



Effects of Diversification and Market Power on Firm Value in the Asian Emerging Markets

Doctor of Business Administration

Thomas King Ha Wu

September 6, 2005



Abstract

- **Effects of diversification and market value on excess firm value using 1,818 firms in 10 Asian emerging markets**
- **V-shape effect of diversification on excess firm value**
- **Diversification, market power, and their interactive effects are associated with higher excess firm value for multi-segment firms**



Implications

- **Study of market power within the context of diversification in the emerging markets**
- **Single segment firms different from multi-segment firms**
 - **Effects of diversification and market power is different**
- **Market power is a variable that should be considered for inclusion in future research on emerging markets**



Diversification - Benefits

- **Internalization of firm assets**
- **Efficiency gains and synergistic benefits**
- **Lower transaction costs**
- **Internal capital markets**
- **Overcome market inefficiencies and failures**



Diversification - Costs

- Increased difficulty to manage
- Negative synergies
- Inefficient allocation of resources
- Agency problems
- Information asymmetry



Diversification - Findings

- **For developed markets, diversification discount found so higher costs than benefits**
 - **Berger and Ofek (1995)**
 - **Lins and Servaes (1999)**
 - **Click and Harrison (2000)**
 - **Denis, Denis and Yost (2002)**
 - **Fauver, Houston and Naranjo (2004)**



Diversification - Findings

- **For emerging markets, inconsistent findings**
 - **Claessens, Djankov, Fan and Lang (1999)**
 - **Khanna and Palepu (2000)**
 - **Fauver, Houston, Naranjo (2003)**
 - **Feinberg and Phillips (2003)**



Market Power

- **Anti-competitive behavior**
 - **Collusion**
 - **Reciprocal buying**
 - **Restrictive agreements**
 - **Price discrimination**
 - **Foreclosure from vertically integrating suppliers**
 - **Resale price maintenance**
 - **Monopolistic leverage through tying arrangement**
 - **Bundling to deter new entrance**
 - **Exclusive dealing and full-line forcing**
 - **Subsidize predatory pricing scheme in another industry**



Market Power - Findings

- **For developed markets, market power generally beneficial for firm value**
 - **Lewellen (1971)**
 - **Sullivan (1974)**
 - **Foster (1989)**
 - **Kim and Singal (1993)**
 - **Kanatas and Qi (2003)**
- **Not much research on market power in emerging markets**
- **Impact of market power within the context of diversification**



Data Compilation

- Thomson Financial's Worldscope database – FYE2002
- Ten markets – China, Hong Kong, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan, Thailand
- Data selection and screening criteria consistent with previous research
- 1,818 firms in sample

The Sample

	China	Hong Kong	India	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand	Total
Number of firms from Worldscope	244	898	380	271	802	844	208	491	504	404	5,046
Less: Exclusion from screening process	118	339	221	99	388	374	132	142	293	151	2,257
Subtotal	126	559	159	172	414	470	76	349	211	253	2,789
Less: Firms with segments without sales multiplier	33	160	35	49	58	130	17	97	35	45	659
Outliers	6	29	3	5	5	13	1	3	0	1	66
Firm size criteria	0	50	16	28	14	44	10	36	0	48	246
Number of firms in sample	87	320	105	90	337	283	48	213	176	159	1,818
% of original from Worldscope	36%	36%	28%	33%	42%	34%	23%	43%	35%	39%	36%
% of total sample	5%	18%	6%	5%	19%	16%	3%	12%	10%	9%	100%



Dependent Variable

- **Excess firm value**
- **Sales multiplier approach by Berger and Ofek (1995)**
 - **Use medium sales multiplier of single segment firm in each SIC category as benchmark for valuation of multi-segment firms to determine theoretical value**
- **Compare theoretical value to actual market value**



Independent Variables

- **Level of diversification**
 - Firm level Herfindahl index
 - Number of segments
- **Level of market power**
 - Industry level Herfindahl index adjusted for industry and firm sales
 - Industry level Herfindahl index adjusted for industry sales
 - Industry based market share adjusted for firm sales
 - Tiering of firms within segment



