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Trust and Local Bias

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Abstract

In this article, we examine the effect of social trust on local bias. Our evidence suggests that institutional investors located in high-trust regions of the United States exhibit lower local bias. Moreover, we find that high-trust investors are better diversified, suggesting that trust helps accomplish greater diversification. The results are not due to firm, demographic, or local economic characteristics. Additional analysis reveals that the documented informational advantage in local holdings exists only in low-trust regions. We show that this finding is consistent with a trust explanation.

> Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. – Kenneth Arrow (1972).

I. Introduction

Despite the well-documented gains from portfolio diversification, investors exhibit strong preferences for local stocks. This phenomenon is known as home bias or local bias, and it exists internationally, domestically, and among individual and institutional investors (Coval and Moskowitz (1999), Karolyi and Stulz (2003), Chan, Covrig, and Ng (2005), Ivković and Weisbenner (2005), Seasholes and Zhu (2010), and Baik, Kang, and Kim (2010)). In this article, we examine social trust as a potential explanation for home/local bias. Social trust is likely to affect investment choice because investments are made for future promises (Sapienza and Zingales (2012)). Investing requires an act of faith in the financial system. Consistent with this view, recent studies find that trust is an important

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determinant of stock market participation (Guiso, Sapienza, and Zingales (2008), Giannetti and Wang (2016), and Gurun, Stoffman, and Yonker (2018)).

We add to these findings by examining the effect of trust on investors' portfolio allocation decisions, after the choice has been made to participate in the stock market. Our approach examines institutional investors because they are professionally delegated to manage investments. Institutional investors are also major participants in the U.S. market, and their decisions affect valuations, risk premiums, and the cost of capital for corporations.

Our empirical tests are guided by the theory developed in Guiso et al. (2008). Although their focus is on the relation between trust and stock market participation, trust also has consequences for portfolio allocation. Guiso et al. discuss this potential implication: "[M]ore knowledge… overcomes the barrier created by lack of trust. Hence, mistrust will be less of an obstacle in investing in local stocks" (p. 2562). Stated differently, investors who lack trust will hold relatively more local stocks and fewer distant stocks, and therefore have portfolios that are more concentrated and potentially underdiversified.

We take this prediction to the data using a measure of trust based on World Values Survey (WVS) respondent answers to the question, "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" The WVS is widely used to measure differences in trust across countries (La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997), Guiso et al. (2008)). To design a proper empirical setting for our research question, we measure social trust across different regions of the United States.[1] There are at least three benefits of the U.S. setting. First, firms in our sample face practically identical regulatory and accounting standards, allowing us to focus on the economic channel of trust while ruling out thorny institutional differences (e.g., language, accounting rules, disclosure requirements, and insider trading regulations) that arise from the international context. Second, the data on the locations of institutional investors and their quarterly portfolio holdings in U.S. firms are publicly available. Third, there is significant variation in social trust across different U.S. regions. These differences are comparable to the differences in trust across Western Europe.[2]

Our analysis begins at the institutional investor level. We assume that institutional investors exhibit trust attitudes that are similar to those of residents in their headquarters region. Because we focus on institutional investors, the local region is defined at the state level following Baik et al. (2010). The unconditional average local bias of investors in low-trust regions is 0.9% greater than that of investors in high-trust regions. Multivariate analysis reveals that a 1-standard-deviation increase in the trust measure reduces local bias by approximately 27% relative to the sample average. The difference is not due to investor characteristics, including total equity assets, age, and number of stocks in the portfolio, nor to differences in

[1]The United States is the only country in the WVS that contains information on the geographical location and detailed personal characteristics of survey respondents. The survey is conducted approximately every 5 years.

[2]In Western Europe, Greece has the lowest level of trust at 20% and Sweden has the highest level of trust at 57%. In our U.S. sample, the lowest level of trust is 22% (East South Central (2000)) and the highest level of trust is 53% (Northwest (2006)).

investor types. Because local bias has information content, we expect a stronger relation between trust and local bias among investors that are better able to exploit local knowledge. Consistent with this view, the effect of trust on local bias is larger among smaller investors, investors with fewer holdings, and investors with shorter holding horizons (Ke and Petroni (2004), Yan and Zhang (2009)).

The theoretical motivation for the relation between trust and local bias also produces a testable prediction on portfolio diversification. Specifically, if low-trust investors avoid distant stocks, they are more likely to be underdiversified. We find evidence in support of this prediction. Following the approach in Pool, Stoffman, and Yonker (2012), we find that a lack of trust is associated with higher portfolio idiosyncratic volatility. Because investors may not necessarily follow the capital asset pricing model (CAPM) as their benchmark, we also employ a second measure of investor portfolio diversification defined as the sum of the squared portfolio weights on each stock (i.e., Herfindahl). The results are similar using the Herfindahl measure. Overall, this line of analysis lends further credence to the relation between trust and local bias.

Because companies may systematically differ across high- and low-trust regions, we conduct stock-level analysis by aggregating ownership of institutional investors to create a measure of local ownership. Multivariate cross-sectional tests reveal that firms located in low-trust regions experience greater local ownership. We conjecture that this relation is relatively greater for stocks with low national recognition. Consistent with this view, we find stronger effects among smaller stocks, non–Standard & Poor's (S&P) 500 members, nondividend payers, stocks without a credit rating, and stocks with high return volatility. The results are not due to firm characteristics (e.g., size, profitability, liquidity, or institutional ownership) and remain when industry fixed effects and firm fixed effects are included. We also include state fixed effects to capture regional industry clusters, financial centers, and urbanization. The results are similar using stricter specifications that directly control for demographics (e.g., gender, age, and education), economic fluctuations (e.g., gross domestic product [GDP], unemployment rate, and household income), and security conditions (e.g., violent and property crime rates). Overall, the evidence suggests that regional characteristics do not explain the relation between trust and local ownership.

Culture-related research is commonly subject to measurement concerns (Karolyi (2015), Zingales (2015)). Our study also faces questions regarding the measurement of trust. One issue is that the WVS measure is noisy because it is calculated at the U.S. regional level. We show that our findings are not sensitive to WVS regional state groupings. Although many investors and firms are located in key financial centers, our main inferences are unchanged after excluding New York, Massachusetts, and California. We find similar results using two alternative trust measures, the first created from a subset of survey respondents that are likely to be stock market participants and the second using General Social Survey (GSS) data. A second concern relates to the external validity of our findings outside of our U.S. setting. Using international cross-border equity portfolio data from the International Monetary Fund (IMF), we find a strong association between trust

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and international home bias at the aggregate country level.[3] This test also allays concerns about measuring investor trust, because trust is measured at the aggregate country level. Moreover, this result demonstrates that our main finding holds in an out-of-sample international setting.

Studies show that local holdings may reflect a stronger preference for familiar companies (Huberman (2001)), skepticism of distant firms (Zingales (2011)), or information advantages. The trust explanation has a specific prediction about the information content of local ownership. When investors lack sufficient trust, they require better knowledge and/or information advantages in their investment decisions. If more local knowledge helps overcome this barrier, we expect information advantages to play a larger role in the local ownership of investors in low-trust regions. Portfolio return tests support this prediction. In high-trust regions, a long–short portfolio of stocks sorted by local ownership generates an insignificant 0% Carhart (1997) 4-factor risk-adjusted annual return. In contrast, a long–short portfolio in low-trust regions earns a Carhart 4-factor alpha of 6.5% annually. It is unlikely that regional factors explain these patterns because the results are similar after orthogonalizing our trust measure by other state characteristics. The evidence implies that low-trust regions drive the performance outcome of local ownership documented in the literature and provides additional support for the link between trust and local bias.

Additional analysis provides insights into the source of the information advantage of low-trust investors. We find a positive association between earnings surprise and local ownership in low-trust regions but not in high-trust regions. Moreover, in areas where local amenities provide better opportunities to build social connections, we find the information advantage of low-trust investors increases substantially. The results of these tests naturally raise questions of privileged access. However, because the information advantage of low-trust investors continues after the passage of Regulation Fair Disclosure (Reg FD), it is unlikely that privileged access is the primary source of this advantage.

Our remaining tests address alternative interpretations and provide robustness checks. An important consideration is the possibility that trust facilitates the collection and dissemination of information, lowering the costs of investing and attracting investment from distant investors. Indeed, it is plausible that both forces, the "pull" of distant investors and the "push" to invest in distant stocks, are at work. We include additional controls for the firm's information environment to capture these lower investing costs and find that our main inferences are unchanged. It is possible that trust is simply a proxy for attitudes toward risk (i.e., high trust captures lower risk aversion). Although risk aversion relates to stock market participation, additional tests reveal that our findings are not sensitive to the inclusion of a proxy for local risk tolerance. Moreover, the theoretical framework (Guiso et al. (2008)) that motivates our study shows that higher risk aversion predicts lower local bias.

Our study contributes to the literature on home/local bias by proposing social trust as an important element of the puzzle. The sources of home/local bias

[3]This association is also consistent with, although distinct from, the finding that bilateral trust affects portfolio investment in a country (Guiso, Sapienza, and Zingales (2009)).

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have long puzzled economists (French and Poterba (1991), Baxter and Jermann (1997)), but recent findings suggest that stock market development, geographic distance, cultural distance, and language may help explain this phenomenon (Grinblatt and Keloharju (2001), Chan et al. (2005), Anderson, Fedenia, Hirschey, and Hill (2011), and Karolyi (2015)).[4] Following theoretical guidance, we find empirical support using two independent surveys (WVS and GSS) and international cross-border equity portfolio flows, which provide external validity for our findings.

Our findings also extend studies that primarily focus on individual investors and the effect of trust on portfolio decisions (Giannetti and Wang (2016), Shao and Wang (2016)). In contrast, we focus on paid professionals. The trust explanation has a specific prediction that information advantages in local ownership should arise mostly in low-trust regions. We find evidence consistent with this unique prediction.

More broadly, we contribute to the growing literature on the role of culture in finance (Karolyi (2015), Zingales (2015)) and specifically focus on investment and portfolio choice.[5] Investment decisions are influenced by language and cultural similarities (Grinblatt and Keloharju (2001), Beugelsdijk and Frijns (2010)), religious beliefs (Kumar, Page, and Spalt (2011), Shu, Sulaeman, and Yeung (2012)), egalitarianism (Siegel, Licht, and Schwartz (2011)), and trust (Guiso et al. (2008), (2009)), Gennaioli, Shleifer, and Vishny (2015), and Kostovetsky (2016)).[6]

II. Data and Main Variables

Our measure of trust is collected from the WVS 1981–2008 Integrated Questionnaire (Inglehart, Haerpfer, Moreno, and Welzel (2014)). Three waves of the WVS (waves 3, 4, and 5) with trust-related questions are conducted in the United States (1995, 2000, 2006).[7] Thus, our sample period starts in 1996 and ends

[4]Cooper, Sercu, and Vanpée (2013) provide a recent comprehensive survey of the home bias puzzle.

[5]Studies show that culture dimensions such as religion, individualism, and social trust relate to shareholder/creditor rights (Stulz and Williamson (2003)), overseas listing decisions (Sarkissian and Schill (2004)), corporate investment (Hilary and Hui (2009)), merger and acquisition activity (Ahern, Daminelli, and Fracassi (2015)), price momentum (Chui, Titman, and Wei (2010)), investment advisor selection (Kostovetsky (2016)), investor trading reaction (Jia, Wang, and Xiong (2017)), and comovement (Eun, Wang, and Xiao (2015)).

[6]Social trust affects economic growth (Knack and Keefer (1997)), judicial efficiency and corruption (La Porta et al. (1997)), international trade (Guiso et al. (2009)), and organizational structure (Bloom, Sadun, and Van Reenen (2012)). Trust also affects financial decisions such as informal borrowing (Karlan, Mobius, Rosenblat, and Szeidl (2009)), the use of checks (Guiso, Sapienza, and Zingales (2004)), stock market participation (Guiso et al. (2008)), and the choice of delegated asset management (Gennaioli et al. (2015)).

[7]In total, there are approximately 4,000 survey respondents in the three waves of the WVS. The survey identifies the locations of respondents by 10 geographical regions: New England (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut), Middle Atlantic (New York, Pennsylvania, and New Jersey), East North Central (Wisconsin, Michigan, Illinois, Indiana, and Ohio), West North Central (Missouri, North Dakota, South Dakota, Nebraska, Kansas, Minnesota, and Iowa), South Atlantic (Delaware, Maryland, Washington, D.C., Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida), East South Central (Kentucky, Tennessee, Mississippi, and Alabama), West South Central (Oklahoma, Texas, Arkansas, and Louisiana), Rocky Mountain

in 2007. In each region, we calculate the trust index (TRUST_INDEX) as the percentage of respondents answering "Most people can be trusted" to the survey question, "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" We estimate the value of TRUST_INDEX in the years between two consecutive surveys by linear interpolation. Interpolation is a standard convention for estimating regional characteristics (Hilary and Hui (2009), Kumar et al. (2011), and Shu et al. (2012)). To allay concerns, we reestimate our key tests using a noninterpolated TRUST_INDEX measure and provide the results in the Supplementary Material.

