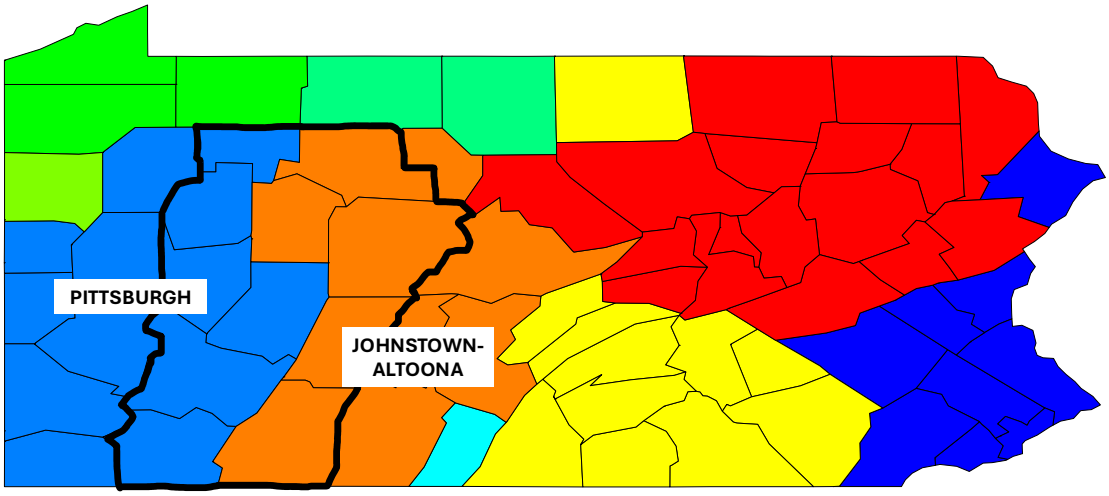
Notes. This figure shows the distribution of theme for financial advertising, including broad persuasive information in Panel (a) and detailed persuasive information in Panel (b). The list of financial advertising persuasive information can be found in Table 1.

Figure 3. Distribution of the Advertising Themes by Product Categories



Notes. This figure shows the distribution of theme for different specific products, including banking services, mortgage and real estate, business loan, and other products. The list of financial advertising broad persuasive information can be found in Table 1.

Figure 4. Example of DMA Border Region



Notes. This figure shows the DMA map for Pennsylvania, highlighting the border region between Pittsburgh and Johnstown-Altoona used in border discontinuity design, as in Equation (6).

Table 2. Summary Statistics

	count	mean	sd	min	p25	p50	p75	max
Panel (a): Financial Advertising								
Duration	46,718	27.46	13.79	1.00	15.00	30.00	30.00	141.00
Air Months	46,718	12.59	23.48	0	1	4	13	192
First Air Year	46,718	2012	4.69	2003	2008	2013	2017	2019
# Schedule Times, Local TV	46,718	1,487.11	13,640.99	0	24	85	343	2,005,261
# Schedule Times, National TV	46,718	224.47	1,752.22	0	0	0	0	160,300
Total Spending, Local TV	46,718	200,495.38	2,061,258.20	0.00	1,335.00	8,706.50	41,679.00	352,723,049.00
Total Spending, Natonal TV	46,718	771,225.91	5,687,806.79	0.00	0.00	0.00	0.00	475,988,212.00
Category: Banking	46,339	48.82	39.99	0.00	10.00	40.00	90.00	100.00
Category: Mortgage	46,339	15.39	33.01	0.00	0.00	0.00	0.00	100.00
Category: Loan	46,339	2.73	11.99	0.00	0.00	0.00	0.00	90.00
Category: Other	46,339	33.06	39.70	0.00	0.00	10.00	80.00	100.00
Panel (b): Financial Intermediaries								
Total Assets (MM)	48,000	9,206.75	88,080.12	0.36	223.72	497.62	1,400.81	3,743,567.00
Advertising Expense (MM)	10,286	17.87	147.06	0.00	0.14	0.69	2.56	3,579.00
Non-interest Expense (MM)	48,770	706.57	6,368.40	-17.47	15.70	34.60	98.54	203,461.55
Deposits (MM)	190,221	1,080.34	19,490.98	0.00	45.92	102.47	247.43	1,988,464.38
# Branches	190,221	12.55	115.64	1.00	1.00	3.00	6.00	6,497.00
Bank Deposit HHI	190,160	0.22	0.13	0.05	0.14	0.19	0.27	1.00
# Mortgage Applications	203,993	2,722.08	39,217.83	1.00	48.00	148.00	498.00	4,681,350.00
Amount of Mortgage Applications (MM)	203,993	488.82	7,719.13	0.00	3.79	15.02	65.95	1,011,229.41
# Originated Mortgage	203,993	1,379.36	16,832.47	0.00	36.00	113.00	372.00	2,058,326.00
Amount of Originated Mortgage (MM)	203,993	255.93	3,527.46	0.00	2.85	11.23	48.50	355,648.98
# Small Business Loans	12,133	9,752.32	92,370.38	0.00	176.00	461.00	1,189.00	3,760,497.00
Amount of Small Business Loans (MM)	12,133	342.07	1,523.32	0.00	30.63	74.74	173.65	40,389.83

