

# Faculty of Engineering and Mathematical Sciences

Project Management & Engineering Practice  
(GENG 5505)

Assoc Prof Cosimo Faiello



THE UNIVERSITY OF  
**WESTERN**  
**AUSTRALIA**



# Project Management & Engineering Practice (GENG5505)

Risk management: Proactively managing uncertainty, complexity and change  
(Ch 10)

(Week 6a) - Lecture eleven, 27<sup>th</sup> August 2024

# Defining risk & management

## Risk

- The possibility of loss or injury;
- Situation, problem, enhancement or opportunity having a measured impact (positive or negative) on an outcome;
- Exposure of an activity to an uncertain outcome;

## Risk management

- The iterative process of: Identifying, assessing, analyzing, managing & monitoring and evaluating & reviewing risk.

# Potential sources of risk

## Internal (controllable)

Some examples:

- Ambiguous project charter
- Communication bottlenecks
- Managerial incompetence
- Lack of reporting
- Lags in decision making
- Poor deliverable definition
- Inaccurate estimates
- Limited resources
- Limited capability
- Lack of accountability
- ...

SWOT analysis

PESTELG framework

## External (uncontrollable)

Some examples:

- Economic cycles
- Changing technology
- Legislative constraints
- Environmental factors
- Social changes
- Supplier capability
- Stakeholder expectations
- Variable contractor performance
- ...

\*\*\*Key stakeholders should all be involved in identifying & managing risks

## SWOT

S-trenghts

W-eaknesses

O-pportunities

T-hreats

## PESTELG

Political

Economic

Social

Technological

Environmental

Legal

Global

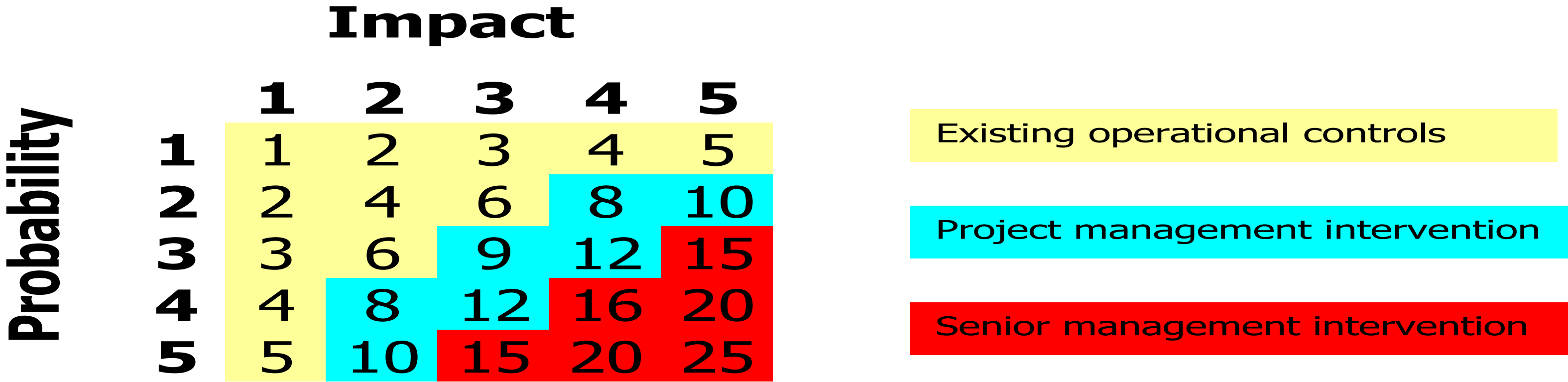
# PMBOK process risk categories

Review the potential risks which can occur in each of the 9 PMBOK processes/competencies – Please refer to table 10.2 in the textbook, p. 342.

