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Does Local Capital Supply Matter for Public Firms' Capital Structures?

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Abstract

Publicly listed firms respond to capital supply conditions shaped by local investing preferences. Public firms headquartered in areas with higher proportions of senior citizens and women use more debt financing. These demographics are associated with conservative investing, leading to a higher and more stable local supply of debt capital. The demographics–leverage relation is more pronounced for firms that cannot easily tap public bond markets, which is the majority of public firms. Changes in firms' financing activities around exogenous shocks to credit supplies, including interstate banking deregulation and the 2008–2009 financial crisis, support the local capital supply hypothesis.

I. Introduction

Our understanding of corporate capital structure comes largely from research on firms' demand for capital. The literature supports both trade-off and pecking order theories but also reveals their shortcomings. These theories do not explain much of the cross-sectional variation in capital structures (Graham and Leary (2011)), nor do they explain why firm-specific financial structures are highly persistent over time (Lemmon, Roberts, and Zender (2008)). These issues have led researchers to explore other explanations for capital structure, some of which

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focus on capital supply conditions. In general, studies taking a capital supply perspective have focused on marketwide changes in supply conditions over time.[1]

We propose a new capital supply explanation for cross-sectional variation in capital structures. Our main hypothesis is that when raising capital, firms respond to supply conditions shaped by local investors' preferences. This hypothesis is based on two main premises. First, firms often raise debt capital in local private markets because of the potentially higher cost of tapping the public bond markets. Second, the risk tolerance and investing preferences of the local populace shape the local capital supply.

Regarding the first premise, local preferences may at first seem irrelevant to the financing of public companies as they could presumably raise capital at low marginal costs in national (or even international) markets. However, a closer examination reveals a different reality. In fact, most publicly listed companies cannot easily access the public debt markets. This is especially true for public firms that are either unrated or rated below investment grade by credit rating agencies, which together make up almost 90% of U.S. public companies (Sufi (2009), Tang (2009)).[2] A simple review of public debt issuance activities in the Securities Data Corporation (SDC) data show that the median investment-grade firm issues bonds once every 5 years, whereas the typical non-investment-grade firm issues new public bonds once every 10 years, and the typical unrated publicly listed firm never issues public bonds.

Our second premise, that local investing preferences affect capital supply, is reasonable as long as capital providers (i.e., investors and banks) tilt their portfolios toward local companies. Local bias is most pronounced in private lending markets. Banks attract local deposits, which affects the amount of capital available for lending (Kashyap and Stein (2000)). Bank lending, in turn, tends to concentrate in local firms (Petersen and Rajan (2002), Becker (2007)).[3] With respect to other classes of investors, Coval and Moskowitz (1999) and Ivković and Weisbenner (2005), among others, show that stock investors are biased toward holding local stocks, and Massa, Yasuda, and Zhang (2013) show that bond funds are biased toward holding debt securities issued by local companies. It is, therefore, reasonable to hypothesize that local capital supply conditions are a function of local investors' preferences.

[1]Recent advances in this area are substantial enough for Graham and Leary ((2011), p. 325) to note, "Several recent studies ... suggest that capital market segmentation and supply conditions significantly influence observed financial structures."

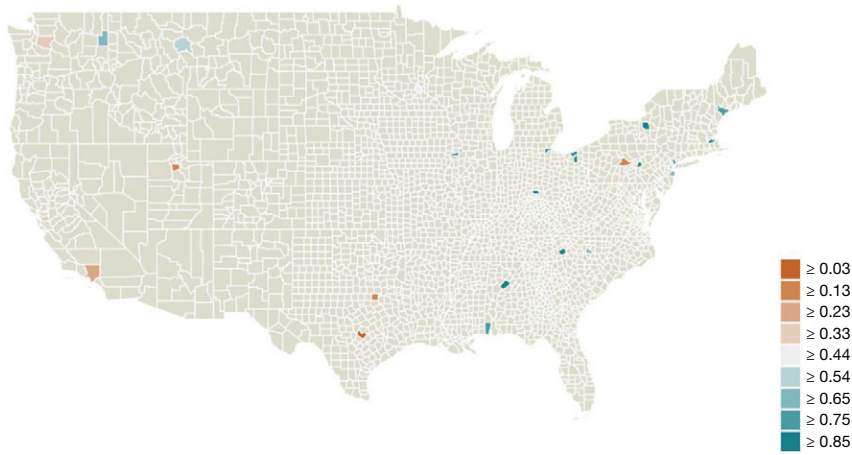
[2]For instance, Colla, Ippolito, and Li (2013) show that although investment-grade firms obtain approximately two-thirds of their debt capital from public bonds or notes, unrated and non-investment-grade public firms raise most of their debt capital in private markets (e.g., from banks), which can be highly segmented.

[3]Regulatory requirements of Section 109 of the Riegle–Neal Interstate Banking and Branching Efficiency Act of 1994 (IBBEA) prohibits a bank from establishing or acquiring branches outside of its home state primarily for the purpose of deposit production. To comply with Section 109, interstate banks (branches) are required to have their loan-to-deposit ratio in the host state to be least 50% of the aggregate ratio for all home state banks. Federal Deposit Insurance Corporation (FDIC) data as of June 30, 2018 show that the mean host state loan-to-deposit ratio among all U.S. states and territories is approximately 84%, suggesting that a very high percentage of in-state deposits are used for in-state loans (https://www.fdic.gov/news/news/press/2019/pr19041a.pdf).

FIGURE 1

Demographics in Counties Where Grocery Stores Were Headquartered in 1995

Figure 1 shows the U.S. counties where the 36 public grocery store chains in our sample were headquartered in 1995. We assign percentile ranks to each county based independently on the percentage of seniors (age 65+) and the ratio of women to men in the county. The percentile ranks are added together and divided by 200 for each county into a composite Local Age and Sex Composition Index (ASC), which ranges from 0.01 to 1.00. Counties are shared according to this composite index.



As discussed in more detail later, we expect women and senior citizens to prefer safer portfolios, which translates into a greater and more stable supply of bank loans and private debt capital in areas where these demographics prevail. In contrast, a younger, more male-dominated local populace likely provides relatively more equity capital. Accordingly, we construct proxies for local investors' risk preferences using fundamental demographics, such as the proportion of senior citizens and women in the local population (Halek and Eisenhauer (2001)), and test whether these measures predict firms' financing choices and capital structures.[4] In doing so, we find new evidence that firms' financial structures reflect differences in capital supplies driven by local investors' risk preferences.

It is instructive to begin with an example, and the retail grocery industry is useful to consider in this context. Grocery store chains have been operating in the United States for more than 100 years. Although they compete on product selection, quality, and price, the business models in this industry are relatively homogenous. Because most grocery stores have origins in their local communities, the headquarters of prominent publicly traded grocery chains are scattered across the country, in areas with varied demographics. Figure 1 shows a map of the U.S. counties where public grocery store chains in our sample were headquartered in 1995, the midpoint of our sample period. The contrasting colors of the counties on the map indicate

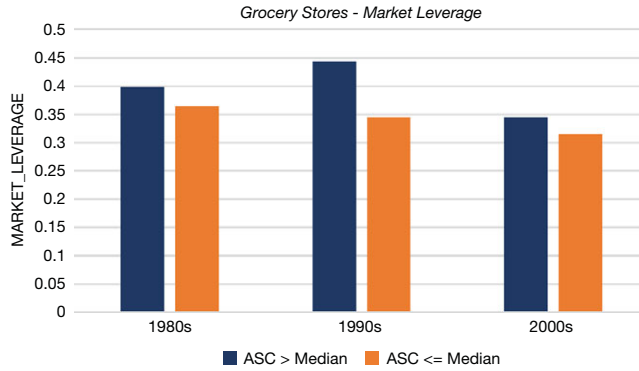
[4]Previous papers have shown other effects of local demographics on individual and corporate financial decisions. Graham and Kumar (2006) show that retail investors' demographics affect their portfolio holdings. Becker, Ivković, and Weisbenner (2011) provide evidence that local clienteles shape payout policy: Firms pay more dividends when they are headquartered in areas with more senior citizens. Becker et al. provide evidence that managers cater to the preferences of local seniors because they hold their stock positions longer.

FIGURE 2

Market Leverage in Grocery Store Chains

Figure 2 shows the average market leverage of publicly traded grocery store chains, sorted by their headquarters locations. We assign percentile ranks to each county based independently on the percentage of seniors (age 65+) and the ratio of women to men in the county. The percentile ranks are added together and divided by 200 for each county into a composite Local Age and Sex Composition Index (ASC), which ranges from 0.01 to 1.00. ASC > Median (ASC ≤ Median) indicates observations with LOCAL_ASC_INDEX values of greater than (less than or equal to) 0.50.

	Number of Observations	
	ASC > Median	ASC <= Median
1980s	199	173
1990s	185	136
2000s	93	87



variation in a composite measure of the age and sex composition in the county across these grocery chain locations (a higher composite score indicates more females and senior citizens).

To evaluate whether there is an association between local demographics and grocery chains' financing choices, we partition all grocery chain firm-years in our sample according to this composite measure of local demographics.[5] Figure 2 shows that across the 1980s, 1990s, and 2000s, grocery chains headquartered in areas where demographics indicate that local investors may prefer safer portfolios have consistently higher debt in their capital structures than those headquartered elsewhere. The results are striking. Grocery chains in areas with the top tercile of female and older populations have market leverage ratios that are 4%, 10%, and 17% higher than those in the bottom tercile as we move across the 3 decades. This simple analysis of a homogenous industry that is naturally dispersed across the United States lends initial support for our hypothesis and motivates a more comprehensive analysis.

To conduct our overall analysis, we must first construct measures that capture the differences in relevant demographics across communities. We focus on imbalances in two salient features of a local population that are correlated with individuals' risk preferences: age and sex (U.S. Census Bureau (2010)). Examining household responses to the University of Michigan's Health and Retirement Study, Halek and Eisenhauer (2001) observe a greater willingness among younger and

[5]We describe the demographic variables of interest and their construction later in this introduction.

male respondents to take speculative risks. Furthermore, research on household portfolio allocation shows that investors shift out of stocks and into fixed-income securities and cash as they age (see, e.g., Bakshi and Chen (1994), Brown (1990), Dahlbäck (1991), and Fagereng, Gottlieb, and Guiso (2017)). Becker (2007) shows that this dynamic leads to higher levels of bank deposits in areas with older populations. Gender-related attitudes toward risk also affect the composition of investment portfolios. Studies in personal finance consistently show that women tend to have lower investment risk tolerance than do men (see, e.g., Hudgens and Fatkin (1985), Johnson and Powell (1994), Sundén and Surette (1998), Bernasek and Shwiff, (2001), and Barber and Odean (2001)). Based on these studies, we expect females and older investors to provide more private debt capital than males and younger investors.

We capture the local age composition using PERCENT_SENIORS, the fraction of the local population that is over 65 years of age following Becker (2007). We construct FEMALES_TO_MALES, the number of females per male in the county, to capture the local sex composition. We also construct an index that aggregates these demographic features to illustrate their combined effect. The Local Age and Sex Composition Index (LOCAL_ASC_INDEX or ASC) adds an area's percentile ranks along these two dimensions and divides the sum by 200 so that it ranges from 0.01 to 1. Thus, a higher index value should represent a more risk-averse local population.[6] Figure 3 shows a U.S. map in which our sample firms' headquarters counties are shaded to indicate their LOCAL_ASC_INDEX values in 1995, the midpoint of our sample period. The average fraction of seniors and the ratio of women to men in the bottom tercile ASC counties are 0.08 and 1.01, respectively, compared to 0.16 and 1.09 in the top tercile ASC counties, demonstrating substantial demographic heterogeneity across the United States.

