

# **Women on Board and Performance of Family Firms: Evidence from India**

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# Research objective

- Effect of women directors on the board on firm performance
  - Emerging market perspective
  - Family control – ownership vs board
- Case study on India
  - Most recent one to join the quota

# Background

- Women have strengths and experiences distinct from that of men that adds value to board deliberations and monitoring of management (Adams and Ferreira, 2009, Davies Report, 2011; Rhode and Packel, 2014)
- ...“are democratic, transformational and trust-building leadership style,” are more risk averse in financial decision making, have higher ethical standards, are more conscientious, well-prepared and are ready to ask awkward questions”(Gul et al 2010)

# Empirical evidence

- Positive effect on profitability or market value (Carter et al., 2003; Nguyen and Faff, 2007; Campbell and Minguez-Vera, 2008; Adams and Ferreira, 2009; Lukerath-Rovers, 2013; Liu et al., 2014; Nguyen et al., 2015)
- Negative effect (Adams and Ferreira, 2009; Ahern and Dittmar, 2012)
- No effect (Hussein and Kiwiwa, 2009; Miller and Triana, 2009; Farrell and Hersch, 2005)

# Motivation & Contribution

- Existing evidence is limited to widely held firms
- Mixed findings indicate roles of governance structures, regulatory framework, economic culture etc to play a role (Rhode and Pakell 2014)
- We provide the evidence on the effects of gender diversity in a Type II agency set up
- Explore the variation in the effectiveness of gender diversity under family dominance – through ownership and control over board
- Also exploit a natural experiment set up given a mandatory gender quota in corporate boards of public limited companies has been introduced in the new Companies Act, 2013

# Data & Research methodology

- All NSE listed firms for 2005-2014 (10218 firm-years)
- Omitted variable bias (firm and year fixed effects FE)
- Reverse causality (FE-IV)
- Panel data and difference-in-difference

$$firm\_performance_{it} = \delta * gender\_diversity_{it} + \beta * firm\_characteristics_{it} + \alpha_i + \lambda_t + \varepsilon_{it}$$

# Research framework

- Gender diversity
  - DFDIR, NFDIR, PFDIR
  - Independent/grey director
- Promoter control
  - Ownership concentration > 20
  - Board control
    - No Control:  $ctrl\_1=1$  when the promoter is neither a chairperson nor CEO; equals zero otherwise.
    - Full Control:  $ctrl\_2=1$  when the promoter is both the chairperson and the CEO; equals zero otherwise.
    - Operational Control:  $ctrl\_3=1$  when the promoter is CEO only; equals zero otherwise.
    - Strategic Control:  $ctrl\_4=1$  when the promoter is Chairperson only; equals zero otherwise.
- Effect of voluntary and mandatory adaptation of Companies Act 2013

# Summary of findings

- Robust evidence that women directors on corporate boards positively impact firm value and that this effect increases with the number of women directors on board.
- The positive effect of gender diversity on firm performance weakens with the extent to which the family exerts control through occupying key management positions on the board.
- Women directors affiliated to the family have no significant effect on firm value, whereas independent women directors do.



# Variables

## *Firm Level Variables*

- *Tobin's Q*
- *ROA*
- *leverage*
- *age*
- *size*

## *Board Level Variables*

- *dfdir, nfdir, pfdir*
- *Dfgreydir, nfgreydir, pfgreydir*
- *dfnedi, nfnedi, pfnedi*
- *Bodsize*

## *Control Variables*

- *ctrl\_1*
- *ctrl\_2*
- *ctrl\_3*
- *ctrl\_4*
- *Fam*
- *industry dummies*
- *time dummies*
- *firm dummies*