Although studies commonly use the WVS to measure trust (Guiso et al. (2004)), the measurement is coarse as surveys occur every 5 to 6 years. Therefore, we employ a second survey, the GSS. The GSS is a U.S.-based survey conducted approximately every 2 years.[8] A benefit of the GSS is that trust can be measured at the state level because the survey provides respondents' state location. However, there are fewer responses per state, which introduces noise to the measure. Therefore, we primarily use the WVS because i) it is more commonly used in the literature and ii) it allows for comparability in our international analysis. Our main inferences are unchanged using the GSS trust measure.

Historical firm headquarters location data are gathered from Compact Disclosure. We obtain firm-level accounting information from Compustat and security return information from the Center for Research in Security Prices (CRSP). Our main sample includes all stocks with institutional ownership. The number of analysts covering a stock and the consensus forecast estimate are from the Institutional Brokers' Estimate System (IBES). Regional variables such as the natural log of the state population (POPULATION), percentage of male population in each state (MALE), percentage of population more than 65 years old in each state (SENIOR), natural log of the median household income (HOUSEHOLD_INCOME), unemployment rate (UNEMPLOYMENT), state coincident index (SC_INDEX), violent crime rate (VIOLENT_CRIME), and property crime rate (PROPERTY_CRIME) are gathered from the U.S. Census Bureau, Bureau of Labor Statistics, Federal Reserve Bank of Philadelphia, and the FBI's Uniform Crime Reports. We collect data on cross-country equity portfolios from the IMF Coordinated Portfolio Investment Survey and data on aggregate stock market capitalization from the World Bank.

Quarterly equity holdings of institutional investors are from the Thomson Reuters CDA/Spectrum (13F) institutional holdings database. The U.S. Securities and Exchange Commission (SEC) requires the quarterly filing of equity positions for institutional investment managers with more than $100 million in equity assets under management. Because CDA/Spectrum does not provide data on investor locations, we collect location information (city, state, and zip code) of institutional

(Montana, Wyoming, Nevada, Utah, Colorado, Arizona, and New Mexico), Northwest (Oregon, Washington, and Idaho), and California.

[8] We use the same method as the WVS by calculating the GSS TRUST_INDEX as the percentage of respondents answering "Most people can be trusted" to the trust survey question. The GSS trust survey question has nearly identical wording to the WVS trust question, "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?"

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investors from their 13F filings. We obtain the corresponding values of latitude and longitude from the Gazetteer Files of Census 2000.

The investor-level measure of local bias (LOCAL_BIAS) is calculated as follows. Because we analyze institutional investors, the local area is defined at the state level following Baik et al. (2010). We calculate the fraction of U.S. equity assets invested in local stocks for investor i at quarter t and subtract the fraction of stocks that are located in the same state. The latter fraction acts as a necessary benchmark because available investments vary across local regions (Coval and Moskowitz (2001)).

We also create a stock-level measure called local ownership (LOCAL_OWNERSHIP) by first calculating the dollar holdings (H) of stock j by all investors i located in the same state at quarter t and dividing by the dollar holdings of stock j by the entire institutional investor universe, I. Following the approach in Coval and Moskowitz (2001) and Gaspar and Massa (2007), we then subtract the total market equity asset value (A) of all investors i located in the same state divided by the total market equity asset value of the entire institutional investor universe, I. This term captures the fact that institutional investors are not uniformly located across the United States.

A benefit of performing analysis at the stock level is that doing so allows for direct controls for stock characteristics that may drive differences in local ownership. Additionally, individual portfolio managers are likely to have variation in trust, so aggregating at the stock level may help reduce measurement noise on this dimension. Stock-level measures of local ownership also allow us to form portfolios to assess the potential for information advantages.

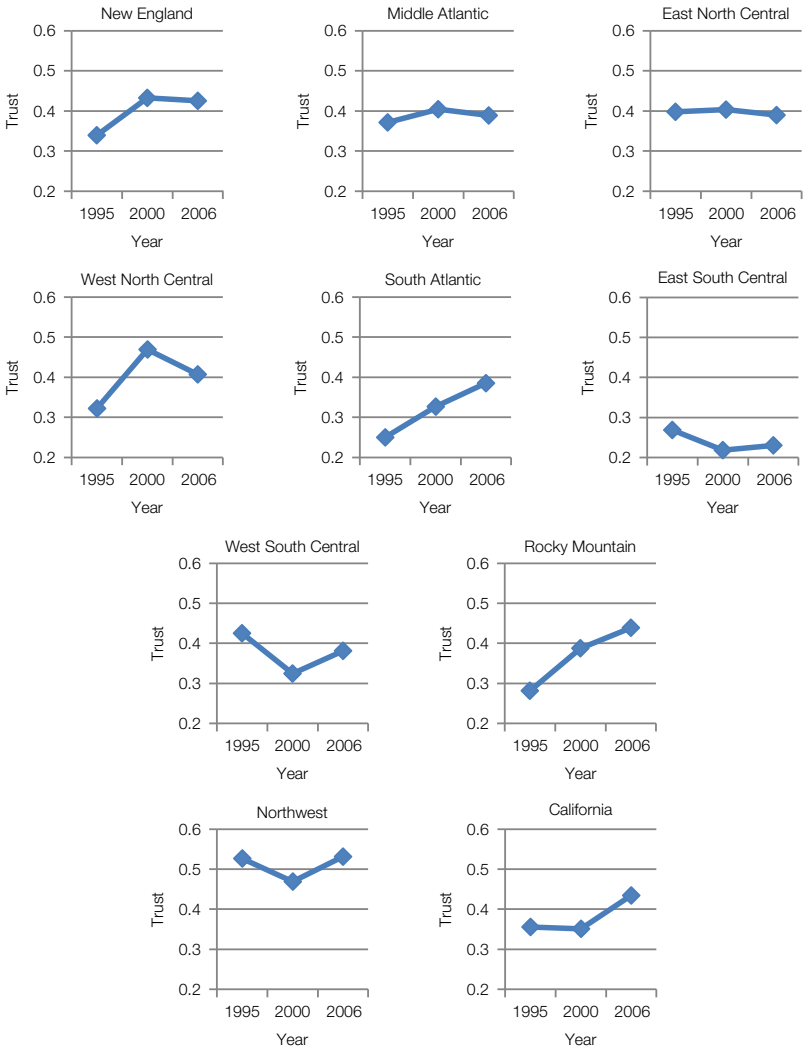
Panel A of Table 1 reports summary statistics of the main variables used in the study. The details of variable construction are described in the Appendix. There are 38,138 firm-year observations in our main sample. The average and median values for TRUST_INDEX are 37.6% and 39.2%, respectively, with a standard deviation of 6.9%. The average and median values for LOCAL_OWNERSHIP are 5.4% and 0.5%, respectively, with a standard deviation of 15.0%. The average and median values for LOCAL_BIAS are 3.4% and 0.8%, respectively, with a standard deviation of 12.7%. Panel B presents TRUST_INDEX by region for each of the three survey waves, (1995, 2000, and 2006). It reports that the relative rankings of TRUST_INDEX in each region remain fairly stable. For example, the Northwest region has the highest average TRUST_INDEX, with values between 46.9% and 53.1% during our sample period. The East South Central region has the lowest average TRUST_INDEX, with values between 21.9% and 26.9%.

There is also considerable variation in TRUST_INDEX over time across different U.S. geographical regions. Figure 1 plots TRUST_INDEX by region and year. For instance, TRUST_INDEX in the Rocky Mountain region increases from 28.2% in 1995 to 38.8% in 2000 and continues to increase to 43.9% in 2006, whereas the index in the Middle Atlantic region increases from 37.1% in 1995 to 40.5% in 2000 but decreases to 38.9% in 2006. TRUST_INDEX in California remains stable between 35.5% and 35.1% from 1995 to 2000 and increases to 43.4% in 2006. Both cross-sectional and time-series variations across regions make it feasible to identify the link between trust and local bias/ownership.

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FIGURE 1
Trust Index by Region and Survey Year

Figure 1 shows plots of TRUST_INDEX by region and year. The World Values Survey conducted three waves of surveys in the United States in 1995, 2000, and 2006. The survey identifies the locations of survey respondents by 10 geographical regions: New England (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut), Middle Atlantic (New York, Pennsylvania, New Jersey), East North Central (Wisconsin, Michigan, Illinois, Indiana, Ohio), West North Central (Missouri, North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa), South Atlantic (Delaware, Maryland, Washington, D.C., Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida), East South Central (Kentucky, Tennessee, Mississippi, Alabama), West South Central (Oklahoma, Texas, Arkansas, Louisiana), Rocky Mountain (Montana, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico), Northwest (Oregon, Washington, Idaho), and California. In each region, TRUST_INDEX is calculated as the percentage of survey respondents answering "Most people can be trusted" to the survey question, "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?"



Trust has relatively low correlations with other demographic and regional characteristics. Panel C of Table 1 reports that TRUST_INDEX is positively correlated with measures of wealth and economic activity (HOUSEHOLD_INCOME: 0.39, SC_INDEX: 0.34) and negatively correlated with measures of economic decline (UNEMPLOYMENT: −0.27, VIOLENT_CRIME: −0.34, PROPERTY_CRIME: −0.23). Because these characteristics are a primary concern for omitted

TABLE 1
Summary Statistics

Table 1 reports summary statistics for the main variables used in the analysis. Panel A reports the number of observations (*N*), mean, median, and standard deviation. Our data come from multiple sources. The data on state-level TRUST_INDEX come from the World Values Survey (WVS) from 1995 to 2006. The data on state population characteristics come from the U.S. Census Bureau population estimates program. The data on state median household income are from the U.S. Census Bureau Small Area Income and Poverty Estimates data sets. The data on unemployment rate are from the Bureau of Labor Statistics. The data on education level of population are from the Economic Research Service in the U.S. Department of Agriculture. The data on state coincident index are from the Federal Reserve Bank of Philadelphia. The data on violent crime rate and property crime rate are from the FBI Uniform Crime Reports. The data on stock returns, trading volumes, and firm accounting information are from Compustat and the Center for Research in Security Prices. The data on quarterly stock holdings of institutional investors are from Thomson CDA/Spectrum (13F) from 1996 to 2007. The holdings data are name matched with the data on institutional investor locations obtained from their U.S. Securities and Exchange Commission filings. Panel B reports the value of TRUST_INDEX by region and year. The WVS conducted three waves of surveys in the United States in 1995, 2000, and 2006. The survey identifies the locations of survey respondents by 10 geographical regions: New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Rocky Mountain, Northwest, and California. In each region, TRUST_INDEX is calculated as the percentage of survey respondents answering "Most people can be trusted" to the survey question, "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" Panel C reports the correlation matrix of state-level variables among 571 state-year observations. We report correlations between TRUST_INDEX, natural log of state population (POPULATION), percentage of male population (MALE), percentage of persons age 65 and above (SENIOR), percentage of population with college degrees (COLLEGE), natural log of the median household income (HOUSEHOLD_INCOME), unemployment rate (UNEMPLOYMENT), state coincident index (SC_INDEX), violent crime rate (VIOLENT_CRIME), and property crime rate (PROPERTY_CRIME). Variables are defined in the Appendix.

