Local Gender Imbalance and Corporate Risk-Taking[♣]

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ABSTRACT

We study the effect of local gender imbalance on corporate risk-taking. We find that firms in areas with a higher local male–female ratio have higher stock return volatilities and leverage, less corporate hedging, and more capital expenditure. Consequently, such firms face higher loan spreads and more covenant restrictions. We address endogeneity concerns using two sets of instrumental variables: the local male-female ratio at birth averaged over the 1960s, and the local prostate cancer and breast cancer mortality rates. We show that a local gender imbalance captures local residents' risk preferences, which influence corporate policies via both local investor and employee channels. The results are robust after addressing endogeneity concerns.

JEL Classification: D22, D90, G21, G32, G40, J16

Keywords: gender imbalance, male-female ratio, risk attitude, corporate risk-taking

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Gender imbalance has profound effects on various aspects of life and society, such as elections, crime, marriages, societal stability, and economic growth (for reviews, see Hesketh and Zhu (2006) and Dyson (2012)).[1] This paper examines the effects of gender imbalance on corporate activities, specifically risk-taking policies. Corporate risk-taking activities are a crucial factor in a firm's performance and economic growth. Prior studies have examined the impacts of various stakeholders, such as corporate executives and directors, creditors, and large shareholders, on corporate risk-taking. This paper aims to trace corporate risk-taking rooted in the risk preferences and beliefs of local residents. We use local gender imbalance (i.e., the local male–female ratio) to identify variations in the risk attitudes of local residents and investigate how these variations affect corporate risk-taking.

A growing body of literature explores the impacts of gender differences among corporate executives and directors on corporate governance, investments, innovation, and financial policies.[2] However, limited attention is devoted to the relationship between gender imbalances among local residents and local corporate policies. We attempt to fill this gap by studying how local gender imbalance affects corporate activities via the lens of risk attitudes.

We explore the local male–female ratio to identify the risk attitudes of local residents, as studies of experimental and survey data clearly document that men are typically less risk averse than women (e.g., Croson and Gneezy, 2009; Charness and Gneezy, 2012; Ertac and Gurdal, 2012; Jacobsen et al., 2014; Vieider et al., 2015; Falk et al., 2018; Brooks et al., 2019; Cueva et al., 2019; Czibor et al., 2019). This difference in risk aversion might be driven by biological factors or cultural and identity-related factors.[3] Male identity might also increase the likelihood

[1] For example, the state legislature in Wyoming, USA first passed a bill granting female residents 21 years and older the right to vote in 1869 (women's suffrage was not granted nationwide until ratification of the Nineteenth Amendment to the US Constitution in 1920), hoping to attract more single women to Wyoming to rectify the gender imbalance (male–female ratio of 6-to-1).

[2] For example, see works by Adams and Ferreira (2009), Ahern and Dittmar (2012), Graham, Harvey, and Puri (2013), Huang and Kisgen (2013), Faccio, Marchica, and Mura (2016), Cronqvist and Yu (2017), Schwartz-Ziv (2017), Inci, Narayanan, and Seyhun (2017), Griffin, Li, and Xu (2019), and McLean, Pirinsky, and Zhao (2020).

[3] For example, see works by Sapienza, Zingales, and Maestripieri (2009), Cesarini et al. (2010), Häusler et al. (2018), Benabou and Tirole (2011), Benjamin, Choi, and Strickland (2010), Falk et al. (2018), and D'Acunto

of overconfidence in men (D'Acunto, 2020). Consistent with these arguments, we find that higher local male–female ratios are associated with lower levels of risk aversion and higher levels of overconfidence according to the General Social Survey (GSS). That is, local gender imbalance captures both the risk preferences and beliefs of local residents.

Figure I shows the county-level gender ratios among the prime work age population (aged 20–64 years) in the US in 2005. This graph reveals large variations in the local male–female ratio across counties. Interestingly, there are considerable variations in gender ratios even between counties within the same state (e.g., Texas or Florida). These variations in local gender imbalance make it feasible to examine the effects of local residents' gender-associated risk attitudes on corporate risk-taking. We find that firms operating in counties with higher local male-female ratios have higher risk profiles in terms of corporate financial and investment policies. We show that these effects of gender differences are expressed mainly through the risk attitude channel.

We structure our empirical investigation as follows. First, we show that a higher local male–female ratio leads to a higher level of firm risk, measured as option-implied stock return volatility. For example, a one standard deviation increase in the local male–female ratio increases a firm's option-implied return volatility by approximately 8.0% relative to the sample mean. Second, we examine the impact of the local male–female ratio on corporate financial and investment policies. We show that firms headquartered in counties with higher male-female ratios have higher levels of market leverage, higher capital expenditures, and lower cash holdings; engage in fewer hedging activities; and incur more covenant violations. Third, we examine the value implications of the local male-female ratios based on ex ante loan contract terms. We find that firms headquartered in counties with higher local male-female ratios face

(2020).

higher borrowing costs and are more likely to be subject to collateral requirements and capital expenditure restrictions in loan contracts.

We also address potential endogeneity concerns in three stages. First, we address concerns about omitted variables by including in our analyses other local characteristics, such as the local median age, industry and county fixed effects, local cultural factors (i.e., gender egalitarianism and religiosity), and the local proportion of retirees. Second, we address concerns about reverse causality. Specifically, to address the concern that local industry drives labor movement and leads to local gender imbalance, we examine subsamples of firms whose revenues are mainly earned out of state and subsamples of counties where the correlation between the industry gender ratio and local gender ratio is weak. Third, we run two-stage least squares (2SLS) regressions using two different sets of instrumental variables. The first instrumental variable is the county-level male–female ratio at birth (i.e., newborns), averaged over the 1960s. This ratio is highly correlated with the local male–female ratio during 1992–2017 (our main sample period) but is unlikely to directly affect local firms' risk-taking activities during the period 1992–2017, as their business activities mainly occur in other states. The second set of instrumental variables comprises the mortality rates of local prostate cancer and breast cancer incidences. Although prostate cancer and breast cancer affect the local gender ratio, firms are unlikely to tailor their risk-taking policies to address the risks of these cancers. Our results suggest that the observed effect of local gender imbalance on corporate risk-taking is unlikely to be driven by omitted firm or other local characteristics.

One might wonder whether cross-county variations in the male–female ratio are large enough to have significant effects on corporate policies. To address this question quantitatively, we reexamine our results by closely examining the gender ratio distributions across various county subsamples. We find that our results remain reasonably significant even after excluding counties in the top and bottom 20% of gender ratio distributions (i.e., 40% of the total sample).

More importantly, as variations in the local male–female ratio increase, our results become both statistically more significant and economically more impactful, confirming a causal effect of local gender imbalance on corporate policies.

Next, we dig deeply to understand the mechanisms through which local gender imbalance influences corporate decisions. Local residents can influence corporate policies by expressing their risk attitudes in two ways. First, local residents are often the shareholders of local firms. Studies show that retail investors' portfolios are often under-diversified and exhibit significant local bias (Coval and Moskowitz, 2001; Huberman, 2001; Grinblatt and Keloharju, 2001; Ivković and Weisbenner, 2005; Massa and Simonov, 2006; Dorn and Huberman, 2010; Bernile, Kumar, and Sulaeman, 2015). Large local investors, or a collection of local retail investors, can influence corporate policies by engaging directly in decision-makings (Becker et al., 2011; Kandel, Massa and Simonov, 2011; Derrien, Kecskés, and Thesmar, 2013; Lyandres et al., 2019). Additionally, firms often cater to the risk attitudes of local investors, including retail investors (Becker, Ivković, and Weisbenner, 2011), suggesting the existence of a local investor channel. To examine this potential investor channel, we investigate the impact of the local male–female ratio on corporate dividend policies and stock price reactions surrounding dividend payments to examine the investor channel, as retail investors are concerned about dividend policies. We find that a higher local male–female ratio leads to lower cash dividends and smaller price reactions to dividend payments.[4]

Second, local residents might affect firm operations through the employee channel, wherein local residents act as corporate employees.[5] Local employees are under-diversified due to firm-specific human capital or equity-based compensation, and they share a similar cultural legacy (Guiso, Sapienza, and Zingales, 2006). Therefore, these employees might collectively

[4] Similarly, Becker, Ivković, and Weisbenner (2011) show that elderly investors prefer cash dividends.
[5] Studies find that the presence of female executives or a larger proportion of female directors can reduce firm risk (Huang and Kisgen, 2013; Faccio, Marchica, and Mura, 2016).

express their risk attitudes through their work, or firms may cater to the risk preferences of employees, even those who are not executives (Spalt, 2013). Both of these responses affect firms' risk-taking behavior. We also find that firms based in areas with higher male-female ratios have fewer female employees, employ fewer female CEOs and board directors, and have more overconfident CEOs. These findings suggest the presence of an employee channel that reflects the risk attitudes of local residents with regard to corporate decision making. This employee channel might co-exist with the investor channel because investors tend to choose entrepreneurs of the same gender as themselves. Thus, the effects of the investor channel and employee channel can be mutually strengthened.

Our paper contributes to the growing literature exploring the connection between gender differences and risk attitudes. For example, using 15 sets of experiments involving one underlying investment game, Charness and Gneezy (2012) find that women are more financially risk averse than men. Ertac and Gurdal (2012) show that male leaders tend to take more risks on behalf of a group than do female leaders. Cueva et al. (2019) find that men take more risks than women in trading experiments. Using a dataset from an online card game platform, Czibor, Claussen, and Praag (2019) find that female players choose lower risk-return profiles than do male players. Brooks et al. (2019) find that men are more tolerant than women of financial risk. Our paper complements the existing literature, as we obtain similar results based on a combination of broad demographic and GSS data.

Our study also adds to the recent literature on the effects of gender differences on corporate decision-making and the associated value implications. Previous studies examine the impacts of gender differences among top executives or board directors on corporate governance and other corporate policies (see Adams and Ferreira, 2009; Graham, Harvey, and Puri, 2013; Huang and Kisgen, 2013; Faccio, Marchica, and Mura, 2016; Cronqvist and Yu, 2017; Schwartz-Ziv, 2017; Inci, Narayanan, and Seyhun, 2017; Griffin, Li, and Xu, 2019; McLean,

Pirinsky, and Zhao, 2020). Our paper further explores the collective effect of gender differences in a broad population (i.e., local residents) on corporate risk-taking.

Finally, this paper contributes to the large body of literature on corporate risk-taking. Corporate risk-taking activities are affected by managers' personal traits (Malmendier, Tate, and Yan, 2011; Hirshleifer, Low, and Teoh, 2012; Dittmar and Duchin, 2015; Benmelech and Frydman, 2015; Pan, Siegel, and Wang, 2017) and career concerns (Hirshleifer and Thakor, 1992), managerial compensation schemes (Coles, Daniel, and Naveen, 2006; Liu and Mauer, 2011; Shue and Townsend, 2017), creditor governance (Acharya, Amihud, and Litov, 2011), the cultural background (Bedendo, Garcia-Appendini, and Siming, 2019; Giannetti and Zhao, 2019), and the litigation environment (John, Litov, and Yeung, 2008). Our paper adds to this literature by showing that the composition of the local population, specifically the gender ratio, is an important driver of corporate risk-taking.

The remainder of the paper is organized as follows. In Section I, we discuss the data used in the study, our construction of the key variables, and sample statistics. In Section II, we test the effects of the local male–female ratio on corporate risk-taking activities, such as financial, investment, and hedging policies. In Section III, we examine the impact of the local male–female ratio on loan contract terms. In Section IV, we address concerns about endogeneity and causality. In Section V, we investigate the economic mechanism underlying the observed effect. In Section VI, we present our conclusions.

I. Data and Summary Statistics

A. Data

Our data are collected from multiple sources. Due to limited data availability, the sample period varies by test specification; however, we aim to use the longest sample for each test. We provide detailed definitions of our variables in Appendix Table A1.

We first collect geographical and demographic information from the US Census Bureau's county population datasets for the 1992–2017 period. County-year level variables include the local male–female ratio (our main variable of interest) and other county characteristics, such as the rates of higher education and unemployment, population, household income, and average age. We restrict the male–female ratio to the population aged 20 to 64 years (i.e., those of prime work age). Individuals between these ages are the most active participants in the stock and labor markets and therefore are more likely to affect corporate decisions.[6]

Our initial sample focuses on firms' corporate policies and risk levels. We combine our dataset of local demographic characteristics with a Compustat dataset and daily stock return information from The Center for Research in Security Prices (CRSP). Our main sample includes 14,342 county-year observations and 83,059 firm-year observations.

To collect corporate interest rate hedging information, we review firms' Form 10-K annual reports for the period 1996–2009, which are listed in the Securities and Exchange Commission's Electronic Data Gathering and Retrieval (EDGAR) database. We use keywords related to the use of interest rate derivatives. A firm is considered to be an interest rate hedger in a given year when its 10-K files indicate that it uses an interest rate derivative. We then merge our interest rate hedging dataset with local demographic characteristics and focus our analysis on industrial firms, yielding 45,830 firm-year observations.

We also merge our initial sample with the DealScan database run by the Loan Pricing Corporation (LPC) to obtain information on loan spreads and collateral requirements and loan-specific information, such as the amounts facilitated, loan maturity levels, loan types, and loan purposes, generating 10,844 loan-level observations during the 1992–2007 period. We then combine the LPC data with the dataset used by Nini, Smith, and Sufi (2009) to obtain information on capital expenditure restrictions, which gives us 2,585 observations during

[6] Our results are both qualitatively and quantitatively similar if we include older local residents (aged > 64 years).

1996–2005. We also obtain data on covenant violations during 1996–2008 from Nini, Smith, and Sufi (2009).

For the endogeneity tests, we obtain the male–female ratio at birth (i.e., newborns) from the Census Bureau, and breast cancer and prostate cancer mortality data from the Global Health Data Exchange.[7]

We obtain data on local financial and living risk attitudes and local overconfidence from GSS. After merging the county–year observations with the county characteristics, CRSP, and Compustat data, we obtain 2,371, 2,956, and 2,742 observations, respectively. We then construct CEO overconfidence using data from Execucomp during 1992–2017.

Data on the proportion of female directors (CEOs and directors) are also obtained from Execucomp. After merging these data with the main sample and board characteristics, we obtain 9,680 observations.[8]

B. Summary statistics

Table I summarizes the county demographic, firm, bank, and loan characteristics. We find that in counties containing firm headquarters, the average local male–female ratio is 0.946 (i.e., more female than male residents), with a standard deviation of 0.051. The lowest male–female ratio is 0.760, and the highest is 1.846. On average, the local population per county is 663,000, and 24.0% of residents have at least a college degree. The local average age is 35.8 years, and the mean income is US$44,082.

In the sample of firms, the mean book asset value is $2.398 billion, and the average market leverage ratio (total debt/market assets) is 0.126. The average free cash flows, cash holdings,

[7] We use the table "Trends and patterns of disparities in cancer mortality among US counties, 1980–2014." We replace missing observations after 2014 with observations from 2014.