We find a robust relation between local investors' risk preferences, as implied by demographics, and firms' capital structures. Both PERCENT_SENIORS and FEMALES_TO_MALES predict a higher level of debt in local firms' capital structures. Because both measures appear to be important predictors of firms' financial policies, we focus our analysis on LOCAL_ASC_INDEX to capture the aggregate effect. Indeed, tests using LOCAL_ASC_INDEX indicate that the combined effect is substantial. Point estimates from panel regressions that include industry $\times$ year fixed effects and relevant control variables reveal that market leverage ratios are approximately 2 percentage points higher in firms in the 75th percentile than in those in 25th percentile of the LOCAL_ASC_INDEX distribution. This difference is approximately 8% of the mean leverage ratio of 25 percentage points in our sample.[7]

To ascertain whether we have identified a capital supply effect, we consider alternative explanations and endogeneity issues. One concern is whether our results actually reflect capital market demand conditions. It is possible that firms choose locations based on their industries or business models and that the financing choices

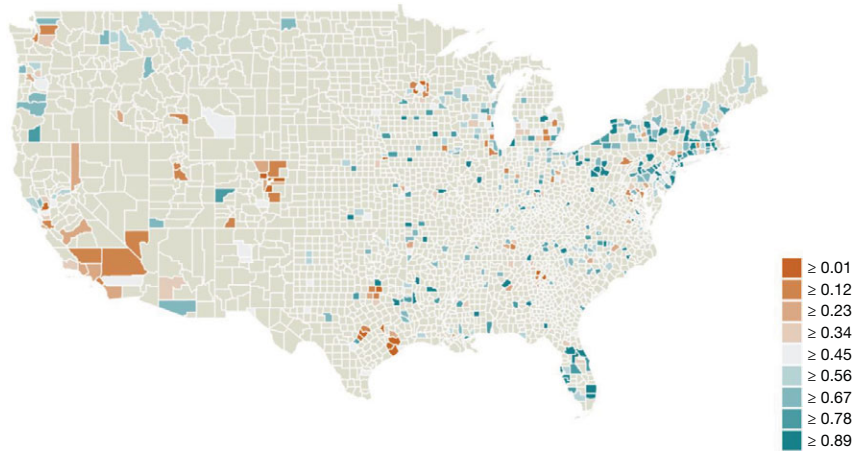
[6]The results are robust to using modified versions of ASC calculated using either the decile or percentile rankings of the underlying demographic variables.

[7]We also evaluate firms' capital-raising activities in Table 5. Firms located where there are more seniors and women raise more debt and less equity capital than firms headquartered elsewhere.

FIGURE 3

LOCAL_ASC_INDEX for Counties Where Sample Firms Were Headquartered in 1995

Figure 3 provides maps of the counties where the firms in our sample are headquartered in 1995. The counties are shaded according to their Local Age and Sex Composition Index (LOCAL_ASC_INDEX) value, which is a composite measure of the counties' percentile rankings along two demographic dimensions: i) the average age of the population in the county and ii) the ratio of women to men in the county. LOCAL_ASC_INDEX ranges from 0.01 to 1.00.



we have identified capture differences in capital demands across firm types (Frank and Goyal (2009)). Firms with more conservative strategies or less risky operations may locate in areas with a more risk-averse population, and these firms may optimally seek more debt financing. Another plausible explanation is that local norms shape managers' preferences and decisions and hence firms' financing choices. Although fully disentangling supply and demand forces is difficult, we conduct a variety of tests that collectively suggest that local capital supply conditions influence firms' capital structures.

First, in our regressions we control for a broad range of covariates relevant to capital structure decisions. The demography–leverage relation is robust in specifications that control for numerous firm characteristics and industry effects that are potentially important for firms' demand for debt capital. Moreover, the relation is robust to controlling for local economic conditions, indicating that our findings do not merely reflect differences in capital demands of firms facing growing versus mature local economies. The demography–leverage relation is also robust to the exclusion of firms in high-tech industries, indicating that it is not driven by greater demand for equity capital in technology firms that tend to cluster in geographic regions with certain demographic features.

Our second approach to addressing endogeneity is to test whether the relation between local investing preferences and firms' financing activities varies with the importance of local capital markets. Specifically, we repeat our main test on subsamples of firms sorted along dimensions that may indicate differences in the ability to access public markets. First, motivated by studies showing that firms without credit ratings face significantly limited and segmented credit markets (e.g., Faulkender and Petersen (2006), Sufi (2009), and Tang (2009)), we partition firms by

credit rating status. We find that the demography–leverage relation is driven by firms with below-investment-grade credit ratings or no credit ratings. We also partition firms by their industry-level tangibility of assets. Because tangible assets can be easily verified and pledged as collateral, firms with more such assets can readily borrow in geographically dispersed debt markets. In contrast, firms with fewer tangible assets may have to rely on local debt markets, allowing lenders to monitor borrowers at a lower cost. As expected, we find that the demography–leverage relation is stronger among firms operating in industries with below-median tangible assets. The results from these subsample analyses are consistent with local capital supply conditions having the greatest impact on the capital structures of firms that face the highest barriers to accessing the public bond markets. We also find that the demographics–leverage relation is concentrated in counties with higher personal incomes. This result provides further support for a supply-side interpretation of the main results because local investors' preferences are likely to matter more when they have greater investible wealth.

Our third strategy is to directly analyze local private debt supply conditions. If supply conditions vary with demographics as we propose, a capital supply explanation for our results is more plausible. We propose two channels through which local preferences may influence debt supply conditions. Under a capital structure model in which firms trade off the costs and benefits of increased debt financing, both channels we identify lead to the prediction that firms will rationally carry more debt when local investors are more risk averse. The first channel builds on the literature showing that individuals and banks have a local investing bias (e.g., Coval and Moskowitz (1999), Ivković and Weisbenner (2005), Kashyap and Stein (2000), Petersen and Rajan (2002), and Becker (2007)). We find that areas with more seniors and females are associated with elevated local bank deposit levels, greater borrowing by local firms through private syndicated loans, and greater local bank participation in the lending syndicates. Interestingly, however, we do not observe that borrowers in these areas pay higher interest rates on their loans, even though they carry more debt overall. These results are consistent with a rightward shift in local debt supply curves in higher ASC areas, allowing firms to borrow more without incurring higher costs.

Stability of the capital supply is the second channel through which local preferences may affect private debt market conditions. Building on Massa et al.'s (2013) argument that firms' debt policies are shaped in part by the stability of the assets under management by their institutional investors, we predict that firms' financing decisions will also reflect the stability of the local capital supply. Aggregate investible wealth should be less volatile in areas where individuals are more risk averse because more wealth is allocated to cash and fixed-income securities, resulting in local banks having more stable deposits that can be used for lending. Local firms may therefore carry more debt because they are more confident that those debts can be rolled over at fair prices when they come due (Baker (2009)).[8]

[8]For example, Choi and Choi (2016) argue that loanable bank deposits will be less sensitive to monetary policy and therefore more stable when the local population is more motivated to maintain bank deposits to store wealth as opposed to using them as an investment option.

In support of this channel, we find that bank deposits are indeed less volatile in higher ASC areas.[9]

Our final two identification strategies evaluate how exogenous shocks to capital supply affect firms' financing choices.[10] We first examine the partial integration of local banking markets associated with the staggered removals of state-level interstate banking restrictions under the IBBEA. Previous studies provide extensive evidence that local capital supplies and financing activities flourished when states lowered these barriers (e.g., Jayaratne and Strahan (1996), Dick and Lehnert (2010), Goetz, Laeven, and Levine (2013), Amore, Schneider, and Žaldokas (2013), Favara and Imbs (2015), and Shenoy and Williams (2015)) and that geographical constraints on capital supply loosened up (Becker (2007)).[11] In this context, we expect that banking integration had a greater impact on firms headquartered in areas where local debt supplies were previously more constrained because the local population provided less debt capital. This analysis is similar in spirit to D'Acunto, Liu, Pflueger, and Weber's (2018) analysis of the differential impact of banking integration across firms conditional on the flexibility of their output pricing. We find that public companies in lower ASC areas borrow more than those in higher ASC areas following banking deregulation. This suggests that firms in higher ASC areas already had ample supplies of local private debt even before the deregulation, whereas firms in lower ASC areas respond to this exogenous increase in debt capital supply by borrowing more to move closer to their optimal debt ratios.

The second shock we analyze is the onset of the 2008–2009 financial crisis. This was a particularly difficult time to raise capital, especially from banks, and many firms failed or experienced financial distress (Gorton (2010), Almeida, Campello, Laranjeira, and Weisbenner (2012)). We find that local capital supply conditions affected firms' ability to weather the crisis. Conditional on being headquartered in a high-income county, firms in higher ASC areas were more likely to raise new capital and to survive the crisis than were stand-alone companies. Interestingly, these results suggest that firms with larger and more stable local capital supplies fared better during the crisis even though they entered this precarious period with higher leverage on average.

[9]Research shows considerable time-series variation in the supply of both public and private debt capital, but private loans are more volatile overall. Moreover, bank lending varies with the economy to a much greater degree than public debt financing. Becker and Ivashina (2014) show that the cyclical nature of bank lending is driven by shocks to credit supply. These patterns may help further explain why firms in high ASC areas raise a greater fraction of private debt: the less risky portfolios of investors in these areas may stabilize the supply of bank capital and thus reduce the volatility of this particularly unstable form of debt capital.

[10]Ideally, we would evaluate shocks to local preferences, but this type of analysis is challenging to conduct since demographics are quite stable over time. We focus instead on shocks to capital supply conditions.

[11]Some studies find mixed evidence on the link between banking deregulation and the capital-raising activities of small, young, and private firms that may suffer from acute agency problems (Rice and Strahan (2010), Zarutskie (2006)). Our sample of public firm is less likely to suffer from agency issues to the same extent, so a stronger relation may be expected between deregulation and financing activities in our sample.

Our final analysis addresses further the possibility that local norms influence managers' preferences, which in turn affect firms' demand for debt.[12] The evidence, discussed earlier, that firms in lower ASC areas quickly changed their financing patterns following the integration of banking markets, is difficult to reconcile with this demand-side explanation, which relies on slow-moving local norms and managers' norms. Nevertheless, we explore the possibility that because women and seniors make less risky personal financial decisions, local norms in areas where these demographics are prevalent may bend toward more conservative corporate financial policies. As shown in Panel B of Table B1 in Appendix B, we find that ASC is negatively correlated with a local population's personal debt-to-income ratios, which is to be expected if senior citizens and women are more risk averse. However, if corporate financial policies mirror local norms, firms located in higher ASC areas would use less debt. This is the opposite of our results. Thus, this dynamic does not appear to drive the relation between local demographics and firms' capital structures.[13]

Although we cannot completely rule out all alternative explanations, the collective results suggest that local preferences influence capital supply conditions and ultimately local firms' capital structures. As such, local investors' preferences may help explain the two empirical regularities highlighted at the beginning of this introduction. First, because local demographics change slowly, and firms rarely move their headquarters, supply effects could contribute to the widely documented persistence in firm-level capital structures. Second, the considerable variation in local demographics across regions may help explain the cross-sectional heterogeneity of capital structures across firms. Furthermore, our results suggest that the investing preferences of a firm's local capital base may affect its ability to weather harsh economic conditions as seen during the financial crisis.

This work contributes to our understanding of the ways that local capital supply conditions affect economic outcomes. Becker (2007) shows that the higher local bank capital associated with concentrations of senior citizens contributes to the creation of new firms and the success of small firms. Our article provides evidence that local capital conditions also matter for the financing of public firms. Furthermore, our article complements Becker et al. (2011), who find that firms respond to older local investors' preference for dividends. We extend the literature by showing that the prevalence of women in the local population can affect capital supply conditions by affecting aggregate preferences for risk. We therefore provide broader evidence that local investing preferences shape public companies' capital structure decisions, thereby shedding new light on this important yet puzzling area of corporate finance.