Panel A. Summary Statistics of Main Variables

Variable	Frequency	Mean	Median	Std. Dev.	*N*
Investor-Level Variables					
LOCAL_BIAS	Year	0.034	0.008	0.127	22,152
INVESTOR_SIZE	Year	6.239	5.940	1.800	22,152
INVESTOR_AGE	Year	1.932	2.079	0.943	22,152
NO_STOCKS	Year	4.682	4.605	1.290	22,152
IVOL	Year	0.486	0.368	0.396	20,531
HERFINDAHL	Year	0.059	0.026	0.113	22,152
Firm-Level Variables					
LOCAL_OWNERSHIP	Year	0.054	0.005	0.150	38,138
FIRM_SIZE	Year	5.880	5.762	2.007	38,138
MARKET_TO_BOOK	Year	2.171	1.331	3.288	38,138
LEVERAGE	Year	0.207	0.162	0.207	38,138
PROFITABILITY	Year	0.060	0.109	0.310	38,138
CASH_HOLDING	Year	0.211	0.103	0.243	38,138
IO	Year	0.458	0.454	0.270	38,138
STOCK_RETURN	Year	0.195	0.084	0.678	38,138
RETURN_VOL	Year	0.036	0.031	0.021	38,138
ILLIQ	Year	0.300	0.125	0.457	38,138
NO_ANALYSTS	Quarter	9.795	7.000	8.958	84,337
EARNINGS_SURPRISE	Quarter	0.000	0.000	0.005	84,337
State-Level Variables					
TRUST_INDEX	Year	0.376	0.392	0.069	571
POPULATION	Year	15.128	15.252	0.982	571
MALE	Year	0.488	0.486	0.010	571
SENIOR	Year	0.143	0.140	0.024	571
COLLEGE	Year	0.181	0.166	0.050	571
HOUSEHOLD_INCOME	Year	10.480	10.462	0.185	571
UNEMPLOYMENT	Year	0.053	0.052	0.014	571
SC_INDEX	Year	1.408	1.391	0.192	571
VIOLENT_CRIME	Year	0.044	0.042	0.021	571
PROPERTY_CRIME	Year	0.371	0.374	0.097	571

(continued on next page)

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TABLE 1 (continued)
Summary Statistics

Panel B. Trust Index by Region and Survey Year

Region	States	1995	2000	2006
New England	Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut	0.339	0.432	0.425
Middle Atlantic	New York, Pennsylvania, New Jersey	0.371	0.405	0.389
East North Central	Wisconsin, Michigan, Illinois, Indiana, Ohio	0.398	0.403	0.389
West North Central	Missouri, North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa	0.322	0.469	0.407
South Atlantic	Delaware, Maryland, Washington, D.C., Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida	0.250	0.327	0.385
East South Central	Kentucky, Tennessee, Mississippi, Alabama	0.269	0.219	0.231
West South Central	Oklahoma, Texas, Arkansas, Louisiana	0.425	0.324	0.381
Rocky Mountain	Montana, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico	0.282	0.388	0.439
Northwest	Oregon, Washington, Idaho	0.526	0.469	0.531
California	California	0.355	0.351	0.434

Panel C. Correlation Matrix of State-Level Variables

Variable	TRUST_ INDEX	POPULATION	MALE	SENIOR	COLLEGE	HOUSEHOLD_ INCOME	UNEMPLOYMENT	SC_INDEX	VIOLENT_ CRIME	PROPERTY_ CRIME
TRUST_INDEX	1.00									
POPULATION	−0.13	1.00								
MALE	0.25	0.05	1.00							
SENIOR	0.16	0.08	−0.09	1.00						
COLLEGE	0.36	−0.15	−0.09	−0.30	1.00					
HOUSEHOLD_ INCOME	0.39	0.05	−0.02	−0.30	0.73	1.00				
UNEMPLOYMENT	−0.27	0.33	0.07	−0.19	−0.33	−0.37	1.00			
SC_INDEX	0.34	−0.05	0.38	−0.27	0.15	0.40	−0.14	1.00		
VIOLENT_CRIME	−0.34	0.49	0.06	−0.12	−0.21	−0.18	0.35	−0.10	1.00	
PROPERTY_CRIME	−0.23	0.25	0.23	−0.05	−0.31	−0.41	0.43	−0.16	0.65	1.00

variables, we provide robustness tests verifying that our results are not driven by these regional factors.

III. Effect of Social Trust on Local Bias

In this section we examine the hypothesis that social trust lowers local bias. We begin with univariate analysis on the relation between trust and local bias. Then, we perform multivariate analysis, first on investor-level local bias and then on stock-level local ownership. Finally, we discuss potential concerns with the measurement of trust.

A. Univariate Analysis

We begin by examining average local bias and local ownership in our sample. The first 3 columns in Panel A of Table 2 present investor-level analysis using local bias. Across all investors, the average institutional investor holds 11.6% of its portfolio in local stocks, and this value translates to a 3.4% local bias ($t =$ 40.20). Similar patterns arise at the stock level. The next 3 columns show that the average local holding is 14.1% and that the average stock-level local ownership is 5.4% ($t = 69.79$).

Next, we examine local bias/local ownership across low- and high-trust regions. The first 3 columns of Panel B show that the average investor-level local bias is significantly higher in low-trust regions (3.9%) compared to high-trust regions (3.0%), with a difference of 0.9% ($t = 5.45$). The difference in local bias across low- and high-trust regions is more pronounced for smaller institutional investors (1.7%, $t = 4.99$) relative to their larger counterparts (0.5%, $t = 2.82$). At the stock level, differences in local ownership across high- and low-trust regions

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TABLE 2
Trust and Local Bias: Univariate Results

Table 2 reports univariate results for the relation between trust and local bias at both the stock and institutional investor levels. An institutional investor is defined as a local investor if it is located in the same state as the headquarter state of the stock. For a given investor, LOCAL_BIAS is defined as the difference between the fraction of portfolio allocation in local stocks and the benchmark allocation in local stocks assuming the benchmark is the market portfolio. For a given stock, LOCAL_OWNERSHIP is calculated as the fraction of holdings held by local investors minus the total market equity asset value of all investors located in the same state divided by the total market equity asset value of the entire institutional investor universe. Panel A reports the averages of LOCAL_BIAS and LOCAL_OWNERSHIP in our sample. We perform *t*-tests to test whether average LOCAL_BIAS (LOCAL_OWNERSHIP) is significantly different from 0. The number of observations is reported in parentheses. Panel B reports the level of LOCAL_BIAS between stocks located in the high trust regions versus stocks located in the low trust regions. An investor/stock is classified as High Trust (Low Trust) if the TRUST_INDEX in the previous year is above (below) sample median. *t*-tests are reported to test whether the average local bias is significantly different between the two groups. We report the results both at the institutional investor level (LOCAL_BIAS) and at the stock level (LOCAL_OWNERSHIP). The number of observations is reported in parentheses. We report the results for the full sample, as well as subsamples of small and large investors (stocks). A stock is classified as small if its beginning-of-year market capitalization is below the bottom sample tercile, and large otherwise. An investor is classified as small if the market value of its portfolio holdings is below the bottom sample tercile, and large otherwise. *** indicates significance at the 1% level.

Panel A. Full Sample

	Investor-Level Analysis (Investor-Year) LOCAL_BIAS			Firm-Level Analysis (Firm-Year) LOCAL_OWNERSHIP		
Sample	Portfolio in Local Stocks	Benchmark Allocation	*t*-Test: LOCAL_BIAS = 0	Holdings by Local Investors	Benchmark Ownership	*t*-Test: LOCAL_OWNERSHIP = 0
Full sample	11.6% (22,152)	8.2% (22,152)	3.4% 40.20***	14.1% (38,138)	8.7% (38,138)	5.4% 69.79***

Panel B. High- versus Low-Trust Regions

	Investor-Level Analysis (Investor-Year) LOCAL_BIAS			Firm-Level Analysis (Firm-Year) LOCAL_OWNERSHIP		
Sample	Low Trust	High Trust	*t*-Test: Difference	Low Trust	High Trust	*t*-Test: Difference
Full sample	3.9% (11,325)	3.0% (10,827)	0.9% 5.45***	6.1% (19,411)	4.6% (18,727)	1.5% 10.24***
Small	4.7% (3,807)	3.0% (3,580)	1.7% 4.99***	12.5% (6,405)	9.1% (6,310)	3.4% 8.84***
Large	3.5% (7,518)	3.0% (7,247)	0.5% 2.82***	3.0% (13,006)	2.2% (12,417)	0.8% 6.59***

are also present. The next 3 columns show that stocks located in low-trust regions exhibit 1.5% ($t = 10.24$) higher local bias compared to their counterparts in high-trust regions (6.1% vs. 4.6%). For small stocks, the difference in average local bias between high- and low-trust regions is 3.4% ($t = 8.84$), whereas for large stocks, the difference is only 0.8% ($t = 6.59$).

B. Trust and Local Bias: Multivariate Investor-Level Analysis

Next, we perform multivariate analysis to control for investor characteristics. We regress LOCAL_BIAS on TRUST_INDEX and the log of investor size (INVESTOR_SIZE), investor age (INVESTOR_AGE), and number of stocks in the portfolio (NO_STOCKS). The regression includes year fixed effects to capture macroeconomic shocks and investor-type fixed effects to control for potential differences in investment objectives across investor types. Investors types are defined using Brian Bushee's classification system.[9] Additional specifications

[9]The investor types include banks, insurance companies, investment companies, independent investment advisor, corporate (private) pension fund, public pension fund, university and foundation

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include state fixed effects to capture persistent geographic/regional characteristics. Standard errors are clustered at the investor level.

Panel A of Table 3 reports that the relation between trust and local bias continues to hold in the multivariate setting. Across all specifications, there is a negative and significant relation between local bias and trust. The coefficient estimate in column 1 (-0.131, $t = -3.54$) implies that a 1-standard-deviation increase in TRUST_INDEX (0.069) reduces LOCAL_BIAS by 27% relative to the sample average ($= -0.131 \times 0.069 \div 0.034$, where 0.034 is the average local bias). Column 2 reports similar findings with the inclusion of investor-type fixed effects to capture differences across investment objectives or styles. Column 3 reports that our inferences are unchanged with the inclusion of time-varying regional factors such as demographics, economic fluctuations, and local security conditions. We find similar results with the inclusion of state fixed effects in column 4, suggesting that permanent, geographic features such as industry clustering are unlikely to explain our results.

Overall, we find evidence that social trust reduces local bias. The results are not due to investor types or local demographic or economic conditions. In the next section, we investigate whether the relation between trust and local bias varies across different types of investors.

C. Trust and Local Bias: Heterogeneity across Investor Types

The previous analysis includes investor-type fixed effects to control for differences in investment objectives. Because studies show that local bias has information content (Baik et al. (2010)), we expect that the effect of trust on local bias may vary across investors with different investment styles. In particular, we conjecture that the relation is stronger among investors who are better able to exploit local knowledge. We investigate this possibility by reestimating the multivariate regressions among subsamples of investors. Specifically, we follow Coval and Moskowitz (2001) in identifying smaller investors, investors with fewer holdings, and older investors as those that are better able to exploit local knowledge. We also examine investors with shorter holding horizons because such investors can adapt quickly to investment opportunities (Ke and Petroni (2004), Yan and Zhang (2009)).[10]

To conduct this analysis, we classify an investor as small if its size (total asset value) is in the bottom tercile of investors, and the remaining investors as rest. Similarly, we classify investors based on number of holdings as few they are in the bottom tercile, and the remaining investors as rest. We classify investors in the top tercile of investor age as older, and the remaining investors as rest. We use two approaches to measure investment-holding horizon. First, we classify investors in the top tercile based on churn rate (Yan and Zhang (2009)) as fast, and the remaining investors as rest. Second, we obtain investor types classified as

endowments, and other investors (miscellaneous). We thank Brian Bushee for making these data available at http://acct.wharton.upenn.edu/faculty/bushee/IIclass.html.

[10]We calculate portfolio churn rate as the rate of portfolio turnover following Yan and Zhang (2009). For the transient investor classification, we collect the investor classification from Brian Bushee's website based on the classification method developed in Bushee and Noe (2000) and Bushee (2001).

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transient (Bushee and Noe (2000), Bushee (2001)) from Brian Bushee's website and separately analyze transient and nontransient investors (i.e., rest).

TABLE 3

Trust and Local Bias: Investor-Level Analysis

Table 3 reports multivariate results for the effect of trust on local bias at the investor level. For an investor, a stock is classified as local if it is headquartered in the same state as the investor. Investor-level LOCAL_BIAS is defined as the difference between the fraction of portfolio allocation in local stocks and the benchmark allocation in local stocks assuming the benchmark is the market portfolio. Panel A reports the baseline results. We control for investor characteristics including the natural log of the dollar amount of investor portfolio holdings (INVESTOR_SIZE), natural log of the number of years since the investor first appeared in the Thomson 13F database (INVESTOR_AGE), and natural log of the number of stocks in the investor's portfolio (NO_STOCKS). Year, investor type, and state fixed effects are included in different specifications. We obtain investor-type classifications from Brian Bushee's website (http://acct.wharton.upenn.edu/faculty/bushee/IIclass.html). In columns 3 and 4, we control for state population characteristics, state economic conditions, and state security conditions. Panel B reports results for the relation between trust and local bias across various types of institutional investors. We identify institutional investor characteristics by investor size (total asset value), number of stocks in the portfolio, age of investor, portfolio churn rate, and investment horizon style. In columns 1 and 2, an investor is classified as small if investor size (total asset value) is in the bottom sample tercile each year, or rest otherwise. In columns 3 and 4, an investor is classified as low if the number of stocks in the investor's portfolio is in the bottom sample tercile each year, or rest otherwise. In columns 5 and 6, an investor is classified as older if the age of the investor is in the top sample tercile each year, or rest otherwise. In columns 7 and 8, an investor is classified as fast if the churn rate of the investor's portfolio (Yan and Zhang (2009)) is in the top sample tercile each year, or rest otherwise. Columns 9 and 10 partition the sample based on investors' investment horizon: Transient investors have the investor classification TRA (Bushee (2001)), and nontransient investors are classified as rest. Year and investor type are included in different specifications. We obtain investor-type classifications from Brian Bushee's website. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Heteroscedasticity-robust standard errors are clustered at the investor level and t-statistics are reported in parentheses. We perform χ^2 tests to test the differences in coefficients between the subsamples (Diff in TRUST_INDEX). Variables are defined in the Appendix.

