

Internet Appendix to
“Board Diversity, Firm Risk, and Corporate Policies”*

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This Internet Appendix provides supplementary material to the paper “Board Diversity, Firm Risk, and Corporate Policies”. In particular, this appendix presents tables that are referenced but not reported in the paper.

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Figure IA.1

The figure displays the average value the diversity index component of firms headquartered in each state. Averages are based on firm year observations over the entire sample period. States with fewer than twenty firm year observations are set to missing (shown in black). Construction of the index is detailed in the data section of the text.

Figure IA1.A – Gender Diversity

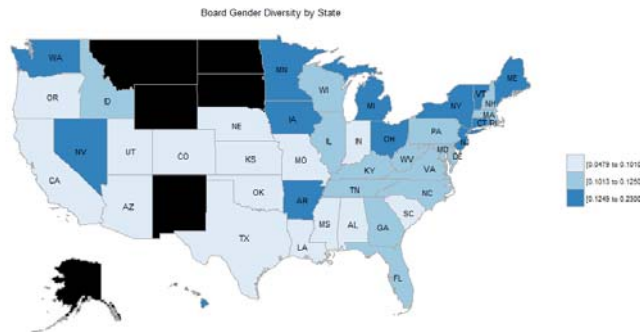


Figure IA1.B – Age Diversity

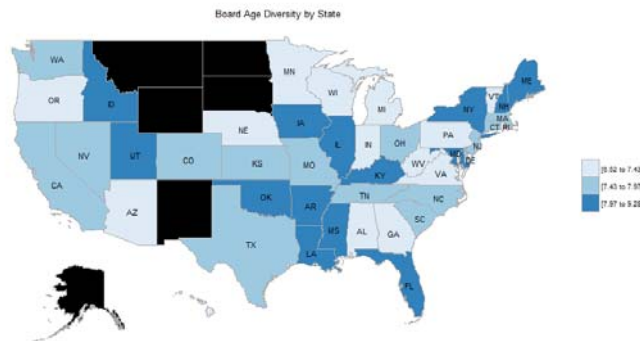


Figure IA1.C – Ethnic Diversity

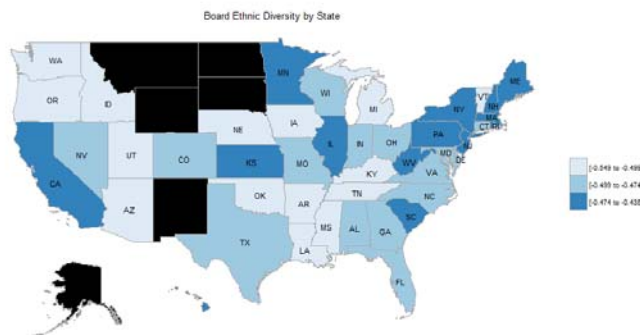


Figure IA1.D – Diversity in Financial Expertise

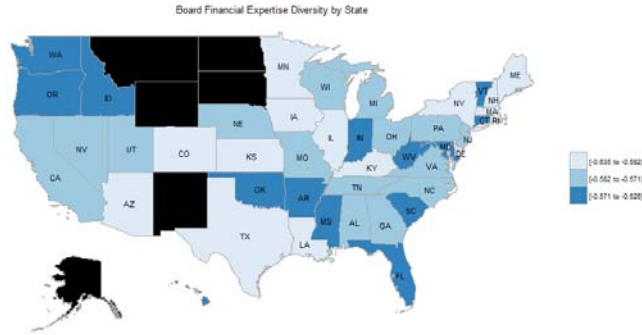


Figure IA1.E – Education Institution Diversity

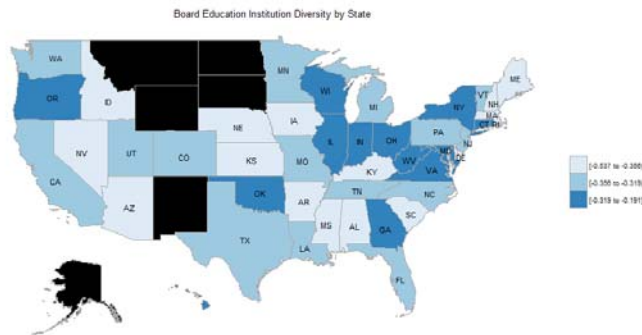


Figure IA1.F – Board Experience Diversity

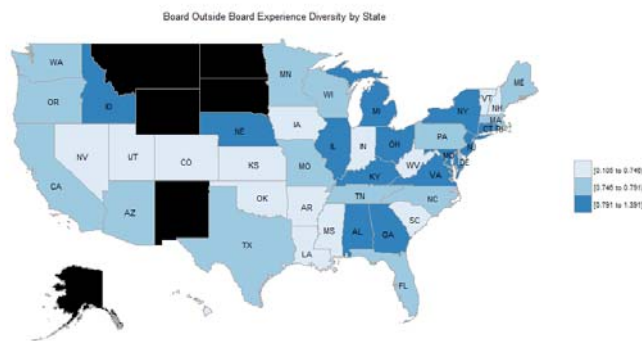


Table IA.1 – Alternative measures of stock return volatility

This table reports regression estimates of models where the dependent variable is the annualized standard deviation of firm stock returns for the current year. Across all panels, the dependent variable in column 1 is the standard deviation of daily idiosyncratic returns from the market model, while it is the standard deviation of monthly raw and idiosyncratic stock returns in columns 3 and 4, respectively. *Board diversity index* is normalized by its sample mean and standard deviation. Panel A reports OLS estimates from models with industry (Fama-French 49), headquarters county, and year fixed effects, while Panel B reports OLS estimates from models with firm and year fixed effects. Panel C report 2nd stage IV estimates from models with industry (Fama-French 49), headquarters county, and year fixed effects. All control variables from Panel A are also included in Panels B and C, but are omitted for brevity. All standard errors are cluster at the firm-level and, in Panel C, account for the two step nature of the estimation. The corresponding *t*-statistics are reported in parenthesis.