[12]Cronqvist, Makhija, and Yonker (2012) provide evidence that firms' financial policies reflect their chief executive officer's (CEO) revealed personal preferences. Here, we allow for the possibility that the local culture affects managers' preferences, which they in turn impose on their firms.

[13]Panel A of Table B1 in Appendix B presents versions of our main regressions that include control variables capturing the average age and gender composition of firms' top executives, and their risk-taking incentives indicated by the Delta and Vega of their compensation. If these demographic characteristics reflect personal preferences that could drive financing decisions, executives' demographics may also be related to leverage. We do not find this to be the case. Moreover, including the executives' risk incentives does not affect the ability of ASC to predict leverage.

II. Data and Variables

We obtain demographic data and county-level variables from the 1980, 1990, 2000, and 2010 U.S. Censuses. We also obtain decennial county-level data on religious adherence from the American Religious Data Archive, and annual data on county income from U.S. Bureau of Economic Analysis website (www.bea.gov). For county-level data that are available only decennially, we follow the literature (Alesina and La Ferrara (2000), Hilary and Hui (2009), and Kumar, Page, and Spalt (2011)) and linearly interpolate the data to obtain estimates for the intermediate years. We follow the literature and match the county-level demographic information to the counties of the firms' headquarters (Coval and Moskowitz (1999), (2001), Ivković and Weisbenner (2005)).

We capture the local age composition using PERCENT_SENIORS, the fraction of the local population over 65 years of age. We capture the local sex composition by defining FEMALES_TO_MALES as the number of females per males in the county. We also construct an index that aggregates these demographic features to illustrate their combined effect. For each year in our sample, we rank firms into percentiles, separately, by PERCENT_SENIORS and FEMALES_TO_MALES in the counties of their headquarters. We add these two independent percentile rankings and divide the sum by 200 to construct LOCAL_ASC_INDEX. This index varies from 0.01 to 1.00 and averages 0.50 by construction. A higher index value should thus represent a more risk-averse local population.

The distributions of these fundamental local demographics associated with our sample of firms are summarized in Panel A of Table 1. There is considerable heterogeneity. For example, although on average there are 1.05 females for every male, the 25th and 75th percentiles are 1.02 and 1.08, respectively, and the 1st and 99th percentiles are 0.96 and 1.15. There are also meaningful differences in the fraction of the population who are seniors. On average, seniors make up 12% of local populations where our firms are headquartered, with a standard deviation of 3%. The 1st and 99th percentiles range from 6 to 23 percentage points.

Figure 3 is a map showing the variation in LOCAL_ASC_INDEX across the U.S. counties where our sample firms were headquartered in 1995, the middle of our sample period. Firms are dispersed across the United States, and there is a great deal of demographic heterogeneity across their headquarters locations. Local populations tend to be older and have more females in the Northeastern, Southeastern, and much of the Midwestern United States. Populations are younger with relatively more males in the Western United States, Texas, and some upper Midwestern counties. These summary statistics suggest that there are likely substantial differences in risk preferences across U.S. counties.[14]

[14]Married couples are more likely to share financial decisions and responsibilities, and own joint bank accounts. In these situations, including them in our analysis may generate noise, which may give rise to attenuation bias. In an unreported analysis, we calculate the gender ratio, excluding married couples. The correlation between the unmarried gender ratio and the raw gender ratio is 0.98, indicating that our results are unlikely to be affected by the choice of gender ratio measure. Moreover, the distribution of the unmarried ratio is wider than that of the raw ratio used in our main analysis. The interquartile range is 0.11, which is almost twice the 0.06 range for the raw ratio. This indicates that the raw gender ratio used throughout this article provides a conservative estimate of the dispersion of the demographic measures, and consequently local preferences for safe assets, across regions in the United States.

TABLE 1

Summary Statistics

Table 1 provides descriptive statistics for the sample of firms in this paper. All variables are defined in Appendix A. The sample consists of nonfinancial, nonutility firms in Compustat from fiscal years 1980–2010. Panels A and B, respectively, present summary statistics of county- and firm-specific variables. Sample size is 83,466.

Variable	Mean	Std. Dev.	P1	P25	Median	P75	P99
Panel A. County Variables							
PERCENT_SENIORS	0.12	0.03	0.06	0.10	0.11	0.13	0.23
FEMALES_TO_MALES	1.05	0.04	0.96	1.02	1.05	1.08	1.15
LOCAL_ASC_INDEX	0.50	0.26	0.05	0.27	0.51	0.74	0.95
INCOME (per capita)	39,968.90	14,110.38	20,131.60	30,569.77	37,143.57	46,073.52	96,824.92
POPULATION (000s)	1,414.65	1,760.80	31.92	468.35	864.72	1,538.10	9,519.32
RURAL_URBAN_CONTINUUM	1.06	1.12	0.00	0.30	1.00	1.00	6.00
RELIGIOUS (per 1,000 people)	534.33	119.33	288.43	437.33	539.91	614.51	797.68
Panel B. Firm-Level Variables							
Main Dependent Variables							
MARKET_LEVERAGE	0.25	0.24	0.00	0.04	0.19	0.41	0.89
BOOK_LEVERAGE	0.24	0.21	0.00	0.05	0.21	0.36	0.91
NEW_DEBT	0.37	0.48	0	0	0	1	1
NEW_EQUITY	0.24	0.43	0	0	0	0	1
Firm Controls							
ln(SIZE)	1,652.51	9,285.48	2.46	35.3	142.22	662.79	26,733
MARKET_TO_BOOK	1.79	1.46	0.58	1.01	1.32	1.97	8.21
PROFITABILITY	−0.01	0.21	−0.98	−0.02	0.04	0.08	0.24
TANGIBILITY	0.30	0.22	0.01	0.12	0.25	0.42	0.88
STOCK_RETURN	0.19	0.72	−0.80	−0.22	0.06	0.40	2.97
STOCK_VOLATILITY	0.14	0.09	0.04	0.09	0.12	0.18	0.49
FIRM_AGE	17.5	12.12	3	8	14	24	53
DIVIDEND_PAYER (1/0)	0.38	0.49	0	0	0	1	1
R&D_TO_SALES	0.16	1.09	0.00	0.00	0.00	0.04	3.63

We gather additional data from other sources. Data on firm characteristics, locations, and stock prices come from the Center for Research in Security Prices (CSRP)/Compustat merged data set. We exclude financials (2-digit Standard Industrial Classification [SIC] codes 60–69) and public utilities (2-digit SIC code 49) because they are highly regulated. Our sample period for the main analysis starts in 1980 and ends in 2010, the last available Census year. Part of our analysis employs data on syndicated commercial loans, which we obtain from DealScan for 1987–2010. For an analysis of bank deposits, we obtain data on commercial banks from their call reports. Our main analysis is based on an unbalanced panel of 83,466 firm-years from 1980 to 2010 for 8,858 unique firms headquartered in 710 different U.S. counties. The numbers of observations vary across the tables based on data availability. Panel B of Table 1 reports descriptive statistics for our sample firms. At the firm-year level, we report the distributions of our main variables of interest (leverage and capital-raising activities) and other firm characteristics that are used as control variables in the regressions.

Other important demographic characteristics that are used as control variables include the total population of a county, whether it is a rural or urban area, the per capita income, and the fraction of residents who consider themselves religious. The construction of these control variables is described in Appendix A.

III. Local Investing Preferences and Firm Financial Policies

A. Main Analysis of Capital Structure

The first set of tests examines the relation between local demographics and firm leverage. We start with baseline regressions that include only year, industry, firm size decile indicators, and dummies representing the top and bottom ASC terciles. Figure 4 reports the parameter estimates for these indicator variables in market and book leverage regressions. The figure shows a monotonic increase in both market (Graph A) and book (Graph B) leverage as the local population has more seniors and females, providing initial evidence that local demographics and preferences are related to capital structures.

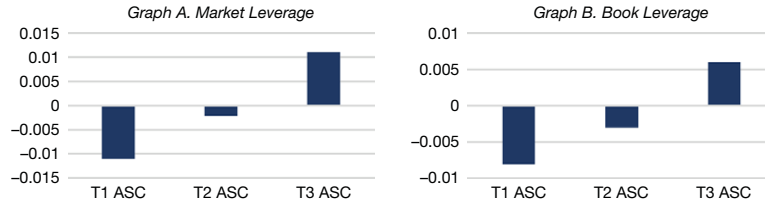
We then estimate panel regressions of leverage on industry × year fixed effects, various control variables related to leverage, and local demographics.[15] We examine the fraction of local seniors and gender ratios separately, and then examine whether leverage varies with a composite measure of demographics (LOCAL_ASC_INDEX). Model 1 in Table 2 reports parameter estimates from a regression of market leverage on PERCENT_SENIORS, echoing Becker's (2007) analysis of the effect of the local concentrations of senior citizens on small firms. The positive estimate of 0.250 (t = 3.70) on PERCENT_SENIORS indicates that firms headquartered in areas with more senior citizens have higher market debt ratios.

Model 2 in Table 2 reports parameter estimates from a regression focused on FEMALES_TO_MALES. We observe a positive estimate of 0.252 (t = 4.92), indicating that firms headquartered in areas with more females have higher market debt ratios. We then evaluate both aspects of local demographics in the same regression in model 3. As women tend to live longer than men, these two variables are highly correlated; the correlation coefficient is 0.53 in our sample. We therefore use

FIGURE 4

Adjusted Market and Book Leverage Across ASC Indices

Graphs A and B of Figure 4 show, respectively, average market and book leverage relative to size decile, and industry and year benchmarks across low (T1), middle (T2), and high (T3) Local Age and Sex Composition Index (ASC) terciles.



an orthogonalized version of this variable (FEMALES_TO_MALES_ORTH) in regressions that include both variables to avoid potential multicollinearity concerns.[16] In model 3, we observe positive coefficients on both ratios in predicting leverage.

Given the significance of both the prevalence of seniors and the local gender composition in explaining capital structure, we focus on the relation between capital structures and LOCAL_ASC_INDEX, which captures the combined effect of these demographic characteristics. Consistent with our prediction and the pattern in Figure 4, LOCAL_ASC_INDEX obtains a positive coefficient in the market leverage regression in model 4, indicating that firms headquartered where the local population is likely to have a stronger preference for safe assets have higher market debt ratios. Firms in the 75th percentile of ASC distribution areas exhibit market leverage ratios that are 2 percentage points higher than those of firms in 25th percentile ASC areas. This difference is approximately 8% of the unconditional market leverage of 25 percentage points. This is an economically significant result given that these regressions control for industry and time trends as well as a broad variety of covariates and determinants of leverage previously documented in the literature.

Models 5–8 in Table 2 present a similar analysis of firms' book leverage. The parameter estimates on the variables of interest are similar to those from the market leverage regressions. Model 8 indicates that the difference in book leverage between the 75th and 25th percentiles of ASC areas is approximately 1.6 percentage points, which is approximately 6.4% of the average book leverage of 24 percentage points.[17]

[15]Unless mentioned otherwise, all of our linear models include Fama-French 48 industry and year interaction (industry × year) fixed effects. Our nonlinear models control for industry and year fixed effects separately.