Notes. This table presents summary statistics for financial advertising in Panel (a) and financial intermediaries at the bank holding company level in Panel (b). Panel (a) presents data on financial advertising derived from Nielsen's Ad Intel dataset. Duration is the length of an advertising in seconds. Air Months is the total number of months the advertising aired on television. First Air Year is the year when the advertising was first aired. # Schedule Times, Local TV / National TV is the total number of times an advertising was scheduled to air on local or national television. Total Spending, Local TV / National TV is the total expenditure on local or national television. The four categories, including Baking, Mortgage, Loan, and Other, represent the percentage distribution of the product categories in the advertising videos. Panel (b) contains a bank holding company-year panel combining various sources of financial intermediaries data, with unavailable data for any bank-year observation recorded as missing. Total Assets (MM) is the total assets of the bank holding companies from the U.S. Call Reports. Advertising Expense (MM) is the amount expenses on advertising for the sample of publicly listed U.S. bank holding companies from Compustat. Non-interest Expense (MM) is the expense amount unrelated to interest from the U.S. Call Reports. Deposits (MM) is the amount of deposits from FDIC Summary of Deposits. # Branches is the number of branches operated by the bank holding company. Bank Deposit HHI is the bank-level market concentration, calculated as the deposit-weighted average of the county-level Herfindahl-Hirschman Index across all the counties that the bank holding company operates in. # Mortgage Applications and # Originated Mortgage is the total number of mortgage applications and originations from HMDA, respectively. Amount of Mortgage Applications (MM) and Amount of Originated Mortgage (MM) is the total value of mortgage applications and originations. # Small Business Loans is the total number of small business loans issued from CRA. Amount of Small Business Loans (MM) is the total value of small business loans issued.

Table 3. Advertising Theme Across Different Product

% Ad Theme$_{b,v,t}$	(1) Pricing	(2) Service	(3) Trust	(4) Emotion
1(Banking)$_{b,v,t}$	-5.119***	6.318***	-4.702***	3.502***
	(0.628)	(0.648)	(0.766)	(0.438)
1(Mortgage)$_{b,v,t}$	3.452***	-6.050***	-11.295***	13.892***
	(0.904)	(0.916)	(0.900)	(0.760)
Omitted Category: 1(Loan)$_{b,v,t}$				
Mean of Omitted Category	26.005	42.244	25.808	5.943
Observations	59,158	59,158	59,158	59,158
R-squared	0.326	0.316	0.282	0.284
No. of Institutions	1655	1655	1655	1655
Bank-Year FE	Y	Y	Y	Y

Notes. This table shows the advertising themes across three main products of interest, including banking services, mortgage and real estate, and business loans, in a bank(b)-creative(v)-year(t) panel. % Ad Theme$_{b,v,t}$ is the percentage distribution of advertising theme for a given creative v used by bank b in year t. 1(Banking)$_{b,v,t}$ and 1(Mortgage)$_{b,v,t}$ are a dummy variable for whether the product is banking services and mortgage and real estate, respectively. The dummy variable for whether the product is a business loan is omitted in the regressions. The model includes bank-year fixed effects. Standard errors are clustered at the creative level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 4. Advertising and Bank Balance Sheet

Panel (a): Liabilities

Y_{bt}	(1) $\Delta \ln$(Total Deposits)	(2) Δ(Deposit Spread)	(3) $\Delta \ln$(Wholesale Funding)	(4) $\Delta \ln$(Total Liabilities)
$\ln(\text{Ad})_{b,t-1}$	0.022**	−0.013	0.009	0.021**
	(0.010)	(0.019)	(0.020)	(0.010)
Observations	20,289	21,009	20,289	20,289
R-squared	0.311	0.868	0.217	0.343
No. of Institutions	672	683	672	672
Mean of Y	0.106	−0.016	0.086	0.104
Bank FE	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y

Panel (b): Assets

Y_{bt}	(1) ln(New Mortgage)	(2) ln(New Small Business Loan)	(3) $\Delta \ln$(RE Loans)	(4) $\Delta \ln$(C&I Loans)	(5) $\Delta \ln$(Total Assets)
$\ln(\text{Ad})_{b,t-1}$	0.800***	0.575***	0.013	0.017	0.020**
	(0.120)	(0.110)	(0.012)	(0.018)	(0.009)
Observations	20,815	11,962	20,289	20,289	20,289
R-squared	0.851	0.892	0.339	0.321	0.346
No. of Institutions	713	436	672	672	672
Mean of Dep Var	19.05	18.96	0.109	0.116	0.103
Bank FE	Y	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y	Y

Notes. This table examines the relationship between bank advertising and components of the bank balance sheet in a bank(b)-quarter(t) panel. The sample contains all the publicly listed U.S. bank holding companies with non-missing and positive Compustat item Advertising and Marketing Expenses (`xadq`). The outcome variables include liability-side measures in Panel (a) and asset-side measures in Panel (b). The advertising variable $\ln(\text{Ad})_{b,t-1}$ is the log amount of overall advertising spending for bank b in quarter $t-1$ obtained from Compustat. The specifications include bank fixed effects and quarter fixed effects. Standard errors are clustered at the bank level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 5. Advertising, Bank Productivity, Funding Stability, and Market Power

	(1)	(2)	(3)	(4)	(5)	(6)
	Productivity		Volatility of Growth Rate		Deposit	Interest Expense
Y_{bt}	Deposit	Asset	Total Deposits	Wholesale Funding	Spread	Beta
$\text{Ad/Expense}_{b,t-1}$	0.013**	0.063***	−0.249***	−0.154	0.081***	0.002
	(0.006)	(0.013)	(0.082)	(0.334)	(0.015)	(0.002)
Observations	12,384	12,384	21,040	21,040	21,055	16,146
R-squared	0.955	0.207	0.123	0.248	0.485	0.287
No. of Institutions	492	492	723	723	734	472
Mean of Y	0.0403	0.0424	11.51	44.35	0.459	0.391
$\text{Bank Controls}_{b,t-1}$	Y	Y	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y	Y	Y