Panel A: OLS Estimates

<i>Dependent Variable:</i>	(1) <i>Idiosyncratic Daily Vol.</i>	(2) <i>Total Monthly Vol.</i>	(3) <i>Idiosyncratic Monthly Vol.</i>
Board diversity index	-0.729*** (-4.111)	-0.788*** (-3.698)	-0.791*** (-3.963)
Ln(Assets)	-3.266*** (-12.028)	-2.266*** (-7.296)	-3.095*** (-10.546)
M/B	0.534** (2.343)	0.721** (2.379)	0.516* (1.800)
Mkt. Lev.	3.082*** (10.320)	3.753*** (10.643)	3.551*** (10.733)
Tangibility	0.912*** (3.110)	1.111*** (3.229)	1.106*** (3.379)
Cash/Asset	2.099*** (9.500)	2.490*** (9.054)	2.207*** (8.977)
I(Dividend Paying)	-2.385*** (-11.704)	-2.456*** (-10.213)	-2.432*** (-10.751)
ROA	-4.071*** (-4.261)	-4.726*** (-3.927)	-4.170*** (-4.242)
(R&D/Assets)	1.096*** (3.278)	1.308*** (3.087)	1.003*** (2.751)
Ln(1+Firm Age)	-1.462*** (-7.236)	-1.408*** (-5.892)	-1.429*** (-6.459)
Ln (Board Size)	-0.932*** (-4.521)	-1.005*** (-4.212)	-0.924*** (-4.032)
Ln(Average Board Age)	-1.247*** (-6.781)	-1.422*** (-6.292)	-1.185*** (-5.441)
Ln(1+CEO Tenure)	-0.527*** (-3.217)	-0.382** (-1.972)	-0.434** (-2.413)
CEO is Chair and President	-0.054 (-0.391)	-0.111 (-0.680)	0.006 (0.037)
County Per Capita Income Growth	0.195 (0.821)	-0.256 (-0.839)	0.604** (2.315)
County Population Growth	-0.246* (-1.111)	-0.428** (-1.811)	-0.292** (-1.411)

	(-1.713)	(-2.286)	(-2.109)
Ln(County Per Capita Income)	2.570**	4.157***	1.379
	(2.389)	(3.088)	(1.095)
Ln(County Population)	-5.258*	-6.049*	-6.269**
	(-1.781)	(-1.827)	(-1.996)
Diversity of Local Directors	-0.572***	-0.449**	-0.279
	(-3.424)	(-2.308)	(-1.447)
Year FE	Yes	Yes	Yes
Industry (FF-49) FE	Yes	Yes	Yes
HQ County FE	Yes	Yes	Yes
Observations	21,572	21,572	21,572
R-squared	0.591	0.487	0.470

Panel B: OLS Estimates with Firm Fixed Effects

	(1)	(3)	(4)
<i>Dependent Variable:</i>	<i>Idiosyncratic Daily Vol.</i>	<i>Total Monthly Vol.</i>	<i>Idiosyncratic Monthly Vol.</i>
Board diversity index	-0.477**	-0.764***	-0.741***
	(-2.006)	(-2.679)	(-2.915)
All Time-varying Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	21,572	21,572	21,572
R-squared	0.742	0.649	0.634

