FN241: Session 7
Introduction to Enterprise Risk Management

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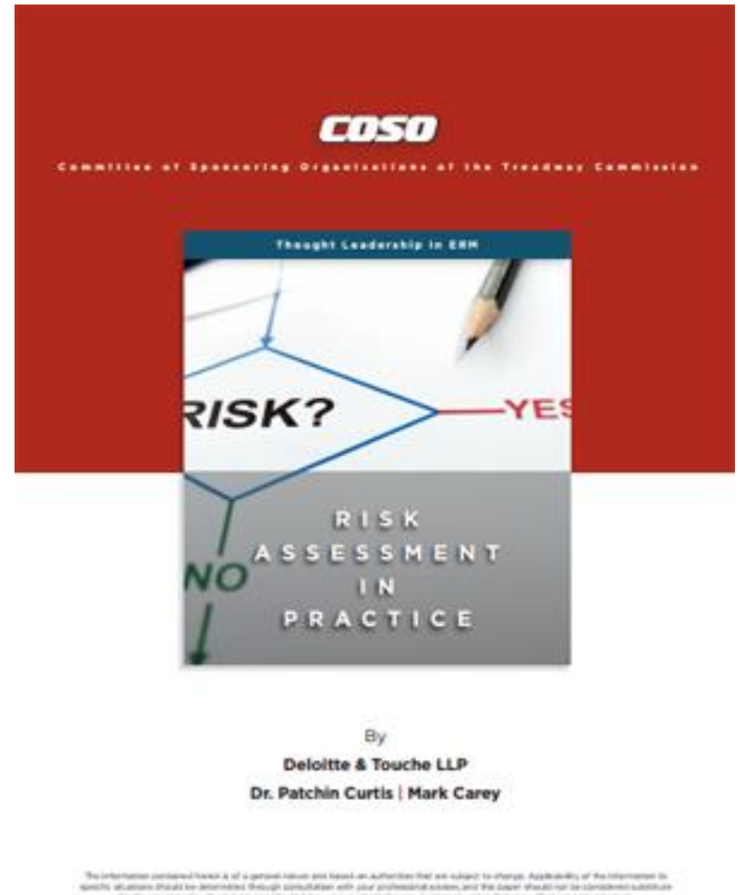
Reading

“Risk Assessment in Practice”



What is ERM?

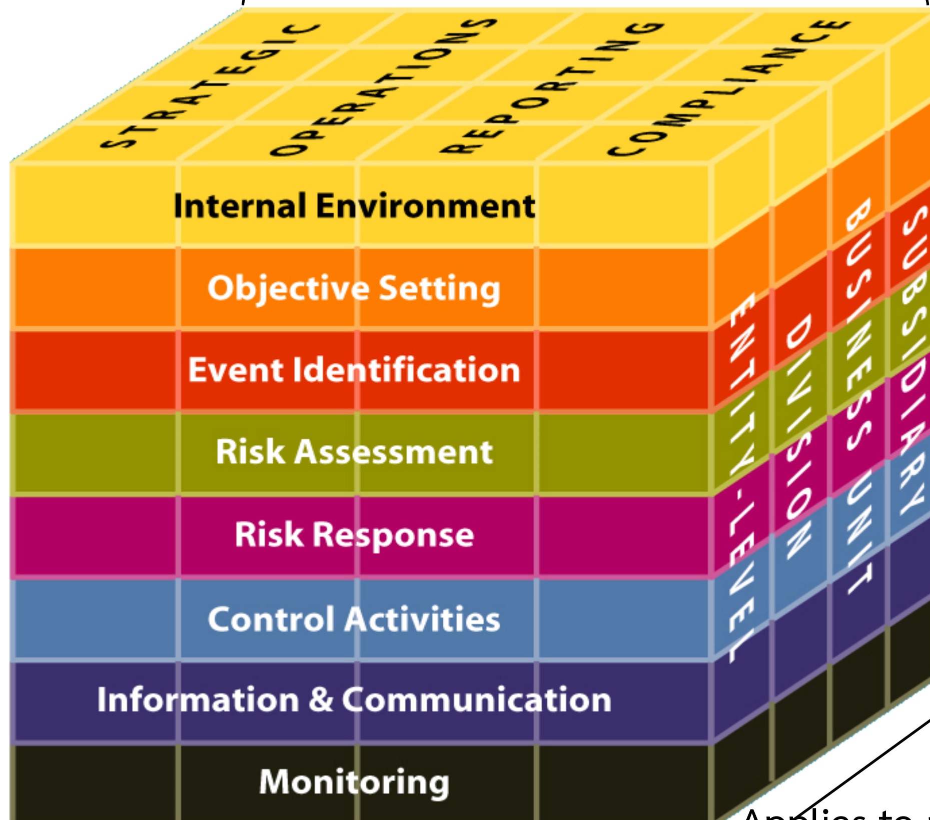
Enterprise Risk Management (ERM) is defined by the Committee of Sponsoring Organizations (COSO) as:

“a PROCESS, effected by an entity’s board of directors, management and other personnel, applied in STRATEGY-SETTING and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide REASONABLE ASSURANCE regarding the achievement of ENTITY OBJECTIVES.”

What is ERM?

- To help assist with the implementation of the ERM process, COSO developed the ERM Integrated Framework (2004), also known as the COSO Cube.

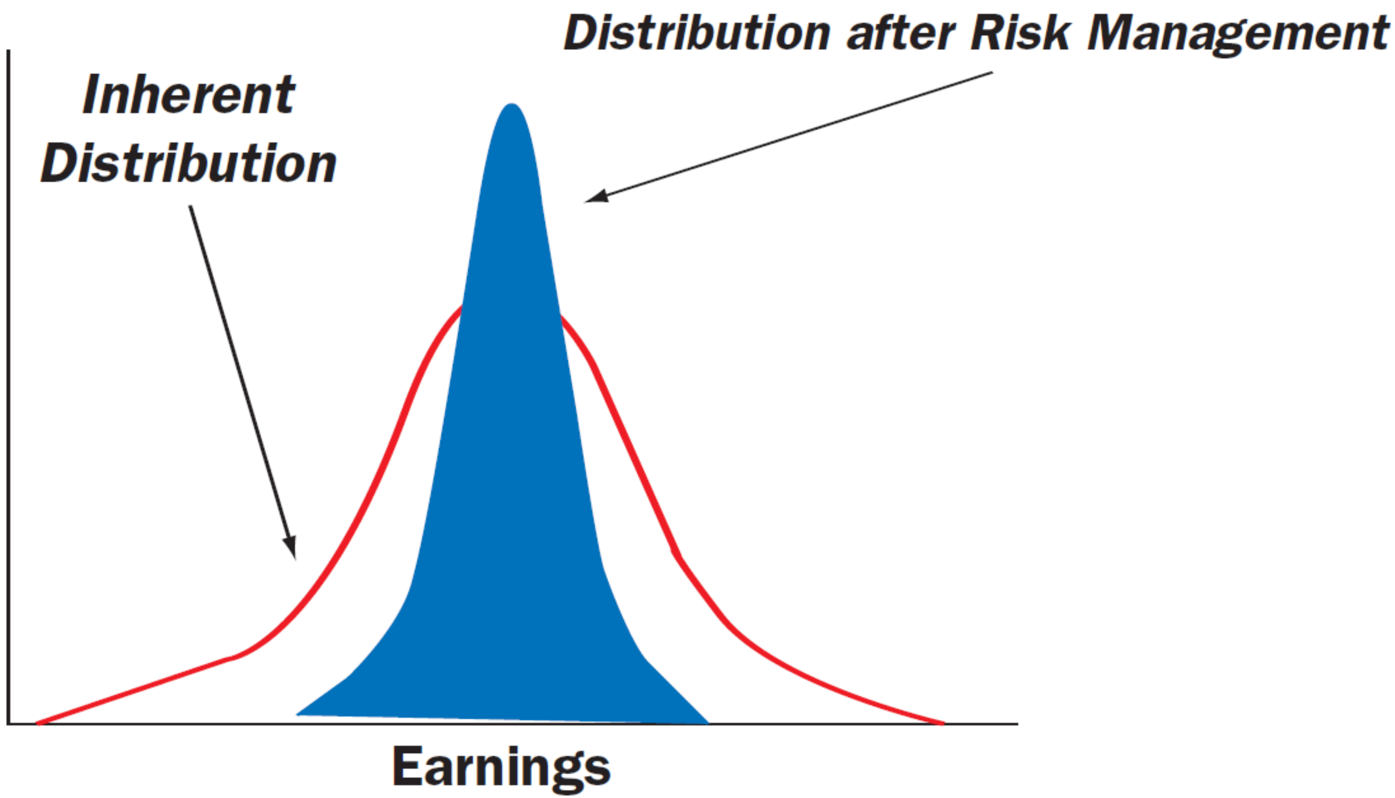
ERM is a process to help achieve entity objectives across these categories



