
Information Networks Within Business Groups: Evidence from India

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Emerging Markets Finance Conference, Mumbai
December 20th , 2013

Business Groups in Emerging Markets

- Business groups responsible for large amount of economic activity in emerging markets
 - What is the **value** of group affiliation in emerging markets?
 - Policy question: Should business groups be allowed free entry into all industries?
 - Reserve Bank of India currently deciding which business groups should receive banking licenses
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Value of Group Affiliation in Emerging Markets

- Empirical work mainly focuses on **costs** of group affiliation
 - Tunneling
 - Internal capital markets used to prop up unprofitable divisions
 - Theoretical literature suggests **benefits** as well
 - Information sharing across divisions (this paper)
 - Economies of scale in political connections
 - Efficient contract enforcement
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Testing for Information Sharing in Business Groups

- Main idea: Group owned funds should do better when they invest in industries where group operates
 - Fund managers have preferential access to managers
 - Management has incentive to share information about industry trends
 - Benefit of focusing on mutual fund case study
 - Avoids typical endogeneity concerns in comparison approach
 - Mutual fund industry is interesting setting because goal is to exploit private information
 - Cost of mutual fund case study
 - Results focused on mutual fund firms
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Related Literature

- Value of Business Group Affiliation

- Comparison Approach: Khanna and Palepu (2000); Lins and Servaes (2003)
- Evidence of Tunneling: Bertrand, Mehta and Mullainathan (2002); Bae, Kang and Kim (2002)
- Internal Capital Markets: Hoshi, Kashyap and Scharfstein (1991), Gopalan, Nanda and Seru (2005),
- Risk Sharing: Khanna and Yafeh (2005)

- Conglomerates vs Stand-alone Firms in US

- Diversification Discount: Lang and Stulz (1994), Berger and Ofek (1995)
 - Selection Issues: Campa and Kedia (2002), Graham et al. (2002)
 - Effects on Plant Productivity: Schoar (2002)
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Related Literature

■ Mutual Fund Performance

- Jensen (1968) , Malkiel (1995), Carhart (1997) , Daniel et al. (1997), Chen, Jegadeesh, Wermers (2000), Baker et al. (2010)
- Information Networks: Cohen, Frazzini and Malloy (2008); Coval and Moskowitz (1999,2001)
- Role of Manager Characteristics: Chevalier and Ellison (1999)
- Industry Concentration and Fund Performance: Kacperczyk, Sialm and Zheng (2005)

■ Bank Affiliated Institutional Investors in US

- Massa and Rehman (2008), Griffin et al. (2012)
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Mutual Fund Data

- Morningstar Direct Database
 - Include all open end equity funds owned by business groups, Indian Financial firms and Foreign Financial Institutions
 - Time period: January 2003 - June 2013
 - Monthly performance data
 - Monthly holdings data
 - Exclude equity funds with > 30 percent in non-equities
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Mutual Funds Data

Year	All Mutual Funds		Business Group Owner			
	Number of Funds	Total Assets (INR bn)	Number of Funds	Total Assets (INR bn)	% Assets	%Funds
2003	136	293.16	41	67.39	23%	30%
2004	175	412.99	55	97.07	24%	31%
2005	214	719.50	68	175.13	24%	32%
2006	217	1040.69	70	292.64	28%	32%
2007	255	1848.94	82	551.07	30%	32%
2008	299	1046.24	95	353.37	34%	32%
2009	335	1943.40	108	702.01	36%	32%
2010	360	1900.39	116	781.07	41%	32%
2011	376	1937.78	115	581.93	30%	31%
2012	393	2144.29	123	603.58	28%	31%

- Business group funds represent approx. 30% of total assets and number of funds
- Approx 12 billion USD in assets in 2012

Business Group Data

- CMIE Prowess firm level data
 - Data on all subsidiaries of business groups that own mutual funds
 - Data from annual reports on:
 - Industry Classification: NIC Code mapped to 3-digit SIC code
 - Assets, Sales and Profits
 - Other Data
 - Stock Return Data from COMPUSTAT Global
 - Analyst Forecasts from I/B/E/S
 - Quarterly Earnings Announcement Dates from Prowess
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Business Group Industrial Classification