Panel A. Baseline Results

	Dependent Variable: LOCAL_BIAS			
Variable	1	2	3	4
TRUST_INDEX	−0.131***	−0.124***	−0.131***	−0.205***
	(−3.54)	(−3.57)	(−3.43)	(−3.42)
INVESTOR_SIZE	−0.002	−0.001	−0.000	0.000
	(−1.60)	(−0.66)	(−0.14)	(0.15)
INVESTOR_AGE	−0.001	−0.002	−0.002	−0.002
	(−0.31)	(−0.90)	(−0.93)	(−0.79)
NO_STOCKS	−0.003	−0.007**	−0.008***	−0.009***
	(−0.97)	(−2.41)	(−2.94)	(−3.25)
POPULATION			0.020***	−0.054
			(6.06)	(−0.68)
MALE			−0.619**	−2.193
			(−2.23)	(−1.18)
SENIOR			0.525***	3.767***
			(4.08)	(2.62)
COLLEGE			−0.246***	0.300
			(−3.72)	(0.36)
HOUSEHOLD_INCOME			0.098***	0.073
			(5.19)	(1.34)
UNEMPLOYMENT			1.231***	−0.072
			(6.36)	(−0.33)
SC_INDEX			0.175***	0.100***
			(8.20)	(2.77)
VIOLENT_CRIME			−0.824***	1.235***
			(−5.59)	(5.01)
PROPERTY_CRIME			0.156***	−0.204***
			(4.36)	(−3.05)
Year fixed effects	Yes	Yes	Yes	Yes
Investor-type fixed effects	–	Yes	Yes	Yes
State fixed effects	–	–	–	Yes
Cluster	Investor	Investor	Investor	Investor
No. of obs.	22,152	22,152	22,152	22,152
R^2	0.01	0.03	0.08	0.10

(continued on next page)

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TABLE 3 (continued)
Trust and Local Bias: Investor-Level Analysis

Panel B. Trust and Local Bias: Heterogeneity across Investor Types

	Dependent Variable: LOCAL_BIAS									
	Investor Size		Number of Stocks		Age of Investor		Portfolio Churn Rate		Investment Horizon	
	Small	Rest	Low	Rest	Older	Rest	Fast	Rest	Transient	Rest
Variable	1	2	3	4	5	6	7	8	9	10
TRUST_INDEX	−0.202***	−0.079**	−0.267***	−0.054	−0.142**	−0.117***	−0.216***	−0.085**	−0.184***	−0.094**
	(−3.31)	(−2.06)	(−3.80)	(−1.49)	(−2.45)	(−2.77)	(−4.80)	(−2.10)	(−4.21)	(−2.34)
INVESTOR_SIZE	0.003	−0.005***	0.003	−0.003**	0.001	−0.002	−0.000	−0.001	−0.002	−0.001
	(0.77)	(−2.83)	(0.94)	(−2.24)	(0.52)	(−0.89)	(−0.17)	(−0.67)	(−1.43)	(−0.72)
INVESTOR_AGE	−0.007**	0.002	−0.004	−0.003	−0.003	−0.003	−0.005**	−0.006*	−0.010***	0.001
	(−2.32)	(0.66)	(−0.79)	(−1.24)	(−0.21)	(−1.03)	(−1.96)	(−1.77)	(−3.14)	(0.21)
NO_STOCKS	−0.007	−0.007**	−0.022***	−0.006***	−0.008	−0.006*	−0.002	−0.009**	0.001	−0.009**
	(−1.47)	(−2.20)	(−2.65)	(−2.79)	(−1.47)	(−1.94)	(−0.67)	(−2.47)	(0.55)	(−2.45)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Investor-type fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Investor	Investor	Investor	Investor	Investor	Investor	Investor	Investor	Investor	Investor
No. of obs.	7,387	14,765	7,474	14,678	7,225	14,927	7,259	14,893	6,987	15,165
R^2	0.020	0.045	0.029	0.058	0.044	0.030	0.025	0.040	0.023	0.032
χ^2 test Diff in TRUST_INDEX	3.33*		7.81**		0.13		6.33**		3.20*	

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The results in Panel B of Table 3 reveal heterogeneity across investor types. We find a negative and significant effect of trust on local bias among smaller investors (column 1), investors with fewer holdings (column 3), older investors (column 5), investors with higher portfolio churn rates (column 7), and transient investors (column 9). Across the specifications, the effect of trust is significantly greater among these investors compared to their counterparts at the 10% level or better with the exception of the comparison between older and rest of the investors.

Consistent with our predictions, the evidence suggests a stronger relation between trust and local bias among investors that are likely to possess information advantages. We explore the possibility in more detail using the stock-level analysis in Section III.E.

D. Trust and Local Bias: Implications for Portfolio Diversification

Although these findings provide strong empirical support for the effect of trust on local bias, cultural explanations of economic phenomenon are traditionally viewed with skepticism (Zingales (2015)). To temper such concerns, we revisit the theory that motivates the relation between trust and local bias. Specifically, a natural implication of the trust explanation is that trust should improve portfolio diversification by increasing investment in distant firms. Because investors that lack trust are likely to exclude distant stocks, they are also likely to be underdiversified, providing a clear, testable prediction of our main hypothesis. We examine this prediction by creating two measures of portfolio diversification. Following Pool et al. (2012), we measure diversification using the idiosyncratic volatility of the portfolio. We calculate the idiosyncratic volatility (IVOL) for each investor in the following quarter by calculating the standard deviation of daily residual estimates from the CAPM. Because not all investors use the CAPM as their benchmark, this measure may be noisy. As underdiversified investors are likely to concentrate their portfolio holdings, we calculate a portfolio concentration measure (HERFINDAHL), defined as the sum of the squares of portfolio weights on individual stocks in the investor's portfolio.[11]

Consistent with this prediction, the results in Table 4 reveal that a lack of trust leads to greater underdiversification. Column 1 reports a statistically negative association between trust and idiosyncratic volatility. The inclusion of local demographic characteristics and economic conditions in column 2 yields similar findings. The coefficient estimate (-0.306, $t = -1.99$) indicates that for a 1- standard-deviation increase in TRUST_INDEX (0.069), IVOL decreases by 4.3% relative to the sample mean ($= -0.306 \times 0.069 \div 0.486$, where 0.486 is the sample mean of IVOL). We find similar results using idiosyncratic volatility based on the Fama–French (1993) 3-factor and Carhart (1997) 4-factor models, suggesting that the relation between trust and portfolio diversification is not due to differences in risk-factor exposure. Column 3 reports that investors in low-trust regions exhibit higher concentration using the HERFINDAHL measure. Our inferences are unchanged with controls for demographic and economic characteristics in

[11] Kacperczyk, Sialm, and Zheng (2005) show that mutual funds that have concentrated industry holdings earn higher returns.

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TABLE 4
Trust and Investor Portfolio Diversification

Table 4 reports results for the effect of social trust on investor portfolio diversification. We construct two measures of portfolio diversification at the investor level. The first measure is idiosyncratic volatility (IVOL), defined as the standard deviation of residuals from regressing portfolio returns on market returns. The second measure is the portfolio Herfindahl (HERFINDAHL), defined as the sum square of portfolio weights on individual stocks in an investor's portfolio. The dependent variable in columns 1 and 2 is IVOL, and the dependent variable in columns 3 and 4 is HERFINDAHL. Year and state fixed effects are included in all specifications. In columns 2 and 4, we control for state population characteristics, state economic conditions, and state security conditions. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Heteroscedasticity-robust standard errors are clustered at the investor level and *t*-statistics are reported in parentheses. Variables are defined in the Appendix.

	Dependent Variable: IVOL		Dependent Variable: HERFINDAHL	
Variable	1	2	3	4
TRUST_INDEX	−0.253**	−0.306**	−0.099***	−0.125***
	(−2.00)	(−1.99)	(−2.73)	(−2.74)
INVESTOR_SIZE	0.016***	0.016***	0.007***	0.007***
	(4.11)	(4.12)	(4.75)	(4.73)
INVESTOR_AGE	−0.022***	−0.022***	0.007***	0.007***
	(−4.34)	(−4.40)	(4.17)	(4.16)
NO_STOCKS	−0.184***	−0.184***	−0.059***	−0.059***
	(−28.52)	(−28.53)	(−23.29)	(−23.25)
POPULATION		0.323*		0.005
		(1.66)		(0.08)
MALE		−15.705**		−1.779
		(−2.38)		(−0.93)
SENIOR		6.935		2.162
		(1.46)		(1.53)
COLLEGE		10.765***		0.938
		(3.41)		(0.99)
HOUSEHOLD_INCOME		−0.645***		−0.008
		(−4.41)		(−0.18)
UNEMPLOYMENT		−2.531***		−0.311
		(−3.61)		(−1.59)
SC_INDEX		−0.206*		−0.008
		(−1.77)		(−0.22)
VIOLENT_CRIME		0.783		0.325
		(1.16)		(1.56)
PROPERTY_CRIME		−0.219		−0.089*
		(−1.18)		(−1.72)
Year fixed effects	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes
Cluster	Investor	Investor	Investor	Investor
No. of obs.	20,531	20,531	22,152	22,152
R^2	0.45	0.45	0.37	0.37

column 4. In this specification, the coefficient estimate of −0.125 ($t = -2.74$) implies that a 1-standard-deviation increase in TRUST_INDEX (0.069) reduces portfolio concentration by 14.6% relative to the sample mean ($= -0.125 \times 0.069 \div 0.059$, where 0.059 is the sample mean of HERFINDAHL).

Overall, the analysis in this subsection suggests that trust helps investors achieve greater portfolio diversification. This evidence is consistent with our main hypothesis and lends support to our main findings that a lack of trust increases local bias.

E. Trust and Local Ownership: Multivariate Stock-Level Analysis

To address the possibility that companies may systematically differ across high- and low-trust regions, we perform analysis at the stock level. We regress

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LOCAL_OWNERSHIP on TRUST_INDEX and control for firm size (FIRM_SIZE), market-to-book (MARKET_TO_BOOK), book leverage (LEVERAGE), profitability (PROFITABILITY), and cash holdings (CASH_HOLDING) in the baseline specifications. The regressions include year fixed effects to capture macroeconomic trends and industry fixed effects to capture industry shocks. We also include state fixed effects to capture persistent geographic/regional characteristics. Standard errors are clustered at the firm level.

The multivariate results in Panel A of Table 5 confirm the univariate results. Column 1 reports a statistically negative parameter estimate on TRUST_INDEX (-0.251, $t=-7.28$). The results are also economically important. A 1-standard-deviation increase in TRUST_INDEX (0.069) is associated with a 32% decrease in LOCAL_OWNERSHIP relative to the sample mean ($= -0.251 \times 0.069 \div 0.054 = 32.1\%$, where 0.054 is the sample average of LOCAL_OWNERSHIP). Our inferences are unchanged in column 2 with the inclusion of institutional ownership (IO), past 1-year return (STOCK_RETURN), stock return volatility (RETURN_VOL), and the Amihud (2002) illiquidity measure (ILLIQ). Consistent with prior studies, local ownership is greater in stocks with low market capitalization, low institutional ownership, low past returns, greater return volatility, and greater illiquidity.

Column 3 in Panel A of Table 5 augments the specifications to capture time-varying regional factors. The parameter estimate on TRUST_INDEX remains quantitatively and qualitatively similar after controlling for demographics, economic fluctuations, and security conditions. It is interesting to note that different measures of economic conditions have different directional effects on local bias. The results are similar with the inclusion of firm fixed effects in column 4, suggesting that unobserved firm heterogeneity is not driving our findings. Overall, the results indicate that the relation between trust and local ownership is robust to the inclusion of various firm or industry characteristics and different regression models.