# Table 2(a) Summary statistics

Number of observations: 10218

Variable	Mean	Std	Min	Max
<b>Board Level Variables</b>				
Board size (bodsize)	9.19	2.93	2.00	27.00
Has female director(dfdir)	0.34	0.48	0	1
Has female executive director	0.12	0.33	0	1
Has one female director(onefdir)	0.27	0.44	0	1
Has two female director(twofdir)	0.07	0.25	0	1
Has more than two female director (g2fdir)	0.01	0.11	0	1
Has female chairperson	0.02	0.16	0	1
Has female ceo	0.04	0.19	0	1
Has female chairperson-ceo	0.01	0.07	0	1
Has male chairperson-ceo	0.28	0.45	0	1
Number of female directors (nfdir)	0.44	0.68	0	4
Number of female independent directors (nfnedi)	0.14	0.38	0	3
Number of male independent directors (nmnedi)	4.21	1.95	0	14
Number of female grey directors (nfgreydir)	0.16	0.41	0	4
Number of male grey directors (nmgreydir)	2.27	2.08	0	17

# Table 2(a) Summary statistics contd...

	Mean	Std	Min	Max
Percent female directors (pfdir)	4.73	7.49	0	66.67
Percent of female independent directors (pfnedi)	1.41	4.16	0	50.00
Percent male independent directors (pmnedi)	46.33	16.73	0	100.00
Percent female grey directors on board (pfgreydir)	1.73	4.53	0	33.33
Percent male grey directors on board (pmgreydir)	23.88	19.53	0	100.00
No board control (ctr_l1)	0.22	0.42	0	1
Full board control (ctrl_2)	0.51	0.50	0	1
Operational board control (ctrl_3)	0.12	0.32	0	1
Strategic board control (ctrl_4)	0.15	0.36	0	1
Board independence (%)	47.73	16.80	0.00	100.00

# Table 2(a) Summary statistics contd...

Firm level variables	Mean	Std	Min	Max
Tobin's Q (Tobin's Q)	1.14	1.29	0.02	34.34
Return on Assets (ROA)	0.13	0.10	-0.59	1.50
Size (size)	8.86	1.56	3.75	15.60
Age (age in years)	31.59	21.87	0	151.00
Leverage (lvrg)	1.69	15.46	0.00	121.86
Promoter ownership >20 per cent (family)	0.95	0.21	0	1
Promoter ownership	51.86	17.13	0	93.15

## Table 2(b): Distribution of Sample by Ownership Group and Type of Control

Ownership Group	Distribution of firm observations Number (%)	Percentage of Promoter Controlled Firms	Types of Promoter Control in Management (percentage)			
			No Control	Full Control	Operational Control	Strategic Control
Group affiliates	5353 (52.49)	97.48	23.44	48.29	7.29	20.98
Standalones	3920 (38.26)	92.27	9.49	63.98	19.06	7.47
Foreign	945 (9.25)	96.08	67.62	13.97	6.67	11.75
All	10218 (100)	95.35	22.18	51.14	11.74	14.94

# Table 3(b): Summary Statistics of Board and Firm Level Variables by Control Types (Sample Means)

	Family Ownership Control		Family Management Control			
	Promoter ownership <20 per cent	Promoter Ownership >=20 per cent	No Control	Full Control	Operation Control	Strategic Control
Board size (bodsize)	9.70	9.17	9.58	9.12***	8.52***	9.40*
Has female director (dfdir)	0.32	0.35	0.28	0.37***	0.35***	0.33**
Has one female director (onefdir)	0.25	0.27	0.22	0.29***	0.29***	0.23
Has female independent director (dfnedi)	0.10	0.13	0.14	0.12***	0.09***	0.13
Has female grey director (dfgreydir)	0.12	0.15	0.11	0.15***	0.13*	0.19***
Number of female directors (nfdir)	0.39	0.44	0.37	0.47***	0.43***	0.45**
Number of female independent directors (nfnedi)	0.11	0.14**	0.16	0.14**	0.10***	0.13**
Number of male independent directors (nmnedi)	4.35	4.21	4.16	4.29***	3.77***	4.43***
Number of female grey directors (nfgreydir)	0.13	0.16**	0.12	0.16***	0.14	0.22***
Number of male grey directors (nmgreydir)	2.74	2.24***	3.25	1.76***	1.98***	2.79***
Percent female directors (pfdir) <sup>2</sup>	4.31	4.75	3.77	5.13***	5.19***	4.43***
Percent female independent directors (pfnedi)	1.09	1.42**	1.60	1.42*	1.12**	1.28**
Percent male independent directors (pmnedi)	45.56	46.36	43.84	47.25***	45.13**	47.79***
Percent female grey directors on board (pfgreydir)	1.47	1.74	1.23	1.82***	1.69***	2.17***
Percent male grey directors on board (pmgreydir)	26.79	23.74***	33.19	18.59***	21.94***	29.69***