	Consumer Non-Durables	Consumer Durables	Healthcare	Manufacturing	Energy	Utilities	Telecom	Business Equipment & Services	Wholesale and Retail	Finance
March 2012										
Birla Aditya	0.2%			61.4%	0.03%	0.0001%	28.1%	0.5%	6.1%	3.8%
Escorts				97.4%		2.1%				0.5%
Larsen & Toubro		0.1%		65.6%	0.005%	3.2%		1.7%	0.3%	29.1%
Mahindra & Mahindra	0.0002%	38.7%		4.6%			0.02%	23.3%	3.7%	29.6%
Murugappa Chettiar Group	13.3%			39.2%		0.1%		0.02%	0.01%	47.4%
Reliance Group (Anil Ambani)	1.1%					40.0%	42.9%			16.1%
Sahara India	73.3%							2.9%	0.7%	23.1%
Tata	1.2%	15.8%		29.8%		12.0%	4.7%	10.1%	3.3%	23.1%
TVS Iyengar		32.5%		3.6%		1.5%		0.7%	5.4%	56.3%
All Business Groups	0.9%	9.5%		31.9%	0.005%	13.7%	15.0%	6.3%	2.6%	20.0%
Market Weight	6.6%	9.3%	5.1%	18.2%	17.5%	5.9%	3.8%	12.7%	2.6%	18.1%
Business Group Affiliated										
Mutual Fund Weights	6.3%	10.6%	8.7%	19.8%	10.8%	5.4%	2.9%	12.1%	1.9%	21.6%
Non Business Group Mutual Fund Weights	7.7%	9.7%	6.7%	17.3%	10.1%	4.8%	4.4%	13.4%	0.8%	25.1%

Measure of Fund's Focus on Group Affiliated Industries

- $\gamma_{i,j,t}$ dummy for parent company of fund i has > 5% assets in industry j at time t
- $w_{i,j,t}$ is value weight of fund i in industry j at time t
- $\bar{w}_{i,j,t}$ is market weight in industry j at time t
- 10 industries in total
- Define BGI index as:

$$BGI_{i,t} = \sum_{j=1}^{10} \gamma_{i,j,t} |w_{ij,t} - \bar{w}_{j,t}|$$

- Higher value of index means greater deviation from market where business group has a meaningful presence.
 - Similar to Industry Concentration Index of Kacperczyk (2005)
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Fund-Level Summary Statistics

	N	Mean	Stdev	Min	Median	Max
BGI	5973	0.24	0.18	0.00	0.19	1.20
BGI_overweight	5973	0.14	0.15	0.00	0.11	0.86
BGI_underweight	5973	0.10	0.09	0.00	0.08	0.63
ICI	5973	0.11	0.18	0.00	0.05	1.06
Total Assets (Rs million)	5973	4322.8	7886.4	0.0	1358.3	81066.2
Fund Age (year)	5973	5.73	3.89	0.08	5.08	18.33
Expense Ratio	5973	2.22	0.49	0.17	2.34	5.23
% Portfolio in Stocks	5973	86.8	7.4	70.0	87.7	100.0
Number of Funds per month	123	48	20	15	45	77
Monthly Return (%)	5973	1.25	7.63	-39.91	1.21	46.13
Monthly Abnormal Return_MktAdj (%)	5973	0.06	3.04	-32.06	0.07	28.23
Monthly Flow	5552	-0.02	0.12	-0.96	-0.01	0.60

Business Groups Affiliation and Portfolio Weights

- *Hypothesis: Business group owned funds are more likely to over-weight industries where the business group has real operations.*
 - **Dependent Variables:**
 - Diffwt_ind(Fund, Mkt): Difference between the weight of an industry in the given fund's portfolio and the weight of that industry in the market.
 - Diffwt_ind(Bgroup, Mkt): Difference between the aggregate weight of an industry in all the funds owned by a business group and the weight of that industry in the market.
 - **Independent Variables:**
 - Bgroupindwt: Weight of the business groups' real assets in a particular industry
 - Bgroup_Dummy: Equals 1 if the business group has at least 5% of its real assets in the industry of the observation and zero otherwise.
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Business Groups Affiliation and Portfolio Weights