# IDENTIFYING RISK: TOOLS & TECHNIQUES

- Risk registers
- Project completion reports
- Lessons learned
- Historical research (or hindsight reviews)
- Checklists
- Fishbone diagrams
- SWOT analysis
- PESTELG
- Brainstorming
- Critical incident reports
- Risk specialists
- Strategic plans
- Interviews & workshops
- Project charter
- Feasibility studies
- Impact assessment studies
- Industry databases
- Subject matter experts
- Specification descriptions
- Simulations
- ....

# Assessing the risk: The 5 by 5 priority grid



Probability		Impact	
1	Remote	1	Insignificant
2	Unlikely	2	Minor
3	Likely	3	Moderate
4	Very likely	4	Major
5	Certain	5	Catastrophic

- Values 1-6= Dealt with by existing procedures;
- Values 8-12= Project manager intervention;
- Values 15-25= Senior management intervention;



# Analysing the risk

- Program Evaluation & Review Technique (PERT analysis ) considers the critical path and other networks;
- SWOT and PESTELG analysis – consider issues impacting the situation;
- Expert judgement – considers opinions, perspectives & viewpoints;
- Stakeholder forums – considers expectations, objectives & deliverables;
- Decision trees – considers possible paths & expected values returned;
- Sensitivity analysis – considers demand, feasibility, take-up;

- Impact analysis – considers action & consequences;
- Scenario scheduling – considers alternative scheduling options;
- Contingency planning – considers possible options & recovery strategies;
- Financial modelling - considers financial implications for funding & cash flows;
- ....

## Managing the Risk: possible risk responses

- 1.Reject-modify plan to eliminate risk;
- 2.Accept-addressed as they arise;
- 3.Mitigate-proactive action to minimize the impact;
- 4.Share-partnership with 3<sup>rd</sup> party;
- 5.Transfer-outsourced to 3<sup>rd</sup> party;
- 6.Enhance - actively increase the probability and/or positive impacts of an opportunity;
- 7.Exploit: ensure that the identified opportunity is realised by eliminating the uncertainty around it altogether so that the opportunity definitely happens.

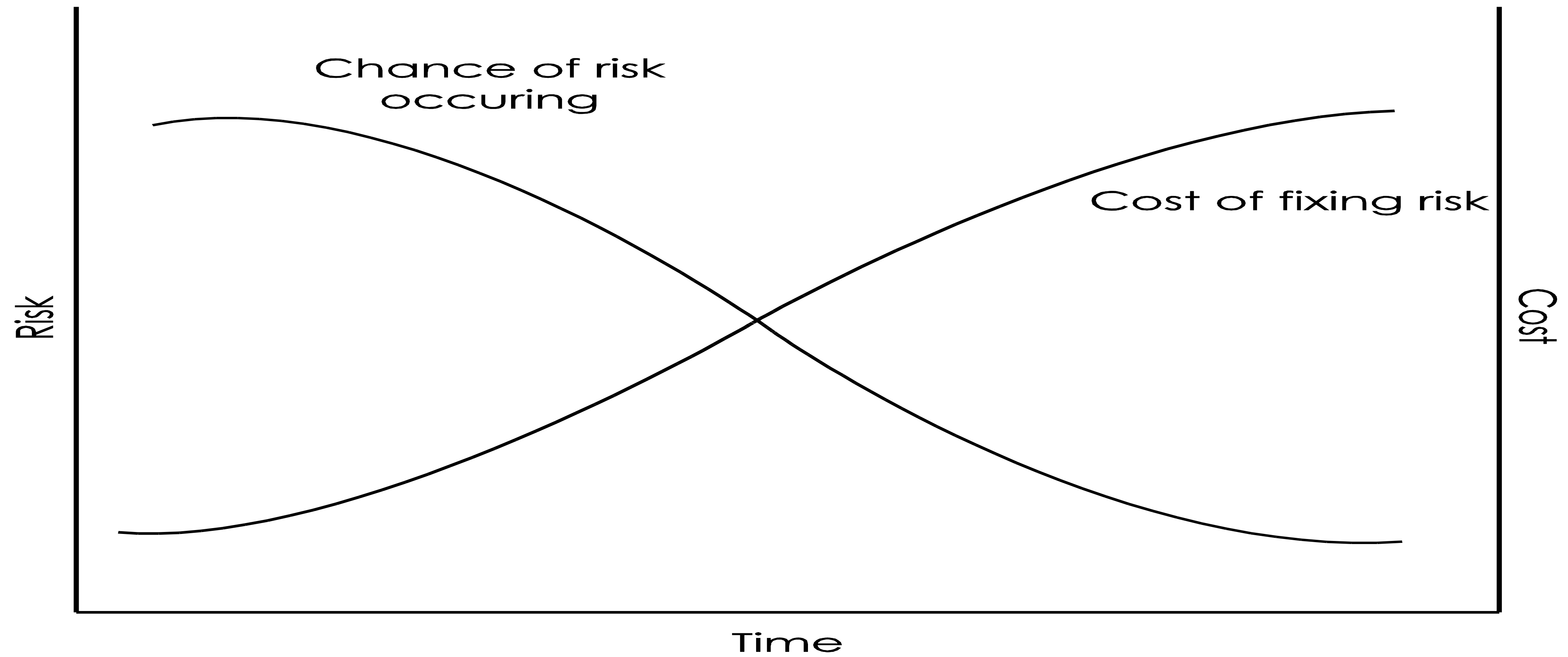
# Monitoring & evaluating: Documenting the risk register