# Table 3(c): Firms Characteristics by Number of Women Directors on Board

Firm level variables	No of Women on Board			
	None	One	Two	> Two
Board size (bodsize)	8.83	9.57***	10.65***	12.54***
Adj.Tobin's Q (qratio)	1.09	1.24***	1.19**	1.28***
ROA (roa)	0.13	0.14	0.13	0.14
Size (size)	8.74	9.05***	9.09***	9.33***
Age (age)	31.32	31.91	34.38*	24.17***
Leverage (levrg)	1.78	1.44***	1.82	1.60
No of firm-years	6693 (65.5)	2722(26.6)	674 (6.6)	129 (1.3)

# Table 4(a): Women Directors and Firm Performance - Regression Results (Tobin's Q)

	Two-way fixed effects (industry and year fixed effects)			Two-way fixed effects (firm and year fixed effects)		
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
<b>Intercept</b>	-0.7707**	-0.7421**	-0.7482**	-2.0763***	-1.016***	-2.0861***
<b>dfdir</b>	0.0715***			0.0379**		
<b>nfdir</b>		0.0390**			0.03642**	
<b>pfdir</b>			0.00249**			0.0017
<b>bodsize</b>	0.01158***	0.0115***	0.0133***	0.0189***	0.1828***	0.0200***
<b>size</b>	0.0349***	0.0356***	0.0358***	0.1285***	0.1281***	0.1287***
<b>age</b>	-0.0020***	0.00196***	-0.0020***			
<b>levrg</b>	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
<b>Adj. R-square</b>	0.07	0.07	0.07	0.63	0.63	0.63



## Table 4(b): Women Directors and Firm Performance - (ROA)

ROA	Industry and Year Fixed Effects			Firm and Year Fixed Effects		
Intercept	0.1041**	-0.1065**	0.1054**	0.2241***	0.2241***	0.2221***
dfdir	0.0054*			0.0086**		
nfdir		0.0025*			0.0046**	
pfdir			0.0002*			0.0005**
bodsize	0.0021***	0.0021***	0.0023***	-0.0006	-0.0006	-0.0004
size	-0.0004	-0.0004	-0.0004	0.0122**	0.0122**	-0.0121**
age	0.0003***	0.0002***	0.0002***			
levrg	-0.0003***	0.0003***	0.0003***	-0.0001**	-0.0001**	-0.0002**
Adj. R-square	0.07	0.07	0.07	0.45	0.45	0.45

# Reverse causality and choice of instrument

- Independent women directors who are hired from the market may depend on performance
- *male-female\_board connection* - percentage of male directors on the board of the firm under consideration who sit on other boards which have female directors(Adams and Ferreira, 2009; Liu et al., 2015).
- Lack of social connections can be a reason of low female representation on board

**Table 5(a): Firm Performance and Presence of Women on Board – Tests for Endogeneity**

	Tobin's Q			ROA		
	(i)	(i)	(i)	(i)	(i)	(i)
<b>Intercept</b>	-0.3255***	-0.6138***	-1.5249	-0.3255***	-0.6138***	-1.5249
<b>male-female_board connection</b>	0.00064***	0.000941**	0.0070	0.00064***	0.000941**	0.0070
<b>bodsize</b>	0.0322***	0.0534***	0.1273***	0.0322***	0.0534***	0.1273***
<b>size</b>	0.0085	0.0191	0.0869	0.0085	0.0191	0.0869
<b>levrg</b>	-0.00038**	-0.00044**	-0.0050*	-0.00038**	-0.00044**	-0.0050*
<b>No. of Obs.</b>	10218	10218	10218	10218	10218	10218
<b>No. cross-sections</b>	1348	1348	1348	1348	1348	1348
<b>No. of time series</b>	10	10	10	10	10	10
<b>Adj. R-square</b>	0.74	0.77	0.78	0.74	0.77	0.78
<b>Pr &gt; Chisq (Hausman test)</b>	0.0532	0.0409	0.1023	0.1731	0.1453	0.2102