Panel C: 2nd Stage IV Estimates

	(1)	(3)	(4)
<i>Dependent Variable:</i>	<i>Idiosyncratic Daily Vol.</i>	<i>Total Monthly Vol.</i>	<i>Idiosyncratic Monthly Vol.</i>
Instrumented Board diversity index	-25.608***	-27.211***	-26.841***
	(-2.631)	(-2.618)	(-2.646)
All Time-varying Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Industry (FF-49) FE	Yes	Yes	Yes
HQ County FE	Yes	Yes	Yes
Observations	21,572	21,572	21,572
R-squared	0.392	0.411	0.380
IV F-stat	23.08	23.08	23.08
Durbin pval	<0.001	<0.001	<0.001

Table IA.2 – Board Diversity and Firm Volatility – No Local Director Control

This table reports 1st and 2nd stage IV regression estimates obtained when the board diversity is instrumented with the diversity of potential directors who reside more than 150 miles away but within a non-stop flight of the firm headquarters. All models include industry (Fama-French 49), headquarters county, and year fixed effects. All standard errors are clustered at the firm level and account for the two-stage nature of the estimation. The corresponding t-statistics are reported in parenthesis.

	(1) IV 1 st Stage	(2) IV 2 nd Stage
Instrumented Diversity Index		-21.492*** (-2.902)
Diversity of Nonlocal Directors w/in Non-Stop Flight	0.060*** (3.347)	
Ln(Assets)	0.253*** (12.162)	3.289 (1.539)
M/B	0.026** (2.109)	1.751*** (3.739)
Mkt. Lev.	-0.011 (-0.712)	2.635*** (5.951)
Tangibility	0.005 (0.219)	1.120* (1.914)
Cash/Asset	-0.007 (-0.427)	2.275*** (5.267)
I(Dividend Paying)	0.005 (0.339)	-2.363*** (-5.869)
ROA	0.023** (2.110)	-4.144*** (-4.049)
(R&D/Assets)	0.067*** (3.644)	2.428*** (3.239)
Ln(1+Firm Age)	0.035** (2.040)	-0.699 (-1.402)
Ln (Board Size)	0.214*** (11.317)	3.334** (2.043)
Ln(Average Board Age)	-0.051*** (-3.012)	-2.455*** (-4.551)
Ln(1+CEO Tenure)	-0.026** (-2.044)	-0.949** (-2.576)
CEO is Chair and President	0.018* (1.751)	0.294 (0.994)
County Per Capita Income Growth	-0.024** (-2.530)	-0.553 (-1.507)
County Population Growth	0.000 (0.036)	-0.251 (-0.999)
Ln(County Per Capita Income)	0.040 (0.474)	5.448** (2.565)
Ln(County Population)	-0.152 (-0.658)	-6.817 (-1.137)

Year FE	Yes	Yes
Industry (FF-49) FE	Yes	Yes
HQ County FE	Yes	Yes
Firm FE	No	No
Observations	21,572	21,572
R-squared	0.390	0.298
IV F-stat		32.72
Durbin p-val.		< 0.001

Table IA.3 – Board Diveristy and Firm Stock Volatility by subsamples of local diversity

This table reports 1st and 2nd stage IV regression estimates obtained when the board diversity is instrumented with the diversity of potential directors who reside more than 150 miles away but within a non-stop flight of the firm headquarters. The first two columns restrict the sample to those counties with below median local potential board member diversity while the last two columns restrict the sample to those counties with above median local potential board member diversity. All models include industry (Fama-French 49), headquarters county, and year fixed effects and all control variables (omitted for brevity) from Table 3. All standard errors are clustered at the firm level and account for the two-stage nature of the estimation. The corresponding t-statistics are reported in parenthesis.

	(1) IV 1 st Stage	(2) IV 2 nd Stage	(3) IV 1 st Stage	(4) IV 2 nd Stage
<i>County-year Subsamples:</i>	<i>Low Local Diversity</i>		<i>High Local Diversity</i>	
Instrumented Diversity Index		-25.041** (-2.261)		-25.376** (-2.227)
Diversity of Nonlocal Directors w/in Non-Stop Flight	0.043** (2.397)		0.065*** (2.581)	
Diversity of Local Directors	0.016 (1.120)	0.262 (0.558)	0.090** (2.202)	2.386 (1.564)
All Time-varying Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry (FF-49) FE	Yes	Yes	Yes	Yes
HQ County FE	Yes	Yes	Yes	Yes
Observations	10,779	10,779	10,783	10,783
R-squared	0.319	0.398	0.286	0.380
IV F-stat		13.45		16.72
Durbin p-val.		< 0.001		< 0.001