Independent Variables

- **Interactive term between diversification and market power**
- **Firm controls**
 - Firm size
 - Financial leverage
 - Growth opportunities
 - Profitability
- **Market controls**
 - Market development dummy variables



Descriptive Statistics

	N	EFV			DIVERS			MPI		
		Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev
All	1,818	1.323	0.929	1.496	0.846	1.000	0.216	0.00761	0.00137	0.024
Single	1,135	1.331	0.965	1.472	0.994	1.000	0.019	0.00915	0.00166	0.027
Multi	683	1.311	0.831	1.535	0.601	0.584	0.163	0.00504	0.00119	0.015
Diff		0.019			0.394			0.00411		
Sig		0.792			0.000			0.0000		

	N	DIVERSMPI			Total Sales			FirmSize		
		Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev
All	1,818	0.0094	0.0018	0.03272	286.44	78.73	1,119	4.497	4.366	1.352
Single	1,135	0.0092	0.0017	0.02760	280.78	83.84	832	4.537	4.429	1.354
Multi	683	0.0098	0.0020	0.03982	295.83	73.33	1,477	4.430	4.295	1.347
Diff		-0.0006			-15.05			0.108		
Sig		0.751			0.807			0.100		

	N	FinLev			GrowOpp			Profit		
		Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev
All	1,818	0.281	0.247	0.241	0.096	0.041	0.199	0.017	0.050	0.254
Single	1,135	0.275	0.236	0.240	0.094	0.039	0.201	0.037	0.056	0.234
Multi	683	0.291	0.265	0.242	0.099	0.044	0.195	-0.017	0.039	0.281
Diff		-0.016			-0.005			0.055		
Sig		0.183			0.605			0.000		

Correlations

	EFV	DIVERS	MPI	DIVERSMPI	FirmSize	FinLev	GrowOpp	Profit
EFV	1.000 (0.000)	-0.003 (0.911)	-0.036 (0.126)	-0.026 (0.276)	-0.170*** (0.000)	0.130*** (0.000)	0.271*** (0.000)	-0.098*** (0.000)
DIVERS		1.000 (0.000)	0.069*** (0.003)	-0.052** (0.026)	0.007 (0.754)	-0.055** (0.020)	-0.014 (0.542)	0.089*** (0.000)
MPI			1.000 (0.000)	0.872*** (0.000)	0.332*** (0.000)	-0.014 (0.537)	-0.027 (0.244)	0.078*** (0.001)
DIVERSMPI				1.000 (0.000)	0.347*** (0.000)	0.001 (0.949)	-0.018 (0.442)	0.071*** (0.003)
FirmSize					1.000 (0.000)	0.050** (0.033)	-0.072*** (0.002)	0.273*** (0.000)
FinLev						1.000 (0.000)	0.010 (0.675)	-0.143*** (0.000)
GrowOpp							1.000 (0.000)	-0.169*** (0.000)
Profit								1.000 (0.000)



Multivariate Analysis

$$\begin{aligned} \text{InEFV} = & a + b_1 \text{ DIVERS} + b_2 \text{ MPI} + b_3 \text{ DIVERSMPI} \\ & + b_4 \text{ FirmSize} + b_5 \text{ FinLev} + b_6 \text{ GrowOpp} + b_7 \text{ Profit} \\ & + b_8 \text{ MktDum}_1 + b_9 \text{ MktDum}_2 + b_{10} \text{ MktDum}_3 \\ & + b_{11} \text{ MktDum}_4 + b_{12} \text{ MktDum}_5 + b_{13} \text{ MktDum}_6 \\ & + b_{14} \text{ MktDum}_7 + b_{15} \text{ MktDum}_8 + b_{16} \text{ MktDum}_9 + \varepsilon \end{aligned}$$