**Table 5(b): Women Directors and Firm Performance - Instrumental Variable Estimation with Fixed Effects (FE-IV)**

	Tobin's Q		
	(i)	(ii)	(iii)
<b>Intercept</b>	-1.2990**	-1.0688*	-1.7484**
<b>dfdir</b>	2.4268*		
<b>nfdir</b>		1.6619*	
<b>pfdir</b>			0.2233
<b>bodsize</b>	-0.0574	-0.0679	-0.0077
<b>size</b>	0.1058**	0.0947**	0.1071**
<b>levrg</b>	0.0011*	0.0009*	0.0012
<b>time dummies</b>	Included	Included	Included
<b>firm dummies</b>	Included	Included	Included

**Table 6(a): Women Directors and Firm Performance – Effect of Promoter Influence (Ownership Control)**

	Tobin's Q IV model			ROA FE Model		
Intercept	-4.3321**	-3.8195***	-4.1027***	0.0162	0.0547	0.0331
dfdir	9.6042*			0.7850		
nfdir		6.8085**			0.5634	
pfdir			0.5415**			0.0445
fam	2.7505*	2.2428**	2.2966**	0.2443	0.2058	0.2085
dfdir x fam	-9.2321*			-0.7511		
nfdir x fam		-6.5645**			-0.5430	
pfdir x fam			-0.5134**			-0.0420
bodsize	-0.0017	-0.0095	0.0148**	-0.0022	-0.0028	-0.0008
size	0.0963**	0.1014**	0.1046**	-0.0145**	-0.0141**	-0.0138**
levrg	0.0002	0.0002	0.0002	-0.0001**	-0.0005**	-0.0001**

**Table 6(b): Women Directors and Firm Performance – Effect of Promoter  
Influence on Boards**

	Tobin's Q IV model			ROA FE Model		
Intercept	-2.3982***	-2.1730***	-2.6109***	0.2188***	0.2207***	0.2188**
dfdir	3.6534*			0.0076		
nfdir		2.7607*			0.0032	
pfdir			0.3129			0.0003
ctrl_2	1.0413**	0.9774*	1.1243	0.0058	0.0056	0.0049
ctrl_3	0.8904**	0.8389*	0.9930	-0.0006	-0.0003	0.0008
ctrl_4	0.8529*	0.7585*	0.9170	0.0041	0.0026	0.0024
dfdir x ctrl_2	-3.2114*			0.0027		
dfdir x ctrl_3	-2.9447*			0.0032		
dfdir x ctrl_4	-2.8633*			-0.0043		
nfdir x ctrl_2		-2.3355*			0.0027	
nfdir x ctrl_3		-2.1493*			0.0019	
nfdir x ctrl_4		-2.0416*			0.0004	
pfdir x ctrl_2			-0.2699			0.0004
pfdir x ctrl_3			-0.2483			-0.0001
pfdir x ctrl_4			-0.2549			0.0001

**Table 7(a): Test for Endogeneity of Presence of Women on Board – Independent Directors**

	Tobin's Q			ROA		
<b>Intercept</b>	-0.2348**	-0.2905***	-0.9634	-0.2348**	-0.2905***	-0.9634
<b>male-female_board connection</b>	0.0006***	0.0008**	0.0047	0.0006***	0.0008**	0.0047
<b>bodsize</b>	0.0171***	0.0222***	0.0714***	0.0171***	0.0222***	0.0714***
<b>size</b>	0.0113	0.0091	0.0717	0.0113	0.0091	0.0717
<b>levrg</b>	-0.0003**	-0.00014	-0.0042*	-0.0003**	-0.00014	-0.0042*
<b>No. of Obs.</b>	10218	10218	10218	10218	10218	10218
<b>No. cross-sections</b>	1348	1348	1348	1348	1348	1348
<b>No. of time series</b>	10	10	10	10	10	10
<b>Adj. R-square</b>	0.61	0.66	0.66	0.61	0.66	0.66
<b>Pr &gt; F (Hausman test)</b>	0.0355	0.0827	0.1198	0.1583	0.1949	0.2254