Notes. This table examines the relationship between financial advertising and measures of bank funding stability, productivity, and market power in a bank(b)-quarter(t) panel. The sample contains all the publicly listed U.S. bank holding companies with non-missing and positive Compustat item Advertising and Marketing Expenses (`xadq`). The outcome variables including bank productivity in Columns (1)-(2) from Egan, Lewellen and Sunderam (2022), growth rate volatility of deposits and wholesale funding in Columns (3)-(4), deposit spread in Column (5), and interest expense beta in Column (6) from Drechsler, Savov and Schnabl (2021). The advertising variable $\text{Ad/Expense}_{b,t-1}$ is advertising expense scaled by total non-interest expense for bank b in quarter $t-1$ obtained from Compustat and Call Reports. The specifications include quarter fixed effects and lagged bank controls. Lagged bank controls include the log of the bank's total assets, the bank's Z-Score (the bank's ROA plus its equity ratio divided by its standard deviation of ROA), the bank's ROA, the bank's equity to assets ratio, the bank's deposits to assets ratio, and the bank's deposit and mortgage market concentration HHI, following Gelman, Goldstein and MacKinlay (2023) and Egan, Lewellen and Sunderam (2022). Standard errors are clustered at the bank level with wild cluster bootstrap procedure (1000 times). *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 6. Advertising and Transmission of Monetary Policy

Panel (a): Liabilities

	(1)	(2)	(3)	(4)	(5)	(6)
Y_{bt}	$\Delta \ln$(Total Deposits)		Δ(Deposit Spread)		$\Delta \ln$(Total Liabilities)	
$\ln(\text{Ad})_{b,t-1}$	0.022**	0.022**	−0.009	−0.007	0.020**	0.022**
	(0.010)	(0.010)	(0.019)	(0.018)	(0.010)	(0.010)
$\Delta\text{FF}_t \times \ln(\text{Ad})_{b,t-1}$	−0.004**	−0.005**	0.082***	0.075***	−0.005**	−0.006**
	(0.002)	(0.002)	(0.018)	(0.014)	(0.002)	(0.002)
Observations	20,289	19,096	21,009	19,757	20,289	19,096
R-squared	0.311	0.322	0.869	0.879	0.344	0.354
No. of Institutions	672	644	683	654	672	644
Mean of Y	0.106	0.107	−0.016	−0.017	0.104	0.104
HHI Controls		Y		Y		Y
Bank FE	Y	Y	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y	Y	Y

Panel (b): Assets

	(1)	(2)	(3)	(4)	(5)	(6)
Y_{bt}	$\Delta \ln$(Total Loans)		$\Delta \ln$(Securities)		$\Delta \ln$(Total Assets)	
$\ln(\text{Ad})_{b,t-1}$	0.020*	0.021*	0.016	0.014	0.020**	0.021**
	(0.011)	(0.012)	(0.015)	(0.016)	(0.009)	(0.010)
$\Delta\text{FF}_t \times \ln(\text{Ad})_{b,t-1}$	−0.004**	−0.005**	−0.005	−0.004	−0.005**	−0.006**
	(0.002)	(0.002)	(0.004)	(0.004)	(0.002)	(0.002)
Observations	20,289	19,096	20,289	19,096	20,289	19,096
R-squared	0.374	0.385	0.209	0.214	0.347	0.357
No. of Institutions	672	644	672	644	672	644
Mean of Y	0.106	0.107	0.0889	0.0903	0.103	0.104
HHI Controls		Y		Y		Y
Bank FE	Y	Y	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y	Y	Y

Notes. This table examines the relationship between financial advertising and the transmission of monetary policy in a bank(b)-quarter(t) panel. The sample contains all the publicly listed U.S. bank holding companies with non-missing and positive Compustat item Advertising and Marketing Expenses (`xadq`). The outcome variables include liability-side measures in Panel (a) and asset-side measures in Panel (b). The advertising variable $\ln(\text{Ad})_{b,t-1}$ is the log amount of overall advertising spending for bank b in quarter $t-1$ obtained from Compustat. The deposit market power Deposit-$\text{HHI}_{b,t-1}$ is bank-level market concentration for bank b in quarter $t-1$, calculated as the deposit-weighted average of the county-level Herfindahl-Hirschman Index across all the counties that the bank operates in. ΔFF_t is the change in the effective Fed funds rate from quarter $t-1$ to quarter t. The specifications include bank fixed effects and quarter fixed effects. Standard errors are clustered at the bank level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 7. Financial Advertising by Local Market Shares