Eight interrelated components

Applies to activities at all levels of the organization

Goals of Risk Management



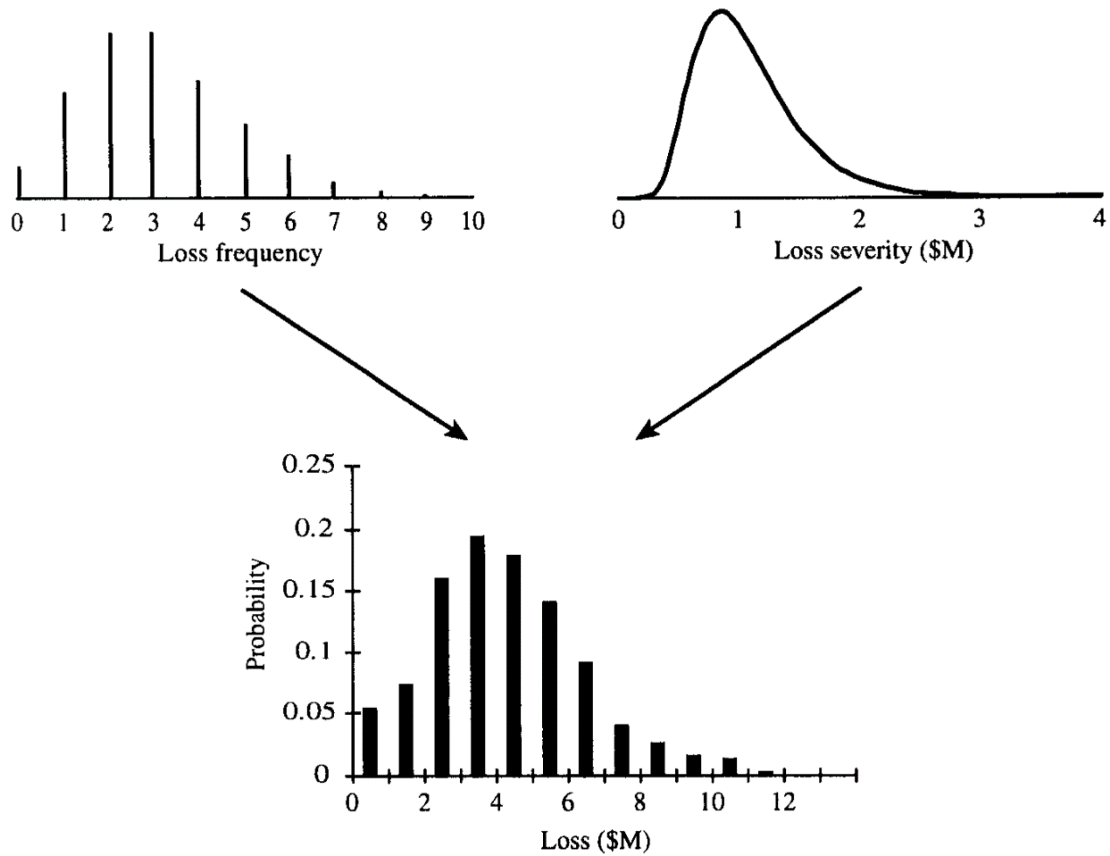
Initiated Risk Mapping

- Helpful to put risk into buckets to assess "what's at risk, where?"
  = Useful in communicating risk priorities and response to Board, others
- Categories vary, but often include:

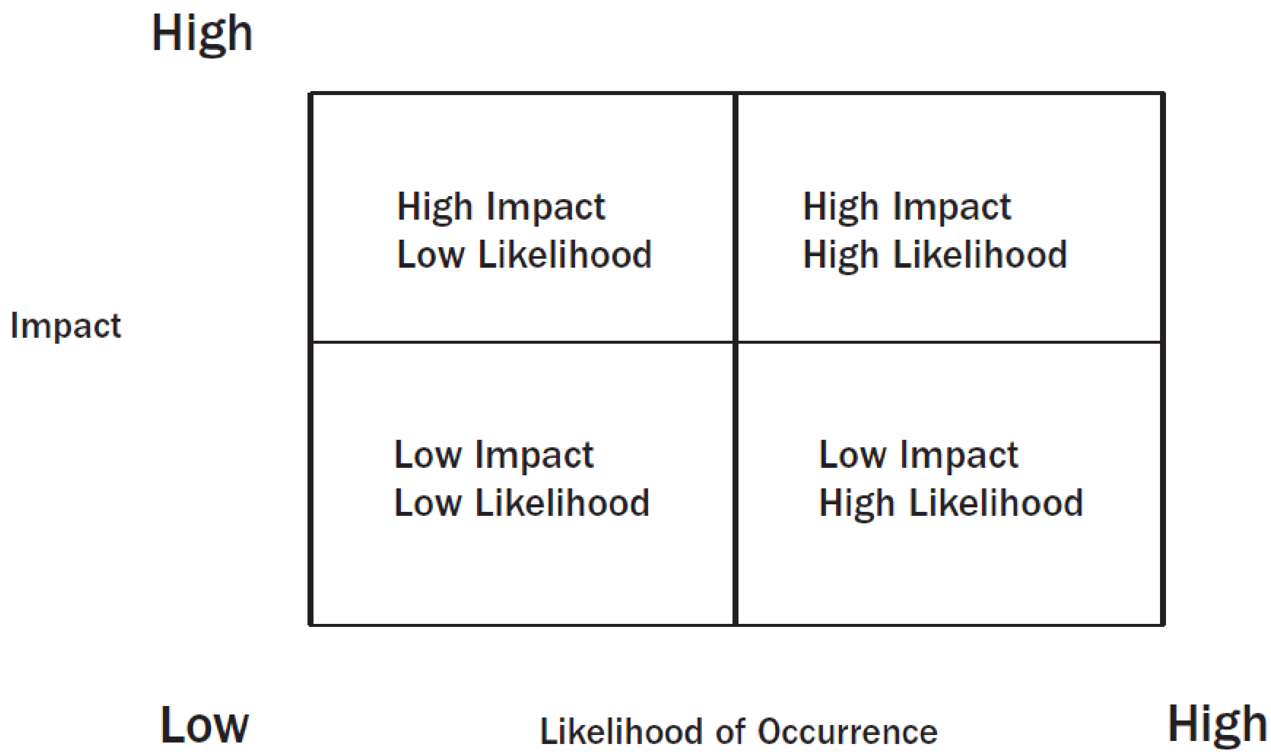
Developed Risk Matrix, Common Language

- Challenge is finding common means to evaluating various risk is terms of frequency, severity
- While all risk eventually may be (eventually) quantified and correlated, did not have the time or resources to do so
  - Idea was subjective process first, quantitative discipline as ERM evolved
- Agreed on Frequency/Likelihood and Severity Matrix for rating risk
  - Severity Matrix blended financial measurements, reputation risk and compliance risk
    - *Built the language bridge across diverse functions like legal, marketing, human resources, technology, finance*
  - Low, Medium, High, “Survival Bet” = Severity

Using Monte Carlo to combine the Distributions



Risk Map


High
High Impact
Low Likelihood
High Impact
High Likelihood
Impact
Low Impact
Low Likelihood
Low Impact
High Likelihood
Low
Likelihood of Occurrence
High

Risk Map

	Low	Moderate	High
Level Impact	**6 Yellow (Level III)** *Close monitoring for increased impact and/or variability*	**8 Red (Level IV)** • *Segment Commitment* • *Reported to Segment Leadership* • *Close monitoring of risk action plan*	**9 Red (Level V)** • *Commitment* • *Reported to Audit Committee* • *Reported to Segment Leadership* • *Close monitoring of risk action plan*
Segment/Intersegment Level Impact	**3 Green (Level II)** *High-level monitoring for increased impact and/or variablity*	**5 Yellow (Level III)** *Close monitoring for increased impact and/or variability*	**7 Red (Level IV)** • *Segment Commitment* • *Reported to Segment Leadership* • *Close monitoring of risk action plan*
Process/Business Level Impact	**1 Green (Level I)** *High-level monitoring for increased impact and/or variablity*	**2 Green (Level II)** *High-level monitoring for increased impact and/or variablity*	**4 Yellow (Level III)** *Close monitoring for increased impact and/or variability*
	(Consistently within tolerable variance in key metric improvement or target)	*(Sometimes within tolerable variance in key metric improvement or target)*	*(Mostly outside of tolerable variance in key metric improvement or target)*