Panel B: OLS Estimates using Restricted Diversity Index

	(1)	(2)	(3)	(4)	(5)	(6)
Diversity Index excl. Female	-0.615** (-2.287)					
Diversity Index excl. Age		-0.508* (-1.705)				
Diversity Index excl. Ethnicity			-0.622** (-2.272)			
Diversity Index excl. Education				-0.509** (-2.102)		
Diversity Index excl. Fin. Expert					-0.667** (-2.494)	
Diversity Index excl. Other Boards						-0.508** (-1.992)
All Time-varying Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry (FF-49) FE	Yes	Yes	Yes	Yes	Yes	Yes
HQ County FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,572	21,572	21,572	21,572	21,572	21,572
R-squared	0.745	0.746	0.745	0.745	0.745	0.745

Table IA.5 – Components of Added Non-Executives Diversity and Non-Local Supply Diversity

This table reports OLS estimates of models where the incremental diversity added by non-executives along each dimension is regressed on the corresponding component of diversity of potential directors who reside more than 150 miles away but within a non-stop flight of the firm headquarters. All models include industry (Fama-French 49), headquarters county, and year fixed effects, along with all time-varying control variables from Table 3 in the main text. Standard errors are clustered at the firm level and the corresponding *t*-statistics are reported in parenthesis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dependent Variable: (Board Diversity - Exec. Diversity) for each component						
Diversity Component:	Δ Female	Δ Age	Δ Bachelors	Δ Ethnic	Δ Fin. Expert	Δ Board Exp.	Δ All
%Female Non-Local	0.022** (1.96)						
Std. Age Non-Local		0.002 (0.141)					
-1*HHI_Bachelors Non-Local			-0.002 (-0.118)				
-1*HHI_Ethnicity Non-Local				0.023** (2.032)			
-1*HHI_FinExpert Non-Local					0.040*** (3.021)		
Board Exp. Non-Local						0.030** (2.287)	
Non-Local Diversity Index							0.039** (2.019)
All Time-varying Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry (FF-49) FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HQ County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,572	21,572	21,572	21,572	21,572	21,572	21,572
R-squared	0.212	0.147	0.270	0.179	0.211	0.166	0.188

Table IA.6 – Board Diversity and Firm Diversity

This table reports OLS estimates of models where KLD scores of firm strength and weakness in terms of workforce diversity is regressed on the firm board diversity index. All models include industry (Fama-French 49), headquarters county, and year fixed effects, along with all time-varying control variables from Table 3 in the main text. Standard errors are clustered at the firm level and the corresponding *t*-statistics are reported in parenthesis.

<i>Dependent Variable:</i>	(1) <i>KLD Diversity Concerns Index</i>	(2) <i>KLD Diversity Strengths Index</i>
Board Diversity Index	-0.090*** (-9.346)	0.125*** (6.558)
All Time-varying Controls	Yes	Yes
Year FE	Yes	Yes
Industry (FF-49) FE	Yes	Yes
HQ County FE	Yes	Yes
Observations	16,004	16,004
R-squared	0.319	0.471

Table IA.7 – Instrumented added diversity of non-executives and firm policies

This table reports 2nd stage IV regression estimates of models where the dependent variable indicated in the column title is standardized to have zero mean and standard deviation equal to one. *Board Diversity Added by Non-Executives* is instrumented with the diversity of potential directors who reside more than 150 miles away but within a non-stop flight of the firm headquarters. All models include industry (Fama-French 49), headquarters county, and year fixed effects, along with all time-varying control variables from Table 3 in the main text. Standard errors are clustered at the firm level and account for the two-stage nature of the estimation. The corresponding *t*-statistics are reported in parenthesis.

<i>Dependent Variable:</i>	(1) <i>Net Book Leverage</i>	(2) <i>Net Market Leverage</i>	(3) <i>Dividend/Equity</i>	(4) <i>Capex/Asset</i>	(5) <i>R&D/Asset</i>
Instrumented Board Diversity Added by Non-Executives	-1.612** (-2.016)	-0.751** (-2.097)	1.430* (1.742)	0.187 (0.566)	1.208** (2.572)
All Time-varying Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry (FF-49) FE	Yes	Yes	Yes	Yes	Yes
HQ County FE	Yes	Yes	Yes	Yes	Yes
Observations	21,572	21,572	21,572	21,572	21,572
R-squared	0.256	0.288	0.244	0.245	0.262
IV F-stat	19.98	19.98	19.99	19.35	19.35
Durbin pval	<0.001	<0.001	<0.001	<0.001	<0.001

Table IA.8 – Instrumented added diversity of non-executives and firm innovation

This table reports the 2nd stage IV regression estimates of models where the dependent variable indicated in the column title is standardized to have zero mean and standard deviation equal to one. *Board Diversity Added by Non-Executives* is instrumented with the diversity of potential directors who reside more than 150 miles away but within a non-stop flight of the firm headquarters. All models include industry (Fama-French 49), headquarters county, and year fixed effects, along with all time-varying control variables from Table 3 in the main text. Standard errors are clustered at the firm level and account for the two-stage nature of the estimation. The corresponding *t*-statistics are reported in parenthesis.