DIVERS = level of diversification

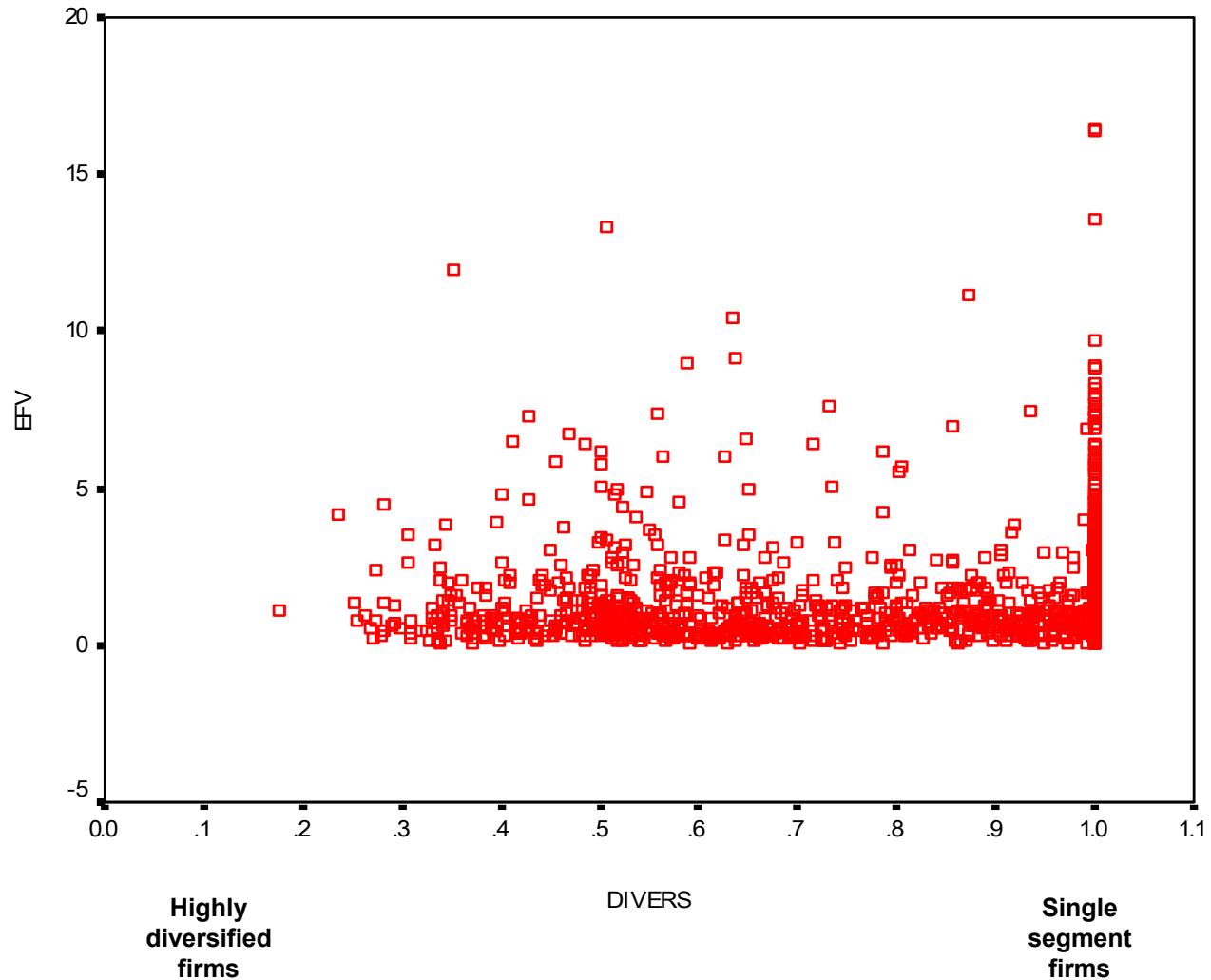
MPI = level of market power

DIVERSMPI = interactive term between level of diversification and market power

Multivariate Analysis

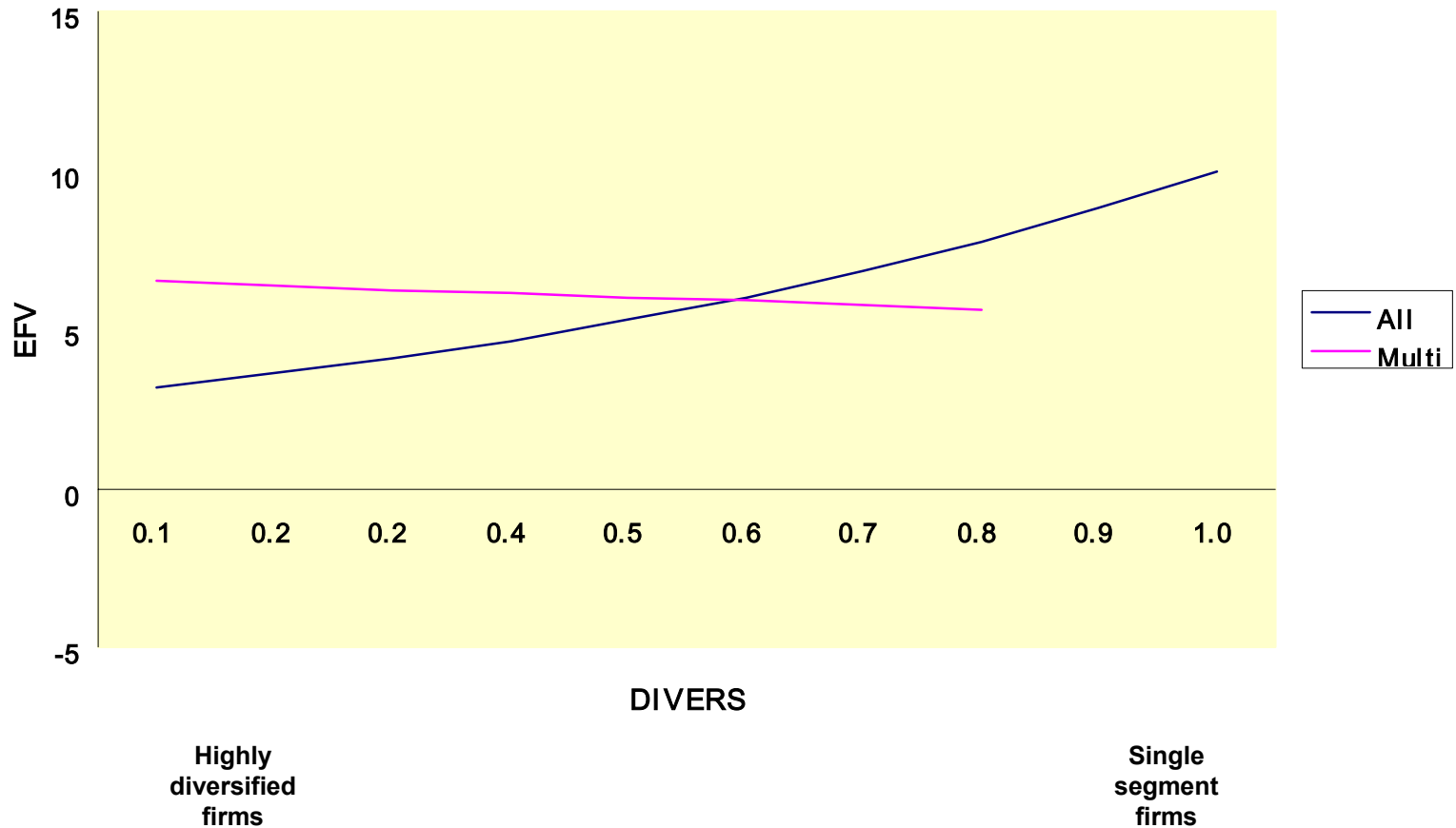
	Effects of diversification		Effects of market power					
	All	Multi	Single	Multi	All	All	All	Multi
Intercept	-0.141 (0.245)	0.012 (0.959)	0.194 (0.059)	0.113 (0.564)	0.131 (0.145)	-0.087 (0.480)	-0.118 (0.340)	0.205 (0.378)
DIVERS	0.237 (0.005)	-0.128 (0.493)				0.221 (0.020)	0.280 (0.001)	-0.133 (0.486)
MPI			0.896 (0.278)	8.993 (0.000)	2.032 (0.011)	1.868 (0.019)	-2.177 (0.165)	7.452 (0.104)
DIVERSMPI							3.409 (0.003)	0.687 (0.692)
FirmSize	-0.159 (0.000)	-0.142 (0.000)	-0.183 (0.000)	-0.192 (0.000)	-0.173 (0.000)	-0.171 (0.000)	-0.177 (0.000)	-0.0194 (0.000)
FinLev	0.913 (0.000)	0.954 (0.000)	0.895 (0.000)	0.976 (0.000)	0.898 (0.000)	0.918 (0.000)	0.918 (0.000)	0.968 (0.000)
GrowOpp	0.822 (0.000)	1.188 (0.000)	0.565 (0.000)	1.178 (0.000)	0.821 (0.000)	0.822 (0.000)	0.815 (0.000)	1.175 (0.000)
Profit	0.154 (0.042)	0.117 (0.338)	0.211 (0.031)	0.154 (0.203)	0.170 (0.025)	0.159 (0.036)	0.161 (0.034)	0.157 (0.196)