[16]Golub and Van Loan (2013) provide guidance on using orthogonalized variables and instruct researchers to assign the common variation to the variable considered "most important" a priori. Because the literature has established a relation between senior citizens and various financial outcomes (e.g., Becker (2007), Becker et al. (2011)), we treat PERCENT_SENIORS as a more important explanatory variable than FEMALES_TO_MALES. Following a modified Gram–Schmidt procedure for orthogonalizing a variable, FEMALES_TO_MALES is regressed onto the percent of seniors and the error terms from this regression are defined as the orthogonalized version, FEMALES_TO_MALES_ORTH.

[17]We also conduct this analysis where we calculate the index using decile and percentile rankings of the underlying demographic variables. The results are similar.

TABLE 2
Local Demography and Firm Leverage

Table 2 presents baseline regressions of firm leverage on local seniors, female ratios, and the Local Age and Sex Composition Index (LOCAL_ASC_INDEX). Variables are defined in Appendix A. All firm-level control variables are lagged by 1 year. The sample consists of nonfinancial, nonutility firms in Compustat from fiscal years 1980 to 2010. The sample excludes financial (Standard Industrial Classification [SIC] codes 6000–6999) and utility (SIC codes 4900–4999) firms. Standard errors are robust to heteroscedasticity and are clustered at the firm level. *t*-statistics are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	MARKET_LEVERAGE				BOOK_LEVERAGE			
Variable	1	2	3	4	5	6	7	8
PERCENT_SENIORS	0.250***		0.258***		0.210***		0.216***	
	(3.70)		(3.82)		(3.39)		(3.49)	
FEMALES_TO_MALES		0.252***				0.205***		
		(4.92)				(4.31)		
FEMALES_TO_MALES_ORTH			0.180***				0.143***	
			(3.35)				(2.85)	
LOCAL_ASC_INDEX				0.041***				0.033***
				(5.12)				(4.44)
ln(INCOME)	−0.017*	−0.017*	−0.018**	−0.018**	−0.009	−0.010	−0.010	−0.010
	(−1.87)	(−1.94)	(−2.01)	(−2.05)	(−1.11)	(−1.16)	(−1.22)	(−1.24)
ln(POPULATION)	−0.007***	−0.006**	−0.006**	−0.005**	−0.007***	−0.006***	−0.006***	−0.006***
	(−2.88)	(−2.43)	(−2.46)	(−2.29)	(−3.22)	(−2.82)	(−2.85)	(−2.71)
ln(RELIGIOUS)	0.019**	0.005	0.006	0.007	0.010	−0.001	−0.000	0.000
	(2.20)	(0.58)	(0.70)	(0.77)	(1.21)	(−0.17)	(−0.05)	(0.03)
RURAL_URBAN_CONTINUUM	−0.005*	−0.002	−0.003	−0.003	−0.005**	−0.003	−0.004	−0.004*
	(−1.85)	(−0.79)	(−1.06)	(−1.37)	(−2.36)	(−1.33)	(−1.61)	(−1.88)
ln(SIZE)	0.027***	0.027***	0.027***	0.027***	0.026***	0.026***	0.026***	0.026***
	(21.99)	(21.88)	(21.97)	(22.02)	(23.33)	(23.25)	(23.29)	(23.35)
MARKET_TO_BOOK	−0.044***	−0.044***	−0.044***	−0.044***	−0.014***	−0.014***	−0.014***	−0.014***
	(−38.11)	(−38.01)	(−38.02)	(−38.09)	(−12.49)	(−12.44)	(−12.42)	(−12.43)
PROFITABILITY	−0.142***	−0.142***	−0.142***	−0.142***	−0.167***	−0.167***	−0.167***	−0.167***
	(−22.17)	(−22.22)	(−22.21)	(−22.21)	(−20.55)	(−20.59)	(−20.57)	(−20.57)
TANGIBILITY	0.191***	0.192***	0.192***	0.192***	0.203***	0.203***	0.203***	0.203***
	(15.95)	(16.01)	(16.00)	(15.99)	(18.13)	(18.18)	(18.18)	(18.17)
STOCK_RETURN	−0.033***	−0.033***	−0.033***	−0.033***	−0.015***	−0.015***	−0.015***	−0.015***
	(−27.44)	(−27.47)	(−27.46)	(−27.48)	(−13.21)	(−13.24)	(−13.23)	(−13.24)

(continued on next page)

TABLE 2 (continued)

Local Demography and Firm Leverage

	MARKET_LEVERAGE				BOOK_LEVERAGE			
Variable	1	2	3	4	5	6	7	8
STOCK_VOLATILITY	0.330***	0.331***	0.331***	0.331***	0.246***	0.247***	0.247***	0.247***
	(20.21)	(20.28)	(20.27)	(20.27)	(15.92)	(15.97)	(15.97)	(15.96)
FIRM_AGE	0.000	0.000	0.000	0.000	−0.001***	−0.001***	−0.001***	−0.001***
	(0.28)	(0.12)	(0.09)	(0.04)	(−2.97)	(−3.10)	(−3.12)	(−3.16)
DIVIDEND_PAYER	−0.088***	−0.089***	−0.089***	−0.089***	−0.069***	−0.070***	−0.070***	−0.070***
	(−19.45)	(−19.62)	(−19.61)	(−19.54)	(−17.32)	(−17.44)	(−17.43)	(−17.39)
R&D_TO_SALES	−0.006***	−0.006***	−0.006***	−0.006***	−0.007***	−0.007***	−0.007***	−0.007***
	(−5.83)	(−5.92)	(−5.91)	(−5.93)	(−4.46)	(−4.50)	(−4.50)	(−4.50)
Fixed effects	Industry × year	Industry × year	Industry × year	Industry × year	Industry × year	Industry × year	Industry × year	Industry × year
No. of obs.	83,466	83,466	83,466	83,466	83,466	83,466	83,466	83,466
R^2	0.343	0.344	0.344	0.344	0.236	0.237	0.237	0.237

TABLE 3
Robustness

Table 3 presents several robustness checks for our main results. We report estimates for the Local Age and Sex Composition Index (LOCAL_ASC_INDEX) in models similar to those presented as models 4 and 8 in Table 2 with the following variations. In Panel A, we replace the leverage ratio with the short-term debt ratio and long-term debt ratio as dependent variables, respectively. Panel B estimates the regressions using: subsamples of firms sorted by whether they are in high- and low-income counties, divided by median income; subsamples that exclude i) firms that have fewer than 500 employees (Becker (2007)), ii) counties that experienced declines in the population under 40 over the last decade, and iii) high-tech firms; and subsamples of firms divided by whether their operations are more or less dispersed than the median firm (as defined by Bernile, Kumar, and Sulaeman (2015)). Panel C includes various additional controls and fixed effects in the regressions. Standard errors are robust to heteroscedasticity and are clustered at the firm level. *t*-statistics are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	LOCAL_ASC_INDEX			
Specification	MARKET_LEVERAGE	*N*	BOOK_LEVERAGE	*N*
Panel A. Debt Structure				
Short-term debt	0.013*** (3.63)	83,466	0.010*** (3.17)	83,466
Long-term debt	0.028*** (4.02)	83,466	0.023*** (3.50)	83,466
Panel B. Subsample Analysis				
High-income counties	0.065*** (4.87)	41,182	0.051*** (4.21)	41,182
Low-income counties	0.027** (2.46)	42,159	0.023** (2.26)	42,159
Excluding firms with < 500 employees	0.045*** (4.63)	53,329	0.039*** (4.33)	53,329
Growing counties only	0.046*** (4.38)	54,676	0.040*** (4.24)	54,676
Excluding high-tech firms	0.029*** (3.15)	65,716	0.021** (2.46)	65,716
Dispersed operations	0.024* (1.69)	20,280	0.023* (1.82)	20,280
Concentrated operations	0.061*** (5.28)	24,826	0.046*** (3.86)	24,826
Panel C. Fixed Effects and Other Controls				
Size and market-to-book ratio decile fixed effects	0.030*** (4.12)	83,417	0.032*** (4.44)	83,417
State fixed effects	0.031** (2.56)	83,362	0.023** (2.10)	83,362
Other growth controls	0.048*** (4.40)	56,551	0.047*** (4.86)	56,551

B. Debt Structure

We now turn to an analysis of debt structure, that is, whether firms in higher ASC areas carry more short- or long-term debt. In Panel A of Table 3 we conduct an analysis similar to that of Table 2 but replace the dependent variable with short- and long-term debt ratios. The regression results indicate that firms in higher ASC areas have higher levels of both short- and long-term debt. This suggests that supply conditions in higher ASC areas allow for greater debt utilization by firms without increasing concerns about rollover risk.

In untabulated analysis, we also observe that debt maturity, measured as the ratio of long-term debt to total debt, is positively related to LOCAL_ASC_INDEX. This result is weaker, however, which could reflect that conflicting forces are at work. On one hand, a local preference for safer securities may allow firms to increase debt maturity because long-term debt may be more readily available from

local sources. On the other hand, it may lead firms to reduce the duration of their debt because short-term debt is cheaper and, in these areas, rollover risk is lower. It may also reflect the relative importance of private bank loans and syndicated loans, which typically have shorter maturities.[18]

C. Subsample Analyses

1. Local Income

We expect local investing preferences to have a greater impact on the supply of capital when the local population has more investible wealth. We therefore hypothesize that the link between corporate capital structure and local preferences is weaker in lower income areas. The first two sets of results in Panel B of Table 3 report regression estimates from subsamples partitioned by whether the firms are located in counties with above- or below-median total income levels. Consistent with our expectations, the link between LOCAL_ASC_INDEX and capital structure is more prominent in high-income areas.

2. Excluding Small Employers

Becker (2007) finds that the higher local bank deposits associated with an older population have a positive effect on the proliferation of small private firms in the local area (those with fewer than 500 employees). To examine whether our results are concentrated in the subsample of firms that, though public, are similar in size to Becker's sample, we exclude public firms with fewer than 500 employees from the sample and reestimate our regressions. As seen in the third row in Panel B of Table 3, the point estimates are slightly higher than those in Table 2. This indicates that local preferences have a wider influence on corporate financing decisions than suggested by previous studies.

3. Growing Counties

It is possible that an older local population reflects the migration of younger residents out of a stagnating or mature local economy in search of better opportunities. If so, our results may indicate that mature local businesses can afford more debt or that stagnant businesses are attracting less equity financing. To test this possibility, we drop observations associated with counties that experienced a decline in the number of people 40 years and younger during the previous decade. If ASC proxies for maturing or stagnant businesses in the area, it should have no predictive power over the capital structures of firms in the remaining, growing areas. Becker et al. (2011) conduct a similar analysis using changes in local demographics to help differentiate between demand and supply explanations for dividend payouts.

[18] Another channel through which local ASC can affect financing decisions is through cash holdings. In an untabulated analysis, we observe a strong negative relation between LOCAL_ASC_INDEX and cash holdings. The effects are statistically significant and economically material. Firms in high-ASC areas have 2.5-percentage-point lower cash holdings (as a fraction of total assets) than firms in low-ASC areas, after controlling for various firm and area characteristics. This combination of higher debt levels and lower cash holdings is consistent with high-ASC firms being more comfortable with having higher leverage with less cash buffer because of the availability of local capital.

As reported in the fourth row of Panel B of Table 3, the results are qualitatively unchanged when we reestimate the regression only in the subsample of growing counties. This suggests that the positive relation between LOCAL_ASC_INDEX and the debt ratios of local companies is unlikely to be driven by the greater demand for debt of mature or stagnant local businesses.

4. Excluding High-Tech Firms

Another potential concern is that the results are related to the clustering of technology firms. High-tech firms may sort together along two dimensions: i) geographically, particularly in areas with a younger population (e.g., Silicon Valley), and ii) financial policy, carrying less debt. Indeed, the high-tech firms in our sample have more than 12-percentage-point lower market leverage relative to other firms (15.3% vs. 27.7%). To determine whether these patterns drive our results, we reestimate the regression on a subsample that excludes high-tech firms. As seen in the fifth row of Panel B of Table 3, restricting the sample in this way does not materially affect the results.