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Product Market	SOD Deposit				HMDA Mortgage				CRA Loan			
Ad Category	Banking				Mortgage				Loan			
% Ad Theme$_{b,c,v,t}$	Pricing	Service	Trust	Emotion	Pricing	Service	Trust	Emotion	Pricing	Service	Trust	Emotion
Large (Product Share)$_{b,c,t-1}$	-4.205***	3.306***	0.426	0.474**	-5.102***	-0.761	-1.913***	7.776***	-3.543***	5.536***	-6.151***	4.158***
	(0.432)	(0.506)	(0.404)	(0.190)	(1.143)	(1.194)	(0.539)	(0.681)	(0.388)	(0.417)	(0.430)	(0.213)
Observations	402,120	402,120	402,120	402,120	58,549	58,549	58,549	58,549	136,859	136,859	136,859	136,859
R-squared	0.193	0.168	0.190	0.143	0.541	0.562	0.494	0.577	0.516	0.442	0.504	0.562
No. of Institutions	635	635	635	635	262	262	262	262	184	184	184	184
Mean of Y	24.54	43.51	19.67	12.28	33.54	26.93	11.34	28.20	29.32	35.72	29.29	5.670
County-Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes. This table examines the financial advertising strategies across banks with different levels of local market power in a bank(b)-county(c)-creative(v)-year(t) panel. The analysis considers three different products, including deposits in Columns (1)-(4), mortgages in Columns (5)-(8), and business loans in Columns (9)-(12). % Ad Theme$_{b,c,v,t}$ is the share of advertising themes for that specific product for a given creative v used by bank b in county c in year t. Large (Product Share)$_{b,c,t-1}$ is a dummy variable for whether bank b is above median market shares in the county c in the respective product market in year $t-1$. The model includes county-year fixed effects. Standard errors are clustered at the county level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 8. Financial Advertising by High- and Low-Productivity Banks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ad Category	Deposit				Asset			
% Ad Theme$_{b,c,v,t}$	Pricing	Service	Trust	Emotion	Pricing	Service	Trust	Emotion
Large (Deposit TFP)$_{b,c,t-1}$	4.634***	-5.687***	-0.737***	1.790***				
	(0.194)	(0.202)	(0.114)	(0.080)				
Large (Asset TFP)$_{b,c,t-1}$					14.815***	-24.559***	4.626***	5.118***
					(0.158)	(0.252)	(0.087)	(0.137)
Observations	2,726,502	2,726,502	2,726,502	2,726,502	1,961,343	1,961,343	1,961,343	1,961,343
R-squared	0.082	0.087	0.076	0.044	0.075	0.131	0.056	0.090
No. of Institutions	166	166	166	166	156	156	156	156
Mean of Y	31.61	38.89	18.23	11.27	36.90	39.13	12.16	11.81
County-Year FE	Y	Y	Y	Y	Y	Y	Y	Y

Notes. This table examines the financial advertising strategies across banks with different levels of productivity in a bank(b)-county(c)-creative(v)-year(t) panel. The analysis considers the liability side (deposits) in Columns (1)-(4) and the asset side (mortgages and business loans) in Columns (5)-(8). % Ad Theme$_{b,c,v,t}$ is the share of advertising themes for that specific product for a given creative v used by bank b in county c in year t. Large (Deposit TFP)$_{b,c,t-1}$ and Large (Asset TFP)$_{b,c,t-1}$ are dummy variables for whether bank b is above median deposit productivity and asset productivity among all the banks in the county c in the respective product market in year $t-1$, respectively. The measures of deposit productivity and asset productivity are defined in Egan, Lewellen and Sunderam (2022). The model includes county-year fixed effects. Standard errors are clustered at the county level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 9. Financial Advertising by High- and Low-Rate Banks

	(1)	(2)	(3)	(4)
Ad Category	Deposit			
% Ad Theme$_{b,c,v,t}$	Pricing	Service	Trust	Emotion
Large (Deposit Rate)$_{b,c,t-1}$	3.746***	0.273	-0.859***	-3.160***
	(0.165)	(0.190)	(0.121)	(0.086)
Observations	2,239,743	2,239,743	2,239,743	2,239,743
R-squared	0.073	0.078	0.068	0.054
No. of Institutions	654	654	654	654
Mean of Y	31.55	39.74	18.06	10.65
County-Year FE	Y	Y	Y	Y

Notes. This table examines the financial advertising strategies across banks with different levels of deposit rate in a bank(b)-county(c)-creative(v)-year(t) panel. The analysis considers the deposit business in Columns (1)-(4). % Ad Theme$_{b,c,v,t}$ is the share of advertising themes for that specific product for a given creative v used by bank b in county c in year t. Large (Deposit Rate)$_{b,c,t-1}$ is a dummy variable for whether bank b is above median average rankings of the three deposit rates among all the banks in the county c in the respective product market in year $t-1$, respectively. The deposit rates include the checking rate for interest checking accounts with less than $2,500, the saving rate for $25,000 money market deposit accounts, and the small time rate for $10,000 12-month CDs. The model includes county-year fixed effects. Standard errors are clustered at the county level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 10. Financial Advertising by High- and Low-Service Quality Banks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Ad Category	Deposit				Deposit				Deposit			
% Ad Theme$_{b,c,v,t}$	Pricing	Service	Trust	Emotion	Pricing	Service	Trust	Emotion	Pricing	Service	Trust	Emotion
Large (Service Charges)$_{b,c,t-1}$	-8.719***	4.514***	1.547***	2.658***								
	(0.130)	(0.149)	(0.103)	(0.077)								
Large (Branch Network)$_{b,c,t-1}$					-7.525***	4.595***	2.189***	0.741***				
					(0.125)	(0.156)	(0.099)	(0.072)				
Large (CFPB Complaints)$_{b,c,t-1}$									6.105***	-6.609***	-1.412***	1.916***
									(0.208)	(0.155)	(0.116)	(0.091)
Observations	2,996,578	2,996,578	2,996,578	2,996,578	3,127,799	3,127,799	3,127,799	3,127,799	2,544,100	2,544,100	2,544,100	2,544,100
R-squared	0.084	0.076	0.066	0.044	0.074	0.072	0.062	0.041	0.085	0.088	0.072	0.039
No. of Institutions	383	383	383	383	766	766	766	766	157	157	157	157
Mean of Y	31.41	39.20	18.46	10.93	30.88	39.52	18.72	10.88	31.46	38.28	19.16	11.09
County-Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes. This table examines the financial advertising strategies across banks with different levels of service quality in a bank(b)-county(c)-creative(v)-year(t) panel. The analysis considers the deposit business. % Ad Theme$_{b,c,v,t}$ is the share of advertising themes for that specific product for a given creative v used by bank b in county c in year t. Large (Service Charge)$_{b,c,t-1}$ is a dummy variable for whether bank b is above the median level of service charges scaled by deposits among all the banks in the county c in the respective product market in year $t-1$. Large (Branch Network)$_{b,c,t-1}$ is a dummy variable for whether bank b is above the median level of number of branches scaled by deposits among all the banks in the county c in the respective product market in year $t-1$. Large (CFPB Complaints)$_{b,c,t-1}$ is a dummy variable for whether bank b is above the median level of number of CFPB consumer complaints scaled by deposits among all the banks in the county c in the respective product market in year $t-1$. The model includes county-year fixed effects. Standard errors are clustered at the county level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 11. Financial Advertising and Customer Demographic Characteristics