<i>Dependent Variable:</i>	(1) <i>Ln(1+Patents)</i>	(2) <i>Patents/R&D</i>	(3) <i>Ln(1+Citations)</i>	(4) <i>Ln(1+Cit./Pat.)</i>
Instrumented Board Diversity Added by Non-Executives	3.564*** (2.891)	1.608* (1.931)	3.360*** (2.892)	2.154*** (2.793)
All Time-varying Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry (FF-49) FE	Yes	Yes	Yes	Yes
HQ County FE	Yes	Yes	Yes	Yes
Observations	20,702	9,129	20,702	20,702
R-squared	0.184	0.261	0.195	0.264
IV F-stat	24.39	15.65	24.39	24.39
Durbin pval	<0.001	<0.001	<0.001	<0.001

Table IA.9 – Board diversity and board frictions

This table reports regression estimates of models where the dependent variable indicated in the column title is standardized to have zero mean and standard deviation equal to one. Columns (1) and (3) display OLS estimates, and columns (2) and (4) display 2nd stage IV estimates. *Diversity Index* is instrumented with the diversity of potential directors who reside more than 150 miles away but within a non-stop flight of the firm headquarters. All models include industry (Fama-French 49), headquarters county, and year fixed effects, along with all time-varying control variables from Table 3. Standard errors are clustered at the firm level and account for the two-stage nature of the estimation where appropriate. The corresponding *t*-statistics are reported in parenthesis.

	(1)	(2)	(3)	(4)
<i>Dependent Variable:</i>	<i>Board 3-Year Turnover Rate</i>		<i>% Directors Attend <75% Meetings</i>	
	OLS	IV 2 nd Stage	OLS	IV 2 nd Stage
Diversity Index	0.003** (2.154)	-0.109 (-0.630)	0.001*** (2.952)	0.003 (0.494)
All Time-varying Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry (FF-49) FE	Yes	Yes	Yes	Yes
HQ County FE	Yes	Yes	Yes	Yes
Observations	17,981	17,981	21,488	21,488
R-squared	0.512	0.522	0.322	0.333

Table IA.10 – Instrumented added diversity of non-executives and firm performance

This table reports second stage IV regression estimates of models where the dependent variable indicated in the column title is standardized to have zero mean and standard deviation equal to one. *Board Diversity Added by Non-Executives* is instrumented with the diversity of potential directors who reside more than 150 miles away but within a non-stop flight of the firm headquarters. All models include industry (Fama-French 49), headquarters county, and year fixed effects, along with all time-varying control variables from Table 3 in the main text. Standard errors are clustered at the firm level and account for the two-stage nature of the estimation. The corresponding *t*-statistics are reported in parenthesis.

<i>Dependent Variable:</i>	(1) <i>EBITDA/Assets</i>	(2) <i>ln(Q)</i>
Instrumented Board Diversity Added by Non-Executives	2.737* (1.910)	6.595*** (2.705)
All Time-varying Controls	Yes	Yes
Year FE	Yes	Yes
Industry (FF-49) FE	Yes	Yes
HQ County FE	Yes	Yes
Observations	21,572	21,572
R-squared	0.188	0.185
IV F-stat	19.91	19.87
Durbin pval	<0.001	<0.001

Table IA.12 – Robustness: Instrumented board diversity and volatility, dropping extreme sizes and most-connected cities

The table reports 2nd stage IV estimates for the relation between board diversity and stock return volatility similar to Table 3 of the main text while excluding from the sample extreme firm and board sizes, i.e., top and bottom decile (Columns 1-4), and most-connected cities (Column 5). Note that in Column 5 the most-connected cities are excluded from pool of potential directors when calculating the instrument and not the final regression, thus the sample size remains the same. All specifications are identical to those in the main text. Standard errors are clustered at the firm level and account for the two-stage nature of the estimation. The corresponding t-statistics are in parenthesis.