5. Dispersion of Operations

Garcia and Norli (2012) and Bernile, Kumar, and Sulaeman (2015) argue that firms with more geographically dispersed operations have a wider investor base. Dispersed firms may therefore have better access to nonlocal sources of financing, including debt financing. Following these studies, we sort firms by the number of states mentioned in their 10-K filings and form subsamples based on whether they are above or below the median. The last two rows in Panel B of Table 3 present regression estimates using these subsamples. LOCAL_ASC_INDEX predicts debt ratios in both subsamples, although the result is stronger among less dispersed firms, consistent with the latter firms relying more on local capital supply and therefore being affected more by local preferences.

D. Nonlinearity and Fixed Effects

Panel C of Table 3 focuses on concerns about omitted variables. First, we address potential nonlinearity in the relation between firm size and leverage, as larger firms may have easier access to the public debt market. A related concern stems from nonlinearity in the effect of relative market valuations (equity vs. debt) on the propensity to issue certain types of securities (see, e.g., the nonlinear effect of returns and institutional demand documented in Alti and Sulaeman (2012)). To address these concerns, in the first row of Panel C we present regressions that control for firm size and book-to-market with decile dummies in addition to their continuous counterparts. The results are largely unaffected, indicating that our main results are not driven by the failure to account for these nonlinearities.

One may also be concerned about our ability to capture important geographic differences in financial policies. For example, the demographics of an area may attract firms that are similar and thus have similar financing policies. Moreover, variation in state laws (e.g., individual and corporate income taxes) may simultaneously affect corporate leverage and individuals' choice of residence. To account for these possibilities, we include state fixed effects to control for time-invariant differences in leverage across states. As shown in the second row in Panel C of

Table 3, the coefficients on LOCAL_ASC_INDEX continue to be positive, with similar economic magnitudes to our baseline analysis.

Finally, we include additional controls for economic growth at the county level in the regressions reported in the last row in Panel C of Table 3. One may be concerned that cross-county differences in demographics are also correlated with differences in the growth opportunities available to firms, which may partially dictate capital structures. In the final regression of Panel C, we address this issue by controlling for the county-level growth in population and income as well as changes in firm sales over the 5-year period centered around the focal firm-year observation. The relations between LOCAL_ASC_INDEX and both market and book leverage are largely unaffected.

E. Sorting by Ability to Access the Capital Markets

Next we examine whether the main results are stronger among firms that may have more limited access to public capital markets. As discussed in Section I, we hypothesize that firms with below-investment-grade credit ratings and those without credit ratings likely have difficulty accessing the public markets and therefore rely more on local sources of capital (Colla et al. (2013)). We also expect that firms from industries with fewer tangible assets will find it harder to access the debt markets.

We start this section by analyzing the capital structures of 3 subsamples of firms separately: those with investment-grade credit ratings from Standard & Poor's (S&P) (8,454 firm-year observations), those with below-investment-grade ratings (7,721 observations), and those that are unrated by S&P (53,118 observations). These regressions are reported in Panel A of Table 4. We do not find significant relations between the local demographic variables of interest and the capital structures of investment-grade firms, but we find that the hypothesized relations are significant for both low-rated and unrated firms. An analysis of book leverage, which we do not report to save space, provides similar results. The coefficient estimates (*t*-statistics) on LOCAL_ASC_INDEX within the investment-grade, speculative-grade, and unrated subsamples are 0.014 (0.83), 0.058 (2.88), and 0.034 (3.95), respectively, for book leverage. These results indicate that public firms that face higher barriers to accessing the public capital markets depend more on local debt supply and are therefore influenced more by the local population's investing preference. Because most public firms are either unrated or have low credit ratings, this effect is also observed in the overall cross section of firms.

We next partition firms by industry-level asset tangibility. Because tangible assets can be more easily verified and pledged as collateral, firms with more such assets can readily borrow in geographically dispersed debt markets or in the public bond markets. In contrast, firms with fewer tangible assets may have to rely on local debt markets, as proximity facilitates monitoring at a lower cost (Petersen and Rajan (2002)). To avoid potential issues associated with the simultaneity of the choice of leverage and the choice of asset mix, we use industry tangibility ratios instead of firm-specific asset tangibility. In particular, we partition firms by whether their main industry is characterized by above- or below-median levels of collateral, defined as

TABLE 4

Dependence on Local Debt Market: Subsample Analyses

Panel A of Table 4 presents baseline regressions of firm leverage on county demography and the Local Age and Sex Composition Index (ASC) using subsamples of firms with investment-grade long-term credit rating (i.e, firms with a rating of BBB– or higher from Standard & Poor's [S&P] in a given year), non-investment-grade credit rating, and no credit rating. Regressions using the sample of credit-rated firms (models 1–4) also control for the ordinal rankings of the rating levels. Panel B presents similar analysis with subsamples of firms in high (above-median) and low (below-median) levels of industry collateral. Variables are defined in Appendix A. All firm-level control variables are lagged by 1 year. The sample consists of nonfinancial, nonutility firms in Compustat from fiscal years 1985 to 2010. The sample excludes financial (Standard Industrial Classification [SIC] codes 6000–6999) and utility (SIC codes 4900–4999) firms. Standard errors are robust to heteroscedasticity and are clustered at the firm level. *t*-statistics are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Subsamples Based on Credit Ratings

	Dependent Variable: MARKET_LEVERAGE					
	Investment Grade		Noninvestment Grade		Unrated	
Variable	1	2	3	4	5	6
PERCENT_SENIORS	0.006 (0.04)		0.318** (2.05)		0.324*** (4.25)	
FEMALES_TO_MALES_ORTH	0.076 (0.77)		0.420*** (3.19)		0.178*** (3.02)	
LOCAL_ASC_INDEX		0.013 (0.77)		0.070*** (3.56)		0.045*** (4.97)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
County controls	Yes	Yes	Yes	Yes	Yes	Yes
Credit rating rank	Yes	Yes	Yes	Yes	N/A	N/A
Fixed effects	Industry × year	Industry × year	Industry × year	Industry × year	Industry × year	Industry × year
No. of obs.	8,454	8,454	7,721	7,721	53,118	53,118
R^2	0.580	0.580	0.509	0.509	0.307	0.307
Test of diff. in LOCAL_ASC_INDEX						
Model 2 vs. 4				−0.057** (−2.30)		
Model 2 vs. 6						−0.032** (−1.79)

Panel B. Subsamples Based on Industry Collateral

	Dependent Variable: MARKET_LEVERAGE			
	High Collateral		Low Collateral	
Variable	1	2	3	4
PERCENT_SENIORS	0.141 (1.61)		0.355*** (4.39)	
FEMALES_TO_MALES_ORTH	0.134* (1.87)		0.212*** (3.17)	
LOCAL_ASC_INDEX		0.027** (2.57)		0.051*** (5.22)
Firm controls	Yes	Yes	Yes	Yes
County controls	Yes	Yes	Yes	Yes
Fixed effects	Industry × year	Industry × year	Industry × year	Industry × year
No. of obs.	43,221	43,221	40,245	40,245
R^2	0.338	0.338	0.321	0.321
Test of diff. in LOCAL_ASC_INDEX				
Model 2 vs. 4				−0.024* (−1.78)

the ratio of the sum of property, plant, and equipment and inventory to total assets. The regression results in Panel B of Table 4 show that the demographic-leverage pattern is stronger among firms from industries with less tangible assets, consistent with our hypothesis. An analysis of book leverage, not reported for brevity, provides similar results. For book leverage, the coefficient estimates (*t*-statistics) on

TABLE 5

Local Supply Conditions and Capital-Raising Activities

Table 5 presents logit regressions of a firm's decision to raise equity and debt capital in a given year on local demography and the Local Age and Sex Composition Index (LOCAL_ASC_INDEX). The dependent variable in models 1–2 is NEW_DEBT, an indicator variable equal to 1 if the firm increases private or public borrowing by 1% or greater. The dependent variable in models 3–4 is NEW_EQUITY, an indicator variable equal to 1 if the firm has a net increase in outstanding equity of 1% or greater. Variables are defined in Appendix A. All firm-level control variables are lagged by 1 year. The sample consists of nonfinancial, nonutility firms in Compustat from fiscal years 1980 to 2010. The sample excludes financial (Standard Industrial Classification [SIC] codes 6000–6999) and utility (SIC codes 4900–4999) firms. Standard errors are robust to heteroscedasticity and are clustered at the firm level. *t*-statistics are in parentheses. *** denotes statistical significance at the 1% level.

	NEW_DEBT		NEW_EQUITY	
Variable	1	2	3	4
PERCENT_SENIORS	1.014***		−2.112***	
	(2.76)		(−4.21)	
FEMALES_TO_MALES_ORTH	1.165***		−1.416***	
	(4.21)		(−3.46)	
LOCAL_ASC_INDEX		0.184***		−0.313***
		(4.27)		(−4.98)
Firm controls	Yes	Yes	Yes	Yes
County controls	Yes	Yes	Yes	Yes
Fixed effects	Industry × year	Industry × year	Industry × year	Industry × year
No. of obs.	83,466	83,466	83,466	83,466
Pseudo-R^2	0.033	0.033	0.183	0.183

LOCAL_ASC_INDEX within the low- and high-collateral-industry subsamples are 0.017 (1.86) and 0.047 (4.63), respectively. These estimates are different from each other at the 5% significance level.

F. Raising New Capital

We next examine the link between local investing preferences and capital-raising activities. Following Hovakimian, Opler, and Titman (2001) and Leary and Roberts (2014), we create dummy variables indicating whether firms raise new capital. NEW_DEBT is a dummy that equals 1 if the net change in the firm's total debt outstanding between years t and $t-1$ is greater than 1% of the firm's existing total assets, and 0 otherwise. This definition captures both new private borrowing and public bond issuance. NEW_EQUITY is a dummy that equals 1 if the difference between common stock issuances and repurchases in year t is greater than 1% of the firm's existing total assets, and 0 otherwise.

Table 5 reports logit regressions modeling NEW_DEBT and NEW_EQUITY. The regressions include control variables related to capital structure choices as before, along with year and industry fixed effects. Consistent with our prediction, PERCENT_SENIORS and FEMALES_TO_MALES_ORTH each separately predicts NEW_DEBT in model 1, and LOCAL_ASC_INDEX positively predicts NEW_DEBT in model 2. In contrast, we find significant negative relations between these variables and NEW_EQUITY in models 3 and 4. These results suggest that the observed relations between local demography and capital structure is driven by differences in firms' active decisions related to raising debt and equity capital, and not by passive differences in book and market values affecting the leverage ratios.

G. Channels

Thus far, we have documented an association between local demographics and firms' capital structures. We next examine 2 possible lending market characteristics that may drive this relation: variations in the level and stability of local bank capital. Although our hypothesis also allows for the possibility that the amount of capital allocated to holding public debt varies with local preferences, analyzing that relation directly is unfeasible as data on the location of public bond holders are not readily available. In addition, bank loans are one of the most prominent sources of private debt capital, even for public companies, and private lending markets are likely to be more segmented than public debt markets, so that we can obtain additional insights from this analysis.