**Table 7(b): Women Directors and Firm Performance –  
Independent Directors  
Instrumental Variable Estimation with Fixed Effects (FE-IV)**

	IV regression for Tobin's Q			Fixed effects model for ROA		
<b>Intercept</b>	-1.5176**	-1.2242*	-1.7702***	0.2233***	0.2232***	0.2221***
<b>dfnedi</b>	2.4406**			0.0090**		
<b>nfnedi</b>		2.9505*			0.0069**	
<b>pfnedi</b>			0.3306			0.0009**
<b>bodsize</b>	-0.0211	-0.0428	-0.0029	-0.0005	-0.0005	-0.0004
<b>size</b>	0.0989**	0.0852**	0.1028**	-0.0122**	-0.0122**	-0.0122**
<b>leverage</b>	0.0009*	0.0010	0.0015	-0.0002**	-0.0002**	-0.0001**

# Grey directors

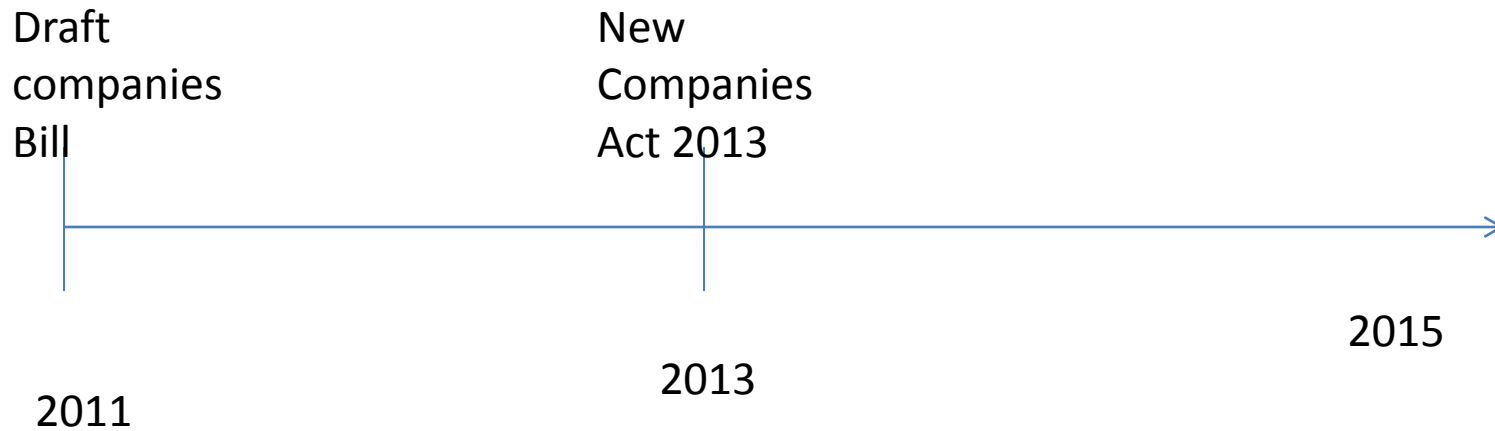
- Facilitate expropriation in Type II agency framework; window-dressing
- Not endogenous in our study
  - Can be explained in an emerging market setting where appointment of grey directors may not depend on firm or industry specific factors and can just be a feature of family board structures.