Panel B of Table 5 reports that the relation between trust and local ownership is concentrated among stocks with relatively low national recognition. Column 1 reveals that the parameter estimate on TRUST_INDEX for small stocks is more than twice as large and significantly different from that for large stocks in column 2 (-0.389, $t=-4.46$ vs. -0.169, $t=-6.42$). The results are similar when examining S&P 500 index inclusion (columns 3 and 4), dividend payer (columns 5 and 6), and the existence of an S&P credit rating (columns 7 and 8). We also expect stronger effects of trust on local ownership for stocks with high information opacity. Using stock volatility to measure information opacity, we find that the effect of trust on local ownership is greater among stocks with high return volatility in columns 9 and 10.

F. Measuring Trust: International Evidence

Our identification strategy assumes that local institutional investors exhibit trust attitudes similar to those of the residents in their region. This identification approach is defensible because trust represents cultural attitudes between members of a social community. To the extent that institutional investors are members of the local community, their cultural attitudes should be correlated with those of

TABLE 5
Trust and Local Bias: Stock-Level Analysis

Table 5 reports results for the effect of trust on local ownership at the stock level. Panel A presents our baseline results. The control variables for firm characteristics include FIRM_SIZE, MARKET_TO_BOOK, LEVERAGE, PROFITABILITY, CASH_HOLDING, IO, STOCK_RETURN, RETURN_VOL, and ILLIQ. We control for state characteristics in columns 3 and 4. Year, state, and industry (2-digit Standard Industrial Classification [SIC]) fixed effects are included in different specifications. Column 4 presents the specification with firm fixed effects. Panel B presents subsample analyses by firm characteristics. Columns 1 and 2 separate the sample by the market value of assets (year-beginning market size, below/above sample tercile, small vs. large). Columns 3 and 4 separate the sample by whether the firm is in the S&P 500 index at the beginning of the year (yes vs. no). Columns 5 and 6 separate the sample by whether the firm pays dividends in the previous year (yes vs. no). Columns 7 and 8 separate the sample by whether the firm has an S&P long-term credit rating at the beginning of the year (yes vs. no). Columns 9 and 10 separate the sample by the stock return volatility in the previous year (below/above sample tercile, high vs. low). All specifications include year, industry, and state fixed effects. We perform χ^2 tests to test the differences in coefficients between subsamples (Diff in TRUST_INDEX). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Heteroscedasticity-robust standard errors are clustered at the firm level and *t*-statistics are reported in parentheses. Variables are defined in the Appendix.

Panel A. Baseline Results

	Dependent Variable: LOCAL_OWNERSHIP			
	1	2	3	4
TRUST_INDEX	−0.251***	−0.237***	−0.220***	−0.223***
	(−7.28)	(−7.03)	(−5.27)	(−5.52)
FIRM_SIZE	−0.022***	−0.006***	−0.006***	−0.010***
	(−23.77)	(−6.81)	(−6.88)	(−3.69)
MARKET_TO_BOOK	−0.002***	0.000	−0.000	−0.000
	(−3.86)	(0.23)	(−0.04)	(−1.09)
LEVERAGE	0.030***	0.005	0.006	0.011
	(4.03)	(0.73)	(0.86)	(1.21)
PROFITABILITY	−0.022***	−0.010*	−0.010*	−0.010
	(−3.24)	(−1.71)	(−1.69)	(−1.21)
CASH_HOLDING	−0.045***	−0.028***	−0.026***	−0.009
	(−6.22)	(−4.02)	(−3.79)	(−0.93)
IO		−0.045***	−0.046***	−0.018**
		(−7.55)	(−7.64)	(−2.14)
STOCK_RETURN		−0.011***	−0.011***	−0.009***
		(−8.65)	(−8.69)	(−7.12)
RETURN_VOL		0.332***	0.293***	0.355***
		(3.23)	(2.84)	(3.42)
ILLIQ		0.066***	0.066***	0.036***
		(13.07)	(13.13)	(5.92)
POPULATION			0.236***	0.011
			(4.14)	(1.57)
MALE			−1.186	0.576
			(−0.86)	(1.20)
SENIOR			0.390	0.073
			(0.31)	(0.27)
COLLEGE			1.494*	0.151
			(1.70)	(1.04)
HOUSEHOLD_INCOME			−0.368***	−0.116***
			(−6.86)	(−3.14)
UNEMPLOYMENT			−0.302	−0.394*
			(−1.60)	(−1.93)
SC_INDEX			−0.065*	−0.002
			(−1.90)	(−0.07)
VIOLENT_CRIME			−0.084	−0.461**
			(−0.34)	(−2.10)
PROPERTY_CRIME			−0.240***	−0.146***
			(−4.76)	(−3.48)
Year fixed effects	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	–
Industry fixed effects	Yes	Yes	Yes	–
Firm fixed effects	–	–	–	Yes
Cluster	Firm	Firm	Firm	Firm
No. of obs.	38,138	38,138	38,138	38,138
R^2	0.12	0.16	0.17	0.62

(continued on next page)

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TABLE 5 (continued)
Trust and Local Bias: Stock-Level Analysis

Panel B. Heterogeneity across Firm Characteristics

	Dependent Variable: LOCAL_OWNERSHIP									
	Firm Size		S&P 500		Dividend Payer		With Credit Rating		Stock Volatility	
	Small	Large	Yes	No	Yes	No	Yes	No	High	Low
	1	2	3	4	5	6	7	8	9	10
TRUST_INDEX	−0.389***	−0.169***	−0.028	−0.266***	−0.086*	−0.317***	−0.065*	−0.295***	−0.378***	−0.153***
	(−4.46)	(−6.42)	(−0.76)	(−6.98)	(−1.96)	(−6.81)	(−1.91)	(−6.48)	(−4.70)	(−4.77)
Controls										
FIRM_SIZE	−0.029***	−0.003***	−0.004**	−0.010***	−0.003**	−0.011***	−0.001	−0.013***	−0.017***	−0.004***
	(−6.98)	(−3.22)	(−2.26)	(−6.85)	(−2.36)	(−7.24)	(−1.09)	(−7.53)	(−7.51)	(−3.98)
MARKET_TO_BOOK	−0.005***	0.001	−0.000	−0.000	0.000	−0.001*	−0.000	−0.000	−0.001***	0.002**
	(−4.36)	(1.59)	(−0.67)	(−0.53)	(0.10)	(−1.65)	(−0.16)	(−1.02)	(−3.25)	(2.25)
LEVERAGE	0.053***	−0.006	−0.006	0.012	−0.007	0.015*	−0.002	0.012	0.028**	0.001
	(3.33)	(−0.90)	(−0.65)	(1.56)	(−0.64)	(1.74)	(−0.19)	(1.26)	(2.30)	(0.08)
PROFITABILITY	−0.003	−0.001	−0.004	−0.009	0.004	−0.011*	−0.034**	−0.006	−0.001	−0.021*
	(−0.53)	(−0.14)	(−0.25)	(−1.50)	(0.23)	(−1.87)	(−2.06)	(−0.98)	(−0.12)	(−1.78)
CASH_HOLDING	−0.034***	−0.005	−0.022	−0.028***	−0.030*	−0.027***	−0.003	−0.026***	−0.026***	−0.022**
	(−2.73)	(−0.83)	(−1.17)	(−3.86)	(−1.75)	(−3.43)	(−0.21)	(−3.38)	(−2.58)	(−2.45)
IO	−0.098***	−0.023***	−0.028*	−0.042***	−0.025**	−0.042***	−0.016*	−0.045***	−0.057***	−0.030***
	(−6.68)	(−3.49)	(−1.82)	(−6.41)	(−2.09)	(−6.25)	(−1.87)	(−5.87)	(−5.60)	(−4.28)
STOCK_RETURN	−0.015***	−0.007***	−0.007***	−0.011***	−0.008***	−0.010***	−0.006***	−0.012***	−0.011***	−0.009***
	(−5.15)	(−5.66)	(−3.04)	(−7.89)	(−3.43)	(−7.65)	(−3.89)	(−7.67)	(−6.03)	(−5.78)
STOCK_VOL	0.263*	0.168*	0.028	0.324***	0.097	0.316***	−0.226	0.341***	0.373**	−0.194
	(1.69)	(1.80)	(0.17)	(3.05)	(0.39)	(2.75)	(−1.27)	(2.97)	(2.49)	(−0.95)
ILLIQ	0.042***	0.065***	−0.122	0.062***	0.081***	0.060***	0.105***	0.057***	0.049***	0.080***
	(6.85)	(3.87)	(−1.32)	(11.79)	(6.18)	(10.90)	(3.77)	(10.82)	(8.02)	(9.01)
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
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm
No. of obs.	12,715	25,415	4,934	33,197	12,659	25,472	11,067	27,064	12,716	25,415
χ^2 test Diff in TRUST_INDEX	5.95**		20.17***		13.19***		16.71***		7.04**	

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their social environment. We propose an alternative approach using country-level aggregate equity portfolio flows and measures of trust. To the degree that there are no issues with aggregation, such analysis pairs well with the within-country U.S. evidence by providing both out-of-sample evidence and external validity.

We collect data on international equity portfolio flows (inbound and outbound) from the Coordinated Portfolio Investment Survey prepared by the IMF. We collect total market capitalization from official World Bank statistics and convert all units to U.S. dollars for comparison. Home bias is calculated for each country as the percentage of total equity holdings held in domestic equities minus the fraction of domestic equities of total world equities. Country-level trust is measured from the WVS following the same method discussed earlier.

Figure 2 shows a scatter plot of country-level home bias against country-level trust for the 2005 year-end. Consistent with our U.S.-based analysis, the plot shows a strong negative pattern between home bias and trust. The R^2 of the univariate regression is 0.37, and the slope is -0.50. Although this admittedly simple analysis is open to omitted-variable concerns[12] regarding cross-country differences, it provides an important out-of-sample evidence of the external validity of our key finding.

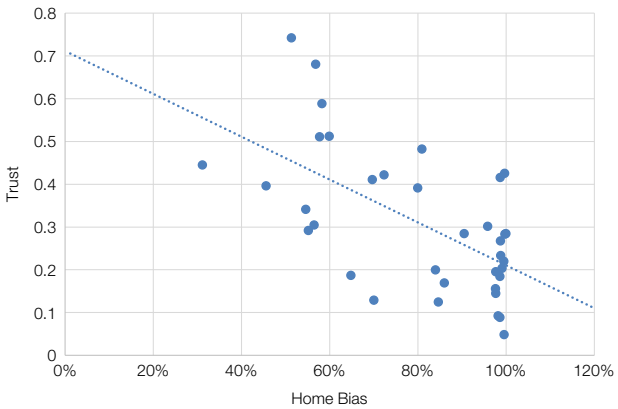
G. Measuring Trust: Using Individual Respondent Characteristics

As discussed previously, TRUST_INDEX measures social trust rather than investor trust. We provide additional evidence by reconstructing TRUST_INDEX to more closely represent the trust attitudes of local institutional managers. We expect that professional money managers and stock market participants are likely

FIGURE 2

Cross-Country Relation between Home Bias and Trust

Figure 2 shows a scatter-plot of the country-level TRUST_INDEX and home bias in the 2005. TRUST_INDEX is calculated as the percentage of World Values Survey (wave 5, 2005–2009) respondents answering "Most people can be trusted" to the survey question, "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" Home bias is calculated for each country as the percentage of total equity holdings held in domestic equities minus the fraction of domestic equities of total world equities. *Source:* Coordinated Portfolio Survey, International Monetary Fund.



[12] We provide a full discussion of omitted-variable concerns in Section IV.

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to share similar demographic characteristics. Research shows that stock market participants tend to be male, older, wealthier, and better educated. In the United States, Whites/Caucasians are more likely to participate in the stock market (Blau and Graham (1990), Hong, Kubik, and Stein (2005)). Because the WVS provides individual characteristics, we recompose TRUST_INDEX along these demographic dimensions and reestimate our baseline local ownership regressions using the demographic-based trust indices. Our inferences are unchanged using this measure. The results are available in the Supplementary Material.

H. Measuring Trust: Using GSS Data

Although we use three waves of the WVS, each wave is conducted by the same organization using a roughly similar approach. In this section, we repeat our local ownership analysis using the GSS, which is a separately conducted U.S.-only survey. The GSS occurs approximately every 2 years, which helps address time gaps, and provides each respondent's state location to improve precision. Our findings are similar using the state-level trust measure from GSS and are available in the Supplementary Material. The GSS results help address concerns of the WVS relating to i) sample frequency, ii) precision, and iii) reliability. They also assure that our findings can be replicated using a different source.