[8] When computing the male–female ratio of local employees, we use the county-level employment data from the Geographic Profile of Employment and Unemployment, Bureau of Labor Statistics. We then combine local employment data with the main sample to obtain 57,126 firm-year observations. Data on non-executive employee stock options during 1992–2006 are obtained from Execucomp. After combining these data with the main sample, we have 14,752 observations.

and capital expenditure represent -13.5%, 12.7%, and 5.1% of book assets, respectively. The sample has a mean market-to-book ratio of 1.875 and a profitability of 4.7%. In terms of loan contracts, the sample has a mean loan spread of 1.567% and an average loan maturity of 42.726 months.

II. Local Male–Female Ratio and Firm Risks

This section explores the impact of the local male–female ratio on corporate risk levels and risk-taking policies. We explore the likelihood of using interest rate hedging, which directly smooths cash flows and helps firms manage risk. We also examine other corporate policies used to curb risk, such as investment conservatism (capital expenditure) and financial conservatism (leverage and cash holding).

A. Impact of the local male–female ratio on firm risk levels

We first investigate the effects of the local male–female ratio on corporate risk levels, which are measured using option-implied stock return volatility. This measure is advantageous because it is forward-looking, enabling us to build a direct link between the expected firm risk level and future corporate financial policies.

Table II reports the results of panel regressions of corporate risk levels on the local male–female ratio after controlling for other county and firm characteristics. Standard errors are adjusted for heteroskedasticity and clustered by firm. We use 182-day option-implied volatility as the dependent variable. In Table II, regressions (1) to (4) show that the local male–female ratio is positively correlated with a firm's option-implied volatility. For example, in regression (3), the coefficient of the local male–female ratio is 0.252. The unconditional mean option-implied volatility is 0.160, indicating that a one standard deviation increase in the local male–female ratio increases a firm's stock volatility by approximately 8.0% (0.252 × 0.051 / 0.160) .

Overall, Table II suggests that a strong positive correlation exists between the local male–female ratio and the expected firm risk level.

B. Impact of the local male–female ratio on risk-taking corporate policies

Next, we investigate the impact of the local male–female ratio on a firm's investment and financial conservatism, measured using the firm's market leverage, capital expenditure, cash holdings, and hedging policy. We run panel regressions of these variables on the local male–female ratio, controlling for other county-level demographic characteristics, firm characteristics, and state fixed effects, and report the results in Table III. As shown, a one standard deviation increase in the local male–female ratio increases a firm's market leverage ratio and cash expenditure by approximately 3.4% (0.085 × 0.051 / 0.126) and 5.3% (0.053 × 0.051 / 0.051), respectively, and decreases its cash holdings by 3.4% (0.084 × 0.051 / 0.127) relative to the sample averages. These results are both statistically significant and economically substantial,[9] consistent with the view that an increase in the local male–female ratio encourages firms to adopt riskier financial and investment policies.

Earlier studies find that firms use derivatives to manage risk. According to Guay (1999), for example, initiating derivative contracts reduces a firm's earnings volatility and stock price volatility. Campello et al. (2011) show that derivative hedging has a significant impact on a firm's value and debt capacity. Interest rate derivatives are the instruments most commonly used for corporate hedging purposes. Therefore, we use interest rate derivatives as a proxy for a firm's hedging activities. This is measured using a dummy variable which equals one if a firm uses interest rate derivatives, and zeros otherwise. In Table III, regression (4) indicates that the local male–female ratio has a marginal effect of -0.259, indicating that a one standard deviation increase in the local male–female ratio decreases the likelihood of corporate interest

[9] Note that the lagged market leverage in Column (1) of Table III is significant, suggesting that market leverage is persistent.

rate hedging by 5.04% (0.259 × 0.051 / 0.262) relative to the sample average. The coefficients of the other control variables are in line with previous findings. For example, increases in firm size and maturity are associated with a higher probability of interest rate hedging.[10]

III. Consequences of Catering to Local Risk Attitudes: Loan Contract Terms

In the previous section, we document evidence showing consistently that firms based in areas with a higher male–female ratio are more likely to adopt riskier corporate policies and experience higher risk levels. In this section, we further investigate the value implications of corporate risk-taking as a reflection of local gender differences. Specifically, we examine the effects of local gender imbalance on loan contract terms.

A. Impact of local male–female ratio on loan spreads

We first examine how firms' policy responses to the local male–female ratio affect the cost of debt. If firms based in areas with a higher local male–female ratio take more risks, then they should face higher borrowing costs.

We run panel regressions in which the dependent variable is the loan spread charged by a bank over the London Inter-Bank Offered Rate (LIBOR), as shown in Panel A of Table IV. Following Graham, Li, and Qiu (2008), we control for a set of firm characteristics associated with a firm's cost of debt, such as book assets, market leverage ratios, tangibility, market-to-book ratios, free cash flows, and credit rating fixed effects. All of the regressions also control

[10] In Table A2 of the Online Appendix, we perform robustness checks to examine the hedging policies of bank holding companies. This sample has some advantages. First, banks' Y-9C reports enable us to use the exact notional values of interest rate derivatives, rather than an indicator. Second, bank holding companies are required to report separately their use of derivatives for trading and hedging purposes. Third, bank holding company reports allow us to control for interest rate risk exposures. Following Bonaimé, Hankins, and Harford (2014), we measure bank interest rate hedging as the gross notional value of interest rate derivatives for non-trading purposes, scaled by market capitalization. The results show that a one standard deviation increase in the local male–female ratio is associated with a 9.10% decrease in bank interest rate hedging relative to the sample mean.

for loan-specific characteristics, such as loan facility values, loan maturity levels, loan type fixed effects, and loan purpose fixed effects.

The results for regressions (1)–(4) are presented in Panel A of Table IV. The estimated coefficient for the local male–female ratio is statistically significant at the 1% level with a positive sign, suggesting that a higher local male–female ratio is positively associated with the cost of bank loans.

B. Impact of the local male–female ratio on collateral requirements

The literature demonstrates that collateral requirements are associated with riskier borrowers (Berger and Udell, 1990; John, Lynch, and Puri, 2003). When firms increase risk-taking in response to lower local risk aversion levels, as proxied by a higher male–female ratio, the probability that their loan contracts require collateral may increase. In this subsection, we investigate this possibility using a Probit regression, in which the dependent variable is an indicator with a value of one when a bank loan is secured, and zero otherwise.

The results of Regressions (5)–(8) with various control variables are shown in in Panel A of Table IV. The coefficient estimate of the local male–female ratio is positive and significant, consistent with the above prediction. In regression (8), the marginal effect of the local male–female ratio is 0.0246 (0.482 × 0.051), indicating that a one standard deviation increase in this ratio increases the likelihood that a firm is subject to a secured loan by roughly 6.5% (the sample average for collateral requirements is approximately 38.1%).

C. Impact of the local male–female ratio on capital expenditure restrictions

Nini, Smith, and Sufi (2009) argue the existence of an important association between capital expenditure restrictions and a firm's credit risk. Therefore, we expect that firms based in areas with high male–female ratios are more likely to be subject to capital expenditure restrictions in bank loan contracts due to their higher level of risk.

We perform Probit regressions in which the dependent variable is an indicator that takes a value of one when a bank loan imposes capital expenditure restrictions, and zero otherwise. The results for regressions (9)–(12) are presented in Panel A of Table IV. In each regression, the coefficient of the local male–female ratio has a positive sign and is significant at the 5% level. As shown in regression (12), the marginal effect of the local male–female ratio is 0.678. This implies that a one standard deviation increase in this ratio increases the probability of capital expenditure restrictions by 3.46% (0.678 × 0.051). As the sample average of capital expenditure restrictions is 29.4%, the effect of the local male–female ratio accounts for 11.8% of the sample mean.

D. Impact of the local male–female ratio on covenant violations

To provide further evidence supporting the effect of the local male–female ratio on corporate risk-taking, we examine firms' likelihood of committing covenant violations. Jensen and Meckling (1976) suggest that firms that take more risks are more likely to violate loan covenants.

Regressions (1)–(4) in Panel B of Table IV are Probit regressions in which the dependent variable is an indicator that takes a value of one when a firm violates a bank loan covenant in a specific year and zero otherwise. In regression (1), we control for the local male–female ratio and firm characteristics. As expected, the coefficient of the local male–female ratio is significantly positive. The marginal effect of this ratio is 0.299, suggesting that a one standard deviation increase increases the likelihood of a covenant violation by 0.015, accounting for 11.7% of the sample mean of the likelihood of covenant violations (0.13).

In regression (2), we control for other county-level demographic characteristics. In regressions (3) and (4), we control for industry and state fixed effects, respectively. We find that the local male–female ratio is positively associated with the likelihood of covenant violations for all specifications.

IV. Robustness Checks and Endogeneity Tests

We also perform a series of additional tests to ensure that the positive relationship between the local male–female ratio and corporate risk-taking is robust to alternative sample and model specifications.

A. Examining different gender ratio variations

Previous results illustrate the effect of gender ratios on corporate policies. Still, it remains unclear whether cross-county variations in gender ratios can generate substantial effects. We address this concern by reexamining the significance of the local male–female ratio over some subsamples in Table V. Specifically, in each year, we intentionally exclude counties in the left and right tails of the cross-county gender ratio distribution (i.e., the extreme counties). For example, the 5–95 percentile subsample only includes counties with a male–female ratio falling between the 5^{th} and 95^{th} percentiles of the cross-county distribution. In this analysis, we observe significant results similar to those reported before. As we further shrink the analysis to the 15–85 percentile subsample (a cross-county standard deviation of 0.028) by excluding counties both in the top and bottom 15% of counties, the gender ratio remains significant in most regressions. The results also remain reasonably significant once we exclude the top and bottom 20% of all counties (i.e., 40% of the sample). Overall, the results hold after using several thresholds to exclude the extreme counties, suggesting a nontrivial impact of the local male–female ratio on corporate risk-taking.

As expected, the significance of the local gender ratio increases in regressions over the subsample of extreme counties. For example, this ratio is strongly significant if we analyze only counties in the top and bottom 20% of the local male–female ratio distribution (i.e., the subsample with large variations). This suggests that as variations in the local male–female ratio

increase, our results become both statistically more significant and economically more important, further confirming a causal effect of this ratio on corporate risk-taking.

Next, we further consider endogeneity issues in this section. First, we consider potential issues involving omitted variables. Second, we address concerns of reverse causality. Third, we take the instrumental variable approach and run two-stage least squares (2SLS) regressions to answer questions about causality. We consider two different sets of instrumental variables.

B. Omitted variables and reverse causality

We perform extensive robustness checks to address potential issues involving omitted variables. First, variations in industry time may contribute to the correlation between the local male–female ratio and corporate risk-taking, because different industries have systematic differences in the shares of male and female employees. The industry time trend may explain these baseline results. For example, the mining industry is likely to have a higher proportion of male employees than the retail industry, and changing conditions in an industry can reflect labor movement across counties, which might affect the male–female ratio in local communities. To the extent that the industry time trend affects local firms' risk-taking behavior, the relation between the local male–female ratio may capture this industry time variation. Although we control for industry fixed effects in the main specification, as shown in the previous tables, to further address this concern, we add the interaction of industry and year fixed effects to absorb the time trend at the industry level. We obtain robust results, as shown in Panel A of Appendix Table A3.

Next, we further consider county fixed effects. That is, we identify the effects of the local male–female ratio on corporate risk-taking depending on time variations in this ratio in counties where companies are headquartered, controlling for all other firm-specific factors that may vary over time as described above. This helps to address the concern that our findings are spurious and driven by county-level, time-invariant omitted variables (e.g., geographic and

cultural factors). Panel B of Appendix Table A3 shows that most of the regression results still hold after the county-level fixed effect is included.

We also control for the local proportion of retirees. Areas in the Southwest and the state of Florida might attract more retirees. As women have longer lifespans, on average, we expect that these areas will have lower male–female ratios. Retirees might affect local firms through various channels, such as local demand and savings. Therefore, we control for the county-level proportion of the population that is above the retirement age (> 60 years) in Panel C of Appendix Table A3, and find that our results are not driven by this variable.

Third, corporate headquarters might cause labor forces to migrate across counties, leading to changes in local male–female ratios. For example, the positioning of local firm headquarters might be related to these ratios. Figure II plots the geographical distribution of firm headquarters in 2005. We find that the correlation coefficient between the local male–female ratio and the fraction of firm headquarters is merely -0.011, which rules out this possible relation.

Fourth, some counties may specialize in industries that lack gender diversity. For example, Silicon Valley (California) has attracted disproportionally more men than women over the past several decades because men are overrepresented in the occupations required by those firms. To the extent that firms headquartered in Silicon Valley attract more male workers, the correlation between increased corporate risk-taking and a higher male–female ratio can be simultaneously determined. To exclude this concern, we control for industry fixed effects and exclude counties in which the male–female ratio is highly correlated with the industry's size-weighted local industry male–female ratio. After excluding these counties from the sample, the male–female ratios of the remaining counties are unlikely to be affected by local industry clustering and its effects on labor force mobility. We find that our main findings are robust after excluding these counties, as shown in Appendix Table A4.

Fifth, it is unclear whether the local male–female ratio reflects other local characteristics, such as attitudes toward gender equality or religiosity. A gender-egalitarian culture might affect the local male–female ratio, with subsequent effects on female corporate board representation and, ultimately, corporate risk-taking (e.g., McLean, Pirinsky, and Zhao, 2020). We use labor market outcomes (e.g., the gender pay gap) to capture cultural gender egalitarianism. In a local culture with a higher level of gender egalitarianism, we would expect to find a higher local female–male income ratio. Local religiosity also might affect corporate activities because more religious populations tend to be more risk averse (Hillary and Hui, 2009). Therefore, we further check our previous results by controlling for the local female–male income ratio and level of religiosity. The results in Appendix Table A5 show that the local male–female ratio remains significant in all regressions, suggesting that our results are not driven by gender egalitarianism or local religiosity.

Finally, local demographic changes might predict local business activities, creating spurious correlations between the local male–female ratio and corporate policies. To rule out this concern, we consider a subsample of firms with revenues mainly from other states (i.e., their top five customers are out of state) and perform analyses similar to those in Tables II–V. Again, we find robust evidence that the local male–female ratio affects risk-taking by these firms, as shown in Table VI.

C. Endogeneity tests: 2SLS

In this subsection, we address concerns about endogeneity by using instrumental variables and running a 2SLS regression.

C.1 Male–female ratio at birth averaged over the 1960s as an instrumental variable

Roberts and Whited (2013) suggest that biological or physical events are more likely than the traditional corporate financial ratio to be good instruments in empirical corporate finance

studies. Here, we exploit human birth as an instrumental variable. Specifically, we use the county-level local male–female ratio at birth averaged over the 1960s, which is naturally positively related to the local male-female ratio 30–50 years later (i.e., during 1992–2017, the main sample period of this study). In the US, the natural sex ratio at birth is quite stable and does not appear to be heavily influenced by labor force movement, local industry clustering, local economic conditions, or the local population. Therefore, the county-level sex ratio at birth is largely exogenous. Additionally, the local male–female ratio at birth averaged over the 1960s is unlikely to directly affect firms' risk-taking policies during 1992–2017, except through the channel of the local male–female ratio. Again, to rule out concerns that local demographic conditions in the 1960s might predict long-term local business operations, we restrict our sample to firms that obtain revenue mainly from other states, i.e., their top five customers are out of state. Therefore, this instrument satisfies both the relevance and exclusion requirements.