# Effect of compliance

- The underlying hypothesis is that the diversity enforced by the law-change itself would increase firm value (Higgs, 2003; Page, 2007).
- If boards are merely 'window-dressing,' the forced change in board characteristics will have no effect on firm value (Westphal, 1998; Helland and Sykuta, 2004; Farrell and Hersch, 2005).
- Sub-sample of firms with no woman director between 2001-2011.
  - Treatment1(Control1): companies that appointed only 1 woman director between 2012-2015
  - Treatment2(Control2): companies that appointed only 1 woman director between 2012-2013
  - Treatment3(Control3): companies that appointed only 1 woman director between 2014-2015

# Companies Act timeline



$$\begin{aligned} \text{firm\_performance}_{it} = & \varphi + \gamma * \text{reatment} + \delta * \text{after} + \beta * \text{reatment} * \text{after} + \phi * \text{firm\_characteristics}_{it} \\ & + \alpha_j + \lambda_t + \varepsilon_{it} \end{aligned}$$

**Table 9: Regulatory Changes and Addition of Women Director  
on Board  
- Difference-in-Difference Analysis**

	Tobin's Q (industry & time FE)			ROA (industry & time FE)		
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-1.466***	-1.175***	-1.440***	0.076***	0.074***	0.098***
treatment1	-0.003			0.014***		
treatment2		0.009			0.005	
treatment3			0.003			0.015***
after1	0.643***			-0.051***		
after2		-0.112***			-0.021***	
after3			0.488***			-0.048***
after1 x treatment1	0.145***			0.011		
after2 x treatment2		0.012			0.007	
after3 x treatment3			0.184**			-0.004
Number of observations	5196	5267	4405	5196	5267	4405
Adj. R-square	0.12	0.10	0.13	0.09	0.09	0.09

**Table 10: Regulatory Changes and Addition of Grey Women Director on Board**  
**- Difference-in-Difference Analysis**

	Tobin's Q			ROA		
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-1.482***	-1.178***	-1.442***	0.072***	0.074***	0.096***
treatment11	-0.082*			0.001		
treatment21		-0.060			0.006	
treatment31			-0.113***			-0.006
after1	0.750***			-0.034**		
after2		-0.113***			-0.021***	
after3			0.606***			-0.045***
after1 x treatment11	0.012					
after2 x treatment21		0.090		0.005	0.028	
after3 x treatment31			0.115			0.012
Number of observations	5196	5267	4405	5196	5267	4405
Adj. R-square	0.12	0.10	0.13	0.09	0.09	0.09

**Table 11: Regulatory Changes and Addition of Independent Women Director on Board**  
**- Difference-in-Difference Analysis**

	Tobin's Q			ROA		
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-1.452***	-1.172***	-1.431***	0.075***	0.074***	0.098***
treatment12	0.069**			0.012***		
treatment22		0.024			0.003	
treatment32			0.061**			0.020***
after1	0.664***			-0.044***		
after2		-0.113***			-0.021***	
after3			0.542***			-0.042***
after1 x treatment12	0.156**			0.009		
after2 x treatment22		0.066			-0.004	
after3 x treatment32			0.148			-0.015
Number of observations	5196	5267	4405	5196	5267	4405
Adj. R-square	0.13	0.10	0.13	0.09	0.09	0.09



# Conclusions

- Robust evidence that presence of women directors on corporate boards has a positive effect on firm value and that market value increases with the number of women directors on board.
- The performance impact of women directors depends on the governance structure; the positive effect of women directors on firm value is lower for family firms.
- Specifically, the positive effect of women directors is weaker the more the promoter exercises control through key management positions on the board, with the weakest when a promoter acts as both the CEO and chairperson of the board.

# Conclusions contd..

- Disentangled effects of women directors by type of director- women independent directors have a positive effect whereas woman grey directors have no effect.
- Positive effect of independent woman directors is also confirmed by the diff-in-diff analysis where the higher valuation of firms post the enactment of the gender quota in India in 2013 came from the appointment of a woman independent director, and not a grey director.
- The positive results with respect to women directors in general and independent directors in particular that we obtain with respect to market value are also confirmed with respect to profitability
- Disconnect between market value and profitability is observed – positive effect of gender diversity does not vary with the extent of family control

**Thank You!**