I. Measuring Trust: Robustness Tests

We provide additional robustness tests to address concerns regarding the WVS trust measure. First, because the WVS has long time gaps of 5 to 6 years between waves, our main tests use a trust measure that interpolates values between each wave. However, this approach raises concerns of measurement noise. Therefore, we repeat our key tests using a noninterpolated trust measure and find that our main inferences are unchanged. The results are available in the Supplementary Material.

Second, the trust measure produces sharp differences across neighboring states because of the way states are grouped by U.S. geographic regions in the WVS. The WVS state groups are roughly based on U.S. Census Bureau division definitions. However, this categorization creates unexpected differences in the trust measure among neighboring states, possibly creating noise and imprecise measurement of trust.[13] We perform the following analysis to explore the seriousness of this issue. We regroup certain border states using a different regional classification system from the Bureau of Economic Analysis that clusters states on the basis of economic similarity.[14] Their regional state groups are arguably more consistent with cultural similarities that we may expect within regions in the United States. Compared to the baseline results, we find similar parameter estimates on the trust measure, and in some cases, the standard errors are lower.

[13]For example, we may expect Arkansas and Louisiana to be more culturally similar to bordering Southern states (e.g., Mississippi) than to Texas and Oklahoma. Seven of nine Census Bureau divisions contain the same states as the corresponding WVS regions. The difference occurs in the West, where the WVS separates California into its own region and flips Idaho and Nevada between the Rocky Mountain and Western regions.

[14]Specifically, we include i) Arkansas and Louisiana in the East South-Central region; ii) Delaware, Maryland, and Washington, D.C. in the Middle Atlantic region; iii) Idaho in the Rocky Mountain region; and iv) New Mexico in the West South Central region.

A third concern is that a few states, namely, those where large investors reside, drive our results. To assess this possibility, we exclude investors located in New York, Massachusetts, and California and reestimate our main specifications. Although removing these states cuts the sample by nearly half, we continue to find a significant relation between trust and local bias.

IV. Trust and Local Bias: Information Advantage

In this section we study whether the relation between trust and local bias reflects an information advantage, which builds on our earlier evidence that the relation between trust and local bias is stronger among investors who are better able to adapt quickly to investment opportunities that arise from local knowledge. The trust explanation has a specific prediction in this regard for the information content of local ownership. When investors lack sufficient trust, they require better knowledge and/or information advantages in their investment decisions. If more local knowledge helps overcome this barrier, we expect information advantages to play a larger role in the local ownership of investors in low-trust regions.

A. Portfolio Sorts

We first confirm that higher local ownership is associated with better performance in our sample. Our procedure is as follows: At the beginning of each month, we sort stocks into 5 portfolios based on previous quarter-end local ownership.[15] Then, we calculate the average return of stocks in each portfolio for the month. For each portfolio, we have 144 monthly return observations from 1996 to 2007. To adjust for risk, we use the CAPM, Fama–French (1993) 3-factor model, and Carhart (1997) 4-factor model that includes the momentum factor to estimate portfolio risk-adjusted returns (i.e., alphas) accordingly.

Panel A of Table 6 reports that the lowest local ownership portfolio (portfolio 1) has average LOCAL_OWNERSHIP of −9.1%, whereas the highest local ownership portfolio (portfolio 5) has average LOCAL_OWNERSHIP of 35.6%. The average monthly return increases from 100 basis points (bps) in portfolio 1 to 132 bps in portfolio 5. The difference between portfolio 5 and portfolio 1 is 32 bps per month ($t = 3.20$), which translates to an annualized outperformance of approximately 4%. The results are similar using risk-adjusted returns across different factor models and are consistent with the findings in Baik et al. (2010).

Our main focus is on portfolio return differences across low- and high-trust regions. We split stocks into high- or low-trust regions and create 5 portfolios based on the previous quarter-end institutional local bias within each region. Our results are both quantitatively and qualitatively similar when sorting independently on high- or low-trust regions and LOCAL_BIAS. A geographic region is defined as high (low) trust if TRUST_INDEX is above (below) the sample median at the beginning of each calendar year.

Panel B of Table 6 reports large return patterns for low-trust, region-based portfolios. The long–short portfolio (long portfolio 5 and short portfolio 1)

[15] The sample includes firms that are held by at least one local investor for the construction of the local ownership measure. Our results in this section are quantitatively similar using the fraction of local ownership (without benchmark adjustment) to sort portfolios as in Baik et al. (2010).

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TABLE 6

Portfolio Returns Sorted by Local Ownership

Table 6 reports the returns of stock portfolios sorted by local ownership as previously defined at the firm level. At each month-beginning from Jan. 1996 to Dec. 2007, stocks are sorted into quintiles based on the previous quarter-end local ownership. Portfolio 1 has the lowest ownership and portfolio 5 has the highest ownership. Equal-weighted returns for the 5 portfolios are calculated over each month. The total number of months is 144. Panel A reports portfolio returns of stocks sorted by local ownership for the full sample of stocks. For each portfolio, we report average LOCAL_OWNERSHIP, raw average portfolio return (Raw Return), abnormal return from the capital asset pricing model 1-factor model (CAPM Alpha), abnormal return from the Fama–French (1993) 3-factor model (Fama–French Alpha), and abnormal return from the Carhart (1997) 4-factor model (Carhart Alpha). The row labeled "Long portfolio 5 & short portfolio 1" reports the difference in returns between the highest and lowest local ownership portfolios. We report the raw return, CAPM Alpha, Fama–French Alpha, and Carhart Alpha for the long–short portfolio accordingly. Panels B and C report portfolio returns of stocks sorted by LOCAL_OWNERSHIP in the same way as in Panel A, but separately consider stocks located in the low- and high-trust regions, respectively, to calculate portfolio returns (dependent sorting). A stock is classified in the low-trust region (high-trust region) if TRUST_INDEX in the previous year is below (above) sample median. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are used, and *t*-statistics are given in parentheses.

Portfolio	Average LOCAL_OWNERSHIP	Raw Return	CAPM Alpha	Fama–French Alpha	Carhart Alpha
Panel A. Portfolio Returns of Portfolios Sorted by Local Ownership					
Portfolio 1	−0.091	0.0100	0.0006	−0.0002	0.0029
			(0.20)	(−0.14)	(1.36)
Portfolio 2	−0.014	0.0112	0.0024	−0.0006	0.0018*
			(1.11)	(−0.44)	(1.91)
Portfolio 3	0.011	0.0105	0.0020	−0.0008	0.0009
			(1.05)	(−0.81)	(1.04)
Portfolio 4	0.076	0.0122	0.0034	0.0013	0.0035***
			(1.44)	(1.00)	(3.04)
Portfolio 5	0.356	0.0132	0.0046	0.0035	0.0064**
			(1.48)	(1.60)	(2.53)
Long portfolio 5 & short portfolio 1		0.0032***	0.0040***	0.0038***	0.0035***
		(3.20)	(4.99)	(4.54)	(3.87)
Panel B. Portfolio Returns of Portfolios Sorted by Local Ownership in Low-Trust Regions					
Portfolio 1	−0.071	0.0108	0.0003	−0.0006	0.0035*
			(0.09)	(−0.24)	(1.71)
Portfolio 2	−0.011	0.0106	0.0013	−0.0020	0.0007
			(0.53)	(−1.22)	(0.62)
Portfolio 3	0.009	0.0112	0.0023	−0.0008	0.0012
			(1.02)	(−0.57)	(1.08)
Portfolio 4	0.064	0.0134	0.0034	0.0014	0.0041***
			(1.15)	(0.84)	(2.89)
Portfolio 5	0.325	0.0166	0.0063	0.0052**	0.0089***
			(1.51)	(1.96)	(3.39)
Long portfolio 5 & short portfolio 1		0.0058***	0.0059***	0.0058***	0.0054***
		(3.33)	(3.42)	(3.55)	(3.09)
Panel C. Portfolio Returns of Portfolios Sorted by Local Ownership in High-Trust Regions					
Portfolio 1	−0.106	0.0120	0.0021	0.0010	0.0043
			(0.53)	(0.38)	(1.57)
Portfolio 2	−0.023	0.0106	0.0018	−0.0012	0.0021
			(0.71)	(−0.61)	(1.51)
Portfolio 3	0.005	0.0104	0.0018	−0.0009	0.0010
			(0.89)	(−0.65)	(0.82)
Portfolio 4	0.055	0.0113	0.0022	−0.0001	0.0027**
			(0.81)	(−0.08)	(2.06)
Portfolio 5	0.306	0.0128	0.0036	0.0020	0.0059**
			(0.93)	(0.72)	(1.99)
Long portfolio 5 & short portfolio 1		0.0008	0.0015	0.0010	0.0016
		(0.53)	(1.09)	(0.74)	(1.16)

generates an average monthly return of 58 bps ($t = 3.33$), which is nearly double the size of the full sample return spread (32 bps). Risk-adjusted returns show similar patterns across various factor models: CAPM (59 bps, $t = 3.42$),

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Fama–French (1993) 3-factor model (58 bps, $t = 3.55$), and Carhart (1997) 4-factor model (54 bps, $t = 3.09$). These patterns translate to an average annualized abnormal return of 6.5% using the Carhart 4-factor model. For the highest local ownership portfolio, the alpha estimate increases with the inclusion of the momentum factor. This increase occurs because the portfolio loads negatively on the momentum factor (the portfolio contains stocks that are relative "losers") and is consistent with the view that local investors in low-trust regions display an ability to select stocks that performed poorly but subsequently rebound. This reversal pattern provides additional support for the claim that local ownership has information content, because studies show that past losers have low expected returns on average (Conrad and Kaul (1998)).

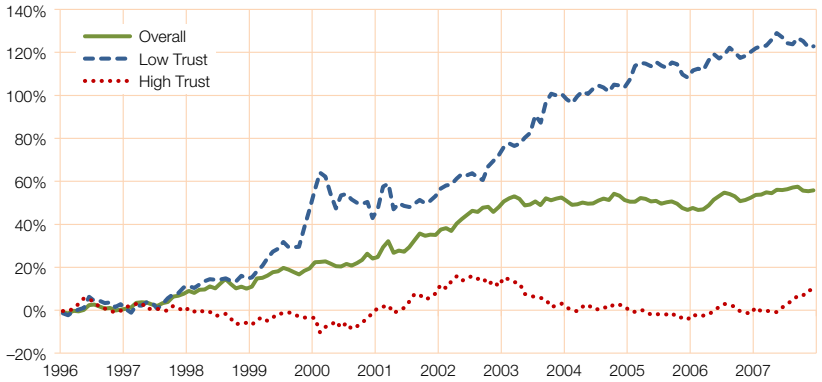
In contrast, there is no abnormal return pattern for high-trust, region-based portfolios. Panel C of Table 6 reports a statistically insignificant ($t = 0.53$) raw return difference between portfolio 5 and portfolio 1 of 8 bps per month. The results for risk-adjusted returns remain small and insignificant across factor models: CAPM (15 bps, $t = 1.09$), Fama–French (1993) 3-factor model (10 bps, $t = 0.74$), and Carhart (1997) 4-factor model (16 bps, $t = 1.11$).

Figure 3 plots the time-series cumulative raw returns of long–short portfolios sorted by local ownership for the overall sample, low-trust subsample, and high-trust subsample. From Jan. 1996 to Dec. 2007, the cumulative long–short portfolio return reaches more than 120% for the low-trust subsample but is close to 0 for the high-trust subsample. Our findings are consistent with the prediction from the trust explanation that the information content of local ownership portfolios is concentrated in low-trust regions.

FIGURE 3

Cumulative Returns: Long–Short Portfolios of Stocks Sorted by Local Ownership

Figure 3 shows cumulative returns of long–short portfolios of stocks sorted by local ownership for the low- and high-trust subsamples. At each month-beginning from Jan. 1996 to Dec. 2007, stocks are sorted into quintiles based on the previous quarter-end local ownership, and the average return of each portfolio is calculated. The return of the long–short portfolio is calculated as the return of the highest local ownership portfolio (P5) minus the lowest local ownership portfolio (P1).



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B. Removing the Influence of Regional Factors

To address the concern that regional factors are behind these return patterns, we orthogonalize TRUST_INDEX from demographic and economic state characteristics using the following method. Based on 571 state-year observations, in each year, we regress the raw TRUST_INDEX on state characteristics including state population characteristics (i.e., population size, fraction of male population, fraction of junior population, fraction of senior population, and fraction with college degrees), state economic conditions (i.e., median household income, per capita GDP, unemployment rate, and state coincident index), and state security conditions (i.e., violent crime rate and property crime rate) using the regression residual as the orthogonalized TRUST_INDEX. Then, following the earlier sorting procedure, we split the sample into high- and low-trust regions based on annual median using the orthogonalized TRUST_INDEX.