Multivariate Analysis





Multivariate Analysis





Capital Markets Development

- **Less developed markets**
 - **Less developed capital markets**
 - **More market inefficiencies and failures**
 - **Higher political and business risks**
- **Are diversification and market power related to higher excess firm value in less developed markets?**



Capital Markets Development

- **Capital Markets Development index**
- **Business risk measure, average of**
 - **Equity market capitalization and private debt to GDP ratio**
 - **Transparent International index**
 - **Natural logarithm of GDP per capita**
 - **EIU Riskwire rating**
 - **Institute for Management Development World Competitiveness rating**
- **Continuous and discrete measures**



Correlations

	CMD	EDI	TI	lnGDP/Cap	EIU Risk	IMD
CMD	1.000 (0.000)	0.787 (0.000)	0.959 (0.000)	0.885 (0.000)	0.890 (0.000)	0.930 (0.000)
EDI		1.000 (0.000)	0.667 (0.000)	0.648 (0.000)	0.548 (0.000)	0.724 (0.000)
TI			1.000 (0.000)	0.822 (0.000)	0.817 (0.000)	0.880 (0.000)
lnGDP/Cap				1.000 (0.000)	0.887 (0.000)	0.702 (0.000)
EIU Risk					1.000 (0.000)	0.782 (0.000)
IMD						1.000 (0.000)

CMD = Capital Markets Development index (average of the other five measurements)

EDI = equity market capitalization + private debt to GDP ratio

TI = Transparent International Index

lnGDP/Cap = Natural logarithm of GDP per capita

EIU Risk = EIU Riskwire rating

IMD = Institute for Management Development World Competitiveness rating



Capital Markets Development

- **Continuous measure, higher EFV**
 - Being focused
 - Interactive term between diversification and market power
- **Discrete measure, higher EFV**
 - More developed emerging markets
 - Being diversified
 - Interactive term between diversification and market power
 - Less developed emerging markets
 - Low market power
 - Interactive term between diversification and market power



Firm Ownership

- **Agency problem, affected by**
 - Ownership level
 - Types of ownership
- **Found statistically insignificant relationship between closely held share ownership level and excess firm value**



Market Growth

- **Total market size in emerging markets smaller**
- **When growth slows or market saturated, easier to diversify than expand market share**
- **Are slow growth and diversification and market power related to higher excess firm value?**
- **Found statistically insignificant relationship between market growth and excess firm value**



Nature of Firms

- **Manufacturing firms derive lower benefits from diversification**
 - Schoar (2002)
 - Villalonga (2004)
- **More capital intensive and more systematic process, so less synergistic benefits derived**
- **Dummy variable to identify non-manufacturing firms**



Nature of Firms

- **Non-manufacturing firms, higher EFV**
 - Being focused
- **Manufacturing firms, higher EFV**
 - Interactive term between diversification and market power



Robustness Tests #1

- **Higher minimum firm size from US\$20 million to US\$40 million**
 - Denis, Denis and Yost (2002)
 - Bodnar, Tang and Weintrop (2003)
 - Sample reduced to 1,518 from 1,818
- **Similar findings as previous results**
 - V-shaped relationship between diversification and excess firm value
 - Firms that diversify and leverage their market power to new or existing segments are associated with higher excess firm value



Robustness Tests #2

- **Two digit SIC classification**
 - For sales multiplier calculation, diversification and market power measurements
 - Sample increased to 2,309 from 1,818
- **Similar v-shaped relationship between diversification and excess firm value**
- **Market power and interactive term between diversification and market power statistically insignificant – inclusion of too many industries**