We present the first-stage regression results in regression (1) of Table VII, Panel A. We see that the local male–female ratio at birth averaged over the 1960s is positively related to the local male–female ratio for the period 1992–2017. The coefficient of the local male–female ratio at birth averaged over the 1960s is significant at 1%, and the *F*-statistic for the weak identification test is 79.17, indicating that this variable passes the relevance test. The regressions (2)–(10) in Panel A of Table VII present the second-stage regression results. In all cases except for those of capital expenditure and loan spread, the local male–female ratio is significant at least at the 10% level. Therefore, our previous results are robust to this instrumental variable approach.

C.2 Prostate cancer and breast cancer as instruments

We also exploit two mortality-related biological factors that may affect the local male–female ratio as instruments. The first is based on breast cancer mortality rates in women. Breast cancer is the most frequently occurring cancer and the most frequent cause of cancer-related

deaths among women. To control for the fact that both men and women can develop breast cancer, we normalize the per-county breast cancer mortality rate in women by that in men and thus ensure that breast cancer has a unidirectional effect on the male–female ratio. We expect that in a region where the local community has a higher ratio of breast cancer mortality in women relative to men, the male population is likely to be larger than the female population. This ratio is unlikely to affect local firms' corporate policy except through the local male–female ratio.

The second instrument is the county-level prostate cancer mortality rate. Prostate cancer is the most common type of cancer affecting men in the US.[11] Therefore, the prostate cancer mortality rate can reduce the local male–female ratio, and this instrument satisfies the relation criterion. According to the CDC, gene-related factors affect the occurrence of prostate cancer.[12] Therefore, this instrument also satisfies the exclusion condition, as gene-related prostate cancer is unlikely to affect local companies' policies through any channel other than the local male–female ratio.

Our data on breast cancer and prostate cancer mortality rates are obtained from the Global Health Data Exchange. We present 2SLS regressions with the local breast cancer and prostate cancer mortality rates as instrumental variables in Table VII, Panel B. In the first-stage regression, we find that the local prostate cancer mortality rate is significantly and negatively correlated with the local male–female ratio, and the local ratio of the breast cancer mortality rate in females over that in males is strongly positively correlated with the local male–female ratio. In the second stage, we find that the instrumented local male–female ratio generally

[11] The American Cancer Society estimated that in 2018, 164,690 men would be newly diagnosed with prostate cancer, 29,430 would die from the disease, and one in every nine men would be diagnosed with this cancer during their lifetimes (see https://www.uclahealth.org/urology/prostate-cancer/what-is-prostate-cancer).

[12] For example, men who have a father, son, or brother who had prostate cancer are at increased risk of getting prostate cancer. Men with three or more first-degree relatives (father, son, or brother) or two close relatives on the same side of the family who have had prostate cancer may have a type of prostate cancer caused by genetic changes that are inherited (see https://www.cdc.gov/cancer/prostate/basic_info/risk_factors.htm).

predicts higher corporate risk-taking, except in the regression of capital expenditure. The Hansen *J* statistic (*p*-value) significantly rejects the null of over-identification. Overall, our main results hold in the 2SLS regressions.

V. Examining the Economic Mechanism

The above evidence suggests that the local male–female ratio affects corporate risk-taking. Nevertheless, we must identify the transmitting mechanisms through which the risk attitudes of the local population are expressed in corporate decisions. We conduct this investigation in two steps. First, we show that the local male–female ratio captures the levels of risk aversion and overconfidence in local residents. Second, in addition to the well-cited local investor channel, we formally identify another direct channel through which firms express the risk preferences of local populations: the employee channel.

A. Understanding the risk attitudes embedded in gender differences

Gender differences may reflect differences in risk preferences or beliefs. Studies suggest that men are less risk averse and more overconfident than women (for example, see Croson and Gneezy, 2009; Vieider et al., 2015; Falk et al., 2018; D'Acunto, 2020). Therefore, a high local male–female ratio suggests a less risk averse and more overconfident population. We test the local male–female ratio by examining relevant items taken from the General Social Survey (GSS) conducted by the National Opinion Research Center at the University of Chicago. We find that the local male–female ratio captures variations in both risk aversion and overconfidence in a population.

The GSS conducted in 1993 included the following item related to attitudes toward financial risk: "Some people say that this is very important to them. Others say that it is not as important. Please tell me how important being financially secure is." This item is scored on a 5-point scale: 1, "It is a top priority"; 2, "It is very important"; 3, "It is somewhat important";

4, “It is not as important”; and 5, “It is not important at all.” A higher score indicates a lower level of risk aversion. In 2008, the GSS included the following item related to attitudes toward living security: “Have you or has anyone you know purchased items that provide a sense of safety (gas masks, duct tape, items that enhance home security, etc.)?” This item is scored on a 4-point scale: 0, “No”; 1, “Yes, the respondent has purchased such items;” 2, “Yes, someone the respondent knows has purchased such items;” and 3, “Yes, both the respondent and someone the respondent knows have purchased such items.” To render this score consistent with the financial risk measure, we calculate it as 6 minus the GSS score. Therefore, a higher score for financial risk or living risk indicates a less risk-averse respondent. We compute the local risk aversion measure as a county’s average score on these items. Panels A and B of Table VIII report the panel regression of local risk aversion against the local male–female ratio while controlling for other local characteristics, such as population size, household income, unemployment rate, age, and state fixed effects. Panel A examines aversion to financial risk, and Panel B examines aversion to living risk. Overall, we find that a higher local male–female ratio is correlated with lower average levels of risk aversion in the population.

In 2016, the GSS, which covered 216 US counties, included four items related to confidence: “In uncertain times, I usually expect the best,” “I'm always optimistic about my future,” “If something can go wrong for me, it will,” and “I rarely count on good things happening to me.” Each item is scored on a 5-point scale: 1, “Strongly disagree”; 2, “Disagree”; 3, “Neutral”; 4, “Agree”; and 5, “Strongly agree.” The former two items represent confidence, whereas the latter two represent a lack of confidence. To be consistent, we calculate the confidence score as 6 minus the GSS score given for each of the latter two items. Therefore, a higher score indicates a higher level of confidence. We then take the average score for each item and aggregate it at the county level as the local overconfidence measure. Panel C of Table VIII reports a panel regression of local overconfidence against the local male–female ratio after

controlling for other local characteristics, such as population size, household income, unemployment rates, age, and state fixed effects. We find that a higher local male–female ratio is associated with greater confidence in a population.

B. Identifying the preference transmission mechanism: The investor channel

Local residents might affect corporate decision-making via the investor channel for three reasons. First, large local investors can directly influence corporate decision-making (Becker et al., 2011; Derrien, Kecskés, and Thesmar, 2013; Lyandres et al., 2019). Second, local retail investors can collectively express their opinions by voting with their feet and can influence stock prices (Kandel, Massa, and Simonov, 2011). Third, firms often shape their policies to cater to retail investors' preferences in response to managers' concerns about valuation or even risk management (Becker, Ivković, and Weisbenner, 2011).[13] For example, Manconi and Massa (2013) demonstrate how firms cater to their investors' payout preferences. Because we do not have comprehensive data on individual shareholders' genders and stock holdings, we examine the effect of the local male–female ratio on dividend policy as an indirect measure.

Female investors often prefer dividend-paying stocks for two reasons. First, dividend-paying stocks provide investors with steady income and appear to be less risky. Empirically, firms that increase (decrease) dividends experience a significant decline (increase) in systematic risk, and the positive market reaction to a dividend increase is significantly related to a subsequent decline in systematic risk (Grullon, Michaely, and Swaminathan, 2002). Therefore, more risk-averse female investors prefer dividend-paying stocks. Second, female investors are more loss averse and become more risk averse than males after prior losses (Schmidt and Traub, 2002; Brooks and Zank, 2005; Hibbert, Lawrence, and Prakash, 2018).

[13] The relevant literature demonstrates that managers may cater to shareholder demands. For instant, firms may adjust their payout policies (e.g., Baker and Wurgler, 2004; Becker, Ivkovic, and Weisbenner, 2011), investment policies (Polk and Sapienza, 2009), stock-split decisions (Baker, Greenwood, and Wurgler, 2009), and capital structure (Baker and Wurgler, 2002) according to shareholders' needs.

Therefore, female investors might prefer stable dividend gains rather than potentially disappointing growth in retained earnings in the distant future, as suggested by prospect theory (e.g., Shefrin and Statman, 1984). Both theoretical and empirical evidence shows that managers are responsive to shareholders' dividend preferences (Baker, Farrelly, and Edelman, 1985; Baker and Wurgler, 2004; Becker, Ivkovic, and Weisbenner, 2011). Therefore, we expect that a higher local female ratio leads to more dividend payouts.

We run panel regressions of dividend payout ratios against the local male–female ratio and report the results in Table IX. Following John, Knyazeva, and Knyazeva (2011), we construct two dividend payout ratios (*dividend payout 1* in Columns (1) and (2) and *dividend payout 2* in Columns (3) and (4)). *Dividend payout 1* is the ratio of cash dividends to the market value of common equity. *Dividend payout 2* is the ratio of cash dividends to net income in firm years with positive net income. We control for other county-level demographic characteristics, firm characteristics, and state fixed effects in the regressions. The coefficient of the local male–female ratio is significantly negative at the 1% level. We find that, relative to the sample averages, a one standard deviation increase in the local male–female ratio is associated with a 9.3% (=0.011*0.051/0.006) decrease in a firm's *dividend payout 1* ratio, shown in Column (2), and a 13.7% (=0.226*0.051/0.084) decrease in a firm's *dividend payout 2*, shown in Column (4). These results are both statistically and economically significant, suggesting that firms tailor their dividend policies to cater to the local male–female ratio (i.e., the demographics of local investors).

C. Identifying the preference transmission mechanism: The employee channel

Intuitively, we expect that most corporate decisions are made by corporate employees, especially members of the management and monitoring team, such as executives and board directors. We examine whether local gender differences affect corporate employment using two tests.

First, we explore whether gender differences in the local population amplify gender imbalances among local employees. Individuals, including top firm managers, prefer to conform to their peers in terms of preferences and practices (Kohlberg, 1984), possibly because employees induce conformity by sharing their preferences or exerting peer pressure. Therefore, a more gender-skewed employee base can strengthen the preference for risk in corporate norms. Appendix Table A6 shows the results of a panel regression of the employee gender ratio against the local male–female ratio. Consistent with our prediction, the results show that a higher local male–female ratio drives a higher male–female ratio among local employees. In addition, local male employees might express their risk attitudes through equity-based compensation; for example, male employees might express a preference for risk-taking by choosing more equity-based compensation, which in turn affects corporate activities (Spalt, 2013). Firms also cater to the preferences of even their non-executive employees (Spalt, 2013). Appendix Table A7 shows that a higher male–female ratio is significantly correlated with higher non-executive employee stock options and greater employee involvement (via employee stock ownership plans (ESOPs) or employee stock purchase plans (ESPPs)). These results suggest that the risk attitudes of local employees influence corporate decisions.

Second, we examine whether local gender imbalances influence gender imbalances among key decision makers, such as corporate executives and board directors. Studies often find that firms with larger proportions of male executives or directors tend to have higher risk profiles.[14] For example, Faccio, Marchica, and Mura (2016) observe that firms with male CEOs have more leverage and more volatile earnings. Pan, Siegel, and Wang (2017) show that the risk attitudes of firms' leaders affect corporate policies. Although corporate executives and directors may not be local residents, their behavior interacts with local traits. Ewens and

[14] In contrast, Ahern and Dittmar (2012) find that the boards of a sample of Norwegian firms become less capable after imposing female board representation quotas.

Townsend (2020) show that female investors express more interest in female entrepreneurs than in observably similar male entrepreneurs, and vice versa. To the extent that female investors tend to select female entrepreneurs, the investor channel can amplify the effect of the employee channel and increase the expression of risk aversion among female leadership. Therefore, we hypothesize that a firm based in an area with a lower male–female ratio has more female executives and board directors, leading to a decrease in risk-taking by the firm.

In Table X, we provide direct evidence showing that a higher local male–female ratio is associated with a lower proportion of female CEOs and directors. In regressions (1)–(4), we regress the proportion of female corporate board members on the local male–female ratio after controlling for other county and firm characteristics. Following Huang and Kisgen (2013), we apply board characteristics (board size and percentage of independent boards) in regression (3) and the Fama–French 12-industry fixed effects in regression (4). Regressions (1)–(4) provide consistent evidence showing that a higher local male–female ratio leads to lower proportions of female corporate board members. In regressions (5)–(8), we use the proportions of female CEOs and female directors.[15] Again, a higher local male–female ratio decreases the proportion of female CEOs and directors of a company, revealing a plausible mechanism by which local residents' risk attitudes are transmitted to corporate decisions.

To examine the effects of gender imbalances among corporate executives and directors, we test whether CEO overconfidence is related to overall local overconfidence. Overconfident CEOs often engage in much riskier corporate activities than their less confident peers (for example, see Malmendier and Tate, 2005; Malmendier and Tate, 2008; Gervais, Heaton, and Odean, 2011; Malmendier, Tate, and Yan, 2011; Hirshleifer, Low, and Teoh, 2012). Following Malmendier and Tate (2005, 2008), we define a CEO as overconfident when they postpone

[15] As female CEOs are very rare in our sample, we do not consider female CEOs separately.

exercising vested stock options that are at least 67% in the money.[16] Following Hirshleifer, Low, and Teoh (2012), we define a CEO as overconfident from the first point at which they exhibit such behavior. We do not require a CEO to hold a 67% in the money option at least twice, as this requirement would introduce look-ahead bias. We collect CEO option holdings in 2017 from the S&P Execucomp database. Table XI reports the results of panel regressions of CEO overconfidence against local overconfidence. Notably, a higher level of local overconfidence is associated with a higher degree of CEO overconfidence. Together with the evidence given in Table XI, this finding implies a correlation between a higher local male–female ratio and a higher level of CEO overconfidence, leading to increased corporate risk-taking activities.

VI. Conclusions

This paper explores the effects of local gender imbalance on corporate activities from the risk preference perspective, as men appear to be less risk averse and more overconfident than women. We find that the male–female ratio among local residents is positively related to risk-taking at local firms. Specifically, firms based in counties with higher local male-female ratios have higher option-implied return volatilities, market/book leverage ratios and capital expenditure, and lower cash holdings. We also find that firms in areas with a higher local male–female ratio face higher loan spreads and stricter loan conditions and incur more covenant violations. Moreover, we show that corporate dividend policies cater to the local male–female ratio, which provides support for the investor channel as a mechanism by which local risk attitudes are transmitted to corporate decision-making. We also find that a higher local male–female ratio leads to a lower proportion of local female employees, less female representation

[16] The existing literature has proposed other measures of CEO overconfidence based on CEO portrayals in the business press (Malmendier and Tate, 2008), survey data (Ben-David, Graham, and Harvey, 2013), and managerial earnings forecasts (Hribar and Yang, 2016).

among CEOs and board directors, higher levels of CEO overconfidence, and higher levels of employee stock options and involvement. These findings suggest that the risk attitudes of the local population are also conveyed to corporate decision makers via an employee channel that may complement the local investor channel. Overall, these results suggest that local gender imbalance is an important driver of corporate risk-taking.

