Product Market Development and Business Group Affiliation Value: Evidence from an Emerging Market

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Outline

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Background

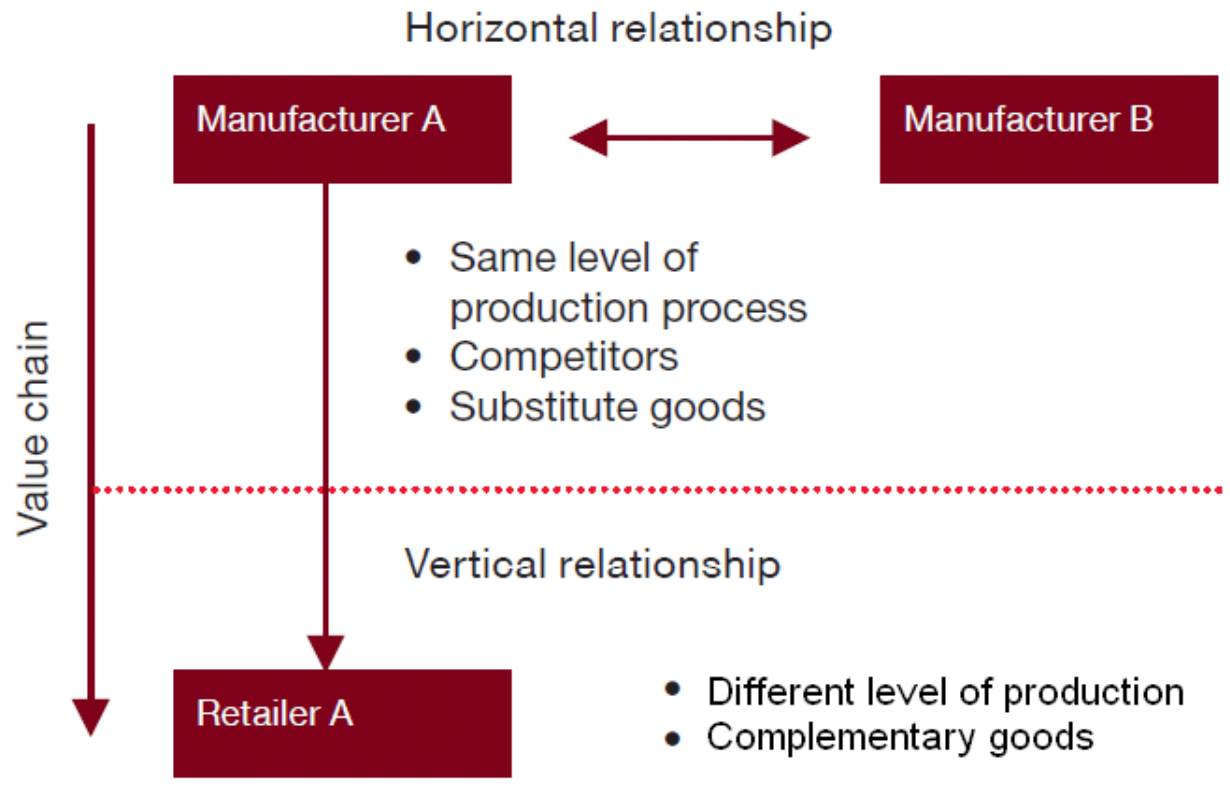
- A Business Group (BG) is a collection of firms bound together in some formal and/or informal ways, characterized by an intermediate level of binding (Granovetter, 1995)
- Firms in a group are characterized by ownership, personnel and operational ties (Strachan, 1976)
- Examples of India BGs – Tata, Reliance, TVS
- BGs rise and flourish in economies with poor institutional development (Institutional Voids theory) (Khanna and Palepu, 2000)

Motivation

- However, existence of BGs is not limited to poor institutional environments (Manikandan and Ramachandran, 2014)
- Outside US and UK, BGs are a dominant organizational form (Colpan et al., 2010)
- Recent studies provide evidence against IV hypothesis (Boutin et al., 2013; Chittoor et al., 2014)
- How do BGs continue to create value in spite of institutional development?
  - We focus on 3 structural aspects: Horizontal Integration, Vertical Integration and Deep Pockets
- We study an exogenous change in Indian competition law – The Competition Act, 2002

Overview of Competition Act

Horizontal/Vertical business structures have adverse affect on competition (PwC, 2012)



Hypotheses

1. BG affiliation adds value in less competitive environments
2. BGs that expand through horizontal integration lose value in the post Competition Act regime
3. BGs that expand through vertical integration lose value in the post Competition Act regime.
4. BG deep pockets are positively associated with group affiliation value and this is not affected by increase in product market competition.