Robustness Tests #3

- **Consolidation standards**
 - **Exclude firms that are not consolidated**
 - **Exclude firms with over 10% of total assets in Investment in Associated Companies and Minority Interest**
 - **Exclude firms with over 10% of total sales from Minority Interest Income**
 - **Sample reduced to 1,119 from 1,818**
- **Most diversification and market power relationships became statistically insignificant**



Summary of Results

- **Single segment firms different from multi-segment firms**
- **Diversification associated with higher EFV for multi-segment firms**
- **Market power significantly associated with higher EFV for multi-segment firms**
- **Interactive term of diversification and market power associated with higher excess firm value**



- **Thank you**
- **Question and answer**



Market Power

	Industry level Herfindahl index	Industry sales	Firm sales	Tiering
MPI	X	X	X	
MPI_{IND}	X	X		
MPI_{MS}		X	X	
MPI_{TIER75}				X



Descriptive Statistics

	N	EFV			DIVERS			MPI		
		Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev
All	1,818	1.323	0.929	1.496	0.846	1.000	0.216	0.00761	0.00137	0.024
Single	1,135	1.331	0.965	1.472	0.994	1.000	0.019	0.00915	0.00166	0.027
Multi	683	1.311	0.831	1.535	0.601	0.584	0.163	0.00504	0.00119	0.015
Diff		0.019			0.394			0.00411		
Sig		0.792	0.002		0.000			0.0000	0.003	

	N	DIVERSMPI			Total Sales			FirmSize		
		Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev
All	1,818	0.0094	0.0018	0.03272	286.44	78.73	1,119	4.497	4.366	1.352
Single	1,135	0.0092	0.0017	0.02760	280.78	83.84	832	4.537	4.429	1.354
Multi	683	0.0098	0.0020	0.03982	295.83	73.33	1,477	4.430	4.295	1.347
Diff		-0.0006			-15.05			0.108		
Sig		0.751	0.090		0.807	0.133		0.100	0.133	

	N	FinLev			GrowOpp			Profit		
		Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev
All	1,818	0.281	0.247	0.241	0.096	0.041	0.199	0.017	0.050	0.254
Single	1,135	0.275	0.236	0.240	0.094	0.039	0.201	0.037	0.056	0.234
Multi	683	0.291	0.265	0.242	0.099	0.044	0.195	-0.017	0.039	0.281
Diff		-0.016			-0.005			0.055		
Sig		0.183	0.073		0.605	0.090		0.000	0.000	



Market Power

- **Competitive means**
 - **Superior products, distribution system, brand name**
 - **Porter's five forces model**
 - **Increase profitability or returns**



Data Selection and Screening

- **Inactive and delisted firms**
- **Incomplete data available**
 - **Segment information**
- **50% or more of sales from financial services**
- **SIC with less than 3 firms**
- **Inconsistent data**
 - **SIC to firm activities**
 - **Segment sales to total firm sales**
 - **Different reporting dates**



Data Selection and Screening

- **Missing SIC multiplier for any segment**
- **Outliers**
 - **Excess firm value over 30**
 - **Leverage over 200%**
 - **Growth opportunities over 500%**
 - **Profitability over -200% or 100%**
 - **Sales growth over -100% or 600%**
- **Assets under US\$20 million and sales under US\$3 million**



Correlations - Diversification

	DIVERS	NumSeg
DIVERS	1.000 (0.000)	0.798 (0.000)
NumSeg		1.000 (0.000)

DIVERS = firm level Herfindahl index

NumSeg = 8 - number of segments per Worldscope



Correlations – Market Power

	MPI	MPI_{IND}	MPI_{MS}	MPI_{TIER75}
MPI	1.000 (0.000)	0.677 (0.000)	0.880 (0.000)	0.540 (0.000)
MPI_{IND}		1.000 (0.000)	0.586 (0.000)	0.510 (0.000)
MPI_{MS}			1.000 (0.000)	0.699 (0.000)
MPI_{TIER75}				1.000 (0.000)

MPI = Market Power Index (adjusted by industry and firm sales)