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Figure I: Local Gender Ratio in the US

This figure plots the male–female ratio across different counties in the United States in 2005. We obtain the data from the Census Bureau and focus on the population of prime work age (between 20 and 64 years).

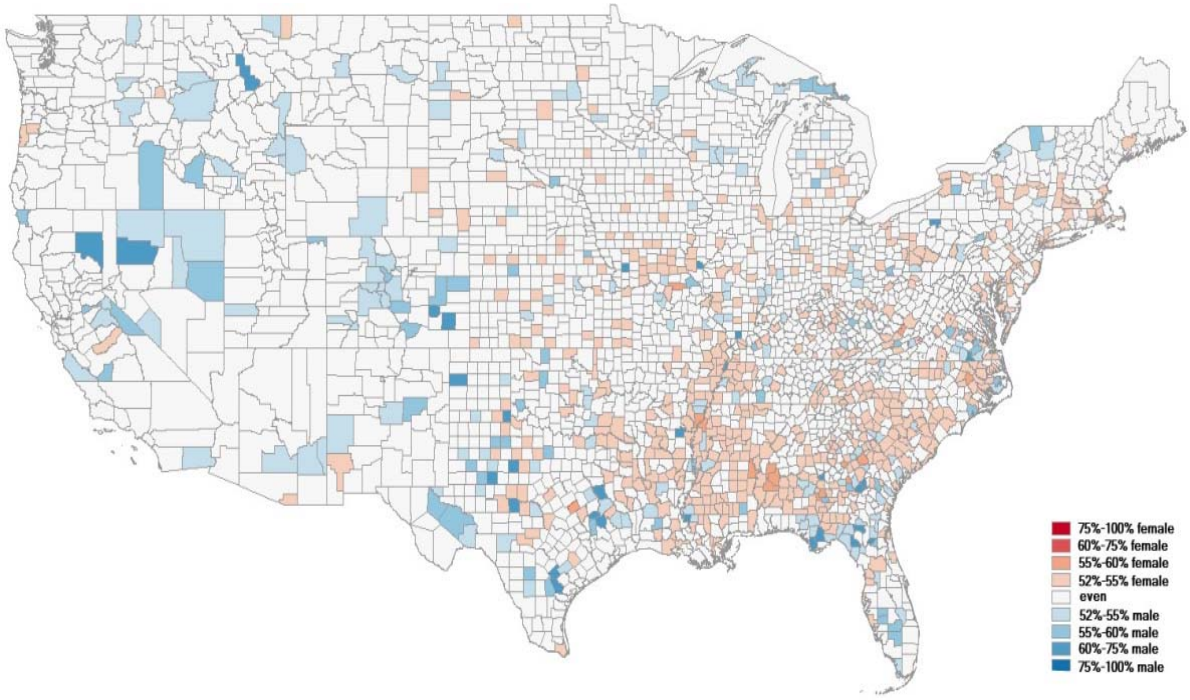

Figure II: Geographical Distribution of Firm Headquarters

This figure plots the geographical distribution of firm headquarters across counties in the United States in 2005.

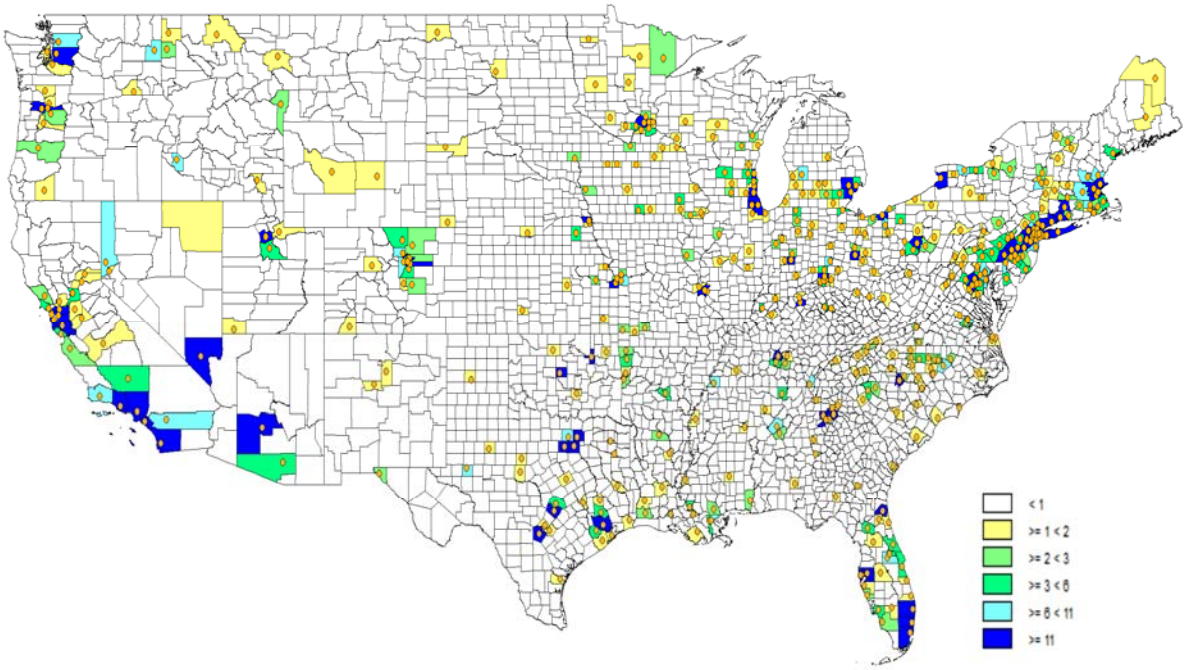

Table I
Summary Statistics

This table presents the summary statistics and data sources for the main variables. We report the mean, median, minimum, maximum, and standard deviation for each variable. See the Appendix for definitions of the variables and Section I for the data sources.

Variable	N	Mean	Minimum	Maximum	Std. Dev.	Source
Local male-female ratio	14,342	0.946	0.760	1.846	0.051	US Census Bureau
County characteristics						
Local higher education proportion	14,342	0.240	0.055	0.716	0.095	US Census Bureau
Local household income (dollars in thousands)	14,342	44.082	19.475	76.260	10.596	US Census Bureau
Local population (in millions)	14,342	0.663	0.035	19.701	1.366	US Census Bureau
Local average age	14,342	35.803	26.500	44.100	2.331	US Census Bureau
Local unemployment rate	14,342	0.058	0.009	0.199	0.024	US Census Bureau
Local male-female ratio of employment	3,806	1.151	0.842	1.473	0.084	Geographic Profile of Employment and Unemployment
Local overconfidence	2,742	3.512	2.000	4.500	0.431	General Social Survey
Local financial risk preference	2,371	1.921	1.000	4.000	0.334	General Social Survey
Local preference of living risk	2,956	0.515	0.000	1.000	0.212	General Social Survey
Local male-female ratio at birth averaged over 1960s	14,342	1.043	0.777	2.271	0.090	US Census Bureau
Local prostatic cancer mortality rate (per 100,000)	14,342	30.628	10.167	71.506	6.557	Global Health Data Exchange
Local breast cancer mortality rate (per 100,000)	14,342	77.360	39.344	173.995	11.696	Global Health Data Exchange
Firm characteristics						
Book value (dollars in billions)	83,059	2.398	0.002	53.423	7.436	Compustat
Book leverage	83,059	0.167	0.000	0.721	0.185	Compustat
Capital expenditure	83,059	0.051	0.000	0.358	0.062	Compustat
Cash holding	83,059	0.127	0.000	0.844	0.166	Compustat
Free cash flow	83,059	-0.135	-1.448	0.146	0.241	Compustat
Interest rate hedging (industrial)	45,830	0.262	0.000	1.000	0.442	EDGAR
Market leverage	83,059	0.126	0.000	0.651	0.156	Compustat
Option-implied stock volatility(%)	19,479	0.160	0.014	0.740	0.140	Compustat
Profitability	83,059	0.047	-1.086	0.432	0.203	Compustat
Sales growth	83,059	0.211	-0.563	2.423	0.499	Compustat
Tangibility	83,059	0.252	0.000	0.903	0.246	Compustat
Market-to-book	83,059	1.875	0.198	13.164	2.022	Compustat
Covenant violation	48,345	0.130	0.000	1.000	0.337	Nini, Smith and Sufi (2009)
Fraction of female directors	27,142	0.053	0.000	1.000	0.118	Execucomp
Fraction of female CEOs and directors	27,142	0.051	0.000	1.000	0.105	Execucomp

CEO overconfidence	527	0.610	0.000	1.000	0.487	Execucomp
Non-executive employee stock option (per 10000 employees)	14,752	0.878	0.000	22.510	2.879	Execucomp
Employee involvement	19,263	0.103	0.000	1.000	0.304	KLD Social Rating
Dividend payout 1	83,059	0.006	0.000	0.087	0.015	Compustat
Dividend payout 2	83,059	0.085	0.000	1.639	0.274	Compustat
Loan characteristics						
Loan spread (%)	10,844	1.567	0.175	6.050	1.169	LPC's DealScan
Ln (loan facility amount)	10,844	4.859	0.693	8.007	1.590	LPC's DealScan
Collateral requirement	10,844	0.381	0	1	0	LPC's DealScan
Loan maturity (months)	10,844	42.726	3.000	101.200	23.060	LPC's DealScan
Capital expenditure restriction	2,585	0.294	0	1	0	LPC's DealScan

Table II
Local Male–Female Ratio and Stock Volatility

This table reports panel regressions of firms' option-implied stock volatility against the local male–female ratio. The dependent variable is option-implied volatility, estimated as the 182-day forward-looking volatility from options. Regression (2) controls for county characteristics. Regression (3) adds industry fixed effects. Regression (4) controls for state fixed effects. All of the regressions include other local population characteristics and firm characteristics as additional controls.

	(1)	(2)	(3)	(4)
Local male-female ratio	0.333***	0.316***	0.252***	0.107***
	(12.19)	(9.28)	(7.32)	(3.39)
County characteristics				
Local higher education proportion		0.090***	0.063***	0.064***
		(6.07)	(4.54)	(3.97)
Ln (1+local population)		0.003***	0.003***	0.001
		(2.58)	(2.77)	(0.76)
Ln (local household income)		-0.029***	-0.015	-0.141***
		(-2.81)	(-1.51)	(-6.08)
Unemployment rate		-0.091	-0.199**	-0.306***
		(-0.89)	(-2.06)	(-2.89)
Local average age		-0.011	-0.003	0.020
		(-0.39)	(-0.11)	(0.20)
Firm characteristics				
Tangibility	-0.058***	-0.052***	-0.035***	-0.032***
	(-10.83)	(-9.42)	(-4.41)	(-3.96)
Ln (book assets)	-0.033***	-0.033***	-0.032***	-0.031***
	(-35.55)	(-35.85)	(-35.70)	(-35.02)
Market leverage	0.080***	0.081***	-0.014*	-0.009
	(10.06)	(10.10)	(-1.81)	(-1.20)
Free cash flow	-0.050***	-0.049***	-0.045***	-0.045***
	(-3.63)	(-3.64)	(-3.40)	(-3.47)
Market-to-book	0.004***	0.004***	0.009***	0.009***
	(6.25)	(6.18)	(11.44)	(11.21)
Profitability	-0.179***	-0.177***	-0.192***	-0.187***
	(-11.52)	(-11.47)	(-13.58)	(-13.29)
Sales growth	0.000	0.000	0.000	0.000
	(1.02)	(1.19)	(1.27)	(1.20)
Industry effects	No	No	Yes	Yes
State fixed effects	No	No	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Clustering	Firm	Firm	Firm	Firm
Observations	17,936	17,936	17,936	17,936
Adjusted R^2	0.548	0.551	0.585	0.592

Table III
Local Male–Female Ratio and Corporate Policies

This table reports panel regressions of firms' financial/investment policies against the local male–female ratio. Corporate financial/investment policies are represented by a firm's market leverage, capital expenditure, and cash holdings in regressions (1)–(3), respectively. Regression (4) presents a Probit regression of firm interest rate hedging against the local male–female ratio and includes its marginal effect. The dependent variable is an indicator that equals one if a firm reports the use of interest rate derivatives in its annual report, and zero otherwise. All of the regressions include other local population characteristics and firm characteristics as additional controls.

	Market Leverage	Capital Expenditure	Cash Holding	Interest Rate Hedging
	(1)	(2)	(3)	(4)
Local male-female ratio	0.085***	0.053*	-0.084***	-1.136**
	(3.80)	(1.70)	(-3.06)	(-1.97)
County characteristics				
Local higher education proportion	0.006	0.009*	0.109***	-0.602***
	(0.63)	(1.83)	(7.69)	(-2.60)
Ln (1+local population)	0.000	0.001**	-0.003***	0.021
	(0.38)	(2.09)	(-3.02)	(1.11)
Ln (local household income)	0.018*	-0.008	0.027**	-0.263
	(1.82)	(-1.41)	(2.01)	(-0.99)
Unemployment rate	-0.112**	-0.059**	-0.063	-3.278***
	(-2.25)	(-2.25)	(-0.96)	(-2.67)
Local average age	0.008	0.036	-0.012	2.585**
	(0.17)	(1.11)	(-0.19)	(2.35)
Firm characteristics				
Tangibility	0.085***	0.172***	-0.147***	0.135
	(17.72)	(45.20)	(-25.95)	(1.43)
Ln (book assets)	0.005***	-0.000*	-0.012***	0.320***
	(13.71)	(-1.67)	(-19.10)	(32.17)
Market leverage	0.450***	-0.045***	-0.129***	1.323***
	(88.18)	(-21.88)	(-26.23)	(19.75)
Free cash flow	0.022***	-0.006	-0.065***	0.194**
	(7.26)	(-1.29)	(-6.46)	(2.26)
Market-to-book	0.001***	0.001***	0.008***	-0.031***
	(4.38)	(4.51)	(6.16)	(-2.59)
Profitability	-0.005**	0.012***	-0.039***	0.936***
	(-2.04)	(3.08)	(-2.69)	(6.47)
Sales growth	0.000	0.000*	0.000	0.000*
	(1.02)	(1.70)	(0.45)	(1.83)
Marginal effect of local male-female ratio				-0.259
Year fixed effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes
Observations	83,059	83,059	83,059	45,830
Adjusted R^2	0.610	0.366	0.348	0.293

Table IV
Local Male–Female Ratio and Debt Financing Conditions

This table presents regressions of debt financing conditions on the local male–female ratio. Panel A considers loan spread, collateral requirement, and capital expenditure restrictions. Regressions (1)–(4) show the results of panel regressions of loan spread, which is charged by the bank over LIBOR. Regressions (5)–(8) are the Probit regressions of collateral requirement, an indicator that equals one if the bank loan is secured, and zero otherwise. Regressions (9)–(12) are the Probit regressions of capital expenditure restriction, an indicator that equals one if the bank loan contains a capital expenditure restriction, and zero otherwise. Panel B reports the Probit regressions of covenant violations, in which the dependent variable is an indicator that equals one if a firm violates a covenant in a specific year. We report the marginal effect of the male–female ratio from those Probit regressions. All of the independent variables are measured as of the fiscal year-end that immediately precedes the loan active date or the covenant violation event.