1. Local Capital Supply

Our first test in this section focuses on the level of bank deposits. The data come from quarterly call reports available through the Bank Regulatory database on Wharton Research Data Services (WRDS). Our expectation is that LOCAL_ASC_INDEX is positively correlated with deposit levels. The first 3 models in Table 6 report regressions of the log of bank deposits per capita in each county onto various county characteristics and LOCAL_ASC_INDEX using specifications similar to Becker's (2007). The results are consistent with our hypothesis. Each of PERCENT_SENIORS (model 1), FEMALES_TO_MALES (model 2), and combined LOCAL_ASC_INDEX (model 3) is positively related to deposits. We verify that the point estimate on PERCENT_SENIORS in column 1 is similar to Becker's. The point estimate on LOCAL_ASC_INDEX suggests that

TABLE 6

Local Demography, Local Deposit Levels, and Volatility

Table 6 shows the influence of local demography on the level and volatility of local bank deposits (ln(DEPOSITS_PER_CAPITA) and DEPOSIT_VOLATILITY, respectively) using quarterly data from 1980 to 2010. The main explanatory variables are county-level demographic variables and the Local Age and Sex Composition Index (LOCAL_ASC_INDEX). Variables are defined in Appendix A. Standard errors are robust to heteroscedasticity and are clustered at the county level. *t*-statistics are in parentheses. ** and *** denote statistical significance at the 5% and 1% levels, respectively.

	ln(DEPOSITS_PER_CAPITA)			DEPOSIT_VOLATILITY		
Variable	1	2	3	4	5	6
PERCENT_SENIORS	2.895*** (8.70)			−1.228*** (−6.61)		
FEMALES_TO_MALES		0.919*** (5.60)			−0.051 (−0.57)	
LOCAL_ASC_INDEX			0.456*** (9.14)			−0.112*** (−4.02)
ln(INCOME)	0.808*** (10.18)	0.792*** (9.74)	0.808*** (10.17)	0.347*** (9.40)	0.339*** (9.01)	0.343*** (9.21)
ln(POPULATION)	−0.107*** (−7.28)	−0.161*** (−12.10)	−0.136*** (−9.96)	−0.030*** (−4.51)	−0.009 (−1.60)	−0.014** (−2.45)
COUNTY_HOUSING_INDEX	0.002*** (17.99)	0.002*** (17.95)	0.002*** (17.92)	−0.007*** (−2.95)	−0.007*** (−2.91)	−0.007*** (−2.98)
Fixed effects	State × year	State × year	State × year	State × year	State × year	State × year
No. of obs.	317,526	317,526	317,526	28,012	28,012	28,012
R^2	0.321	0.313	0.321	0.107	0.103	0.104

compared to areas in the 25th percentile, those in the 75th percentile of ASC distribution have 22% higher deposits per capita. These results support our expectation that local preferences for safer investments lead to higher bank deposits available for local firms to borrow.

2. Local Capital Stability

Investing preferences may also affect the stability of local capital and, thus, firms' capital structures (e.g., Massa et al. (2013)). Capital stability is particularly important in the context of short-term or maturing debt because a more stable source of local capital can mitigate rollover risk. To examine this potential channel, we analyze the volatility of local deposits as a function of local demographics.

Models 4–6 in Table 6 evaluate the relation between local demographics and the volatility of aggregate bank deposits in a county. The dependent variable is the log of the standard deviation of quarterly percentage changes in total deposits at all banks headquartered in a county, calculated over 3-year nonoverlapping windows.[19] Our empirical specifications are similar to those evaluating deposit levels. We find that PERCENT_SENIORS (model 4) and combined LOCAL_ASC_INDEX (model 6) are negatively related to local deposit volatility, although the relation between deposit volatility and FEMALES_TO_MALES (model 5) is not statistically significant. The coefficient on LOCAL_ASC_INDEX in column 6 indicates that deposit volatility at banks located in the 75th percentile of ASC is 5 percentage points lower than those in the 25th percentile of ASC. These results suggest that firms located in higher ASC areas have more stable sources of local capital if they need to roll over their debt during episodes of systemwide credit contractions. We come back to this issue in the final analysis of this article (Section III.I) where we evaluate how firms fared during the financial crisis.

3. Local Banking Relationships (Syndicated Loans)

Another approach to testing the private debt channel is to examine the association between local demographics and firms' banking relationships directly. To evaluate actual borrowing activity, we analyze syndicated loans using data from DealScan, which includes loan characteristic such as the loan amount, each lender's role in the loan syndicate (manager, comanager, or member), and the lender's location. We define a member of a lending syndicate as local if it is in the same state as the borrower firms' headquarters, and evaluate whether local lenders are more important sources of capital when local demographics suggest investors hold safer portfolios.

Table 7 reports estimates from several regression models evaluating syndicated loans. We include various firm- and location-level controls, and industry and year fixed effects in these regressions to control for potential confounding factors. Because lender locations are identified at the state level, we construct LOCAL_ASC_INDEX_STATE and other location-level variables by taking the population-weighted averages of county variables within each state. We first analyze the broad effect of ASC on the size of the syndicated credit facility in model

[19]The results are similar regardless of the choice of measurement windows.

TABLE 7

Local Demography and Syndicated Loans

Table 7 shows the influence of local demography on syndicated loans. The data on syndicated loans come from Thomson Reuters DealScan and span 1987–2010. Model 1 presents the results of an ordinary least squares (OLS) regression of facility amount scaled by the borrowers' book asset, where the facility amount is the actual amount of the facility committed by the facility's lender pool over 1 year. This analysis includes all firms that appear in DealScan at least once during the sample period. Models 2, 3, and 4 are OLS regressions where the dependent variables are, respectively, fractions of all members (lead or nonlead), lead members, and nonlead members in the loan syndicate from the same state as the borrower's headquarters. State-level control variables are constructed as the county-population-weighted averages of variables measured at the county level. Model 5 is an OLS regression of facility-level interest-rate spread in basis points over a benchmark. Variables are defined in Appendix A. Standard errors are robust to heteroscedasticity and are clustered at the state level. *t*-statistics are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Fraction of Local				
	FACILITY_SCALED	ALL_MEMBERS	MEMBERS_LEAD	MEMBERS_NONLEAD	SPREAD
Variable	1	2	3	4	5
LOCAL_ASC_INDEX_STATE	0.022***	0.198**	0.247**	0.206***	−4.945
	(3.25)	(2.52)	(2.45)	(2.96)	(−0.90)
FACILITY_SCALED		−0.156***	−0.131***	−0.120***	20.294*
		(−6.18)	(−4.21)	(−5.10)	(1.94)
Firm controls	Yes	Yes	Yes	Yes	Yes
Location controls	Yes	Yes	Yes	Yes	Yes
Fixed effects	Industry × year	Industry × year	Industry × year	Industry × year	Industry × year
No. of obs.	37,450	10,126	9,021	7,410	10,725
R^2	0.032	0.225	0.181	0.164	0.467

1. We find a positive coefficient on LOCAL_ASC_INDEX_STATE, indicating that firms in higher ASC states take out larger syndicated loans. In particular, the estimate of 0.022 on LOCAL_ASC_INDEX_STATE indicates that compared to firms headquartered in areas in the 25th percentile of the index, those in the 75th percentile obtain 1 percentage point more in syndicated loan facilities as a fraction of total assets (representing approximately 15% of this ratio's mean) in a given year. This result is consistent with our earlier results that in these areas, banks have more deposits and firms raise more debt and have higher leverage.[20]

The next 3 models in Table 7 report regressions predicting the fraction of syndicate lenders that are local (model 2), the fraction of syndicate leads that are local (model 3), and the fraction of nonlead syndicate members that are local (model 4). The results show that syndicated lending to firms in higher ASC states are more likely to include local financial institutions as both lead and nonlead members.[21]

We also regress the loan interest rate spread (relative to prevailing benchmark rates) onto LOCAL_ASC_INDEX and various firm- and state-level controls in

[20]These DealScan-based results are consistent with the bank-financing channel as we hypothesize. However, because of the limited scope of DealScan data, they do not fully explain the main leverage results. DealScan records new syndicated loan contracts (not all bank loans), including undrawn revolving credits lines, whereas Compustat records all types of debts (both private and public, and only the drawn-down amounts). We believe that the most comparable aspects of these two data sets are the new term loan contracts from DealScan and the long-term debt issuance data from Compustat. In unreported analysis, we find that our index predicts these 2 related variables in very similar manners. The coefficient estimate on LOCAL_ASC_INDEX for term loans/assets is 0.006 (t = 1.90). For long-term debt issued/assets, it is 0.007 (t = 2.22).

[21]In unreported analyses, we confirm that similar results hold in logit regressions predicting the presence of at least 1 local syndicate member or lead lender.

model 5. To the extent that ASC reflects omitted variables related to debt demand (rather than supply, as we argue), the greater quantity of loans in areas with high ASC values would be accompanied by higher interest rates or spreads. However, if the supply channel is dominant, that is, if higher ASC reflects a rightward shift in the local debt supply curve, loan spreads should not be affected in equilibrium. The coefficient estimate on LOCAL_ASC_INDEX when predicting the loan spread in model 5 is not statistically different from 0, suggesting that variation in corporate demand for debt is unlikely to drive the results.

Although syndicated loans are only one channel through which public companies can raise private debt, this analysis provides evidence suggesting that the supply of private debt capital to public firms is indeed a function of local investing preferences.

H. Exogenous Variation in Capital Supply (Bank Branching)

Our analysis thus far suggests that the relation between local demographics and corporate financing decisions is at least partially driven by variations in local supply of credit resulting from local investors' preferences. Ascertaining causality is challenging in this context because, as discussed earlier, the static nature of demographics makes it difficult to identify exogenous shocks to local preferences or suitable instruments. As a result, a possible challenge for our study is separating demand versus supply effects because our main explanatory variable, LOCAL_ASC_INDEX, may be correlated with omitted firm characteristics that drive firms' demand for debt.

In this section, we address this concern by designing an experiment that exploits exogenous changes in debt capital supply. If demographics-based ASC captures only differences in firms' demand for private debt, the exogenous changes in debt capital supply should have no effect on the relation between ASC and debt financing. However, if ASC reflects existing local private debt capital supply, an exogenous shock to supply conditions should affect its relation with debt financing.

Accordingly, we evaluate the impact of regulatory shocks that relax geographical constraints on lending activities. The setting is the staggered deregulation of interstate banking under the IBBEA, which led to the integration of local banking markets. Banking deregulation likely evens out firms' access to private debt capital as banks move capital into areas with unmet borrowing demand. Our main hypothesis implies that the impact of deregulation on corporate borrowing should be more acute in areas where existing private debt capital supplied by the local populace is relatively scarce. In contrast, geographic integration of the debt market should matter less in areas where an ample supply of local debt capital is already available.

We evaluate changes in debt issuances patterns and capital structure following local banking deregulation from fiscal years 1970 to 1997, the period during which different states amended their banking laws.[22] For each firm, we include indicator variables that capture recent interstate banking deregulation in the state of the firm's

[22]Our analysis ends in 1997 as the process of interstate banking deregulation is completed by the passage of Riegle–Neal Act in 1994. By 1997, all states have effectively removed restrictions on geographic expansion for banking institutions. The list of the staggered deregulation by each state is obtained from Kroszner and Strahan (1999), who use Amel (1993) as a primary source.

headquarters in regressions predicting debt issuance or capital structure. The indicator variables INTERSTATE_T0, INTERSTATE_T1, INTERSTATE_T2, and INTERSTATE_T3+ represent, respectively, the year of each state's deregulation, 1 year after deregulation, 2 years after deregulation, and 3 or more years after deregulation. Following the literature, we control for firm fixed effects in addition to industry × year fixed effects in all specifications. Following Francis, Hasan, and Wang (2014), we exclude young firms (i.e., firm age < 4 years) from the analysis because they are likely to wind down the substantial amount of external funding raised in cash during initial public offerings. The results are reported in Table 8.