Example:
Impact Scale

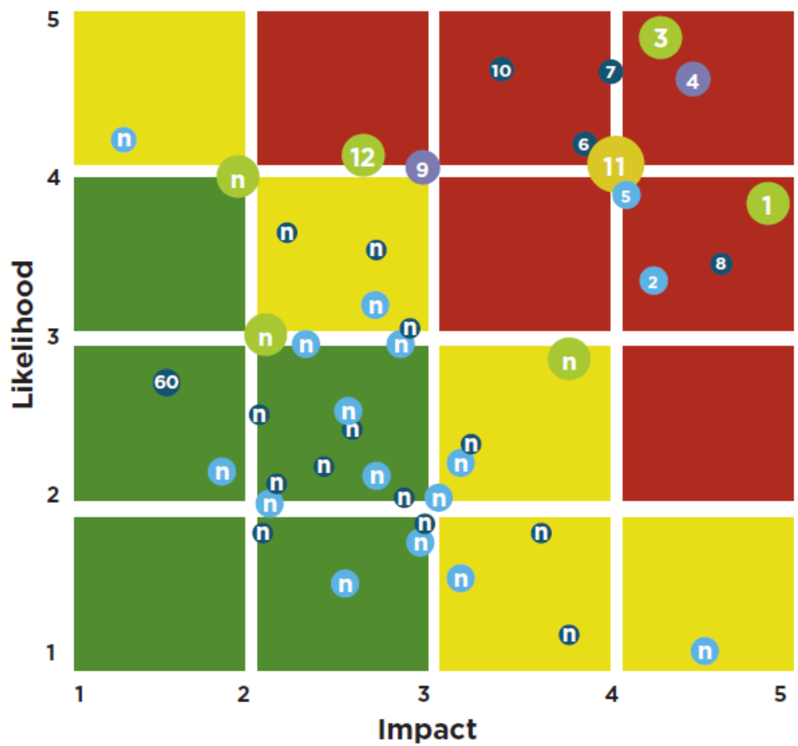
Illustrative Impact Scale

Rating	Descriptor	Definition
5	Extreme	• Financial loss of $X million or more[3] • International long-term negative media coverage; game-changing loss of market share • Significant prosecution and fines, litigation including class actions, incarceration of leadership • Significant injuries or fatalities to employees or third parties, such as customers or vendors • Multiple senior leaders leave
4	Major	• Financial loss of $X million up to $X million • National long-term negative media coverage; significant loss of market share • Report to regulator requiring major project for corrective action • Limited in-patient care required for employees or third parties, such as customers or vendors • Some senior managers leave, high turnover of experienced staff, not perceived as employer of choice
3	Moderate	• Financial loss of $X million up to $X million • National short-term negative media coverage • Report of breach to regulator with immediate correction to be implemented • Out-patient medical treatment required for employees or third parties, such as customers or vendors • Widespread staff morale problems and high turnover
2	Minor	• Financial loss of $X million up to $X million • Local reputational damage • Reportable incident to regulator, no follow up • No or minor injuries to employees or third parties, such as customers or vendors • General staff morale problems and increase in turnover
1	Incidental	• Financial loss up to $X million • Local media attention quickly remedied • Not reportable to regulator • No injuries to employees or third parties, such as customers or vendors • Isolated staff dissatisfaction

Example: Likelihood Scale

Illustrative Likelihood Scale				
Rating	**Annual Frequency**		**Probability**	
	Descriptor	**Definition**	**Descriptor**	**Definition**
5	Frequent	Up to once in 2 years or more	Almost certain	90% or greater chance of occurrence over life of asset or project
4	Likely	Once in 2 years up to once in 25 years	Likely	65% up to 90% chance of occurrence over life of asset or project
3	Possible	Once in 25 years up to once in 50 years	Possible	35% up to 65% chance of occurrence over life of asset or project
2	Unlikely	Once in 50 years up to once in 100 years	Unlikely	10% up to 35% chance of occurrence over life of asset or project
1	Rare	Once in 100 years or less	Rare	<10% chance of occurrence over life of asset or project