Independent Variables	Dependent Variable					
		Diffwt_ind(Fund,Mkt)			Diffwt_ind(Bgroup,Mkt)	
Intercept	-0.009 (-4.32)	-0.008 (-3.23)	0.012 (0.81)	0.013 (0.82)	-0.010 (-3.84)	-0.010 (-3.90)
BGroupIndwt	0.089 (4.32)				0.100 (3.84)	
BGROUP_Dummy		0.023 (3.24)	0.012 (2.24)	0.012 (2.24)		0.031 (4.11)
Cluster(Fund)	Yes	Yes	Yes	Yes	No	No
Cluster(Bgroup)	No	No	No	No	Yes	Yes
Month Fixed Effects	No	No	No	Yes	No	No
Industry Fixed Effects	No	No	Yes	Yes	No	No
R2 (%)	2.15	1.04	11.72	11.72	7.35	5.01
Nobs	70230	70230	70230	70230	8940	8940

Performance in Same Industry vs. Different Industry Stocks

- *Hypothesis: Performance of stocks held by business group owned mutual funds will be correlated with whether the stock is in industry where the business group has a real presence.*
 - We follow two approaches:
 - Stock-level approach: Pooling the information across all business group mutual funds together.
 - Fund-level approach: Testing the performance of the business group owned mutual funds conditional on the overweighting/underweighting of industries where the business group has a real presence
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Performance in Same Industry vs. Different Industry Stocks: Stock Returns Evidence

	Avg number of Stocks	Value Weighted_Returns	Value Weighted Size Adjusted Returns	Value Weighted Industry Adjusted Returns	Value Weighted 4 Factor Alpha	Value Weighted Non-Business Group Adjusted Returns
Different Industry Stocks	228	1.95 (2.75)	0.05 (0.30)	0.14 (1.19)	0.09 (0.58)	0.04 (0.36)
Same Industry Stocks	197	2.52 (2.95)	0.59 (2.90)	0.39 (3.05)	0.54 (2.64)	0.32 (2.61)
Same-Different		0.57 (2.26)	0.55 (2.16)	0.25 (1.92)	0.45 (2.08)	0.28 (2.34)

Performance in Same Industry vs. Different Industry Stocks: Evidence from Large Over-Weights

	Avg number of Stocks	Value Weighted_ Returns	Value Weighted Size Adjusted Returns	Value Weighted Industry Adjusted Returns	Value Weighted 4 Factor Alpha	Equal Weighted Size Adjusted Returns
Different Industry Stocks	36	1.98 (2.82)	0.08 (0.18)	0.19 (0.60)	-0.02 (-0.05)	0.09 (0.35)
Same Industry Stocks	24	3.29 (3.52)	1.43 (3.94)	0.90 (3.15)	1.16 (3.13)	1.03 (3.54)
Same-Different		1.31 (2.29)	1.35 (2.32)	0.72 (2.03)	1.18 (2.31)	0.93 (2.31)

Performance in Same Industry vs. Different Industry Stocks: Evidence from Large Under-Weights

Avg number of Stocks	Value Weighted_Returns	Value Weighted Size Adjusted Returns	Equal Weighted Size Adjusted Returns	Value Weighted Industry Adjusted Returns	Value Weighted 4 Factor Alpha
13	1.47 (2.23)	-0.38 (-1.54)	-0.39 (-1.67)	-0.24 (-1.47)	-0.30 (-1.40)
11	1.08 (1.57)	-0.77 (-2.64)	-0.82 (-2.97)	-0.54 (-2.46)	-0.46 (-1.63)
	-0.39 (-1.46)	-0.39 (-1.46)	-0.43 (-1.41)	-0.30 (-1.78)	-0.17 (-0.62)

Performance in Same Industry vs. Different Industry Stocks: Longer-term Performance

	Value Weighted Size Adjusted Returns			
	OverWeight Rank=Top 5 percentile			
	month+1	month+2	month+3	month+4
Different Industry Stocks	0.08 (0.18)	0.03 (0.08)	0.24 (0.57)	0.14 (0.37)
Same Industry Stocks	1.43 (3.94)	1.04 (2.95)	1.09 (3.47)	1.13 (3.20)
Same-Different	1.35 (2.32)	1.01 (1.88)	0.85 (1.48)	1.00 (1.96)

Performance in Same Industry vs. Different Industry Stocks: Earnings Announcement Returns

	Avg number of Stocks	Value Weighted Returns	Value Weighted Market Adjusted Returns	Value Weighted Size Adjusted Returns
Different Industry Stocks	29	-0.05 (-0.09)	-0.26 (-0.56)	-0.32 (-0.67)
Same Industry Stocks	21	1.35 (2.35)	1.28 (2.76)	1.15 (2.56)
Same-Different		1.40 (1.94)	1.54 (2.47)	1.46 (2.38)