The orthogonalized TRUST_INDEX produces similar results in Table 7. Panel A reports that in low-trust regions, the long–short portfolio sorted by institutional local bias generates a Carhart (1997) 4-factor return of 65 bps ($t = 3.03$) per month. This return is in direct contrast to the high-trust region results in Panel B, which reveal an insignificant 0.01 bps ($t = 0.04$) return per month. The patterns are similar based on raw returns and other factor model adjusted returns. Additional robustness tests exclude penny stocks (stocks with prices less than \$1) and microcap stocks (market capitalization less than \$50 million or less than \$100 million) and omit January (to avoid tax-loss selling return effects). We continue to find that the outperformance of local ownership portfolios only exists in low-trust regions.

C. Understanding the Nature of Information Advantages

The relation between local ownership and future returns suggests that investors in low-trust areas possess information advantages that may arise from their geographic advantages in monitoring local companies and/or gathering valuable information from local sources (e.g., customers, suppliers, and employees). In this section we perform tests to better understand the nature of their information advantages.

1. Earnings Announcements

To explore the extent to which local ownership in low-trust regions reflects private information, we focus on earnings announcements, because public disclosure of earnings news reveals private information to the rest of the market. Specifically, we test the hypothesis that if the relation between trust and local bias reflects an information advantage, local ownership predicts higher earnings surprises in low-trust regions compared to high-trust regions. We investigate this possibility by estimating earnings surprise as the difference between the actual earnings minus the analyst forecast consensus divided by the stock price. Using the main stock-level specifications from Table 5, we regress earnings surprises on local ownership separately for stocks located in high- and low-trust regions.

The results in Panel A of Table 8 are consistent with the private information interpretation. Comparing column 1 with column 2, we find a positive and significant relation between local bias and earnings surprise only in the low-trust region.

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TABLE 7

Portfolio Returns Sorted by Local Ownership Using the Orthogonalized Trust Index

Table 7 reports robustness tests for the returns of stock portfolios sorted by local ownership in low- and high-trust regions (dependent sorting). Instead of using the raw TRUST_INDEX in the main specifications, these tests use an orthogonalized TRUST_INDEX to identify high- and low-trust regions. Based on 571 state-year observations, in each year the raw trust index is regressed on various state characteristics including state population characteristics (i.e., population size, fraction of male population, fraction of junior population, fraction of senior population, fraction with college degrees), state economic conditions (i.e., median household income, per capita gross domestic product, unemployment rate, state coincident index), and state security conditions (i.e., violent crime rate and property crime rate), and compute the regression residual as the orthogonalized TRUST_INDEX. A stock is classified in the low-trust region (high-trust region) if TRUST_INDEX in the previous year is below (above) the sample median. For each portfolio, we report average LOCAL_OWNERSHIP, raw average portfolio return (Raw Return), abnormal return from the capital asset pricing model 1-factor model (CAPM Alpha), abnormal return from the Fama–French (1993) 3-factor model (Fama–French Alpha), and abnormal return from the Carhart (1997) 4-factor model (Carhart Alpha). The row labeled "Long portfolio 5 & short portfolio 1" reports the difference in returns between the highest and lowest local ownership portfolios. The total number of months is 144. Panel A reports the returns of portfolios based on stocks located in low-trust regions. Panel B reports the returns of portfolios based on stocks located in high-trust regions. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are used, and *t*-statistics are given in parentheses.

Portfolio	Average LOCAL_OWNERSHIP	Raw Return	CAPM Alpha	Fama–French Alpha	Carhart Alpha
Panel A. Portfolio Returns of Portfolios Sorted by Local Ownership in Low Trust Regions (using orthogonalized TRUST_INDEX)					
Portfolio 1	−0.075	0.0101	−0.0007	−0.0012	0.0029
			(−0.19)	(−0.50)	(1.45)
Portfolio 2	−0.015	0.0113	0.0017	−0.0011	0.0016
			(0.67)	(−0.68)	(1.30)
Portfolio 3	0.008	0.0113	0.0021	−0.0005	0.0014
			(0.87)	(−0.33)	(1.09)
Portfolio 4	0.064	0.0132	0.0027	0.0011	0.0039**
			(0.83)	(0.59)	(2.37)
Portfolio 5	0.301	0.0164	0.0056	0.0052*	0.0094***
			(1.21)	(1.74)	(3.09)
Long portfolio 5 & short portfolio 1		0.0064***	0.0063***	0.0064***	0.0065***
		(3.08)	(3.01)	(3.41)	(3.03)
Panel B. Portfolio Returns of Portfolios Sorted by Local Ownership in High-Trust Regions (using orthogonalized TRUST_INDEX)					
Portfolio 1	−0.084	0.0122	0.0024	0.0011	0.0047*
			(0.69)	(0.48)	(1.88)
Portfolio 2	−0.012	0.0107	0.0021	−0.0014	0.0020
			(0.86)	(−0.76)	(1.45)
Portfolio 3	0.007	0.0106	0.0023	−0.0009	0.0011
			(1.15)	(−0.73)	(1.11)
Portfolio 4	0.053	0.0124	0.0036	0.0010	0.0036***
			(1.58)	(0.74)	(3.48)
Portfolio 5	0.284	0.0122	0.0032	0.0009	0.0047*
			(0.94)	(0.38)	(1.83)
Long portfolio 5 & short portfolio 1		0.0000	0.0008	−0.0002	0.0001
		(0.00)	(0.58)	(−0.15)	(0.04)

The difference in coefficient estimates on local bias across the two specifications is significant at the 10% level. Our inferences are similar in columns 3 and 4 with the inclusion of industry fixed effects. If local investors trade local stocks based on information, we expect the change in local bias to be a good indicator for private information. In unreported tests, we find similar results using a specification with firm fixed effects to approximate the change in local bias. Overall, this analysis provides evidence that investors in low-trust areas possess valuable private information.

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TABLE 8
Trust and Local Bias: Potential Information Channels

Table 8 reports results from tests of potential information channels. Panel A reports results for the relation between local ownership and earnings surprise in the following quarter. We perform the analyses at the stock level, comparing stocks located in high-trust regions versus low-trust regions. A stock is classified in the low-trust region (high-trust region) if TRUST_INDEX in the previous year is below (above) sample median. EARNINGS_SURPRISE is the difference between the actual earning minus the analyst forecast consensus divided by the stock price before the earnings announcement date. For a given stock, we calculate the fraction of holdings held by local investors divided by the amount of total institutional holdings of the stock. LOCAL_OWNERSHIP is defined as the difference between the local holdings fraction and the benchmark fraction by local investors assuming every investor is holding the market portfolio. Columns 1 and 2 reports stocks headquartered in low-trust regions, and columns 3 and 4 report stocks headquartered in high-trust regions. We perform χ^2 tests to test the differences in coefficients between subsamples. Panel B reports results using the sample of institutional investors located close to top-ranked state golf courses. We proceed as follows: In each state, we obtain location information for the top 20 golf courses from http://www.golflink.com/top-golf-courses/. For each institutional investor, we calculate the "distance-to-golf" as the average distance between the investor and the 20 golf courses. Then, we select a subsample of institutional investors (close-to-golf investors) whose distance to golf is below the state median. Next, we follow the previous method and define close-to-golf local ownership as the difference between the local investment and the benchmark investment by the local close-to-golf investors. We present portfolio returns sorted by close-to-golf local ownership for stocks in low- and high-trust regions separately. Portfolio 1 (5) has the lowest (highest) close-to-golf local ownership. For each portfolio, we report average LOCAL_OWNERSHIP, raw average portfolio return (Raw Return), abnormal return from the capital asset pricing model 1-factor model (CAPM Alpha), abnormal return from the Fama–French (1993) 3-factor model (Fama–French Alpha), and abnormal return from the Carhart (1997) 4-factor model (Carhart Alpha). The row labeled "Long portfolio 5 & short portfolio 1" reports the difference in returns between portfolio 5 and portfolio 1. For brevity, we report only the results for portfolio 1, portfolio 5, and the long–short portfolio, respectively. The total number of months in Panel B is 144. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Heteroscedasticity-robust standard errors are clustered at the firm level and *t*-statistics are reported in parentheses. Variables are defined in the Appendix.

Panel A. Earnings Surprise in High/Low-Trust Regions

	Dependent Variable: EARNINGS_SURPRISE			
Variable	1 Low-Trust Region	2 High-Trust Region	3 Low-Trust Region	4 High-Trust Region
LOCAL_OWNERSHIP	0.100** (2.49)	0.005 (0.12)	0.107*** (2.65)	0.006 (0.13)
FIRM_SIZE	0.017*** (5.16)	0.015*** (5.14)	0.016*** (4.46)	0.017*** (5.32)
MARKET_TO_BOOK	−0.001* (−1.73)	−0.009*** (−6.63)	−0.001 (−1.61)	−0.009*** (−6.20)
LEVERAGE	−0.012 (−0.47)	−0.035 (−1.53)	−0.029 (−1.09)	−0.036 (−1.45)
PROFITABILITY	0.027 (1.06)	0.017 (0.60)	0.049* (1.81)	−0.008 (−0.29)
CASH_HOLDING	0.145*** (6.30)	0.147*** (6.60)	0.139*** (5.80)	0.142*** (6.15)
NO_ANALYSTS	0.000 (0.07)	−0.000 (−0.07)	0.004 (0.56)	0.000 (0.05)
IO	0.022 (1.29)	0.005 (0.30)	0.017 (0.99)	−0.005 (−0.28)
STOCK_RETURN	0.029*** (5.32)	0.024*** (4.84)	0.028*** (5.20)	0.024*** (4.66)
RETURN_VOL	−0.894** (−2.38)	0.560 (1.54)	−0.441 (−1.12)	0.475 (1.26)
ILLIQ	−0.006 (−0.15)	−0.033 (−1.10)	−0.016 (−0.44)	−0.035 (−1.13)
Year-quarter fixed effects	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	–	–	Yes	Yes
Cluster	Firm	Firm	Firm	Firm
No. of obs.	40,790	43,547	40,790	43,547
R^2	0.01	0.01	0.02	0.01
χ^2 test Diff. in TRUST_INDEX	2.73*		3.09*	

(continued on next page)

TABLE 8 (continued)
Trust and Local Bias: Potential Information Channels

Panel B. Portfolio Returns of Portfolios Sorted by Close-to Golf LOCAL_OWNERSHIP

	Average LOCAL_OWNERSHIP	Raw Return	CAPM Alpha	Fama–French Alpha	Carhart Alpha
Low-Trust Regions					
Portfolio 1	−0.090	0.0106	−0.0005	−0.0009	0.0037*
			(−0.14)	(−0.35)	(1.95)
Portfolio 5	0.425	0.0191	0.0086*	0.0077***	0.0112***
			(1.95)	(2.74)	(3.97)
Long portfolio 5 & short portfolio 1		0.0084***	0.0091***	0.0086***	0.0075***
		(3.77)	(4.28)	(3.84)	(3.23)
High-Trust Regions					
Portfolio 1	−0.128	0.0128	0.0029	0.0017	0.0053**
			(0.77)	(0.68)	(2.18)
Portfolio 5	0.342	0.0122	0.0026	0.0013	0.0053**
			(0.67)	(0.50)	(2.03)
Long portfolio 5 & short portfolio 1		−0.0006	−0.0003	−0.0004	0.0000
		(−0.37)	(−0.22)	(−0.25)	(0.01)

2. Do Investors in Low-Trust Regions Have Better Social Connections?

Social connections with the local business community can facilitate the gathering of valuable information or monitoring of local companies. Studies show that social connections are an important source of private information. For example, Cohen, Frazzini, and Malloy (2008) find that mutual fund managers earn abnormal returns on stocks where they have social ties with the firm's CEO. Although identifying such types of direct social connection would be ideal, doing so is a considerable challenge in our setting because institutions often have multiple funds and managers. For many of these nonmutual fund institutions, the managers cannot be readily identified.

Instead, we take a different empirical approach that is motivated by the following description in Coval and Moskowitz (2001): "Mutual fund managers and local corporate executives may run in the same circles, belong to the same country club, and so forth" (p. 839). We conjecture that country clubs provide a natural venue for facilitating interactions and building social connections. Because it is more convenient to visit nearby country clubs, proximity may proxy for variation in social connections. We implement this idea by using the rankings of golf courses by Golflink.com to calculate the average distance to highly ranked, "prestigious" golf courses in the state.[16] We focus on these highly ranked golf courses because they are likely to have country clubs and host social functions and gatherings.