	(1)	(2)	(3)	(4)	(5)
	No small firms	No large firms	No small boards	No large boards	No most-connected cities
Instrumented Diversity Index	-23.455*** (-2.815)	-20.075* (-1.650)	-25.531*** (-2.786)	-22.072** (-2.001)	-16.471*** (-3.801)
All Time-varying Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry (FF-49) FE	Yes	Yes	Yes	Yes	Yes
HQ County FE	Yes	Yes	Yes	Yes	Yes
Observations	19,584	19,603	16,483	18,199	21,572
R-squared	0.384	0.375	0.390	0.372	0.265
IV F-stat	29.39	19.92	25.26	14.25	55.98
Durbin pval	<0.001	<0.001	<0.001	<0.001	< 0.001

Table IA.13 – Robustness: Instrumented board diversity and volatility, by firm size

Non-Local Supply Diversity IV	-13.263***
	(-3.967)
IV * Size Tercile 2	2.425
	(1.049)
IV * Size Tercile 3	-2.108
	(-0.921)
Size Tercile 2	-1.367
	(-1.390)
Size Tercile 3	1.196
	(0.779)

All Time-varying Controls	Yes
Year FE	Yes
Industry (FF-49) FE	Yes
HQ County FE	Yes
Observations	21,572
R-squared	0.393
IV F-stat	35.23
Durbin pval	<0.001

Table IA.14 – Alternative IV: Board diversity and stock return volatility

The table reports 2nd stage IV estimates for the relation between board diversity and stock return volatility (Panel A), persistence of firm policies (Panel B), the level of firm policies (Panel C), innovation (Panel D), and performance (Panel E) using a demand-based instrument for board diversity instead of the baseline supply-based instrument. *FF5/Size Matched Diversity* is the average director diversity across firms in the same size quintile and Fama-French 49 industry – excluding each firm actual board. All specifications are identical to those in the main text, except for the alternative instrument of board diversity. Standard errors are clustered at the firm level and account for the two-stage nature of the estimation. The corresponding t-statistics are in parenthesis.

Panel A: Effect of Demand-based Instrument for Diversity on Stock Volatility

	(1)	(2)
	First Stage	Second Stage
Instrumented Diversity Index		-5.167*** (-7.358)
FF5/Size Matched Diversity	0.613*** (7.114)	
All Time-varying Controls	Yes	Yes
Year FE	Yes	Yes
Industry (FF-49) FE	Yes	Yes
County HQ FE	Yes	Yes
Observations	21,572	21,572
R-squared	0.561	0.417
IV F-stat		45.53
Durbin pval		<0.001

Panel B: Effect of Demand-based Instrument for Diversity on Persistence of Firm Policies

<i>Dependent Variable:</i>	(1) Net Book Leverage _{t+1}	(2) (Dividends/ Equity) _{t+1}	(3) (Capex/ Assets) _{t+1}	(4) (Advertising / Sales) _{t+1}	(5) (R&D/ Assets) _{t+1}	(6) Policy Index _{t+1}	(7) Policy Index _{t+2}	(8) Policy Index _{t+3}
(Policy Variable) _t	0.872*** (2.935)	0.383*** (2.818)	0.937*** (2.904)	0.907*** (2.783)	0.881*** (2.918)	0.851*** (2.790)	0.797*** (2.837)	0.754*** (2.993)
(Instr. Diversity) _t × (Policy Variable) _t	0.023*** (2.636)	0.252*** (3.466)	0.009*** (2.749)	0.029 (1.630)	0.077* (1.890)	0.048*** (3.863)	0.052*** (3.447)	0.050** (2.493)
Instrumented Diversity	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Time-varying Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HQ Country, Industry (FF-49), and Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,073	19,073	19,073	19,073	19,073	19,073	16,812	14,786
R-squared	0.639	0.312	0.566	0.807	0.681	0.846	0.797	0.754
IV F-stat	16.72	16.51	16.45	19.40	18.80	17.57	15.32	13.83
Durbin p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Panel C: Effect of Demand-based Instrument for Diversity on Firm Policies

<i>Dependent Variable:</i>	(1) <i>Net Book Leverage</i>	(2) <i>Net Market Leverage</i>	(3) <i>Dividend/ Equity</i>	(4) <i>CAPX/Assets</i>	(4) <i>R&D/Asset</i>
Instrumented Diversity Index	0.029 (0.644)	-0.132*** (-2.847)	0.121*** (3.229)	0.091 (1.211)	0.056 (1.509)
All Time-varying Controls	Yes	Yes	Yes	Yes	Yes
HQ Country, Industry (FF-49), and Year FE	Yes	Yes	Yes	Yes	Yes
Observations	21,572	21,572	21,572	21,572	21,572
R-squared	0.297	0.051	0.131	0.150	0.474
IV F-stat	41.41	41.41	38.88	38.88	39.31
Durbin pval	<0.001	<0.001	<0.001	<0.001	<0.001