- Earnings Announcement Return: CAR(0,+2)
- 37% of the quarterly return explained over these 3 days

Same Industry vs. Different Industry Stocks: Analyst Forecast Errors

- *Hypothesis: If Business Groups substitute for the absence of skilled analysts, we should expect analyst forecast errors to be more positive for the Same Industry Stocks.*
 - Mean Analyst Forecast Errors=
(Actual-Mean Analyst Forecast)/Lagged Price (qtr-2)
 - Include stocks with minimum of 3 fiscal year earnings forecasts.
 - Diffwt= Difference in stock's weight in fund's portfolio and it's market weight.
 - BGROUP_Dummy=1 if stock is in an industry where the business group has invested at least 5% in real assets.
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Same Industry vs. Different Industry Stocks: Analyst Forecast Errors

Independent Variables	Dependent Variable			
	All Positions	Top 10%	Bottom 10%	
	Mean Forecast Error			
Intercept	-0.001 (-0.97)	0.000 (-0.47)	0.001 (1.20)	0.001 (2.65)
BGROUP_Dummy	0.002 (2.60)	0.001 (1.81)	0.005 (2.58)	0.002 (1.72)
DIFFWT	0.028 (3.79)	0.001 (0.14)		
DIFFWT *BGROUP_Dummy		0.064 (2.26)		
Cluster(Qtr)	Yes	Yes	Yes	Yes
R2 (%)	0.87	1.11	4.24	1.46
Nobs	11664	11664	1242	1134

- Economic Significance: Difference in average mean forecast error between same industry and different industry stocks = 0.003 which is 18% of the standard deviation of mean forecast error

Performance of Investment in Own Business Group Stocks

	Avg number of Stocks	Value Weighted_ Returns	Value Weighted Size Adjusted Returns	Value Weighted 4 Factor Alpha	Market Cap Weighted Size Adjusted Returns	Equal Weighted Size Adjusted Returns
All Stocks	15	2.23 (2.09)	0.35 (0.72)	0.15 (0.34)	0.21 (0.61)	0.39 (1.23)
Top 10 Percentile	3	1.32 (0.92)	-0.15 (-0.16)	-0.11 (-0.13)	0.01 (0.01)	0.82 (0.99)

Additional Tests: Financial Conglomerates

All Stocks					
	Avg number of Stocks	Value Weighted_Returns	Value Weighted Size Adjusted Returns	Value Weighted 4 Factor Alpha	Market Cap Weighted Size Adjusted Returns
Non-Financial Stocks	363	1.91 (2.81)	0.03 (0.17)	0.08 (0.63)	-0.10 (-0.85)
Financial Stocks	49	2.48 (2.54)	0.61 (1.25)	0.7 (1.40)	0.42 (1.00)
Same-Different		0.57 (1.00)	0.59 (1.03)	0.62 (1.11)	0.52 (1.01)

Fund Level Overall Performance

	Monthly Return	Monthly Excess Return	Holdings Based Size Adjusted Return	CAPM Alpha	FF Carhart 4- Factor Alpha
All Equity Funds	1.83 (2.78)	1.31 (1.98)	0.17 (1.53)	0.15 (1.32)	0.09 (0.87)
All Financial Sector Affiliated Funds	1.82 (2.78)	1.30 (1.97)	0.12 (1.04)	0.14 (1.27)	0.07 (0.69)
Domestic Financial sector Affiliated Funds	1.84 (2.80)	1.32 (2.00)	0.17 (1.57)	0.16 (1.43)	0.10 (0.95)
Foreign Financial sector affiliated Funds	1.76 (2.70)	1.24 (1.89)	-0.02 (-0.11)	0.09 (0.77)	0.00 (0.07)
Business Group Affiliated Funds	1.86 (2.81)	1.34 (2.01)	0.27 (2.34)	0.17 (1.42)	0.14 (1.26)