Panel A: Local Male-Female Ratio and Ex Ante Contract Terms

	Loan Spread				Collateral Requirement				Capital Expenditure Restriction			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Local male-female ratio	1.139***	0.907***	0.819**	0.366	2.764***	2.334***	2.227***	1.882***	2.728***	3.443***	4.034***	3.091**
	(4.71)	(2.96)	(2.57)	(1.05)	(7.55)	(5.24)	(4.85)	(3.41)	(3.02)	(3.02)	(3.48)	(2.03)
County characteristics										-0.320	-0.283	0.386
Local higher education		0.364***	0.320**	0.242		0.463**	0.577**	0.497*		(-0.62)	(-0.53)	(0.60)
proportion		(2.68)	(2.23)	(1.42)		(2.09)	(2.55)	(1.79)		0.078**	0.067*	0.003
Ln (1+local population)		0.010	-0.001	-0.003		0.026	0.011	0.007		(2.23)	(1.76)	(0.06)
		(1.05)	(-0.05)	(-0.27)		(1.53)	(0.62)	(0.33)		-0.475	-0.752*	-2.404**
Ln (local household		-0.084	-0.008	-0.311		-0.521***	-0.386**	0.482		(-1.33)	(-1.91)	(-2.16)
income)		(-0.93)	(-0.09)	(-1.27)		(-3.29)	(-2.39)	(1.22)		2.133	4.916	3.499
Unemployment rate		1.537*	1.573**	1.617*		-0.268	0.249	0.335		(0.62)	(1.36)	(0.82)
		(1.94)	(1.96)	(1.86)		(-0.20)	(0.18)	(0.21)		1.060	-0.065	-1.030
Local average age		-0.351	-0.416	0.179		-0.797*	-0.556	-1.498		(1.06)	(-0.06)	(-0.30)
		(-1.31)	(-1.50)	(0.17)		(-1.80)	(-1.20)	(-0.97)		-0.320	-0.283	0.386
Firm characteristics												
Tangibility	-0.190***	-0.171***	-0.481***	-0.496***	-0.020	-0.040	-0.379***	-0.406***	-0.457**	-0.490**	-0.158	-0.260
	(-4.12)	(-3.57)	(-6.92)	(-7.16)	(-0.25)	(-0.48)	(-3.22)	(-3.47)	(-2.47)	(-2.53)	(-0.53)	(-0.86)
Ln (book assets)	-0.151***	-0.155***	-0.146***	-0.146***	-0.244***	-0.246***	-0.257***	-0.259***	-0.202***	-0.212***	-0.272***	-0.265***
	(-9.50)	(-9.45)	(-8.74)	(-8.79)	(-8.41)	(-8.35)	(-7.89)	(-8.16)	(-3.57)	(-3.70)	(-4.51)	(-4.42)
Market leverage	1.024***	1.035***	1.237***	1.228***	1.002***	1.023***	1.050***	1.018***	0.493**	0.461**	0.440*	0.557**
	(18.59)	(18.77)	(20.59)	(20.49)	(11.53)	(11.71)	(11.01)	(10.63)	(2.14)	(2.00)	(1.73)	(2.14)
Free cash flow	-2.545***	-2.490***	-2.202***	-2.216***	-1.199***	-1.174***	-1.018***	-1.051***	-0.912	-1.002	-1.343*	-1.095
	(-13.71)	(-13.24)	(-11.34)	(-11.49)	(-5.07)	(-4.91)	(-3.85)	(-3.96)	(-1.35)	(-1.47)	(-1.75)	(-1.40)
Market-to-book	0.015**	0.014**	0.018**	0.017**	0.006	0.005	0.005	0.005	-0.070	-0.072	-0.087	-0.065
	(2.14)	(2.01)	(2.53)	(2.49)	(0.49)	(0.39)	(0.34)	(0.41)	(-0.99)	(-1.01)	(-1.17)	(-0.85)
Profit	-0.844***	-0.837***	-0.864***	-0.850***	-0.868***	-0.869***	-1.098***	-1.129***	-0.806	-0.778	-1.023	-1.297*

	(-6.63)	(-6.57)	(-6.86)	(-6.84)	(-4.14)	(-4.09)	(-5.34)	(-5.49)	(-1.24)	(-1.20)	(-1.45)	(-1.79)
Sales growth	-0.001*	-0.001	-0.001	-0.001	0.019	0.018	0.054	0.044	-0.016	-0.016	-0.007	-0.012
	(-1.66)	(-0.97)	(-1.19)	(-1.28)	(1.08)	(1.02)	(1.59)	(1.37)	(-0.83)	(-0.89)	(-0.82)	(-0.54)
Ln (facility amount)	-0.160***	-0.161***	-0.202***	-0.200***	-0.054*	-0.059*	-0.074**	-0.073**	0.014	0.023	0.061	0.068
	(-9.96)	(-9.76)	(-12.59)	(-12.48)	(-1.79)	(-1.92)	(-2.20)	(-2.21)	(0.28)	(0.44)	(1.10)	(1.23)
Ln (maturity)	-0.137***	-0.133***	0.001	-0.001	-0.014	-0.004	0.001	-0.001	0.054	0.055	0.068	0.049
	(-6.89)	(-6.65)	(0.08)	(-0.05)	(-0.44)	(-0.12)	(0.02)	(-0.04)	(0.61)	(0.62)	(0.72)	(0.50)
Marginal effects of local male-female ratio								0.482				0.678
Loan type fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan purpose fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Credit rating fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
State fixed effects	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes
Observations	10,844	10,844	10,844	10,844	10,844	10,844	10,844	10,844	2585	2585	2585	2585
Adjusted/Pseudo R^2	0.551	0.552	0.557	0.563	0.353	0.355	0.372	0.377	0.250	0.253	0.315	0.350

Table IV Continued

Panel B: Local Male-Female Ratio and Ex Post Covenant Violations

	(1)	(2)	(3)	(4)
Local male-female ratio	1.526***	1.414***	1.224***	0.747*
	(5.94)	(4.47)	(3.75)	(1.79)
County characteristics				
Local higher education proportion		0.195	0.181	0.031
		(1.47)	(1.31)	(0.20)
Ln (1+local population)		0.014	0.017	0.002
		(1.35)	(1.60)	(0.13)
Ln (local household income)		-0.095	-0.079	-0.250
		(-0.94)	(-0.77)	(-0.97)
Unemployment rate		-1.349	-1.570*	-2.481**
		(-1.53)	(-1.78)	(-2.57)
Local average age		-0.090	-0.166	0.399
		(-0.33)	(-0.60)	(0.38)
Firm characteristics				
Tangibility	-0.353***	-0.328***	-0.113	-0.103
	(-6.94)	(-6.32)	(-1.63)	(-1.48)
Ln (book assets)	-0.141***	-0.142***	-0.138***	-0.136***
	(-22.44)	(-22.62)	(-20.74)	(-20.08)
Market leverage	1.483***	1.487***	1.553***	1.577***
	(32.01)	(31.99)	(30.67)	(30.96)
Free cash flow	-0.417***	-0.404***	-0.323***	-0.307***
	(-7.01)	(-6.79)	(-5.02)	(-4.85)
Market-to-book	-0.083***	-0.084***	-0.078***	-0.080***
	(-9.70)	(-9.81)	(-8.86)	(-9.10)
Profit	0.398***	0.399***	0.291***	0.299***
	(9.02)	(9.03)	(4.82)	(6.38)
Sales growth	0.000**	0.000**	0.000**	0.000**
	(2.24)	(2.24)	(2.08)	(2.13)
Marginal effects of local male-female ratio			0.299	
Credit rating fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	No	No	Yes	Yes
State fixed effects	No	No	No	Yes
Observations	48,345	48,345	48,345	48,345
Adjusted/Pseudo R^2	0.106	0.106	0.113	0.116

Table V
Reexamining the Significance of the Male–Female Ratio: Subsample Regressions

This table re-examines the significance of the male–female ratio in some subsamples. From the dataset of each year, we exclude counties in the left and right tails of the cross-county gender ratio distribution. For example, the 20–80 percentile subsample only includes counties in the 20–80% range of cross-county gender ratios. For simplicity, we do not report the coefficients of the control variables. We report the range, mean, and standard deviation of the male–female ratio for each subsample. All of the regressions include other local population characteristics and firm characteristics as additional controls.

Range of male-female ratio	Mean	Std. Dev.	Option-Implied Volatility	Market Leverage	Capital Expenditure	Cash Holding	Interest Rate Hedging	Loan Spread	Collateral Requirement	Capital Expenditure Restriction	Covenant Violation
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
5-95 percentile	0.941	0.035	0.242***	0.104***	0.052**	-0.091**	-1.992***	0.778**	2.258***	3.187**	1.164***
(0.859-1.124)			(7.14)	(3.91)	(1.98)	(-2.54)	(-4.33)	(2.36)	(4.34)	(2.57)	(3.52)
10-90 percentile	0.941	0.033	0.250***	0.069**	0.028*	-0.101**	-1.737***	0.761**	2.470***	3.003**	1.237***
(0.879-1.041)			(6.82)	(2.33)	(1.87)	(-2.43)	(-3.53)	(2.20)	(4.18)	(2.23)	(3.62)
15-85 percentile	0.939	0.028	0.134***	0.069*	0.038	-0.154***	-1.493**	0.681*	1.368*	4.108***	1.423***
(0.892-1.004)			(2.66)	(1.80)	(1.31)	(-3.03)	(-2.21)	(1.66)	(1.81)	(2.62)	(3.19)
20-80 percentile	0.940	0.023	0.090*	0.067	0.046*	-0.163**	-1.783*	0.063	1.743*	2.212	1.259**
(0.908-0.991)			(1.85)	(1.57)	(1.61)	(-2.29)	(-1.92)	(0.10)	(1.67)	(1.05)	(2.33)
<20% & >80% percentile	0.958	0.089	0.304***	0.081***	0.064*	-0.120***	-2.125***	1.390***	2.757***	5.114***	1.037***
			(7.21)	(2.79)	(1.85)	(-3.23)	(-4.00)	(3.22)	(4.71)	(3.11)	(2.58)
County characteristics			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm characteristics			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bid characteristics			-		-	-	-	-	-	-	Yes
Loan type fixed effects			-		-	-	-	Yes	Yes	Yes	-
Loan purpose fixed effects			-		-	-	-	Yes	Yes	Yes	-
Credit rating fixed effects			-		-	-	-	Yes	Yes	Yes	-
Year fixed effects			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table VI
Local Male–Female Ratio and Firm Risk: A Subsample of Firms Whose Top Five Customers Are out of State

To avoid the direct impacts of local demographic conditions on local business activities, we restrict the sample to firms whose top five customers are out of state. In regressions (1)–(9), the dependent variables are implied option volatility, market leverage ratio, capital expenditure, cash holding, an indicator that equals one if a firm reports the use of interest rate derivatives in its annual report and zero otherwise, the loan spread charged by the bank over LIBOR, an indicator that equals one if the bank loan is secured and zero otherwise, an indicator that equals one if the bank loan contains a capital expenditure restriction and zero otherwise, and an indicator that equals one if the firm violates a covenant in a specific year, respectively. The other control variables are the same as those in Tables II–V.

	Option-Implied Volatility	Market Leverage	Capital Expenditure	Cash Holding	Interest Rate Hedging	Loan Spread	Collateral Requirement	Capital Expenditure Restriction	Covenant Violation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Local male-female ratio	0.238***	0.121***	0.054**	-0.156**	-2.956*	1.524*	3.866***	9.528*	1.267**
	(3.03)	(2.81)	(2.20)	(-2.28)	(-2.84)	(1.84)	(2.85)	(1.89)	(2.01)
Relative controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All relevant controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,455	11,947	11,947	11,947	6,164	1,466	1,466	187	6,434
Adjusted R^2	0.636	0.616	0.504	0.360	0.303	0.597	-	-	-

Table VII
2SLS Endogeneity Tests

This table presents the results of two-stage least squares (2SLS) regressions. In Panel A, the instrumental variable is the county-level male–female ratio at birth averaged over the 1960s. To avoid the direct impacts of local demographic conditions on local business activities, we restrict the sample to firms whose top five customers are out of state. Panel B uses two instruments. The first instrumental variable is the county-level prostate cancer mortality rate. The second instrument is the breast cancer mortality rate in among female residents divided by that among male residents (to control for male residents with breast cancer). Regression (1) shows the first-stage regression, in which the dependent variable is the local male–female ratio. Regressions (2)–(10) show the second-stage regression results, in which the dependent variables are firms' implied option volatility, market leverage ratio, capital expenditure, cash holding, an indicator that equals one if a firm reports the use of interest rate derivatives in its annual report and zero otherwise, the loan spread charged by the bank over LIBOR, an indicator that equals one if the bank loan is secured and zero otherwise, an indicator that equals one if the bank loan contains a capital expenditure restriction and zero otherwise, and an indicator that equals one if the firm violates a covenant in a specific year. The other control variables are the same as those in Tables II–VI.