MPI_{IND} = Market Power Index by Industry (adjusted by industry sales)

MPI_{MS} = Market Power Index by Market Share (adjusted by market share)

MPI_{TIER75} = Market Power Index by 75% Tiering (adjusted by ranking of firms)



Strengths

- **Multiplier approach used in other research studies on diversification**
- **Several measurements to proxy market power**
- **Incorporation of interactive term between diversification and market power in analysis**
- **Decompositional analysis to evaluate the effects of diversification and market power**



Weaknesses

- **Availability and quality of data**
 - **Worldscope database**
 - **Nature of data**
 - **Cross-sectional data**
- **Measurement of variables**
 - **Excess firm value**
 - **Level of diversification**
 - **Level of market power**



Contributions

- **Academic**
 - **Contributes to existing pool of knowledge**
- **Management**
 - **Effects of diversification as strategic alternative**
 - **Accrual of market power**
- **Equity holders**
 - **Firm evaluation and valuation**
- **Study of market power**
 - **Effects of market power**



Future Research

- **Expansion of sample**
 - Include private firms
 - Include developed markets
- **Develop better variable measurements**
 - For diversification
 - For market power
 - Investment allocation
- **Incorporate ownership information**



Diversification - Benefits

- **Internalization of firm assets**
 - Information-based or firm-specific assets
- **Efficiency gains and synergistic benefits**
 - Economies of scale and scope
 - Synergistic benefits
 - Higher debt capacity and tax shields
 - Lower borrowing costs
 - Lower taxes through transfer pricing
 - Asymmetric tax treatment of gains and losses
- **Lower transaction costs**
- **Internal capital markets**
- **Overcome market inefficiencies and failures**



Diversification - Costs

- Increased difficulty to manage
- Negative synergies
- Inefficient allocation of resources
- Agency problems
 - Misalignment of interest
 - Limitations of corporate governance
- Information asymmetry



Diversification - Measurement

- **Use Herfindahl index**
- **Measurement errors**
 - **Source of data**
 - **Appropriateness of use**
 - **Self-selection bias**
 - **Self-reporting bias**
 - **Sample selection**
 - **Survivor bias**
 - **Selection bias**
 - **Measurement errors**
 - **Inaccurate measurement of firm value**
 - **Violation of homogenous firm assumption**
 - **Proxy for firm value**
 - **Endogenous factors**



Market Power - Measurement

- **Market concentration index like Herfindahl index**
- **Difficult to measure**
 - **Definition**
 - **Usage**
 - **Effects**



Descriptive Statistics

	N	EFV			DIVERS			MPI		
		Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev
All	1,818	1.323	0.929	1.496	0.846	1.000	0.216	0.00761	0.00137	0.024
Single	1,135	1.331	0.965	1.472	0.994	1.000	0.019	0.00915	0.00166	0.027
Multi	683	1.311	0.831	1.535	0.601	0.584	0.163	0.00504	0.00119	0.015
Diff		0.019			0.394			0.00411		
Sig		0.792			0.000			0.0000		

	N	Total Assets			Total Sales			FirmSize		
		Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev
All	1,818	528.02	115.80	2,361	286.44	78.73	1,119	4.497	4.366	1.352
Single	1,135	430.49	108.57	1,863	280.78	83.84	832	4.537	4.429	1.354
Multi	683	690.10	127.67	3,007	295.83	73.33	1,477	4.430	4.295	1.347
Diff		-259.61			-15.05			0.108		
Sig		0.023			0.807			0.100		

	N	FinLev			GrowOpp			Profit		
		Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev
All	1,818	0.281	0.247	0.241	0.096	0.041	0.199	0.017	0.050	0.254
Single	1,135	0.275	0.236	0.240	0.094	0.039	0.201	0.037	0.056	0.234
Multi	683	0.291	0.265	0.242	0.099	0.044	0.195	-0.017	0.039	0.281
Diff		-0.016			-0.005			0.055		
Sig		0.183			0.605			0.000		



- **Diversification associated with higher EFV**
- **Market power significantly associated with higher EFV for multi-segment firms**
- **Interactive term of diversification and market power associated with higher excess firm value**