To establish the baseline relation between interstate banking deregulation and firms' financing activities, we present regressions predicting NEW_DEBT, NEW_EQUITY, TOTAL_DEBT, and BOOK_LEVERAGE, respectively, using the full sample of firms in Panel A of Table 8. TOTAL_DEBT is the sum of long- and short-term debt in dollars. Other variables are defined as before. We focus on book leverage in this exercise because changes in market leverage are complicated by the fact that firms could also experience increases in market valuations following deregulation. The results from Panel A indicate that firms issued more debt in the years following deregulation, but not more equity, leading to higher overall debt levels and, eventually, leverage.[23]

To identify any differential effect of deregulation across areas, we next estimate similar regressions using subsamples of firms sorted on our key local demographic variables. We sort firms by whether they are headquartered in an area that is in the top tercile or the bottom tercile of PERCENT_SENIORS in Panel B of Table 8. Similarly, firms are sorted by whether they are in a top or bottom tercile of FEMALES_TO_MALES in Panel C, and by whether they are in a top or bottom tercile of composite LOCAL_ASC_INDEX in Panel D. In these 3 panels, we find that the relations between interstate banking deregulation and debt issuance as well as capital structure are concentrated in the bottom tercile subsamples.

Overall, these results indicate that bank deregulation affects firms' debt financing choices, but not equity financing, in areas that had a relatively low supply of local debt capital. This suggests that our findings are not driven by changes in firm growth and investment opportunities due to bank deregulation (which would also affect equity issuance), but are mainly due to the change in local debt supply conditions. Although this analysis does not involve exogenous shocks to local investors' preferences, it allows us to measure firms' responses to shocks in supply conditions. The differential impact of banking deregulation across areas sorted by local investor preferences provides further evidence that the correlation between local preferences and capital structure decisions is causal in nature and is driven by the debt supply channel.

I. The Financial Crisis

The financial crisis of 2008–2009 was a massive unexpected shock to the capital markets. The extent to which financial institutions experienced distress and

[23]We note that the effect of deregulation on capital structure is nosier than its effect on debt ratios because firms also increased assets significantly after deregulation, which affected both the numerator and the denominator of book leverage.

TABLE 8

Interstate Banking Deregulations, Local Demography, and Capital Raising

Table 8 presents regressions that estimate the effect of interstate bank deregulation on capital-raising activities using firm fixed-effects models. The sample consists of nonfinancial, nonutility firms in Compustat from fiscal years 1970 to 1997, excluding those with less than 4 years of FIRM_AGE. INTERSTATE_T0, INTERSTATE_T1, INTERSTATE_T2, and INTERSTATE_T3+ are indicator variables that represent, respectively, the year of deregulation, 1 year after deregulation, 2 years after deregulation, and 3 years and later after deregulation in the state of the firm's headquarters. All other variables are defined in Appendix A. Panel A presents regressions of NEW_DEBT, NEW_EQUITY, ln(TOTAL_DEBT), and BOOK_LEVERAGE using the full sample. Panels B–D present these regressions within the subsamples of firms in the highest and the lowest terciles (T3, T1) of local seniors ratio (Panel B), local females-to-males ratio (Panel C), and Local Age and Sex Composition Index (LOCAL_ASC_INDEX) (Panel D). Standard errors are robust to heteroscedasticity and are clustered at the firm level. *t*-statistics are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Interstate Banking Deregulation and Capital Issuance (Full Sample)

	NEW_DEBT	NEW_EQUITY	ln(TOTAL_DEBT)	BOOK_LEVERAGE
	1	2	3	4
INTERSTATE_T0	0.020	−0.003	0.034	0.004
	(1.56)	(−0.35)	(1.55)	(1.22)
INTERSTATE_T1	0.027*	0.014	0.076***	0.007
	(1.81)	(1.22)	(2.72)	(1.55)
INTERSTATE_T2	0.027	0.004	0.063*	0.009
	(1.64)	(0.31)	(1.90)	(1.57)
INTERSTATE_T3+	0.051***	0.004	0.111***	0.013*
	(2.85)	(0.26)	(2.69)	(1.93)
Firm controls	Yes	Yes	Yes	Yes
Fixed effects	Firm, industry × year			
No. of obs.	65,586	65,586	60,739	65,586
R^2	0.211	0.381	0.908	0.710

Panel B. Local Seniors, Banking Deregulation, and Capital Issuance

	High Seniors	Low Seniors	High Seniors	Low Seniors	High Seniors	Low Seniors	High Seniors	Low Seniors
Variable	1	2	3	4	5	6	7	8
INTERSTATE_T0	0.002	0.059**	−0.025	0.016	0.003	0.087*	0.004	0.011
	(0.07)	(2.22)	(−1.49)	(0.71)	(0.07)	(1.80)	(0.69)	(1.54)
INTERSTATE_T1	−0.007	0.051	0.009	0.017	0.045	0.135**	0.003	0.017*
	(−0.27)	(1.61)	(0.47)	(0.63)	(0.95)	(2.03)	(0.40)	(1.73)
INTERSTATE_T2	0.019	0.076**	0.009	0.002	0.035	0.195**	0.008	0.024*
	(0.65)	(2.04)	(0.43)	(0.07)	(0.63)	(2.37)	(0.89)	(1.88)
INTERSTATE_T3+	0.038	0.100**	0.003	−0.005	0.094	0.267***	0.011	0.022
	(1.23)	(2.32)	(0.13)	(−0.16)	(1.36)	(2.60)	(0.94)	(1.39)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Firm, industry × year							
No. of obs.	20,448	20,639	20,448	20,639	19,159	18,919	20,448	20,639
R^2	0.250	0.268	0.402	0.416	0.916	0.919	0.722	0.742

Panel C. Local Females, Banking Deregulation, and Capital Issuance

	High Females	Low Females	High Females	Low Females	High Females	Low Females	High Females	Low Females
Variable	1	2	3	4	5	6	7	8
INTERSTATE_T0	−0.005	0.071***	−0.033*	0.032	−0.006	0.145***	0.004	0.011
	(−0.22)	(2.61)	(−1.93)	(1.42)	(−0.17)	(2.79)	(0.82)	(1.43)
INTERSTATE_T1	0.009	0.101***	−0.003	0.033	0.046	0.245***	0.010	0.020*
	(0.32)	(3.09)	(−0.15)	(1.21)	(1.02)	(3.46)	(1.26)	(1.84)
INTERSTATE_T2	−0.008	0.096**	−0.010	0.018	0.004	0.306***	0.015	0.028*
	(−0.26)	(2.38)	(−0.47)	(0.59)	(0.07)	(3.41)	(1.64)	(1.95)
INTERSTATE_T3+	−0.007	0.139***	−0.024	0.019	0.019	0.371***	0.015	0.038**
	(−0.21)	(2.96)	(−1.02)	(0.53)	(0.26)	(3.28)	(1.27)	(1.99)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Firm, industry × year							
No. of obs.	20,277	20,569	20,277	20,569	19,193	18,793	20,277	20,569
R^2	0.247	0.261	0.396	0.423	0.920	0.910	0.727	0.734

(continued on next page)

TABLE 8 (continued)

Interstate Banking Deregulations, Local Demography, and Capital Raising

Panel D. LOCAL_ASC_INDEX Banking Deregulation and Capital Issuance

Variable	High ASC 1	Low ASC 2	High ASC 3	Low ASC 4	High ASC 5	Low ASC 6	High ASC 7	Low ASC 8
INTERSTATE_T0	0.005	0.096***	−0.030	0.014	−0.028	0.181***	0.003	0.016**
	(0.20)	(3.23)	(−1.61)	(0.54)	(−0.76)	(3.21)	(0.53)	(2.02)
INTERSTATE_T1	−0.006	0.106***	−0.001	0.012	−0.003	0.246***	0.003	0.019
	(−0.23)	(2.84)	(−0.03)	(0.37)	(−0.07)	(3.14)	(0.36)	(1.62)
INTERSTATE_T2	0.004	0.117**	0.004	−0.015	−0.003	0.319***	0.013	0.024
	(0.14)	(2.55)	(0.19)	(−0.42)	(−0.05)	(3.15)	(1.36)	(1.57)
INTERSTATE_T3+	0.006	0.150***	−0.017	−0.016	0.016	0.392***	0.013	0.020
	(0.18)	(2.82)	(−0.68)	(−0.41)	(0.22)	(3.02)	(1.12)	(0.98)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects				Firm, industry × year				
No. of obs.	18,795	19,021	18,795	19,021	17,707	17,376	18,795	19,021
R^2	0.252	0.272	0.406	0.423	0.921	0.915	0.723	0.739

the capital markets tightened had not been seen since the Great Depression. Most firms almost certainly did not anticipate such a severe crisis and were unlikely to factor in the possibility of such a crisis in choosing their capital structures. This setting allows us to examine whether local investors' preferences matter for financing by analyzing firms' responses and their outcomes during the crisis.

We expect that firms in higher ASC areas had greater access to new capital during the financial crisis. The most obvious prediction is a greater ability to borrow new capital. However, if local debt capital was more abundant and stable, this may also have allowed firms to issue more new equity if investors are less concerned about firms' ability to roll over their debt. Finally, if they have greater access to new capital, we expect that firms in higher ASC areas are more likely to survive the crisis.

We sharpen this analysis by incorporating the earlier finding in Section III.C.1 (Panel B of Table 3) that the impact of local preferences on capital supply is more pronounced in high-income areas (where there are more investable assets) and less relevant in low-income areas. Accordingly, we interact our key demographic variables with a LOW_INCOME dummy (1 when the county's total income is below the median, and 0 otherwise) in logit regressions in Table 9. The dependent variables in models 1–4, respectively, include dummy variables for: i) raising any new capital (NEW_CAPITAL), ii) NEW_DEBT, iii) NEW_EQUITY, and iv) whether the firm disappears because of merger or bankruptcy during 2008 and 2009 (BANKRUPT_OR_MERGED). For the first 3 variables, the sample includes firms that have at least some debt in their capital structure, identified by book leverage > 0.01, in 2007.

The first model shows that firms were more likely to raise new capital when LOCAL_ASC_INDEX was higher. However, the relation is offset by the interaction of the demographic variable with LOW_INCOME. This indicates that firms located in higher ASC areas were better able to raise capital during the crisis only if

TABLE 9

Ability to Raise Capital and Survive During the Crisis

Table 9 presents logit regressions on the propensity of the firms to raise capital (debt and equity) and not survive the crisis. Models 1–4 are cross-sectional logit regressions where the dependent variables indicate whether a firm raised debt and/or issued new equity, defined similar to Table 5, either during fiscal year 2008 or 2009. The sample for models 1–3 consists of all firms that have some debt in their capital structure in 2007 (defined as book leverage > 0.01). All explanatory variables are fixed at the end of fiscal year 2007. Model 4 is a logit regression in which the dependent variable is whether a firm disappeared from our sample due to merger or bankruptcy during fiscal year 2008 or 2009. Standard errors are robust to heteroscedasticity. *t*-statistics are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	NEW_CAPITAL	NEW_DEBT	NEW_EQUITY	BANKRUPT_OR_MERGED
	1	2	3	4
LOCAL_ASC_INDEX	1.204***	1.413***	0.623	−1.482**
	(3.34)	(3.95)	(1.54)	(−2.48)
LOW_INCOME × LOCAL_ASC_INDEX	−1.319***	−1.408***	−0.806	1.257*
	(−2.82)	(−2.99)	(−1.49)	(1.72)
LOW_INCOME	0.040	0.221	0.135	−0.279
	(0.13)	(0.72)	(0.38)	(−0.62)
MARKET_LEVERAGE	−0.331	−1.043***	0.666*	−0.199
	(−0.93)	(−3.04)	(1.68)	(−0.40)
ln(INCOME)	−0.711***	−0.681***	0.028	0.629
	(−2.77)	(−2.69)	(0.10)	(1.50)
ln(POPULATION)	−0.135	−0.087	0.044	0.093
	(−1.34)	(−0.88)	(0.38)	(0.54)
ln(REIGIOUS)	−0.037	0.178	−0.153	−0.774*
	(−0.13)	(0.66)	(−0.48)	(−1.83)
RURAL_URBAN_CONTINUUM	−0.038	−0.005	−0.081	0.152
	(−0.36)	(−0.05)	(−0.72)	(0.90)
ln(SIZE)	0.006	0.055	−0.037	−0.116**
	(0.18)	(1.62)	(−0.99)	(−2.32)
MARKET_TO_BOOK	0.306***	0.115**	0.386***	−0.241***
	(3.77)	(2.01)	(5.82)	(−2.84)
PROFITABILITY	−0.813**	0.313	−2.622***	0.448
	(−1.97)	(0.81)	(−4.90)	(1.04)
TANGIBILITY	1.518***	1.910***	0.244	−1.252**
	(4.20)	(5.47)	(0.62)	(−1.99)
STOCK_VOLATILITY	−0.008	−1.340	2.275**	0.213
	(−0.01)	(−1.21)	(1.96)	(0.15)
CURRENT_RATIO				−0.061
				(−1.33)
$PROFITABILITY_{t-1}$				−0.638
				(−1.32)
Fixed effects	Industry × year	Industry × year	Industry × year	Industry × year
No. of obs.	1,652	1,652	1,616	2,201
Pseudo-R^2	0.090	0.088	0.134	0.070

they were also in high-income counties. A similar pattern holds in the regressions evaluating NEW_DEBT only in model 2. When evaluating NEW_EQUITY in model 3, a similar but weaker pattern holds.