	(1)	(2)	(3)	(4)
Ad Category	Deposit		Asset	
% Ad Actors$_{b,c,v,t}$	Black	Hispanic	Black	Hispanic
Large (County w/ % Black)$_{b,c,t-1}$	1.008***		0.307***	
	(0.102)		(0.054)	
Large (County w/ % Hispanic)$_{b,c,t-1}$		0.191***		0.053***
		(0.010)		(0.011)
Observations	2,087,576	2,087,576	1,508,658	1,508,658
R-squared	0.287	0.480	0.342	0.639
No. of Institutions	638	638	554	554
Mean of Y	20.77	1.177	23.99	1.061
Bank-Year FE	Y	Y	Y	Y

Notes. This table examines the financial advertising strategies of banks across counties with different customer demographic characteristics in a bank(b)-county(c)-creative(v)-year(t) panel. The analysis considers the liability side (deposits) in Columns (1)-(2) and the asset side (mortgages and business loans) in Columns (3)-(4). % Ad Actors$_{b,c,v,t}$ is the share of minority actors for a given creative v used by bank b in county c in year t. Large (County w/ % Black)$_{b,c,t-1}$ and Large (County w/ % Hispanic)$_{b,c,t-1}$ are dummy variables for whether county c is above the 80 percent quantiles of the share of Black or African American and Hispanic population in year $t-1$, respectively. The model includes bank-year fixed effects. Standard errors are clustered at the county level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 12. Advertising and Demand for Financial Products

Panel (a): Deposits

	(1)	(2)	(3)	(4)	(5)	(6)
Y_{bct}	$\Delta \ln$(Deposits)			Δ(Deposit Spread)		
$\ln(\text{Ad})_{bct}$	0.0017***	0.0015***		0.0056***	0.0020***	
	(0.0006)	(0.0004)		(0.0011)	(0.0007)	
$\ln(\text{Ad})_{-b,ct}$		−0.0006			−0.0059***	
		(0.0009)			(0.0018)	
$\ln(\text{Ad}) \times \Pr(\text{Pricing})_{bct}$			0.0015*			−0.0044***
			(0.0008)			(0.0013)
$\ln(\text{Ad}) \times \Pr(\text{Service})_{bct}$			0.0016***			0.0088***
			(0.0006)			(0.0011)
$\ln(\text{Ad}) \times \Pr(\text{Trust})_{bct}$			0.0021***			0.0016
			(0.0008)			(0.0014)
$\ln(\text{Ad}) \times \Pr(\text{Emotion})_{bct}$			0.0013			0.0134***
			(0.0008)			(0.0021)
Observations	49,502	49,502	49,502	35,938	35,938	35,938
R-squared	0.564	0.331	0.564	0.800	0.723	0.804
No. of Institutions	528	528	528	437	437	437
Mean of Y	0.0409	0.0409	0.0409	0.0853	0.0853	0.0853
Bank-County FE	Y	Y	Y	Y	Y	Y
County-Year FE	Y	Y	Y	Y	Y	Y

Panel (b): Loans

	(1)	(2)	(3)	(4)	(5)	(6)
Y_{bct}	ln(Mortgage Origination)			ln(Small Business Loan Origination)		
$\ln(\text{Ad})_{bct}$	0.063***	0.052***		0.010***	0.009***	
	(0.008)	(0.009)		(0.003)	(0.003)	
$\ln(\text{Ad})_{-b,ct}$		−0.067***			−0.003	
		(0.024)			(0.009)	
$\ln(\text{Ad}) \times \Pr(\text{Pricing})_{bct}$			0.017			0.030***
			(0.014)			(0.006)
$\ln(\text{Ad}) \times \Pr(\text{Service})_{bct}$			0.097***			0.009
			(0.014)			(0.006)
$\ln(\text{Ad}) \times \Pr(\text{Trust})_{bct}$			0.144***			−0.003
			(0.015)			(0.005)
$\ln(\text{Ad}) \times \Pr(\text{Emotion})_{bct}$			−0.033**			0.007
			(0.013)			(0.009)
Observations	84,648	84,648	84,648	98,996	98,996	98,996
R-squared	0.819	0.819	0.819	0.915	0.915	0.915
No. of Institutions	505	505	505	218	218	218
Mean of Y	11.988	11.988	11.988	12.753	12.753	12.753
Bank-County FE	Y	Y	Y	Y	Y	Y
County-Year FE	Y	Y	Y	Y	Y	Y