Risk event	Probability	Impact	Priority	Strategy	Responsibility	Review

- The more detailed the risk event, the more targeted the response;
- Managed risk requires the 'right' owner;
- Risk is always communicated and owned by all stakeholders;
- Risk is either rejected, accepted or managed;
- Risk can impact the project schedule and other variables;
- Ongoing risk control is essential;
- Risk register should be updated at every phase of the project lifecycle.



# The risk management dilemma



## Project management as a strategy (not simply as planning & execution)

- Recognize & manage proactively project complexity;
- Decision making based on strategic approaches;
- Project lifecycle thinking;
- Include variables in line with TBL.

## Identified risk variables

- Promotion risk
- Market/price
- Political
- Technical
- Financial
- Environmental
- Cost estimate
- Schedule
- Operating
- Organizational
- Integration
- Force majeure
- ...

Treatment  
under the  
LCPM Model  
(refer to p. 95  
article)

• Remarks  
(refer to p. 95  
article)



# Risks with global projects

## PESTELG framework (in line with TBL)

- Political
- Economic/financial
- Social (including culture, values, language, religion, negative impact on community etc.)
- Technological
- Environmental
- Legal
- Global
- Life cycle thinking
- ...

# Aligning the risk profile

## ➤ Risk averse

- Low tolerance & ability to accept & manage risk
- Conservative approach, proven techniques, *distanced from change*
- Caution is the principal focus

## ➤ Risk neutral

- Dispassionate tolerance & ability to accept & manage risk
- No defined philosophies, reaction oriented, *measured indifference*
- Balance is the principal focus

## ➤ Risk taking

- High tolerance & ability to accept and manage risk
- Challenges current thinking, *innovative* approach
- Experimentation is the principal focus

# Critical thinking question

Reflect on the relationship between change & perceived risk  
from three different perspectives:

- 1) Risk averse
- 2) Risk neutral
- 3) Risk taking

In which category are you?



## Readings week 6

Jaafari A., 2001, Management of risks, uncertainties and opportunities on projects: Time for a fundamental shift, *International Journal of Project Management*, pp 89 – 101

Yen Yng Ling F. and Hoi L., 2006, Risks faced by Singapore firms when undertaking construction projects in India, *International Journal of Project Management*, pp 261 – 270

Yean Yng Ling F., Pheng Low S., Wang S. Q., Lim H. H., 2007, Key project management practices affecting Singaporean firms' project performance in China, *International Journal of Project Management*, pp 59 – 71

Sebenius J., 2002, The hidden challenge of Cross-Border Negotiations, *Harvard Business Review*, pp 76 – 85