Finally, model 4 predicts whether a firm is acquired or goes bankrupt during the crisis. The odds of not surviving are significantly lower for firms headquartered in areas with greater LOCAL_ASC_INDEX values. This effect is again limited to high-income counties. Taken together, these results suggest that a benefit of being headquartered where investors prefer safer portfolios (and have higher incomes) is greater access to capital during a downturn. These findings corroborate our expectation that firms use more debt financing in these areas in part because of the greater stability of capital and the ability to access the market when new capital is scarce.

IV. Conclusion

This article provides new evidence that local capital supply conditions affect firms' financing policies. In particular, we show that firms borrow more when their local populations have more senior citizens and women, two proxies for local investors' preference for safer portfolios. Local capital supply conditions appear most important for public firms that likely face higher barriers to accessing the public capital markets, such as firms without investment-grade credit ratings, or those in industries characterized by fewer easily identified tangible assets. Because aggregate investing preferences vary substantially across locations but remain relatively stable over time within a location, our results may partly explain puzzling patterns of large variation in capital structure across firms and the strong persistence of capital structure in firms over time.

Local investor preferences appear to affect private debt supply conditions through two channels. Differences in local investing preferences cause shifts in debt supply curves, and they lead to differences in the stability of the private capital supply. The first channel is reflected in the higher level of bank deposits and locally arranged syndicated loans in areas with more seniors and females, whereas the second channel is supported by evidence of more stable deposits in these areas. The value of robust local capital markets is reflected in the better outcomes for firms in these areas through the financial crisis in 2008–2009.

Appendix A. Variable Definitions

AGE_TOP_EXECS: Average age of all top executives reported in ExecuComp each year.

BANKRUPT_OR_MERGED: 1 if the firm is delisted from its stock exchange due to merger or bankruptcy during years 2008 and 2009; 0 otherwise.

BOOK_LEVERAGE: Total debt/total book assets, where total debt = short-term debt + long-term debt = DLTT + DLC; total book assets = AT. Source: Compustat.

COLLATERAL: Ratio of net property, plant, and equipment (PPENT) and inventory to total assets. Source: Compustat.

COUNTY_HOUSING_INDEX (STATE_HOUSING_INDEX): County- (state-) level quarterly house price indices. Source: Federal Housing Finance Agency.

CURRENT_RATIO: Ratio of current assets (ACT) and current liabilities (LCT). Source: Compustat.

DELTA_TOP_EXECS: Average Delta components in the compensations of all top executives reported in ExecuComp in a given year. Source: Lalitha Naveen's website.

DIVIDEND_PAYER: Equals 1 if a firm paid cash dividends this year, and 0 otherwise. Source: Center for Research in Security Prices (CRSP).

FACILITY_SCALED: Sum of all types of loans in a facility (DealScan) divided by total book assets (Compustat).

FEMALES_TO_MALES: Ratio of female to male population of a county in a given year. Linearly interpolated between census years. Source: U.S. Census Bureau.

FEMALES_TO_MALES_ORTH: Ratio of females to males orthogonalized with respect to percentage of seniors using a Gram–Schmidt procedure. Rescaled to have the same mean and variance as FEMALES_TO_MALES.

FIRM_AGE: Firm age approximated by the difference between current fiscal year and the year the firm first appeared in Compustat.

HIGH_INCOME: Equals 1 if a firm belongs to a county with above-median total income in a given year, and 0 otherwise.

INVESTMENT_GRADE: Equals 1 if a firm has a long-term credit rating by Standard & Poor's (S&P) of BBB− or higher, and 0 otherwise.

JUNK_GRADE: Equals 1 if a firm has a long-term credit rating by S&P of BBB or lower, and 0 otherwise.

ln(INCOME): Natural log of median per capita county income adjusted for inflation. Source: U.S. Bureau of Economic Analysis (BEA).

ln(POPULATION): Natural log of population of a county in a given year. Linearly interpolated between census years. Source: U.S. Census Bureau.

ln(RELIGIOUS): Natural log of number of religious adherents per 1,000 population in a county. Linearly interpolated between survey years. Source: American Religious Data Archive.

ln(SIZE): Natural logarithm of total assets. Source: Compustat.

ln(TOTAL_DEBT): Natural logarithm of total debt, where total debt = DLC + DLTT. Source: Compustat.

SPREAD: Interest rate over a base rate such as London Inter-Bank Offered Rate (LIBOR) or prime. Source: DealScan.

LOCAL_ASC_INDEX: Local Age and Sex Composition Index: Sum of percentiles order of PERCENT_SENIORS and FEMALES_TO_MALES. Scaled by 200 so that values range from 0.01 to 1.00.

MEMBERS_LEAD (MEMBERS_NONLEAD): Syndicate loan or lead member (nonlead member) institutions located in the same state as the borrower firm's headquarters, divided by the number of all syndicate member institutions. Source: DealScan.

LOW_INCOME: Equals 1 if a firm belongs to a county with below-median total income in a given year, and 0 otherwise.

MARKET_LEVERAGE: Total debt/market value of assets, where total debt = short-term debt + long-term debt = DLTT + DLC, and market value of assets = PRCC_F × CSHPRI + DLC + DLTT + PSTKL – TXDITC. Source: Compustat.

MARKET_TO_BOOK: Book value of assets minus book value of equity plus market value of equity minus investment tax credit scaled by book value of assets (AT − CEQ + CSHO × PRCC_F − TXDITC)/AT. Source: Compustat.

NEW_CAPITAL: Equals 1 if either NEW_DEBT or NEW_EQUITY (both defined below) is equal to 1, and 0 otherwise.

NEW_DEBT: Equals 1 if net new debt > 1%, and 0 otherwise, where net new debt = $[(\text{DLTT}(t) + \text{DLC}(t)) - (\text{DLTT}(t-1) + \text{DLC}(t-1))]/\text{AT}(t-1)$.

NEW_EQUITY: Equals 1 if net new equity> 1%, and 0 otherwise, where net new equity= $(\text{SSTK} - \text{PRSTKC}(t)/\text{AT}(t-1)$. Source: Compustat.

PERCENT_SENIORS: Fraction of population ages 65 and older in a county in a given year. Linearly interpolated between census years. Source: U.S. Census Bureau.

PROFITABILITY: Net income divided by total assets. Source: Compustat.

R&D_TO_SALES: Ratio of research and development expenditure (XRD) to sales. Source: Compustat.

RURAL_URBAN_CONTINUUM: Classification scheme that distinguishes metropolitan (i.e., metro) counties by the population size of their metro area, and nonmetropolitan counties by the degree of urbanization and adjacency to a metro area(s). Scaled from 1 to 9, where a higher number means more rural (1–3: metro areas; 4–9: nonmetro areas). Linearly interpolated between census years.

STOCK_RETURN: Stock return of the firm in a given year. Source: CRSP.

STOCK_VOLATILITY: Standard deviation of monthly stock return in a given year. Source: CRSP.

TANGIBILITY: Ratio of PPENT to total assets. Source: Compustat.

UNRATED: Equals 1 if a firm does not have a long-term credit rating by S&P, and 0 otherwise.

VEGA_TOP_EXECS: Average Vega components in the compensations of the all top executives reported in ExecuComp in a given year. Source: Lalitha Naveen's website.

Appendix B.

TABLE B1

Tests for Local Culture Affecting Firm Culture and the Demand for Debt

Panel A of Table B1 presents regressions of firm leverage on Local Age and Sex Composition Index (LOCAL_ASC_INDEX) and variables related to top executives' demographics and compensation structures using ExecuComp. PERCENT_FEMALE_EXECS is the fraction of female executives among all top executives reported in ExecuComp in a given year. AGE_TOP_EXECS, VEGA_TOP_EXECS, and DELTA_TOP_EXECSs, respectively, are the average age, the average of the Vega and Delta components in the compensations of all top executives reported in ExecuComp in a given year. The Vega and Delta measures are obtained from Lalitha Naveen's website (https://sites.temple.edu/lnaveen/data/). All other control variables are the same as in Table 2 and are defined in Appendix A. All firm-level control variables are lagged by 1 year. Standard errors are robust to heteroscedasticity and are clustered at the firm level. In Panel B, the dependent variable is DEBT_TO_INCOME, the median household debt-to-income ratio (lower bound) from 1999 to 2010 obtained from the U.S. Federal Reserve website (https://www.federalreserve.gov/data.htm). Other variables are defined in Appendix A. Standard errors are robust to heteroscedasticity and are clustered at the county level. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Local Demography, Firm Demography, and Risk Incentives

	MARKET_LEVERAGE	BOOK_LEVERAGE
Variable	1	2
LOCAL_ASC_INDEX	0.029**	0.036***
	(2.22)	(2.75)
PERCENT_FEMALE_EXECS	−0.025	−0.029
	(−1.08)	(−1.20)
AGE_TOP_EXECS	0.000	0.000
	(0.98)	(0.08)
VEGA_TOP_EXECS	−0.000***	−0.000***
	(−9.92)	(−5.40)
DELTA_TOP_EXECS	−0.000***	−0.000***
	(−6.89)	(−6.39)
Other controls	Yes	Yes
Fixed effects	Industry × year	Industry × year
No. of obs.	19,688	19,688
R^2	0.444	0.301

Panel B. Local Demography and Personal Leverage

	DEBT_TO_INCOME		
Variable	1	2	3
PERCENT_SENIORS	−1.025*		
	(−1.94)		
FEMALES_TO_MALES		−0.492*	
		(−1.92)	
LOCAL_ASC_INDEX			−0.485***
			(−5.96)
ln(POPULATION)	−0.109***	−0.088***	−0.112***
	(−6.00)	(−5.56)	(−6.87)
ln(INCOME)	0.495***	0.514***	0.539***
	(4.84)	(4.99)	(5.21)
COUNTY_HOUSING_INDEX	0.001***	0.001***	0.001***
	(2.89)	(2.97)	(2.79)
Fixed effects	State × year	State × year	State × year
No. of obs.	30,948	30,948	30,948

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