Notes. This table examines the relationship between financial advertising and demand for financial products in a bank(b)-county(c)-year(t) panel. The outcome variables, Y_{bct}, include the changes in the log of deposits $\Delta \ln$(Deposits) in Columns (1)-(3) of Panel (a), changes in the deposit spread Δ(Deposit Spread) in Columns (4)-(6) of Panel (a), the log amount of new mortgage origination ln(Mortgage Origination) in Columns (1)-(3) of Panel (b), and the log amount of new small business loan origination ln(Small Business Loan Origination) from CRA in Columns (4)-(6) of Panel (b). The advertising variables include the log amount of advertising spending $\ln(\text{Ad})_{bct}$ for bank b in county c in year t and the log amount of total advertising spending $\ln(\text{Ad})_{-b,ct}$ for all other banks in county c in year t excluding the focal bank b. We use product-specific advertising spending, namely spending on deposits in Columns (1)-(6) of Panel (a), spending on mortgages in Columns (1)-(3) of Panel (b), and spending on business loans in Columns (4)-(6) of Panel (b). In Columns (3) and (6) of each panel, we include the interaction between $\ln(\text{Ad})_{bct}$ and the share of various advertising themes, $\Pr(\text{Theme})_{bct}$. The specifications include bank-county fixed effects and county-year fixed effects. Standard errors are clustered at the county level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 13. Advertising and Demand for Financial Products: Border Discontinuity Design

Panel (a): Deposits

	(1)	(2)	(3)	(4)	(5)	(6)
Y_{bct}	$\Delta \ln$(Deposits)			Δ(Deposit Spread)		
$\ln(\text{Ad})_{bct}$	0.0026***	0.0027***		0.0054***	0.0053***	
	(0.0007)	(0.0007)		(0.0013)	(0.0013)	
$\ln(\text{Ad})_{-b,ct}$		0.0008			−0.0015	
		(0.0015)			(0.0032)	
$\ln(\text{Ad}) \times \Pr(\text{Pricing})_{bct}$			0.0017*			−0.0038**
			(0.0009)			(0.0017)
$\ln(\text{Ad}) \times \Pr(\text{Service})_{bct}$			0.0029***			0.0083***
			(0.0007)			(0.0015)
$\ln(\text{Ad}) \times \Pr(\text{Trust})_{bct}$			0.0030***			0.0035*
			(0.0009)			(0.0018)
$\ln(\text{Ad}) \times \Pr(\text{Emotion})_{bct}$			0.0023**			0.0118***
			(0.0010)			(0.0029)
Observations	42,144	42,144	42,144	30,918	30,918	30,918
R-squared	0.479	0.479	0.479	0.826	0.826	0.829
No. of Institutions	420	420	420	352	352	352
Mean of Y	0.0312	0.0312	0.0312	0.0904	0.0904	0.0904
Bank-County FE	Y	Y	Y	Y	Y	Y
Bank-Border-Year FE	Y	Y	Y	Y	Y	Y

Panel (b): Loans

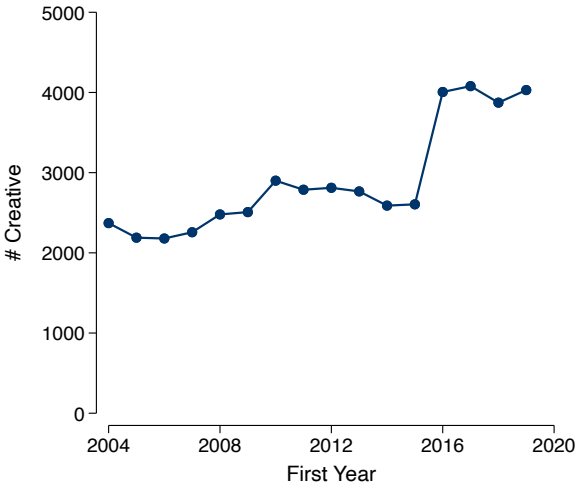
	(1)	(2)	(3)	(4)	(5)	(6)
Y_{bct}	ln(Mortgage Origination)			ln(Small Business Loan Origination)		
$\ln(\text{Ad})_{bct}$	0.053***	0.049***		0.007	0.007	
	(0.012)	(0.012)		(0.005)	(0.004)	
$\ln(\text{Ad})_{-b,ct}$		−0.037**			−0.000	
		(0.017)			(0.005)	
$\ln(\text{Ad}) \times \Pr(\text{Pricing})_{bct}$			0.013			0.020*
			(0.019)			(0.010)
$\ln(\text{Ad}) \times \Pr(\text{Service})_{bct}$			0.081***			0.005
			(0.020)			(0.009)
$\ln(\text{Ad}) \times \Pr(\text{Trust})_{bct}$			0.140***			0.001
			(0.022)			(0.007)
$\ln(\text{Ad}) \times \Pr(\text{Emotion})_{bct}$			−0.057***			0.004
			(0.018)			(0.013)
Observations	81,972	81,972	81,972	99,402	99,402	99,402
R-squared	0.761	0.761	0.761	0.856	0.856	0.856
No. of Institutions	493	493	493	216	216	216
Mean of Y	11.33	11.33	11.33	12.41	12.41	12.41
Bank-County FE	Y	Y	Y	Y	Y	Y
Bank-Border-Year FE	Y	Y	Y	Y	Y	Y

Notes. This table examines the relationship between financial advertising and demand for financial products using a border discontinuity design in a bank(b)-county(c)-border($d(c)$)-year(t) panel. The outcome variables, Y_{bct}, include the changes in the log of deposits $\Delta \ln$(Deposits) in Columns (1)-(3) of Panel (a), changes in the deposit spread Δ(Deposit Spread) in Columns (4)-(6) of Panel (a), the log amount of new mortgage origination ln(Mortgage Origination) in Columns (1)-(3) of Panel (b), and the log amount of new small business loan origination ln(Small Business Loan Origination) from CRA in Columns (4)-(6) of Panel (b). The advertising variables include the log amount of advertising spending $\ln(\text{Ad})_{bct}$ for bank b in county c in year t and the log amount of total advertising spending $\ln(\text{Ad})_{-b,ct}$ for all other banks in county c in year t excluding the focal bank b. We use product-specific advertising spending, namely spending on deposits in Columns (1)-(6) of Panel (a), spending on mortgages in Columns (1)-(3) of Panel (b), and spending on business loans in Columns (4)-(6) of Panel (b). In Columns (3) and (6) of each panel, we include the interaction between $\ln(\text{Ad})_{bct}$ and the share of various advertising themes, $\Pr(\text{Theme})_{bct}$. The specifications include bank-county fixed effects and bank-border-year fixed effects. Standard errors are clustered at the bank-county level and border-year level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