BGI Index and Performance: Portfolio Based Evidence

BGI	Monthly Return	Monthly Excess Return	Return over Value Weighted		CAPM Alpha
			S&P CNX 500	Return Over S&P CNX 500	
1	1.83	1.30	0.07	0.00	0.17
	(2.82)	(2.00)	(0.39)	(0.02)	(1.22)
2	1.75	1.22	-0.01	0.00	0.05
	(2.63)	(1.83)	(-0.09)	(-0.02)	(0.43)
3	1.79	1.27	0.03	-0.29	0.12
	(2.71)	(1.91)	(0.17)	(-1.12)	(0.78)
4	1.93	1.40	0.17	0.04	0.20
	(2.79)	(2.02)	(0.92)	(0.17)	(1.20)
5	2.04	1.52	0.28	0.44	0.34
	(3.01)	(2.23)	(1.46)	(1.59)	(2.03)
5-1	0.21	0.21	0.21	0.44	0.17
	(1.58)	(1.58)	(1.58)	(1.87)	(1.25)

BGI Index and Performance: Holdings Based Evidence

BGI	Holdings Based Raw Returns	Size Adjusted Abnormal return	Holdings Based Industry Adjusted Returns
1	2.04 (2.77)	0.12 (0.84)	0.16 (1.54)
2	2.07 (2.77)	0.14 (1.05)	0.21 (2.12)
3	2.03 (2.72)	0.11 (0.76)	0.21 (1.93)
4	2.17 (2.77)	0.29 (2.02)	0.29 (2.29)
5	2.29 (2.85)	0.39 (2.29)	0.31 (2.44)
5-1	0.26 (1.73)	0.27 (1.87)	0.15 (1.28)

Performance in Same Industry vs. Different Industry Stocks: Holdings Based Evidence

BGI	Same Industry Stocks			Different Industry Stocks		
	% in Same Industry Stocks	Holdings Based Raw Returns	Size Adjusted Abnormal return	% in Different Industry Stocks	Holdings Based Raw Returns	Size Adjusted Abnormal return
1	29.7	2.59 (2.98)	0.64 (2.51)	70.3	1.77 (2.58)	-0.13 (-0.68)
2	37.9	2.46 (2.87)	0.50 (2.14)	62.1	1.93 (2.82)	0.03 (0.16)
3	44.2	2.36 (2.70)	0.41 (1.73)	55.8	1.90 (2.83)	-0.01 (-0.06)
4	53.6	2.36 (2.73)	0.46 (2.07)	46.4	2.04 (2.77)	0.19 (0.93)
5	60.4	2.42 (2.80)	0.49 (2.24)	39.6	1.99 (2.72)	0.10 (0.39)
5-1		-0.18 (-0.79)	-0.15 (-0.71)		0.22 (1.05)	0.24 (1.10)

BGI Index and Performance: Regression Evidence

Independent Variables	Dependent Variable				
	Monthly Return-S&P 500 CNX				Holdings based size adjusted return
	1	2	3	4	6
Intercept	0.000 (0.11)	-0.0078 (-0.50)	-0.0077 (-0.49)	-0.0072 (-0.44)	0.0011 (0.11)
BGI	0.005 (2.60)	0.0059 (2.84)	0.0072 (2.20)		0.0097 (2.24)
BGI_overweight				0.0074 (3.12)	
BGI_underweight				0.0022 (0.36)	
ICI			-0.0021 (-0.62)		
Controls	Yes	Yes	Yes	Yes	Yes
Errors Clustered by	Fund	Fund	Fund	Fund	Month
Owner Fixed Effects	Yes	Yes	Yes	Yes	Yes
R2 (%)	0.26	0.44	0.45	0.45	0.6
Nobs	5973	5552	5552	5552	5481
Number of Months	123	123	123	123	122

Sharpe Ratio Tests

- Can business group owned mutual funds increase their risk adjusted performance or Sharpe Ratio by increasing the amount invested in the Same Industry stocks?

Sharpe Ratio	N	Excess Return Mean	Size Adjusted Abnormal Return Mean
All Holdings	98	0.113	0.071
Same Industry Stocks	98	0.116	0.089
Different Industry Stocks	98	0.092	0.006
Same Industry Stocks -All Holdings	98	0.004	0.017
Funds with Positive Difference	98	52(53%)	58 (59%)
Funds with Significant Positive Difference	98	13 (13%)	35 (39%)

Conclusion

- Business Group Affiliated Funds perform better in their investments in industries where the group has presence.
 - Results suggest that information networks may drive an important part of the superior performance of large diversified business groups in emerging markets.
 - Quantifying the benefits of information sharing between different business group firms is an important area for future research.
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