We repeat our portfolio return analysis by sorting stocks within low- and high-trust regions into quintile portfolios based on local ownership calculated using investors that are proximate to prestigious country clubs and golf courses. Although we cannot observe direct social connections in this setting, we should observe two effects from information acquisition through social connections: i) the highest quintile "close-to-golf" local ownership portfolio should have higher

[16]For each institutional investor, we calculate the distance-to-golf as the average distance between the investor and the top 20 ranked state golf courses. Then, we form the subsample of investors based on whether their distance-to-golf is below the median among all investors in the same state.

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total local ownership and ii) greater information content in local ownership, which should produce larger abnormal returns in the long–short local ownership portfolios.

Consistent with our assertion that proximity to prestigious golf courses facilitates social connections, Panel B of Table 8 reports that the highest quintile close-to-golf local ownership portfolio exhibits higher local ownership compared to original local ownership sorts (0.425 vs. 0.325) in low-trust regions. The return patterns are also consistent with this view, as the Carhart (1997) 4-factor alpha reaches 9% per annum for the long–short portfolio of stocks sorted on close-to-golf local ownership in low-trust regions. The corresponding long–short portfolio in high-trust regions exhibits no significant abnormal returns.

Overall, the results suggest a link between social connections and the information advantages we document, but we interpret these findings cautiously. A limitation of this analysis is that the building of social connections at these country clubs remains unobservable. Because this setting relies on variation in proximity to country clubs, other geographic characteristics that are difficult to rule out may also affect these findings.

3. Privileged Access? Evidence from Reg FD

The superior performance of local ownership portfolios in low-trust regions could be due to privileged access to information. To explore this possibility, we use the implementation of Reg FD. Reg FD was adopted by the SEC in Aug. 2000 to curb the selective disclosure of material nonpublic information by firms to analysts and institutional investors. The purpose of Reg FD is to prohibit potential quid pro quo arrangements that may be a source of privileged information.

First, we analyze the univariate change in local ownership in the pre- and post-Reg FD periods (i.e., before and after 2001). The overall level of local ownership drops after the implementation of Reg FD in both high- and low-trust regions (Bernile, Kumar, Sulaeman, and Wang (2019)), but the drop is greater in high-trust regions. We find these patterns are similar in a multivariate setting. Because there is time-series variation in local ownership, we ask whether local ownership still contains information content in the post-Reg FD era. Portfolio sorts show that the information advantages of low-trust investors remain after Reg FD. Based on the risk-adjusted return from the Carhart (1997) 4-factor model, a long–short portfolio of stocks sorted on local bias exhibits significant outperformance in both the pre- and post-Reg FD periods in low-trust regions. This result suggests that the information advantage of institutional investors in low-trust regions is not solely driven by selective disclosure of material information, as their information advantage is not eliminated by Reg FD. We provide further details of this analysis in the Supplementary Material.

V. Additional Tests and Alternative Explanations

This section provides additional tests that address issues surrounding the measurement of trust and alternative explanations for our main findings.

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A. Omitted Variables and Alternative Explanations

In this section we discuss how our identification strategy helps mitigate omitted-variable concerns. Our trust interpretation may be confounded by unobserved heterogeneity across geographic regions including societal characteristics (e.g., urbanization and segregation) or investor sophistication. However, these explanations are unlikely for the following reasons. The state fixed effects in our main specifications washes out persistent geographic heterogeneity. Our specifications also capture time-varying fluctuation in local crime rates, demographics, and economic conditions. In the local ownership analysis, we estimate firm fixed-effect regressions that should address the possibility that our results are due to persistent differences in firm characteristics.

Investor sophistication is also an unlikely candidate. First, we use a direct firm-level proxy for investor sophistication with the institutional ownership measure. Second, region-level investor sophistication is likely captured by time-varying measures of income, GDP, and education. Although it is difficult to rule out all possible omitted variables, the following analysis provides further evidence to address a few of the most likely candidates.

B. Alternative Interpretation: Trust and Information Transparency

An alternative interpretation of our findings is that trust facilitates the collection and dissemination of information, lowering the costs of investing. As a result, stocks in high-trust regions attract more investment from distant investors. It is plausible that both forces, the "pull" of distant investors and the "push" to invest in distant stocks, affect the relation between trust and local bias.

To assess the relative importance of these two forces, we consider the effects that should result from lower costs of information collection and dissemination. Specifically, we conjecture that these lower costs create a more transparent information environment, all else equal. Therefore, we add the following measures as controls for the firm's information environment: i) number of analysts covering the firm, ii) probability of informed trading (Easley, Hvidkjaer, and O'Hara (2002), Brown and Hillegeist (2007)), and iii) return-volume coefficient (Llorente, Michaely, Saar, and Wang (2002)). The latter two measures use order-flow data to capture aspects of the information environment.

We reestimate the trust/local ownership regressions follow the same baseline specifications with these added controls. We continue to find a negative and significant effect of trust on local ownership. Consistent with the pull effect, information transparency is associated with lower local ownership (and thus greater investment from distant investors), suggesting that both effects are likely at play. We present the results and discuss further details in the Supplementary Material.

C. Omitted Variable: Risk Aversion

A possible explanation for our findings is that trust simply captures investor risk aversion: The idea is that low-trust investors have higher risk aversion and vice versa. However, standard portfolio theory posits that greater risk aversion raises the benefits of diversification, which is contrary to the evidence in Section III.D. Moreover, this explanation predicts that low-trust investors have more diversified portfolios and lower local bias, which is again contrary to our

main findings. Moreover, Guiso et al. (2008) find supporting empirical evidence that the WVS trust measure is distinct from risk aversion. Nevertheless, we perform an additional test using a proxy for risk-taking behavior. Specifically, we include the Catholic–Protestant ratio and local religiosity as a proxy for the risk-aversion attitudes of local residents (Kumar et al. (2011), Shu et al. (2012)).[17] Our results remain unchanged. These results are available in the Supplementary Material.

VI. Conclusion

The origins of local and home bias have long puzzled economists (e.g., French and Poterba (1991), Baxter and Jermann (1997)). Leading explanations include structural market frictions, local information advantages, and investor biases (i.e., familiarity). We identify social trust as a potential source of local bias. Based on the theoretical predictions from Guiso et al. (2008), we find empirical support for the relation between trust and local bias.

Specifically, we find that institutional investors located in high-trust regions exhibit significantly lower local bias. A distinguishing feature of our trust-based explanation is the prediction that information advantages in local bias are more likely to occur in low-trust regions. We find support for this unique prediction, as investors located in low-trust regions earn significant abnormal returns on their local holdings. Their high-trust counterparts do not possess local information advantages.

Our findings more generally suggest that trust affects portfolio choice. Our results are surprising because we find empirical evidence among professional delegated investors. This evidence raises the possibility that trust may affect other dimensions of portfolio choice. We leave this possibility for future research.

Appendix. Variable Definitions

State-Level Variables

TRUST_INDEX: The WVS conducted three waves of surveys in the United States in 1995, 2000, and 2006. In total, there are approximately 4,000 survey respondents in the three waves. The survey identifies the locations of survey respondents by 10 geographical regions: New England (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut), Middle Atlantic (New York, Pennsylvania, New Jersey), East North Central (Wisconsin, Michigan, Illinois, Indiana, Ohio), West North Central (Missouri, North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa), South Atlantic (Delaware, Maryland, Washington, D.C., Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida), East South Central (Kentucky, Tennessee, Mississippi, Alabama), West South Central (Oklahoma, Texas, Arkansas, Louisiana), Rocky Mountain (Montana, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico), Northwest (Oregon, Washington, Idaho), and California. Specifically, in each region, we calculate the percentage of survey respondents answering "Most people can be trusted" to the survey question: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?"

[17] We thank Johan Sulaeman for sharing data on the Catholic–Protestant ratio and local religiosity.

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We estimate the value of TRUST_INDEX in the years between two consecutive surveys by linear interpolation. *Source:* WVS.

POPULATION: Natural log of the state population. *Source:* U.S. Census Bureau county population estimates data sets.

MALE: Percentage of male population in each state. We include only the population from ages 35 to 85. *Source:* U.S. Census Bureau county population estimates data sets.

SENIOR: Percentage of population more than 65 years old in each state. *Source:* U.S. Census Bureau county population estimates data sets.

COLLEGE: Percentage of population with college degrees in each state. *Source:* Economic Research Service in the U.S. Department of Agriculture.

HOUSEHOLD_INCOME: Natural log of the median household income in each state. *Source:* U.S. Census Bureau SAIPE data sets.

UNEMPLOYMENT: Unemployment rate in each state. *Source:* Bureau of Labor Statistics.

SC_INDEX: State-level economic condition index variable developed at the Federal Reserve Bank of Philadelphia based on a national coincident index method developed by Stock and Watson (1989). It combines the following four state-level indicators to summarize current economic conditions in a single statistic: nonfarm payroll employment, average hours worked in manufacturing, unemployment rate, and wage and salary disbursements deflated by the Consumer Price Index (U.S. city average).

VIOLENT_CRIME: Rate of violent crime that includes murder, rape and sexual assault, robbery, and assault. *Source:* FBI's Uniform Crime Reports (annuals).

PROPERTY_CRIME: Rate of property crime that includes burglary, larceny-theft, motor vehicle theft, and arson. *Source:* FBI's Uniform Crime Reports (annuals).

Firm-Level Variables

LOCAL_OWNERSHIP: Sum of dollar holdings (H) of stock j by all investors i located in the same state, divided by the dollar holdings of stock j by the entire institutional investor universe, I. Following the approach in Coval and Moskowitz (2001) and Gaspar and Massa (2007), we then subtract the total market equity asset value (A) of all investors i located in the same state divided by the total market equity asset value of the entire institutional investor universe, I. *Source:* Compact Disclosure and Thomson CDA/Spectrum (13F).

FIRM_SIZE: Natural log of assets (AT).[18] *Source:* Compustat.

MARKET_TO_BOOK: Market value of assets/book assets (AT), where the market value of assets is calculated as: stock price (PRCC_F) × shares outstanding (CSHO) + short-term debt (DLC) + long-term debt (DLTT) + preferred stock liquidation value (PSTKL) − deferred taxes and investment tax credits (TXDITC). *Source:* Compustat.

LEVERAGE: Total debt/book assets (AT), where the total debt is long0-term debt (DLTT) + short-term debt (DLC). *Source:* Compustat.

PROFITABILITY: Operating income before depreciation (OIBDP)/book assets (AT). *Source:* Compustat.

CASH_HOLDING: Cash and short-term investments (CHE)/book assets (AT). *Source:* Compustat.

IO: Fraction of institutional ownership, calculated from Thomson CDA/Spectrum institutional ownership database (13F). *Source:* Thomson CDA/Spectrum (13F)

STOCK_RETURN: Cumulative stock returns in the year. *Source:* CRSP.

RETURN_VOL: Standard deviation of daily stock returns in the year. *Source:* CRSP.

[18]Compustat items are given in parentheses.

ILLIQ: Square-root version of the Amihud (2002) illiquidity measure. It is calculated as the average over each day in year t, the square root of the ratio of the absolute price change divided by daily dollar volume. It is calculated as: $1/D_t \sum_{Days \in t}(1000 \times \sqrt{|\text{daily return}| / \text{daily dollar volume}})$, where D_t is the number of days in year t. *Source:* CRSP.

NO_ANALYSTS: Number of analysts covering the firm. *Source:* IBES.

EARNINGS_SURPRISE: The difference between the actual earning minus the analyst forecast consensus divided by the stock price before the earnings announcement date. *Source:* IBES.

Investor-Level Variables

LOCAL_BIAS: Difference between the fraction of U.S. equity assets invested in local stocks for investor i and the benchmark allocation of stocks that are located in the same state, assuming the benchmark is the market portfolio. *Source:* Compact Disclosure and Thomson CDA/Spectrum (13F).

INVESTOR_SIZE: Natural log of the dollar amount of investor portfolio holdings. *Source:* Thomson CDA/Spectrum (13F).

INVESTOR_AGE: Natural log of the number of years since the investor first appeared in the CDA/Spectrum 13F database. *Source:* Thomson CDA/Spectrum (13F).

NO_STOCKS: Natural log of the number of stocks in the investor's portfolio. *Source:* Thomson CDA/Spectrum (13F).

IVOL: Standard deviation of daily residual estimates from the CAPM. *Source:* CRSP and Thomson CDA/Spectrum (13F).

HERFINDAHL: Sum of squared portfolio weights on individual stocks in the investor's portfolio. *Source:* Thomson CDA/Spectrum (13F).

Supplementary Material

Supplementary Material for this article is available at https://doi.org/10.1017/S0022109019000942.

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