Measuring Horizontal Integration (HI)

- Measure based on Related Entropy (Palepu, 1985)
- Intuition: A BG that has many firms operating in the same NIC 4-digit code has high HI

$$HI_{gt} = \sum_{i=1}^{m} P_i * ln(1/P_i) * P_I$$

Where,

HI_{gt}	:	HI of group g for year t
m	:	Number of firms in group g
P_i	:	(Sales of firm i)/(Total group sales in industry I). Each firm is assigned a NIC 5-digit code for industry classification. Industry I refers to the NIC 4-digit industry corresponding to firm i's 5-digit code
P_I	:	Proportion of Industry I's (NIC 4-digit) sales to total sales of the group

Measuring Vertical Integration (VI)

- Measure based on input-output matrix
- Intuition: A BG that has firms operating in different stages of the value chain has high VI

$$VI_{gt} = \sum_{d=1}^{n} \left[P_d * \sum_{d \neq u} (IC_{du} * CW_{du}) \right]$$

Where,

VI_{gt}	:	VI of group g for year t
n	:	Number of industries in which group g is present
d and u	:	Downstream and Upstream industry (i.e. inputs of industry u are used in industry d). Each industry can get inputs from all other industries in which the group is present
P_d	:	Proportion of industry d sales in total group sales
IC_{du}	:	(Value of industry u's inputs into industry d)/(Total value of all inputs into industry d). IC = Input Coefficient. For the denominator, captive consumption of inputs of an industry is excluded. Data from the input-output matrix is used to calculate IC
CW_{du}	:	(Group sales in industry u) / (Group sales in industry d). Subject to a maximum value of 1. CW = Cross Weights

Example for VI and HI (TVS)

Upstream industries Downstream industry

Year 2000 - Total 30 firms						
Vertical Integration (VI). VI=0.069						
NIC (2 digit)	22 (Rubber manufacturing)	24 (Metals manufacturing)	26 (Electronic products manufacturing)	30 (Manufacture of other transport equipment)	46 (Wholesale trade, except automobiles)	Total
Share in group sales	3%	3%	3%	62%	28%	99%
Contribution to VI (absolute)	0.005	0.006	0.013	0.042	0.001	0.066
Contribution to VI (%)	7%	9%	18%	61%	1%	97%
No. of firms	3	1	1	17	4	26
Horizontal Integration (HI). HI=1.494						
NIC (4 digit)				3091 (Manufacture of motorcycles)	4659 (Wholesale trade of other machinery)	Total
Share in group sales				62%	28%	89%
Contribution to HI (absolute)				1.320	0.156	1.476
Contribution to HI (%)				88%	10%	99%
No. of firms				17	3	20

Measuring Deep Pockets (DP)

- Measured using Kaplan and Zingales & Whited and Wu indices of financial constraints (Lamont et al., 2001 & Whited and Wu, 2006)
- KZ and WW indices inverted by multiplying them with "-1"
- KZ Inverse and WW Inverse measure extent of deep pockets
- KZI/WWI is measured for each firm in a group and a weighted average (firm total assets as weights) constructed at the group level

Data and Sample

- Main Data source: CMIE Prowess
- Input-Output matrix from Central Statistics Office (CSO)
- Sample period: 1990 to 2012
- Non-financial private sector firms (BG affiliated and unaffiliated)
- Competition Act passed in 2002; Hence observations of 2002 dropped
  - 1990-2001: Pre-competition reform period (Regime1)
  - 2003-2012: Post-competition reform period (Regime2)
- Annual change in HI, VI and DP used in regressions

Main Results

1. BG affiliation adds value in less competitive environments - Supported
2. BGs that expand through horizontal integration lose value in the post Competition Act regime – Not Supported
3. BGs that expand through vertical integration lose value in the post Competition Act regime – Weakly Supported
4. BG deep pockets are positively associated with group affiliation value and this is not affected by increase in product market competition – Strongly Supported

Results (H1)

(Dependent variable : Q ratio)