Example: Results



ID	Risk	I	L	V	S
1	Supply chain disruption	4.8	3.7	3.8	4
2	Customer preference shift	4.1	3.3	3.5	2
3	Copper price rise >10%	4.3	4.7	2.3	4
4	Work stoppage > 1 week	4.4	4.5	4.1	3
5	Economic downturn	4.0	3.7	3.5	2
6	Supplier consolidation	3.8	4.2	3.2	1
7	Local competitors enter	3.9	4.5	3.6	1
8	New substitutes available	4.5	3.6	4.2	1
9	Cost of capital rise >5%	2.9	4.0	2.9	3
10	Tighter emission standards	3.4	4.6	2.9	1
11	FCPA violation	4.0	4.0	3.3	5
12	Exchange rate fluctuations	2.7	4.1	2.7	4
n	. . .	...	...	...	...
60	Impairment of assets	1.6	2.7	1.6	1

Dots represent risk #1 - #n
Dot size reflects speed of onset:
Very Low Low Medium High Very High

I = Impact L = Likelihood V = Vulnerability S = Speed of onset

Revenue Structure

Unit: Million Baht

Products	Operated by	% Share holding of the Company	2014 Revenues	2014 %	2015 Revenues	2015 %	2016 Revenues	2016 %	2017 Revenues	2017 %
Revenues from Construction Services	CH. Karnchang Public Company Limited	-	18,950.78	53.47	23,544.90	61.93	17,179.81	36.54	12,784.87	33.88
	CH. Karnchang (Lao) Co., Ltd.	100.00	10,022.24	28.28	8,834.06	23.24	24,181.04	51.43	14,252.18	37.78
	CH. Karnchang-Tokyu Construction Co., Ltd.	55.00	3,090.10	8.72	2,400.98	6.31	1,948.82	4.15	2,741.47	7.27
	CKTC Joint Venture	70.00	629.80	1.78	5.49	0.01	-	-	16.89	0.04
	CKCH Joint Venture	70.00	-	-	-	-	2,392.86	5.09	5,205.42	13.80
	CH. Karnchang - Krung Thon Engineers Joint Venture	60.00	164.95	0.47	29.16	0.07	2.54	0.01	-	0.00
	CKST Joint Venture	60.00	-	-	-	-	-	-	898.85	2.38
Total Revenues from Construction Services			**32,857.87**	**92.72**	**34,814.59**	**91.56**	**45,705.07**	**97.22**	**35,899.68**	**95.15**
Construction Revenue from Public Sector			**9,271.13**	**28.22**	**6,384.03**	**18.34**	**6,556.36**	**14.34**	**10,793.57**	**30.07**
Construction Revenue from Private Sector			**23,586.74**	**71.78**	**28,430.56**	**81.66**	**39,148.71**	**85.66**	**25,106.11**	**69.93**
Revenue from Sales of Construction Materials	Construction Material Supply Co., Ltd.	99.99	7.07	0.01	32.35	0.08	62.75	0.13	22.02	0.05
	CKCH Joint Venture	70.00	-	-	-	-	-	-	0.99	0.00
	CKST Joint Venture	60.00	-	-	-	-	-	-	0.11	0.00
	CH. Karnchang (Lao) Co., Ltd.	100.00	-	-	-	-	-	-	-	-
	CKTC Joint Venture	70.00	0.12	0.00	-	0.00	0.47	0.00	-	-
Total Revenue from Sales of Construction Materials			**7.19**	**0.01**	**32.35**	**0.08**	**63.22**	**0.13**	**23.12**	**0.05**
Interest Income			74.95	0.21	56.59	0.14	355.42	0.75	738.05	1.96
Dividend Income and Profit Sharing from Jointly Controlled Entities			711.71	2.01	900,89	2.37	464.63	0.99	464.64	1.23
Other Income (1)			1,791.64	5.05	2,223.33	5.85	431.20	0.91	605.19	1.61
Total (2)			**35,443.36**	**100.00**	**38,027.75**	**100.00**	**47,019.54**	**100.00**	**37,730.68**	**100.00**

Case Study:
Business Operations

Case Study: Risk Factors

1. Major Shareholders Exceeding 25 Percent
2. Reliance on Customers in the Company Group Invested by the Company
3. Risk from Management and Risk from Delays in Projects
4. Exchange Rate
5. Construction Material Price, Labor Cost and Fluctuation of Oil Price
6. Changes of Government’s Policies
7. Investments in Subsidiaries, Associated Companies, Jointly Controlled Entities, Related Companies and Other Companies

Question?