Panel A: Using Local Male-Female Ratio at Birth averaged over 1960s as Instrument

	Local Male-Female Ratio	Option-Implied Volatility	Market Leverage	Capital Expenditure	Cash Holding	Interest Rate Hedging	Loan Spread	Collateral Requiremen	Capital Expenditure Restriction	Covenant Violation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Instrument: Local male-female birth	0.192***									
	(8.93)									
Local male-female ratio		0.131*	0.584**	0.120*	-0.417*	-6.306*	0.781	1.151*	19.288*	4.903***
		(1.90)	(2.09)	(1.68)	(-2.32)	(-2.00)	(0.14)	(1.94)	(1.70)	(2.70)
Relative controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All relevant controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weak identification test: *F*-statistic	79.17									
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,947	2,455	11,947	11,947	11,947	6,164	1,466	1,466	187	6,434
Adjusted R^2	0.394	0.623	0.600	0.505	0.324	-	0.669	-	-	-

Table VII Continued

Panel B: Using Local Mortality Rate of Prostatic Cancer and Breast Cancer as Instrument

	Local Male-Female Ratio	Option-Implied Volatility	Market Leverage	Capital Expenditure	Cash Holding	Interest Rate Hedging	Loan Spread	Collateral Requirement	Capital Expenditure Restriction	Covenant Violation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Prostatic cancer	-0.002***									
	(-19.80)									
Breast cancer	0.001***									
	(27.47)									
Local male-female ratio		0.325***	0.136*	-0.004	-0.278***	-2.476***	1.461***	0.676***	4.625***	1.533***
		(7.46)	(1.72)	(-0.08)	(-2.62)	(-5.84)	(4.09)	(4.05)	(3.55)	(3.83)
Relative controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All relevant controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weak identification test: *F*-statistic	311.70									
Hansen *J* (*p*-value)		0.121	0.200	0.115	0.123	0.384	0.118	0.154	0.429	0.221
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	83,059	17,936	83,059	83,059	83,059	45,830	10,844	10,844	2,585	48,345
Adjusted R^2	0.511	0.570	0.610	0.374	0.347	-	0.587	-	-	-

Table VIII
The Local Male–Female Ratio, Local Risk Aversion, and Local Overconfidence

This table reports the results of panel regressions of local risk aversion or overconfidence on the local male–female ratio. We measure local risk aversion in two ways. Panel A uses the local financial risk preference, which is calculated as the county average response to the following item related to financial risk in General Social Survey (GSS) data from 1993: "Some people say these things are very important to them. Other people say they are not so important. Please tell me how important being financially secure is." This item is scored on a 5-point scale from 1 to 5. Panel B uses the local preference of living risk, which is calculated as the county average response to the following item related to living security in the GSS data from 2008: "Have you, or anyone you know purchased things to make them safer (gas masks, duct tape, things to make their house safer, etc.)?" This item is scored on a 4-point scale from 0 to 3. We convert the responses to these two items so that a higher score indicates lower risk aversion. We then compute the county-level average risk aversion score. Panel C uses local overconfidence, which is calculated as the average of the overconfidence scores on the following four items related to confidence in the GSS data from 2016: "In uncertain times I usually expect the best," "I'm always optimistic about my future," "If something can go wrong for me it will," and "I rarely count on good things happening to me." These items are scored using a 5-point scale from 1 to 5. We convert and aggregate the responses to these four items and calculate the county-level average. A higher score indicates greater overconfidence.

	Panel A Financial risk			Panel B Living risk			Panel C Local overconfidence		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Local male-female ratio	1.817**	1.788**	2.023**	1.458***	0.990**	1.373*	2.120***	1.819**	1.971*
	(2.46)	(2.54)	(2.58)	(3.13)	(2.04)	(1.91)	(2.89)	(2.17)	(1.82)
Local higher education proportion		-0.203	-0.839		-0.244	-0.237		-0.192	-0.121
		(-0.32)	(-0.93)		(-0.96)	(-0.66)		(-0.46)	(-0.23)
Ln (1+local population)		-0.015	-0.040		-0.012	-0.012		0.008	0.002
		(-0.27)	(-0.47)		(-0.61)	(-0.40)		(0.29)	(0.07)
Ln (local household		0.522	-0.723**		0.031	-0.587**		0.313	0.777
		(1.10)	(-2.68)		(0.22)	(-2.03)		(1.40)	(0.96)
Unemployment rate		-1.412	-5.307		-0.194	-3.624		-2.694	-3.028
		(-0.46)	(-1.55)		(-0.08)	(-0.99)		(-1.25)	(-0.78)
Local average age		0.866	-1.688		-0.670*	-0.023		0.235	1.472
		(0.79)	(-1.48)		(-1.73)	(-0.02)		(0.39)	(1.05)
State fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Observations	81	81	81	123	123	123	158	158	158
R-squared	0.054	0.088	0.439	0.086	0.104	0.345	0.037	0.049	0.348

Table IX
The Local Male–Female Ratio and Dividend Payout

This table reports the results of a panel regression of dividend payout against the local male–female ratio. Following John, Knyazeva, and Knyazeva (2011), we define dividend payout as the ratio of cash dividends to the market value of common equity (*dividend payout 1)*, or the ratio of cash dividends to net income in firm years with positive net income (*dividend payout 2)*. All of the regressions include other local population characteristics and firm characteristics as additional controls.

	Dividend payout 1	Dividend payout 1	Dividend payout 2	Dividend payout 2
	(1)	(2)	(3)	(4)
Local male-female ratio	-0.021***	-0.011***	-0.380***	-0.226***
	(-7.11)	(-2.81)	(-7.35)	(-3.39)
County characteristics				
Local higher education proportion	-0.006***	-0.006***	-0.092***	-0.074***
	(-4.06)	(-3.80)	(-3.73)	(-2.69)
Ln (1+local population)	-0.000***	-0.000	-0.007***	-0.004
	(-3.66)	(-0.80)	(-3.61)	(-1.50)
Ln (local household income)	0.002**	0.003**	0.028*	0.049*
	(1.98)	(1.98)	(1.68)	(1.85)
Unemployment rate	-0.005	0.002	-0.005	0.115
	(-0.60)	(0.21)	(-0.04)	(0.79)
Local average age	0.006**	0.027***	0.108**	0.279**
	(2.18)	(3.29)	(2.49)	(2.01)
Firm characteristics				
Tangibility	0.005***	0.005***	0.105***	0.106***
	(6.44)	(6.54)	(8.55)	(8.67)
Ln (book assets)	0.001***	0.001***	0.029***	0.028***
	(22.53)	(21.77)	(25.73)	(24.85)
Market leverage	-0.002***	-0.002***	-0.094***	-0.095***
	(-2.91)	(-3.00)	(-11.17)	(-11.32)
Free cash flow	-0.000	-0.000	0.008	0.007
	(-0.03)	(-0.12)	(1.14)	(1.06)
Market-to-book	-0.000***	-0.000***	-0.002**	-0.001**
	(-3.46)	(-3.22)	(-2.50)	(-2.26)
Profitability	0.001*	0.001*	0.011	0.010
	(1.83)	(1.65)	(1.50)	(1.35)
Sales growth	0.000	0.000	0.000	0.000
	(0.35)	(0.32)	(0.33)	(0.28)
Year fixed effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
State fixed effects	No	Yes	No	Yes
Observations	83,059	83,059	83,059	83,059
Adjusted R^2	0.217	0.222	0.225	0.230

Table X
Inspecting the Mechanism: Impact of the Local Male–Female Ratio on Female Representation among Corporate Directors/CEOs

This table reports the influence of the local male–female ratio on female representation among corporate directors and executives. Regressions (1)–(4) report the results of panel regressions of the corporate female board fraction, defined as the number of female directors divided by the total number of directors, against the local male–female ratio. In regressions (5)–(8), the dependent variable is the proportion of female CEOs plus female directors, which is calculated as the sum of an indicator of female CEO and the total number of female directors divided by (1+ the total number of directors). The control variables include the local female–male income ratio (defined as the local median female income divided by the local median male income), local population characteristics (higher education proportion, Ln (1+local population), Ln (1+household income), unemployment rate, and average age), board characteristics (board size and percentage of independent board), the local female-male income ratio, which is defined as the local median female income divided by the local median male income, and the Fama–French 12-industry fixed effects. Local income data are obtained from the American Community Survey, US Census Bureau. The fractions of female representation on boards and indicator of female CEO are based on Execucomp data for the period 1992 to 2009.

	Proportion of Female Directors				Proportion of Female CEOs and Directors			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Local male-female ratio	-0.076**	-0.113***	-0.135**	-0.118*	-0.075**	-0.114***	-0.133**	-0.116*
	(-2.21)	(-2.75)	(-2.32)	(-1.93)	(-2.06)	(-2.62)	(-2.20)	(-1.79)
Local female-male income ratio		0.191**	0.141	0.131		0.210**	0.137	0.142
		(2.28)	(1.36)	(1.27)		(2.42)	(1.26)	(1.33)
Board size			0.001	0.001			0.001	0.001
			(0.80)	(0.70)			(0.71)	(0.55)
Percentage of independent			0.014	0.016			0.015	0.015
board			(1.07)	(1.24)			(1.11)	(1.10)
County characteristics								
Local higher education		0.079***	0.109***	0.124***		0.082***	0.116***	0.128***
proportion		(3.31)	(3.44)	(3.71)		(3.19)	(3.48)	(3.71)
Ln (1+local population)		0.006***	0.005**	0.004*		0.006***	0.004*	0.003
		(3.52)	(2.12)	(1.67)		(3.41)	(1.83)	(1.41)
Ln (local household income)		0.029*	0.029	0.026		0.028*	0.030	0.026
		(1.83)	(1.35)	(1.16)		(1.67)	(1.35)	(1.13)
Unemployment rate		0.043	0.103	0.174		0.025	0.118	0.189
		(0.37)	(0.57)	(0.91)		(0.21)	(0.63)	(0.97)
Local average age		0.010	-0.031	-0.056		0.010	-0.031	-0.056
		(0.20)	(-0.50)	(-0.87)		(0.20)	(-0.49)	(-0.83)
Firm characteristics								
Tangibility		0.006	-0.001	-0.013		0.003	-0.003	-0.016
		(0.80)	(-0.05)	(-0.92)		(0.33)	(-0.28)	(-1.14)
Ln (book assets)		-0.005***	-0.004**	-0.005***		-0.005***	-0.004**	-0.005***
		(-4.61)	(-2.30)	(-3.03)		(-4.49)	(-2.42)	(-2.86)
Market leverage		0.007	0.014	-0.002		0.006	0.009	-0.005
		(0.82)	(1.15)	(-0.13)		(0.69)	(0.75)	(-0.39)
Free cash flow		0.012*	0.029***	0.024**		0.005	0.023**	0.023**
		(1.72)	(2.59)	(2.20)		(0.66)	(2.43)	(2.05)
Market-to-book		0.001	0.001	0.000		0.000	0.000	-0.000
		(1.23)	(0.58)	(0.13)		(0.67)	(0.10)	(-0.33)
Profit		0.003	0.008	0.016		0.012	0.004	0.013
		(0.21)	(0.27)	(0.59)		(0.78)	(0.16)	(0.45)
Sales growth		-0.003	-0.007*	-0.009**		-0.002	-0.008	-0.009**
		(-1.08)	(-1.66)	(-1.97)		(-1.18)	(-1.65)	(-1.98)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fama-French 12-industry	No	No	No	Yes	No	No	No	Yes
Observations	27,142	25,101	9,608	9,608	27,142	25,101	9,608	9,608
R-squared	0.036	0.050	0.035	0.098	0.039	0.051	0.034	0.106

Table XI
Local Overconfidence and CEO Overconfidence

This table reports the results of panel regressions of CEO overconfidence against local overconfidence. We classify a CEO as overconfident if they postpone the exercise of vested stock options that are at least 67% in the money, following Malmendier and Tate (2005, 2008). The dependent variable equals one if the CEO is overconfident, and zero otherwise. Local overconfidence is calculated as the average of the overconfidence scores for the following four items related to confidence in the General Social Survey (GSS) data from 2016: "In uncertain times I usually expect the best," "I'm always optimistic about my future," "If something can go wrong for me it will," and "I rarely count on good things happening to me." These items are scored on a 5-point scale from 1 to 5. We convert and aggregate the responses to these four items and take the county-level average. A higher score indicates greater overconfidence.

	(1)	(2)	(3)	(4)
Local overconfidence	0.327**	0.392**	0.413**	0.516**
	(2.49)	(2.26)	(2.34)	(2.17)
County characteristics				
Local higher education proportion			-0.239	-0.927
			(-0.27)	(-0.56)
Ln (1+local population)			-0.285***	-0.249
			(-2.64)	(-1.51)
Ln (local household income)			-0.514	5.681
			(-0.70)	(1.28)
Unemployment rate			6.238	5.271
			(0.65)	(0.28)
Local average age			0.301	6.465
			(0.22)	(0.56)
Tangibility		-0.119	-0.060	0.034
		(-0.23)	(-0.11)	(0.06)
Ln (book size)		0.051	0.036	0.052
		(1.14)	(0.77)	(1.05)
Market leverage		-0.876**	-1.073**	-1.120**
		(-2.03)	(-2.44)	(-2.39)
Free cash flow		21.356**	20.878**	22.451**
		(2.34)	(2.23)	(2.22)
Market-to-book		0.382***	0.374***	0.396***
		(4.27)	(4.17)	(4.30)
Profitability		1.159**	0.986*	0.881
		(2.02)	(1.67)	(1.50)
Sales growth		0.136	0.172	0.146
		(0.57)	(0.68)	(0.58)
Industry fixed effects	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes
Observations	527	527	527	527
Pseudo R-squared	0.071	0.163	0.179	0.202

Online Appendix

I. Variable definitions

Table A1 defines all of the variables used in this paper and provides the data sources.

II. Robustness checks for bank holding companies' hedging policy

Table A2 presents the results of robustness checks to account for bank holding companies' interest hedging policies. To evaluate interest rate hedging by bank holding companies, we construct measures from the quarterly Federal Reserve Y-9C files for the period 1995 to 2017 based on the Bank Regulatory database, which includes information on bank holding companies with total assets of $150 million or more. We focus on interest rate derivatives rather than other contracts, as 90% of bank holding companies' hedging is concentrated in interest rate derivative transactions (Bonaimé, Hankins, and Harford, 2014). The reported purposes of non-trading (hedging) enable us to identify interest rate derivatives for risk management purposes. By combining local demographic characteristics with information from the Bank Regulatory Database, we obtain 12,949 bank-quarter observations. On average, bank holding companies have a market capitalization of $1.682 billion, book assets of $2.425 billion, and a market-to-book ratio of 0.618. Bank interest rate hedging accounts for roughly 16.9% of market capitalization, with a mean average bank interest rate exposure level of 0.551.

We find consistently that the local male-female ratio is negatively correlated with bank holding companies' interest hedging activity.

III. Robustness checks for omitted variables

Table A3 presents the results of robustness checks to account for omitted variables. Panel A controls for industry–time fixed effects; Panel B controls for county fixed effects; and Panel C controls for local retirees. We obtain robust results after adding these fixed effects.

IV. Robustness checks for county–industry effects

Table A4 presents the results of robustness checks to account for county–industry effects. Some counties might specialize in industries with characteristic gender imbalances. To mitigate this concern, we control for industry fixed effects and exclude counties where the male–female ratio is highly correlated with the industry size-weighted local industry male–female ratio. We construct the relation between the local male–female ratio and size-weighted local industry male–female ratio as follows. We collect data on the male–female ratio from the US Bureau of Labor Statistics for the following industries: agriculture, mining, construction, manufacturing, transportation, public utilities, wholesale trade, retail trade, finance, insurance, real estate, services, and public administration. We then calculate the weighted industry male–female ratio for each county-year, weighted according to industry size. Finally, we calculate the correlation between the local male–female ratio and the weighted local industry male–female ratio in each county and identify counties where the correlation is in the top 20%, top 30%, or top 50%. After excluding those counties from our analyses, our results remain qualitatively similar to the main findings, as shown in Table A4.