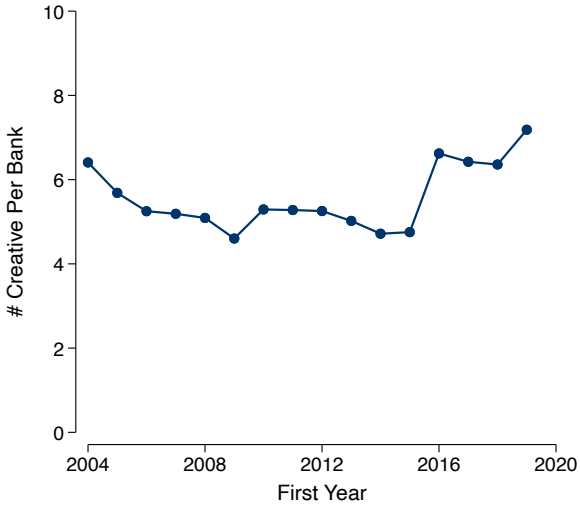
Appendix (For Online Publication Only)

Figure A.1. Financial Advertisement Over Time

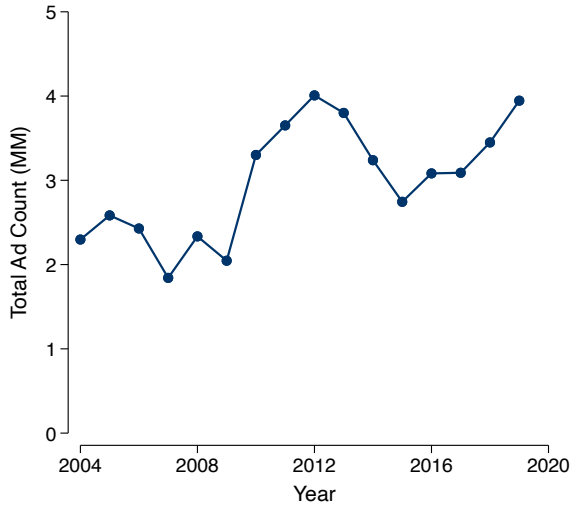
Panel (a): # Creative



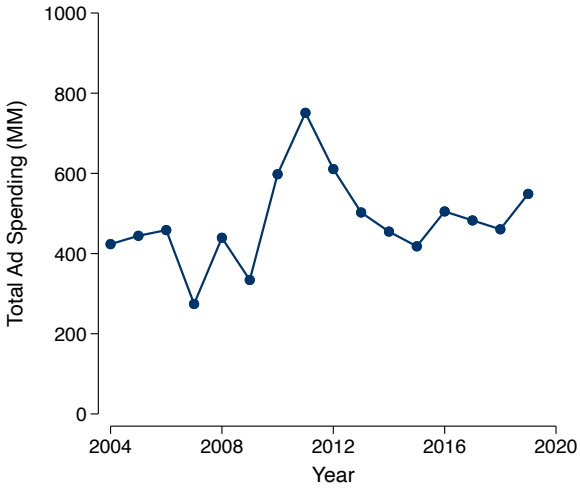
Panel (a): # Creative Per Bank



Panel (b): # Occurrence

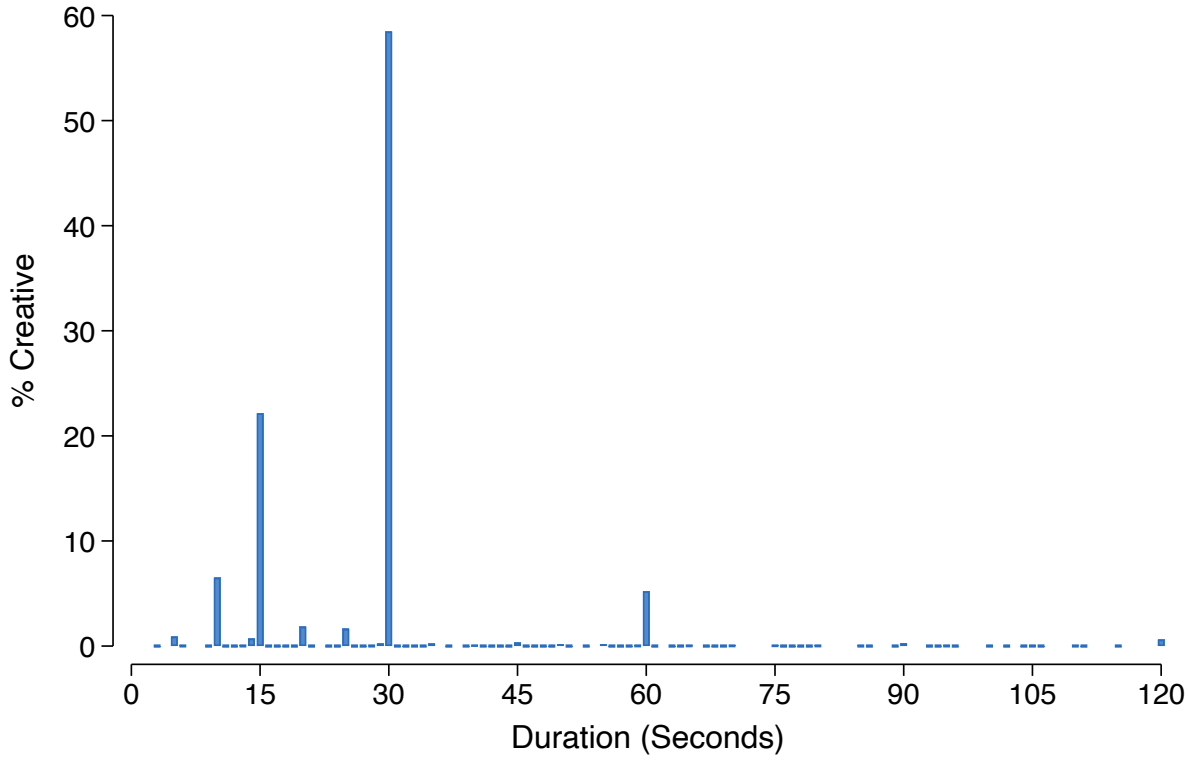


Panel (c): Spending



Notes. This figure presents the statistics of financial advertisement over time. Panel (a) shows the number of new creative video over year in our data, and Panel (b) shows the number of new creative video per bank over year. Panel (c) and Panel (d) show the number of occurrences and their corresponding spending over year, respectively.

Figure A.2. Distribution of Duration for Financial Advertisement



Notes. This figure shows the distribution of duration of financial advertisement, where duration is the length of an advertisement in seconds.

Figure A.3. Prompt Format for Quantifying Advertising Content

Role: I want you to act as an advertisement consultant for a financial product consulting firm. You will be given a list of advertisements with the name of the financial firm and the transcript of its advertisement video. The financial firm tries to appeal customers with specific theme in their advertisement. You job is to analyze the transcript of advertisement and determine their themes. You will be fired if the identified theme is not accurate.

Task: Here is more specific instruction: (1) Your task is to determine the related themes for each advertisement transcript and estimate the probability distribution for those themes. Please also provide the confidence level (0-1) and reasoning (less than 25 words) for that estimated probability. Please ENSURE that the probabilities of all themes SUM UP TO ONE. (2) Please also provide the 10 most important words to help you identify the themes.

Response Format: For each advertisement, provide your answer in one line using the format: "{#id} {theme 1};{probability 1};{confidence level 1};{reasoning 1}—{theme 2};{probability 2};{confidence level 2};{reasoning 2}—etc%%{word 1};{word 2};etc."

ONLY choose from the list of themes provided here: Interest Rates and Loan Options; Financial Benefits; Affordability and Payment Plans; Easy Application and Approval Process; Customer Service and Support; Mobile and Online Applications; Special Offers or Incentives; Financial Education; Financial Responsibility; Expert Advice and Consultation; Testimonials and Success Stories; Lifestyle and Aspirations; Homeownership Advantages.