Panel D: Effect of Demand-based Instrument for Diversity on Innovation

	(1)	(2)	(3)	(4)
<i>Dependent Variable:</i>	<i>Ln(1+Patents)</i>	<i>Patents/R&D</i>	<i>Ln(1+Citations)</i>	<i>Ln(1+Cit./Pat.)</i>
Instrumented Diversity Index	0.182*** (4.052)	0.092 (1.081)	0.133*** (3.009)	0.087** (2.085)
All Time-varying Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry (FF-49) FE	Yes	Yes	Yes	Yes
HQ County FE	Yes	Yes	Yes	Yes
Observations	21,572	21,572	21,572	21,572
R-squared	0.352	0.249	0.396	0.294
IV F-stat	43.47	28.85	43.47	43.47
Durbin pval	<0.001	<0.001	<0.001	<0.001

Panel E: Effect of Demand-based Instrument for Diversity on Performance

	(1)	(2)
<i>Dependent Variable:</i>	<i>EBITDA/Assets</i>	<i>ln(Q)</i>
Instrumented Diversity Index	0.213*** (4.533)	0.559*** (11.971)
All Time-varying Controls	Yes	Yes
Year FE	Yes	Yes
Industry (FF-49) FE	Yes	Yes
HQ County FE	Yes	Yes
Observations	21,572	21,572
R-squared	0.212	0.255
IV F-stat	38.62	49.19
Durbin pval	<0.001	<0.001

Table IA.15 – Principal Component Analysis of Board Diversity

This table reports the results of the principal component analysis conducted on the six measures of diversity used to construct the board diversity index in the main text. Panel A reports the eigenvectors with the corresponding loadings. Panel B reports the eigenvalues associated with each principal component and the fraction of common variation of the six measures that is explained by each component. Panel C reports simple OLS regression estimates for the relation between the first principal component and each measure of diversity, with standard errors clustered at the firm-level. The corresponding *t*-statistics are in parenthesis.

Panel A – Eigenvectors and factor loadings

	<i>1st Comp.</i>	<i>2nd Comp.</i>	<i>3rd Comp.</i>	<i>4th Comp.</i>	<i>5th Comp.</i>	<i>6th Comp.</i>
% Female	-0.3477	0.435	-0.2632	0.7521	-0.109	0.2077
Std. Dev. Age	0.3598	-0.4675	0.2254	0.5836	0.51	0.0216
HHI Ethnicity	0.0747	0.603	0.7739	0.0017	0.1594	-0.0798
HHI Bachelors	0.5773	0.1976	-0.1132	-0.1119	-0.0806	0.7719
HHI Fin. Expert	0.4038	0.4342	-0.5111	-0.0571	0.4235	-0.4522
Mean Boards	-0.4978	0.0303	-0.083	-0.2794	0.7188	0.3869

Panel B – Eigenvalues and Common Variation

	<i>Eigenvalue</i>	<i>Difference</i>	<i>Proportion</i>	<i>Cumulative</i>
1 st Comp.	1.7144	0.6920	0.2857	0.2857
2 nd Comp.	1.0223	0.0294	0.1704	0.4561
3 rd Comp.	0.9928	0.1175	0.1655	0.6216
4 th Comp.	0.8753	0.0842	0.1459	0.7675
5 th Comp.	0.7910	0.1869	0.1318	0.8993
6 th Comp.	0.6040	--	0.1007	1

Panel C – Regression of first principal component of diversity on each factor

	(1)	(2)	(3)	(4)	(5)	(6)
% Board Female	-4.584*** (-75.086)					
STDEV Age		0.194*** (78.441)				
-1 × HHI Ethnicity			-0.732*** (14.437)			
-1 × HHI Bachelors				-2.824*** (169.542)		
-1 × HHI Fin. Expert					-5.217*** (91.497)	
Mean # of Other Boards						-1.099*** (-126.207)
Observations	21,572	21,572	21,572	21,572	21,572	21,572
R-squared	0.207	0.222	0.010	0.571	0.280	0.425

Table IA.16 – Principal Components Analysis: Effects of board diversity

The table reports regression estimates for the effects board diversity using the PCA-based measure of diversity instead of the diversity index with predetermined weights used in the main text. The panels analyze the effect of board diversity on stock return volatility (Panel A), persistence of firm policies (Panel B), the level of firm policies (Panel C), innovation (Panel D), and performance (Panel E) using the first principal component of the diversity index. All specifications are identical to those reported in the main text, except for the alternative underlying measure of board diversity. Standard errors are clustered at the firm level in all panels and account for the two-stage nature of the estimation where appropriate. The corresponding t-statistics are reported in parenthesis.