V. Local male–female ratio and local employee male–female ratio

First, we explore whether gender imbalance in the local population leads to gender imbalance among local employees. As local employees are undiversified due to firm-specific human capital and equity-based compensation, they might express their risk attitudes through their work as firm employees, which would affect corporate activities. Due to limited data availability, we use the county-level employee male–female ratio.[17] Table A6 shows the results of panel regression of the employee male–female ratio against the local male–female ratio. Consistent with our prediction, a higher local male–female ratio is shown to drive a higher

[17] The Geographic Profile of Employment and Unemployment does not report the gender ratio of employees for all counties, and the ratio is reported at the MSA level. Therefore, the number of county-year observation drops to 3,806 after we merge this data with other datasets.

male–female ratio among local employees. In column (3), the coefficient of the local male–female ratio suggests that a one standard deviation increase is associated with a 4.4% (1.022 × 0.051 / 1.180) increase in the local employee male–female ratio.

VI. Local male-female ratio, gender-equality culture, and religiosity

One potential concern is that the local male–female ratio might reflect local attitudes toward gender equality, which in turn affect female representation on corporate boards and corporate risk-taking (e.g., McLean, Pirinsky, and Zhao, 2020). We test this alternative interpretation by adding the local female–male income ratio as a control variable in the regressions. In a local culture that prioritizes gender equality, we expect to find higher local female–male income ratios. We test this interpretation by applying the local female–male income ratio as a control variable in the regressions. This variable is calculated as the local median female income divided by the local median male income, based on data from the American Community Survey by the US Census Bureau.

Another concern is that local gender imbalance might reflect other local characteristics. For example, Hillary and Hui (2009) argue that local religiosity captures the risk aversion of local residents and influences corporate activities. Therefore, we also add local religiosity as a control variable. This variable is measured as the proportion of a county's population that adheres to any religion, using "Churches and Church Membership" files from the American Religion Data Archive (ARDA). We obtain local income data over the 1992 to 2017 period from the US Census Bureau.

Table A5 reports the results of regression of the local female–male ratio after controlling for the local income ratio (a proxy of gender equality) and local religiosity. Although a higher local female–male income ratio and local religiosity do imply lower stock return volatilities, these relationships are insignificant in the regressions of corporate policies, whereas the local

male–female ratio remains significant in all of the regressions. These results suggest that our results are not driven by local gender egalitarianism and religiosity.

VII. Local male–female ratio, non-executive employee option grants, and employee involvement

Employees' wealth is positively correlated with stock return volatility through non-executive employee stock options, which incentivize employees to take more risks (Chang, Fu, Low, and Zhang, 2015). Stock options are characterized by the convexity of the wealth-performance relation, which promotes risk-taking incentives (Murphy, 1999; Guay, 1999; Coles, Daniel, and Naveen, 2006). Local employees with strong risk-taking preferences—in our context, those in regions with a higher local male–female ratio—may be attracted to firms that offer option-based compensation plans because employee stock ownership plans (ESOPs) encourage more risk-taking.

If firms are aware that option-based compensation is more attractive to employees with stronger risk-taking preferences, they might cater to those preferences by adopting more broad-based employee stock option plans. Therefore, we expect employee stock option plans to be more popular among firms located in regions with a higher local male–female ratio.

We test this hypothesis in Panel A of Table A7. Following Bergman and Jenter (2007), we construct the per-employee option value of the non-executive employee stock option. Stock option grants are measured as the Black–Scholes (BS) value of per-employee option grants to non-executive employees (per 10,000 employees). Consistent with our hypothesis, we find that the estimated coefficient of the local male–female ratio is significantly negative throughout all of the regressions. A one standard deviation increase in the local male-female ratio is associated with a 0.156 (3.058 × 0.051) increase in the BS option value. Relative to the mean value of 0.878, this represents an 11.95% increase in the BS option value.

If the local male–female ratio affects corporate risk-taking through employee stock option grants, our empirical results should be more significant for firms that strongly encourage

worker involvement or ownership via stock option plans made available to a majority of employees. We test this prediction in Panel B of Table A7.

Our source for data on employee involvement is the KLD Research & Analytics, Inc. (KLD) Social Rating database. This database provides an indicator to identify companies that encourage worker involvement via generous ESOPs or employee stock purchase plans. We use this indicator to construct our employee involvement indicator and expect the positive relationship between the local male–female ratio and corporate risk-taking to be stronger in firms with an employee involvement indicator equal to one. We tabulate the results in Panel B of Table A7. The empirical evidence supports our argument.

Table A1

Variable Definitions

This appendix provides detailed descriptions of the variables used in this study.

Variable	Definition
County characteristics:	
Local higher education fraction	Percentage of the county population with a college degree.
Ln (local household income)	Logarithm of the median household income in each county.
Ln (1+local population)	Logarithm of the size of a county population.
Local male–female ratio	Ratio of the male population to the female population in each county.
Local average age	Average age of the population in each county.
Local unemployment rate	Annual rate of unemployment in each county as determined by the Bureau of Labor Statistics.
Local financial risk preference	Calculated as the county average score for the following financial risk-related item on the General Social Survey (GSS): "Some people say that this is very important to them. Others say that it is not so important. Please tell me how important being financially secure is." Scores of 1 to 5 respectively denote the following responses: "It is a top priority," "It is very important," "It is somewhat important," "It is not as important," and "It is not important at all." A higher score indicates a less risk averse respondent.
Local living risk preference	Calculated as the county average score for the following living insecurity item on the General Social Survey (GSS): "Have you or has anyone you know purchased items that provide a sense of safety (gas masks, duct tape, items that enhance home security, etc.)?" Scores of 0 to 3 denote the following answers: "No," "Yes, the respondent has purchased such items," "Yes, someone the respondent knows has purchased such items," and "Yes, both the respondent and someone the respondent knows have purchased such items." We define a score for this item as 6 minus the GSS score to render it consistent with the financial risk measure. Therefore, a higher score for financial risk or living risk indicates a less risk averse respondent.
Local male–female ratio of employment	The employed local male population divided by the employed local female population. The Geographic Profile of Employment and Unemployment (GPEU) provides MSA-level information on male and female employment percentages. We then use the GPEU MSA-county match to obtain county-level gender-specific employment information.
Local male–female ratio at birth across the 1960s	County-level male–female ratio at birth (newborns) averaged over the 1960 to 1970 period
Local prostate cancer mortality rate (per 100,000)	County-level prostate cancer mortality rate
Female–male ratio of local breast cancer mortality rate	Breast cancer mortality rate in female residents divided by that in male residents
Local overconfidence	Calculated using the county average scores for the following four confidence-related items measured by the General Social Survey (GSS): "In uncertain times, I usually expect the best," "I'm always optimistic about my future," "If something can go wrong, for me it will," and "I rarely count on good things happening to me." For each item, the GSS respectively assigns scores of 1 to 5 to denote the following answers: "Strongly disagree," "Disagree," "Neutral," "Agree," and "Strongly agree." The former two items represent confidence levels, whereas the latter two denote a lack of confidence. To be consistent, we define the score for each of the latter two items as 6 minus the item score. Therefore, a higher the score indicates a more confident respondent. We then calculate the county-level average for each of the items.
Local female–male income ratio	Earnings of local women as a percentage of earnings of local men.
Local religiosity	The number of religious adherents divided by the total population in a county. Data are obtained from the "Churches and Church Membership" files from the American Religion Data Archive (ARDA).

Firm characteristics:

Book value of assets	Logarithm of book assets (*AT*).
Book leverage	Long-term debt (*DLTT*) / book assets (*AT*).
Capital expenditure	Capital expenditure (*CAPX*) / book assets (*AT*).
Cash holdings	Cash and short-term investments (*CHE*) / book assets (*AT*).
Interest rate hedging	Indicator that equals one when a firm reports using interest rate derivatives in its annual report, and zero otherwise.
Free cash flow	Operating income before depreciation (*OIBDP*) – interest and related expenses (*XINT*) – total income taxes (*TXT*) – total dividends common / ordinary (*DVC*) / book assets (*AT*).
Market leverage	Long-term debt (*DLTT*) / (total debt (*AT* – *CEQ*) + market value of equity (*PRCC_F* × *CSHO*)).
Market-to-book	(Book assets + market value of equity – book value of equity) / book assets (*AT*), where the book value of equity is calculated as total stockholders' equity (*XEQ*) + deferred taxes (*TXDB*) + investment tax credit (*ITCB*) – preferred stock (combining *SEQ*, *PSTKL*, and *PSTK*), and the market value of equity is calculated as the price per share (*PRCC_C*) × common shares outstanding (*CSHO*).
Covenant violation	An indicator that equals one if a firm violates a covenant in a specific year.
Option-implied volatility	A firm's one-year average of forward-looking (182 days) stock return variance.
Profitability	Operating income before depreciation (*OIBDP*) / book assets (*AT*).
Sales growth	Annual percentage change in sales (*SALE*).
Tangibility	Net PPE (*PPENT*) / book assets (*AT*).
CEO overconfidence	We estimate CEO overconfidence as described by Hirshleifer, Low, and Teoh (2012). First, we divide the value of exercisable unexercised options (Execucomp items: opt_unex_exer_est_val) by the number of exercisable unexercised options (Execucomp items: opt_unex_exer_num) and subtract this value from the stock price at the fiscal year end (Compustat item: PRCC_F) to obtain the average strike price per option. Next, we divide the value of exercisable unexercised options per option by the average strike price per option to calculate the average moneyness of the options. We define a CEO as overconfident when they postpone the exercise of vested stock options that are at least 67% in the money, following Malmendier and Tate (2005, 2008). Following Hirshleifer, Low, and Teoh (2012), we do not require the CEO to hold a 67% in the money option at least twice; rather, we define the CEO as overconfident on the first occasion that they exhibit such behavior. Once a CEO is identified as overconfident, they remain overconfident for the rest of the sample period.
Dividend payout 1	The ratio of cash dividends on common stock (dv) to the market value of common equity (*CSHO* × *PRCC_F*)
Dividend payout 2	The ratio of cash dividends on common stock (*dv*) to net income (*NI*) for firm-years with positive net income
Black–Scholes value of non-executive employees' stock options per 10,000 employees	We follow Bergman and Jenter (2007). Specifically, we first use "pcttotop" in Execucomp to estimate the total number of stock options granted to all employees. Second, we extrapolate the total number of options granted to non-executive employees by subtracting the number of options granted to the top five executives. Third, we calculate the Black–Scholes (1973) formula value of each option value granted to each employee. The risk-free rate is set to 6%, and option maturity is set to ten years. Finally, we calculate the per-employee option grants as total numbers of the non-executive employee stock options times the Black–Scholes value of the per-employee stock option, divided by the number of employees.
Employee involvement through stock option plans	An indicator that equals one if the company strongly encourages worker involvement or ownership through stock option plans that it makes available to a majority of its employees.

Board and governance characteristics:

Female director fraction	Number of female board members divided by the total number of board members.
Proportion of female CEOs and directors	The sum of an indicator of the proportion of female CEOs and the total number of female directors divided by (1 + the total number of directors).

% of independent boards	Percentage of outside directors on a board.
Bank characteristics:	
Bank commercial loans	Commercial loans divided by market capitalization.
Bank federal funds	Federal funds divided by market capitalization.
Bank income	Cash flows minus cash flows from derivatives divided by market capitalization.
Bank interest rate exposure	Interest rate exposure (one-year maturity gap, following Flannery and James (1984), divided by market capitalization).
Bank interest rate hedge	Dollar value spent on interest rate hedging divided by market capitalization.
Bank market-to-book	A bank holding company's market capitalization divided by book assets.
Bank securities	Securities divided by market capitalization.
Bank tier 1 capital	Tier 1 capital divided by market capitalization.
Ln (bank book value)	Logarithm of bank book assets.
Loan characteristics:	
Ln (loan amount)	Logarithm of the loan deal (facility) value.
Ln (loan maturity)	Logarithm of loan maturity.
Loan spread	All-in-drawn spread over the LIBOR charged by the bank for a loan facility.
Collateral requirement	An indicator taking a value of one when a loan is secured by collateral, and zero otherwise (for missing LPC data, we set the indicator to zero).
Capital expenditure restriction	An indicator that takes a value of one when a bank loan applies a capital expenditure restriction, and zero otherwise.

Table A2

Interest Hedging of Bank Holding Companies

This table presents panel regression results of corporate hedging policy using bank holding companies. The dependent variable is the dollar value of bank interest rate hedging scaled by the bank holding company's market value. See the appendix for variable definitions and Section I for the data sources. The *t*-statistics in parentheses are adjusted for heteroskedasticity and clustered within firms. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
Local male-female ratio	-0.380***	-0.331**	-0.341***	-0.303**
	(-3.09)	(-2.50)	(-2.60)	(-2.27)
County characteristics				
Local higher education proportion		0.001	0.001	0.001
		(1.22)	(1.46)	(1.06)
Ln (1+local population)		-0.002	-0.002	0.010
		(-0.31)	(-0.47)	(1.64)
Ln (local household income)		-0.081*	-0.076*	-0.113
		(-1.73)	(-1.67)	(-1.61)
Unemployment rate		-0.001	0.001	0.002
		(-0.45)	(0.24)	(0.98)
Local average age		0.009	0.054	0.288
		(0.07)	(0.40)	(0.80)
Bank characteristics				
Ln (market size)	0.064***	0.063***	0.059***	0.060***
	(11.18)	(11.17)	(10.80)	(11.21)
Market-to-book	-0.039**	-0.039**	-0.025*	-0.019*
	(-2.20)	(-2.21)	(-1.83)	(-1.86)
Commercial loans	0.016***	0.016***	0.010***	0.009***
	(4.72)	(4.69)	(3.00)	(3.17)
Securities	0.003	0.003	0.003	0.003
	(1.38)	(1.25)	(1.59)	(1.34)
Cash	0.031	0.031	0.040	0.026
	(0.80)	(0.78)	(0.98)	(0.73)
Exposure			0.005**	0.005***
			(2.54)	(2.72)
Tier 1 capital ratio			-0.007***	-0.006***
			(-5.00)	(-4.26)
State fixed effects	No	No	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	12,949	12,949	12,949	12,949
Adjusted R^2	0.171	0.174	0.188	0.245

Table A3

Robustness Checks for Omitted Variables

This table reports the results of panel regressions of firms' risk against the local male–female ratio, including industry × year fixed effects in Panel A, county fixed effects in Panel B, and the local proportion of retirees in Panel C. As we are limited by the number of observations, we do not perform similar tests over bank hedging in Panel A. For simplicity, we do not report the coefficients of the control variables. All of the regressions include other local population characteristics and firm characteristics as additional controls.