	Overall Sample		Sub-sample of firms in industries with high competition		Sub-sample of firms in industries with low competition	
Variable name	**M1**	**M2**	**M1**	**M2**	**M1**	**M2**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
BG dummy	0.165***	0.240***	0.137***	0.242***	0.200***	0.235***
	[7.35]	[10.00]	[5.21]	[8.03]	[6.52]	[6.89]
BG dummy * R2 dummy		-0.054**		-0.102***		0.017
		[2.04]		[3.19]		[0.43]
R2 dummy		0.211***		0.225***		0.175***
		[12.37]		[10.58]		[6.85]
Firm sales (log)	-0.002	-0.005	-0.005	-0.008	0.000	-0.004
	[0.23]	[0.58]	[0.43]	[0.74]	[0.01]	[0.33]
Firm depr/sales	-0.031	-0.040*	0.023	0.015	-0.064**	-0.073***
	[1.46]	[1.90]	[0.69]	[0.46]	[2.37]	[2.75]
Firm leverage	0.668***	0.677***	0.709***	0.709***	0.605***	0.625***
	[16.22]	[16.89]	[12.76]	[13.25]	[10.24]	[10.69]
Firm age (log)	-0.108***	-0.225***	-0.099***	-0.221***	-0.115***	-0.210***
	[7.40]	[15.45]	[5.07]	[11.07]	[5.92]	[11.07]
Constant	1.128***	1.326***	1.066***	1.263***	1.147***	1.309***
	[21.43]	[25.03]	[12.93]	[15.39]	[17.65]	[20.09]
Chi-square	554	815	257	396	283	419
No. of observations	36559	36559	19160	19160	17399	17399
p-value	0.00	0.00	0.00	0.00	0.00	0.00

- BG affiliated firms valued higher but lose value in Regime2 (as compared to unaffiliated firms)
- This result is mainly driven by firms in industries with high competition

Results (H2 and H3)

(Dependent variable : Q ratio)

Variable name	Panel A: Firm level regressions			Panel B: Group level regressions		
ΔHI	-0.018		0.001	-0.106		-0.078
	[0.23]		[0.01]	[0.80]		[0.58]
ΔHI *R2	0.056		0.037	0.137		0.110
	[0.50]		[0.32]	[0.78]		[0.62]
ΔVI		1.365**	1.365**		3.010***	2.968***
		[2.22]	[2.19]		[2.92]	[2.83]
ΔVI *R2		-1.526*	-1.525*		-3.586**	-3.543**
		[1.83]	[1.81]		[2.50]	[2.44]
Chi-square	198	208	208	57	64	66
No. of observations	12095	12095	12095	5265	5265	5265
p-value	0.00	0.00	0.00	0.00	0.00	0.00

- Sample of only BG firms
- Weighted averages of firm level variables used for group level regressions
- HI has no impact on firm/group value (No support for H2)
- VI has positive impact in Regime1 and impact turns negative in Regime2 (H3 supported)

Results (H4)

	Panel A: Firm level regressions					
DP measured by →	KZI			WWI		
Variable name						
ΔDP	0.005***	0.008***	0.008***	0.516***	0.590***	0.560***
	[2.72]	[4.35]	[4.27]	[3.94]	[3.77]	[3.79]
ΔHI		-0.011	0.049		-0.032	0.030
		[0.14]	[0.80]		[0.41]	[0.51]
ΔVI		0.525	1.067*		0.501	1.303**
		[1.24]	[1.71]		[1.22]	[2.19]
R2	0.162***	0.165***	0.165***	0.165***	0.166***	0.165***
	[6.61]	[6.23]	[6.23]	[6.97]	[6.47]	[6.42]
ΔDP * R2	0.002	0.000	0.000	0.026	0.322	0.331
	[0.78]	[0.12]	[0.16]	[0.13]	[1.27]	[1.34]
ΔDP * ΔHI		0.026			-1.841	
		[1.05]			[1.45]	
ΔDP * ΔVI			0.004			11.300
			[0.02]			[1.42]
ΔHI * R2		0.103			0.103	
		[0.87]			[0.89]	
ΔVI * R2			-0.861			-1.390*
			[0.99]			[1.69]
ΔDP * ΔHI * R2		-0.022			2.924	
		[0.81]			[1.45]	
ΔDP * ΔVI * R2			-0.071			-7.616
			[0.35]			[0.72]
Chi-square	233	224	225	272	247	254
No. of observations	12454	11366	11366	13122	11792	11792
p-value	0.00	0.00	0.00	0.00	0.00	0.00

- Deep Pockets has positive impact on value; effect same in both regimes
- Nothing else matters! (Apologies to Metallica)
- Group level regressions are qualitatively similar

Conclusion

- Affiliated firms lose value with increase in competition but are still valued higher than unaffiliated firms
- Group Deep Pockets seems to be the source of this value
- Horizontal and Vertical integration seem to matter less