Panel A: First Principal Component of Board Diversity and Stock Volatility

	(1)	(3)	(4)
	OLS	IV 1 st Stage	IV 2 nd Stage
PC Diversity	-0.690*** (-3.196)		
Instrumented PC Diversity			-19.800*** (-3.592)
Diversity of Directors w/ Non-Stop Flight		0.067*** (4.311)	
All Time-varying Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Industry (FF-49) FE	Yes	Yes	Yes
HQ County FE	Yes	Yes	Yes
Observations	21,572	21,572	21,572
R-squared	0.600	0.391	0.468
IV F-stat			23.82
Durbin p-val.			< 0.001

Panel B: First Principal Component of Board Diversity and Persistence of Corporate Policies

<i>Dependent Variable:</i>	(1) Net Book Leverage _{t+1}	(2) (Dividends/ Equity) _{t+1}	(3) (Capex/ Assets) _{t+1}	(4) (Advertising / Sales) _{t+1}	(5) (R&D/ Assets) _{t+1}	(6) Policy Index _{t+1}	(7) Policy Index _{t+2}	(8) Policy Index _{t+3}
(Policy Variable) _t	0.879*** (2.930)	0.466*** (3.756)	0.938*** (2.899)	0.904*** (2.870)	0.871*** (2.998)	0.852*** (3.576)	0.792*** (2.719)	0.748*** (2.984)
(Instr. PC Diversity) _t × (Policy Variable) _t	0.061*** (3.296)	0.220*** (2.675)	0.016*** (3.528)	0.082** (2.507)	0.051* (1.879)	0.088*** (3.780)	0.143*** (4.539)	0.138*** (4.000)
Instrumented Diversity	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All Time-varying Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HQ Country, Industry (FF-49), and Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,073	19,073	19,073	19,073	19,073	19,073	16,812	14,786
R-squared	0.834	0.085	0.764	0.806	0.768	0.844	0.789	0.745
IV F-stat	26.03	21.06	21.06	21.38	18.32	20.05	21.3	18.8
Durbin p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Panel C: First Principal Component of Board Diversity and Corporate Policies

<i>Dependent Variable:</i>	(1) <i>Net Book Leverage</i>	(2) <i>Net Market Leverage</i>	(3) <i>Dividend/ Equity</i>	(4) <i>Capex/ Asset</i>	(5) <i>R&D/ Asset</i>
Instr. PC Diversity	-0.831*** (-3.580)	-0.387*** (-4.434)	0.808*** (2.669)	0.012 (0.340)	0.711*** (3.820)
All Time-varying Controls	Yes	Yes	Yes	Yes	Yes
HQ Country, Industry (FF-49), and Year FE	Yes	Yes	Yes	Yes	Yes
Observations	21,572	21,572	21,572	21,572	21,572
R-squared	0.222	0.289	0.240	0.247	0.261
IV F-stat	22.15	22.15	19.19	15.12	20.01
Durbin pval	<0.001	<0.001	<0.001	<0.001	<0.001

Panel D: First Principal Component of Board Diversity and Innovation

	(1)	(2)	(3)	(4)
<i>Dependent Variable:</i>	<i>Ln(1+Patents)</i>	<i>Patents/R&D</i>	<i>Ln(1+Citations)</i>	<i>Ln(1+Cit./Pat.)</i>
Instrumented (-1×First PC)	2.139*** (5.622)	2.140* (1.926)	2.016*** (5.560)	1.293*** (4.905)
All Time-varying Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry (FF-49) FE	Yes	Yes	Yes	Yes
HQ County FE	Yes	Yes	Yes	Yes
Observations	20,702	9,129	20,702	20,702
R-squared	0.390	0.468	0.390	0.326
IV F-stat	42.73	17.53	42.73	42.73
Durbin pval	<0.001	<0.001	<0.001	<0.001

Panel E: First Principal Component of Board Diversity and Performance

	(1)	(2)
<i>Dependent Variable:</i>	<i>EBITDA/Assets</i>	<i>ln(Q)</i>
Instrumented (-1×First PC)	1.509*** (3.444)	4.430*** (4.725)
All Time-varying Controls	Yes	Yes
Industry (FF-49) FE	Yes	Yes
HQ County FE	Yes	Yes
Observations	21,572	21,572
R-squared	0.243	0.277
IV F-stat	27.57	36.49
Durbin pval	<0.001	<0.001