Panel A Industry*Year Fixed Effects

	Option-Implied Volatility	Market Leverage	Capital Expenditure	Cash Holding	Interest Rate Hedging	Loan Spread	Collateral Requirement	Capital Expenditure Restriction	Covenant Violation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Local male-female ratio	0.213***	0.090***	0.058*	-0.080***	-2.666	0.732**	2.582***	4.289***	1.182
	(6.54)	(4.03)	(1.70)	(-2.93)	(-7.35)	(2.20)	(6.48)	(3.17)	(3.43)
Controls the same as in	Table II	Table III	Table III	Table III	Table IV Panel A	Table V	Table V	Table V Panel A	Table V Panel B
	Col (1)	Col (1)	Col (3)	Col (4)	Col (3)	Col(3)	Col(7)	Col(11)	Col(3)
Observations	17,936	83,059	83,059	83,059	45,830	10,844	10,844	2,585	48,345
Adjusted R^2	0.644	0.627	0.392	0.362	0.295	0.596	0.355	0.315	0.131

Panel B County Fixed Effects

	Option-Implied Volatility	Market Leverage	Capital Expenditure	Cash Holding	Interest Rate Hedging	Loan Spread	Collateral Requirement	Capital Expenditure Restriction	Covenant Violation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Local male-female ratio	0.100	0.133***	0.087***	-0.085***	-0.224	0.374	3.530**	7.053**	0.307**
	(1.15)	(3.13)	(3.54)	(-3.03)	(-1.18)	(0.42)	(2.37)	(2.06)	(2.36)
Controls the same as in	Table II	Table III	Table III	Table III	Table IV Panel A	Table V	Table V	Table V Panel A	Table V Panel B
	Col (1)	Col (1)	Col (3)	Col (4)	Col (3)	Col(3)	Col(7)	Col(11)	Col(3)
Observations	17,936	83,059	83,059	83,059	45,830	10,844	10,844	2,585	48,345
Adjusted R^2	0.613	0.626	0.385	0.368	0.361	0.597	0.391	0.414	0.325

Panel C Retiree Effects

	Option-Implied Volatility	Market Leverage	Capital Expenditure	Cash Holding	Interest Rate Hedging	Loan Spread	Collateral Requirement	Capital Expenditure Restriction	Covenant Violation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Local male-female ratio	0.100	0.133***	0.087***	-0.085***	-0.224	0.374	3.530**	7.053**	0.307**
	(1.15)	(3.13)	(3.54)	(-3.03)	(-1.18)	(0.42)	(2.37)	(2.06)	(2.36)
Elder than 60	0.119***	0.050*	0.070***	0.013	(0.627)	0.064	-0.538	0.517	0.139
	(3.16)	(1.66)	(3.46)	(0.36)	(1.08)	(0.43)	(-0.93)	(0.75)	(0.11)
Controls the same as in	Table II	Table III	Table III	Table III	Table IV Panel A	Table V	Table V	Table V Panel A	Table V Panel B
	Col (1)	Col (1)	Col (3)	Col (4)	Col (3)	Col(3)	Col(7)	Col(11)	Col(3)
Observations	17,936	83,059	83,059	83,059	45,830	10,844	10,844	2,585	48,345
Adjusted R^2	0.588	0.610	0.296	0.353	0.322	0.295	0.187	0.558	0.373

Table A4

The Local Male–Female Ratio and Firm Risk: Excluding the Industry-Driven Male–Female Ratio

This table reports panel regressions of firms' risk against the local male–female ratio. We exclude the county-year observations that have the highest correlation with the industry mean male–female ratio. We identify the correlation as follows. We obtain the industry average male–female ratio from the US Bureau of Labor Statistics for the following industries: agriculture, mining, construction, manufacturing, transportation, public utilities, wholesale trade, retail trade, finance, insurance, real estate, services, and public administration. We then calculate the weighted industry male–female ratio for each county–year, using industry size as the weight. Finally, we calculate the correlation between the local male–female ratio and the weighted local industry male–female ratio in each county. We present the results after excluding the counties whose correlations between these variables are in the top 20%, top 30%, and top 50% in Panels A, B, and C, respectively. For simplicity, we do not report the coefficients of the control variables. All of the regressions include other local population characteristics and firm characteristics as additional controls.

Panel A: Excluding counties whose correlation with the weighted industry male-female ratio is in the top 20%

	Option-Implied Volatility	Market Leverage	Capital Expenditure	Cash Holding	Interest Rate Hedging	Loan Spread	Collateral Requirement	Capital Expenditure Restriction	Covenant Violation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Local male-female ratio	0.243***	0.085***	0.067**	-0.080***	-2.635***	1.426***	2.303***	3.086**	1.268***
	(6.96)	(3.80)	(1.99)	(-2.79)	(-7.06)	(5.13)	(4.68)	(2.47)	(3.64)
Controls the same as in	Table II	Table III	Table III	Table III	Table IV Panel A	Table V	Table V	Table V Panel A	Table V Panel B
	Col (3)	Col (1)	Col (3)	Col (4)	Col (3)	Col(3)	Col(7)	Col(11)	Col(3)
Observations	16,155	76,901	77,753	76,563	40,843	11,647	11,647	2,277	45,607
Adjusted R^2	0.589	0.612	0.367	0.351	0.285	0.802	0.373	0.329	0.112

Table A4 Continued

Panel B: Excluding counties whose correlation with the weighted industry male-female ratio is in the top 30%

	Option-Implied Volatility	Market Leverage	Capital Expenditure	Cash Holding	Interest Rate Hedging	Loan Spread	Collateral Requirement	Capital Expenditure Restriction	Covenant Violation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Local male-female ratio	0.170***	0.062**	0.082**	-0.053*	-2.979***	1.636***	2.058***	3.191**	1.479***
	(4.42)	(2.45)	(2.08)	(-1.78)	(-7.12)	(5.09)	(3.62)	(2.13)	(3.57)
Controls the same as	Table II	Table III	Table III	Table III	Table IV Panel A	Table V	Table V	Table V Panel A	Table V Panel B
	Col (3)	Col (1)	Col (3)	Col (4)	Col (3)	Col(3)	Col(7)	Col(11)	Col(3)
Observations	11,235	60,123	60,792	59,835	29,518	8,618	8,618	1,696	31,961
Adjusted R^2	0.563	0.616	0.372	0.358	0.265	0.805	0.383	0.363	0.114

Panel C: Excluding counties whose correlation with the weighted industry male-female ratio is in the top 50%

	Option-Implied Volatility	Market Leverage	Capital Expenditure	Cash Holding	Interest Rate Hedging	Loan Spread	Collateral Requirement	Capital Expenditure Restriction	Covenant Violation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Local male-female	0.103**	0.086***	0.047**	-0.007	-2.286***	1.082**	2.673***	7.370***	1.317*
	(2.01)	(2.70)	(2.15)	(-0.19)	(-4.02)	(2.01)	(2.93)	(2.76)	(1.71)
Controls the same as	Table II	Table III	Table III	Table III	Table IV Panel A	Table V	Table V	Table V Panel A	Table V Panel B
	Col (3)	Col (1)	Col (3)	Col (4)	Col (3)	Col(3)	Col(7)	Col(11)	Col(3)
Observations	4,193	35,556	35,865	35,366	13,310	3,907	3,907	764	12,846
Adjusted R^2	0.601	0.621	0.482	0.380	0.247	0.538	0.394	0.499	0.122

Table A5
Alternative Explanations: Gender Egalitarianism and Religiosity in the Local Culture?

This table examines whether gender egalitarianism or religiosity in the local culture drive the results observed in our previous analyses. Local gender egalitarianism is measured using the local female–male income ratio, which is defined as the local median income earned by female employees divided by that earned by male employees. Local income data are obtained from the American Community Survey, US Census Bureau. We also control for the local religious culture using local religiosity, which is measured as the proportion of a county's population that adheres to any religion, using data from the "Churches and Church Membership" files from the American Religion Data Archive (ARDA). We use panel/Probit regressions in which the dependent variables are firms' implied option volatility, market leverage, book leverage, capital expenditure, cash holding, an indicator that equals one if a firm reports the use of interest rate derivatives in its annual report and zero otherwise, loan spread charged by the bank over LIBOR, an indicator that equals one if the bank loan is secured and zero otherwise, an indicator that equals one if the bank loan contains a capital expenditure restriction and zero otherwise, and an indicator that equals one if a firm violated a covenant in a specific year in regressions (1)–(9), respectively. All of the regressions include other local population characteristics (higher education fraction, Ln (1+local population), Ln (1+household income), unemployment rate, and average age) as additional controls. The other control variables are the same as those in Tables II-VI.

	Option-Implied Volatility	Market Leverage	Capital Expenditure	Cash Holding	Interest Rate Hedging	Loan Spread	Collateral Requirement	Capital Expenditure Restriction	Covenant Violation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Local male-female ratio	0.190***	0.092***	0.076*	-0.102***	-1.769***	1.049***	2.248***	4.301***	0.939***
	(4.73)	(3.98)	(1.93)	(-3.70)	(-3.46)	(4.05)	(4.63)	(3.72)	(2.61)
Local female-male income ratio	-0.103**	-0.010	-0.018	0.066	-0.617	0.223	1.660**	-2.368	1.505***
	(-2.51)	(-0.36)	(-1.02)	(1.63)	(-1.08)	(0.53)	(2.18)	(-1.47)	(3.20)
Local religiosity	-0.026**	-0.002	0.007	-0.009	-0.007	0.032	0.255*	0.069	-0.007
	(-2.56)	(-0.24)	(1.29)	(-0.82)	(-0.06)	(0.32)	(1.48)	(2.74)	(-0.07)
County characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bid characteristics	-		-	-	-	-	-	-	Yes
Loan type fixed effects	-		-	-	-	Yes	Yes	Yes	-
Loan purpose fixed effects	-		-	-	-	Yes	Yes	Yes	-
Credit rating fixed effects	-		-	-	-	Yes	Yes	Yes	-
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,936	83,059	83,059	83,059	45,830	10,844	10,844	2585	48,345
Adjusted/Pseudo R^2	0.588	0.603	0.242	0.327	0.286	0.572	0.374	0.258	0.114

Table A6
Effect of the Local Male–Female Ratio on the Male–Female Ratio among Local Employees

This table reports the effect of the local male–female ratio on the male–female ratio among local employees. The dependent variable is the local male–female ratio among employees, which is calculated as the number of local male employees divided by the number of local female employees. We obtain county-level employment information from the Geographic Profile of Employment and Unemployment, Bureau of Labor Statistics. Control variables include local population characteristics (higher education fraction, Ln (1+local population), Ln (1+household income), unemployment rate, and average age), firm characteristics, and Fama-French 12-industry fixed effects.

	(1)	(2)	(3)	(4)
Local male-female ratio	1.216***	1.223***	1.022***	1.120***
	(77.22)	(71.03)	(60.25)	(45.45)
County Characteristics				
Local high education fraction			-0.038***	-0.092***
			(-5.65)	(-9.92)
Ln (1+local population)			0.030***	0.032***
			(34.49)	(30.69)
Ln (local household income)			-0.081***	0.084***
			(-13.29)	(9.34)
Unemployment rate			0.618***	-0.153***
			(13.56)	(-3.71)
Local average age			-0.189***	-0.761***
			(-15.27)	(-8.52)
Firm Characteristics				
Tangibility		-0.012***	-0.009**	-0.003
		(-2.72)	(-2.47)	(-1.21)
Ln (book size)		0.000	-0.000	0.000
		(1.10)	(-0.47)	(0.16)
Market leverage		0.011***	0.008***	0.001
		(3.27)	(3.04)	(0.73)
Free cash flow		-0.001	0.002	-0.001
		(-0.43)	(0.72)	(-0.65)
Market to book		-0.000	-0.000	-0.000***
		(-0.94)	(-1.59)	(-2.65)
Profit		0.006***	0.004***	0.003***
		(3.46)	(2.83)	(2.95)
Sales growth		0.000	0.000	0.000**
		(1.52)	(1.21)	(2.26)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
State fixed effects	No	No	No	Yes
Observations	57,126	57,316	57,126	57,126
R-squared	0.408	0.400	0.555	0.670

Table A7
Local Male-Female ratio, Employee Incentives, and Corporate Policies

Panel A reports the regression results of non-executive employee stock options on the local male-female ratio and other covariates. Stock option grants are measured as the Black-Scholes value of per-employee option grants to non-executive employees (per 10,000 employees). In column (4), we use the Tobit model. Panel B reports the results of an interaction analysis. We interact the local male-female ratio with the employee involvement index, which equals one if the company strongly encourages worker involvement or ownership through stock option plans that it makes available to a majority of its employees. For simplicity, we do not report the coefficients of the control variables. All of the regressions include other local population characteristics and firm characteristics as additional controls.

Panel A: Local Male-Female Ratio and Non-Executive Employee Stock Options

	(1)	(2)	(3)	(4)
Local male-female ratio	9.058***	5.328***	2.058***	3.081***
	(7.09)	(5.22)	(2.76)	(2.76)
County characteristics				
Local higher education			1.305***	1.314***
			(2.58)	(2.68)
Ln (1+local population)			0.054	0.053
			(1.36)	(1.34)
Ln (local household income)			-0.183	-0.172
			(-0.62)	(-0.58)
Unemployment rate			-3.650*	-3.844*
			(-1.73)	(-1.80)
Local average age			-2.941***	-2.957***
			(-2.95)	(-2.98)
Firm characteristics				
Tangibility		-1.143***	-1.032***	-1.041***
		(-4.08)	(-3.72)	(-4.01)
Ln (book assets)		-0.083**	-0.095**	-0.089**
		(-2.27)	(-2.57)	(-2.54)
Market leverage		-0.488**	-0.475**	-0.546***
		(-2.43)	(-2.38)	(-3.09)
Free cash flow		0.438	0.452	0.449
		(1.33)	(1.38)	(1.36)
Market-to-book		0.429***	0.426***	0.426***
		(7.79)	(7.76)	(22.46)
Profitability		-4.287***	-4.210***	-4.209***
		(-5.43)	(-5.35)	(-6.14)
Sales growth		0.010	0.009	0.009
		(0.61)	(0.57)	(0.57)
Year fixed effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes
Observations	14,752	14,752	14,752	14,752
Adjusted R^2	0.120	0.296	0.299	0.070

Table A7 Continued
Panel B: Local Male-Female Ratio, Employee Involvement, and Corporate Policies

	Option-Implied Volatility	Market Leverage	Capital Expenditure	Cash Holding	Interest Rate Hedging	Loan Spread	Collateral Requirement	Capital Expenditure Restriction	Covenant Violation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Local male-female ratio	0.124***	0.009	0.022	0.030	-1.300*	0.913*	2.626**	2.713	0.839
	(6.01)	(0.30)	(0.98)	(0.67)	(-1.66)	(1.70)	(2.10)	(1.04)	(1.23)
Interaction term	0.053*	0.144***	-0.010	-0.181**	-2.868*	0.808	8.567*	4.989	0.863
	(1.69)	(2.74)	(-0.45)	(-2.26)	(-1.72)	(0.86)	(1.83)	(0.54)	(0.49)
Employee Involvement	-0.047	-0.142***	0.009	0.172**	2.559	0.787	-8.315*	-5.519	-0.793
	(-1.18)	(-2.81)	(0.42)	(2.28)	(1.60)	(0.89)	(-1.85)	(-0.61)	(-0.47)
Controls the same as in	Table II Col (1)	Table III Col (1)	Table III Col (3)	Table III Col (4)	Table IV Col (3)	Table V Col(3)	Table V Col(7)	Table V Col(11)	Table V Col(3)
Observations	8,619	19,263	19,263	19,263	12,464	3,638	3,638	769	9,943
Adjusted R^2	0.503	0.709	0.598	0.401	0.223	0.591	0.465	0.475	0.103