Notes. This figure presents the prompt format to quantify the advertising content using GPT.

Table A.1. Race/Gender Share from Different Sources at the Video Level

Data source:	DeepFace			Extreme Reach	Census
	All Years	2019	Manual Check	2019	2019
% White Actors	82.3%	86.5%	69.5%	73.6%	61.2%
% Black Actors	9.6%	7.5%	19.3%	12.3%	12.7%
% Hispanic Actors	1.5%	0.4%	6.3%	6.2%	19.8%
% Asian Actors	6.6%	5.6%	4.9%	8.0%	6.3%
% Male Actors	76.4%	74.1%	46.9%	67.8%	49.5%
% Female Actors	23.6%	25.9%	53.1%	32.2%	50.5%

Notes. This table compare the racial and gender share of advertisement extracted from our framework with other sources of data, including the DeepFace framework that we rely on, the statistics on the actors in financial advertisement obtained from Extreme Reach, and the 2019 census data.

Table A.2. The Performance of DeepFace Framework at Video Level

	Unconditional Average		Conditional Average	
	True value	Prediction	True value	Prediction
Race				
% White Actors	64.70%	16.12%	69.53%	73.95%
% Black Actors	18.00%	2.49%	19.34%	11.42%
% Hispanic Actors	5.82%	1.32%	6.26%	6.04%
% Asian Actors	4.54%	1.87%	4.87%	8.58%
% Other Actors	6.95%	78.20%		
Gender				
% Male Actors	45.32%	15.48%	46.93%	71.02%
% Female Actors	51.26%	6.32%	53.07%	28.98%
% Other Actors	3.43%	78.20%		

Notes. This table reports the video-level performance of the DeepFace framework that we use to identify the facial attributes of the actors in the advertising video. The sample contains 400 videos that we manually labeled with true labels of race and gender.

Table A.3. The Performance of DeepFace Framework at Person Level

Panel (a) Race

Prediction True value	White	Black	Hispanic	Asian	Recall
White	566	4	25	11	93.40%
Black	14	131	8	8	81.37%
Hispanic	15	1	14	15	31.11%
Asian	6	0	0	54	90.00%
Precision	94.18%	96.32%	29.79%	61.36%	**87.73%**

Panel (b) Gender

Prediction True value	Male	Female	Recall
Male	468	3	99.36%
Female	130	271	67.58%
Precision	78.26%	98.91%	**84.75%**

Notes. This table reports the person-level performance of the DeepFace framework that we use to identify the facial attributes of the actors in the advertising video. The sample contains 400 videos that we manually labeled with true labels of race and gender.