The Actuarial Profession
making financial sense of the future

GIRO conference and exhibition 2010
George Orros

ERM for Emerging Risks in General Insurance

25 July 2010

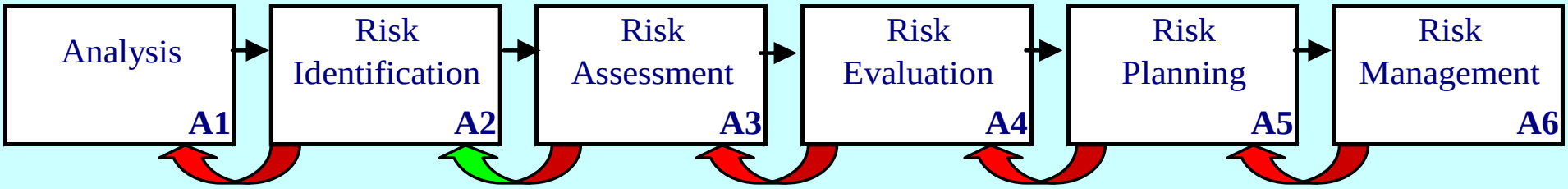
Risk and Opportunity Management Framework

1. Corporate Governance
(Board oversight)

2. Internal Control
(sound system of internal control)

3. Implementation
(appointment of external support)

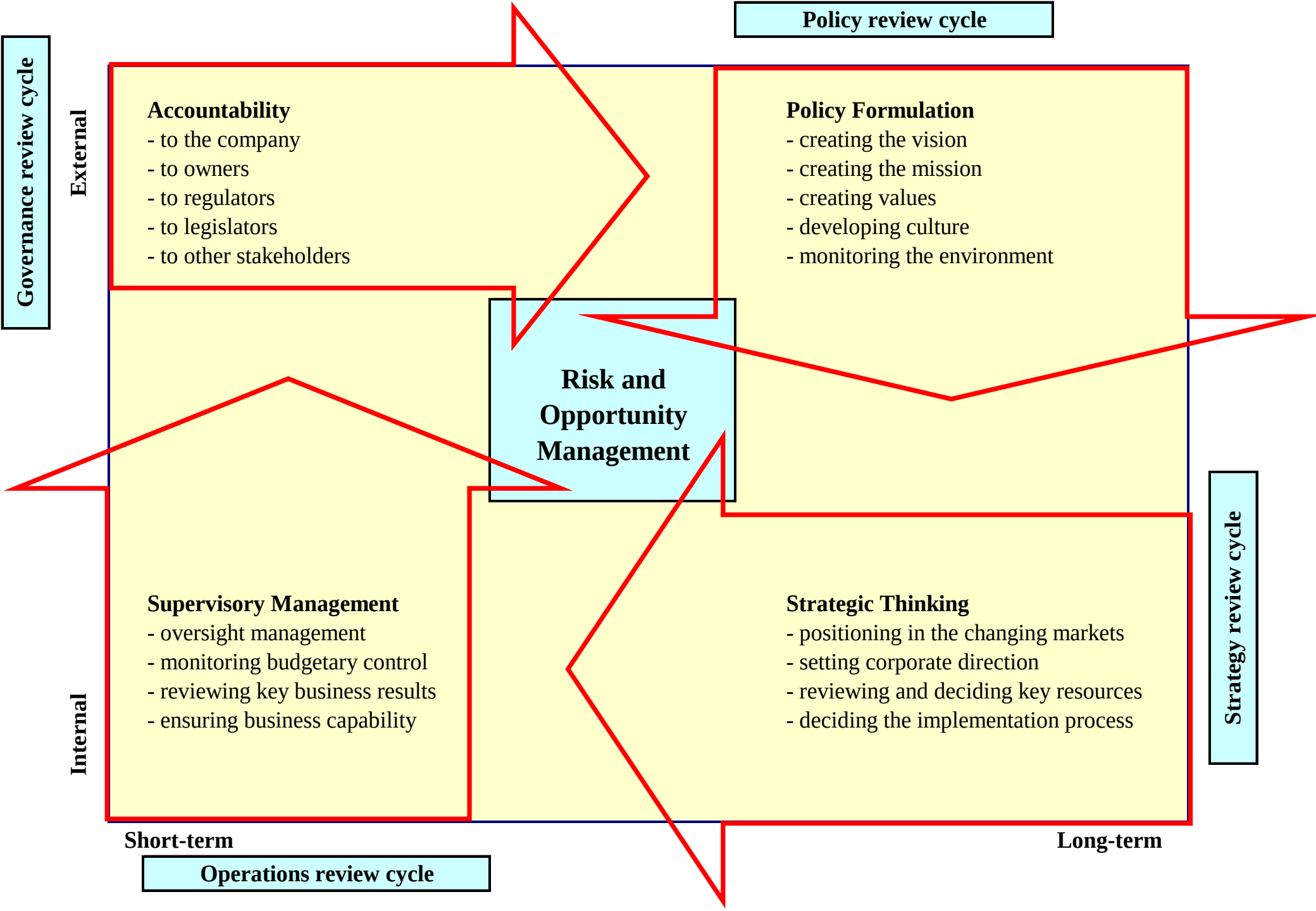
4. Risk Management Processes
(incremental phases of an iterative process)



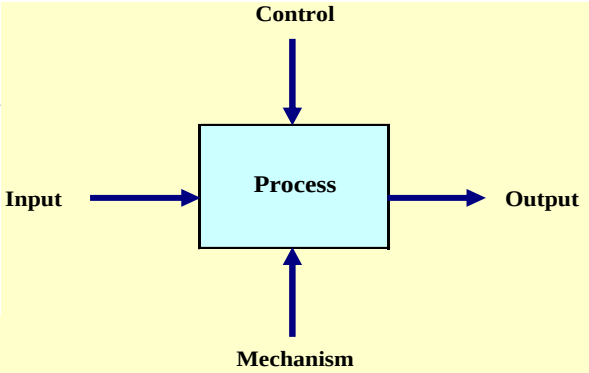
5. Sources of Risk
(internal to a business and emanating from the environment)

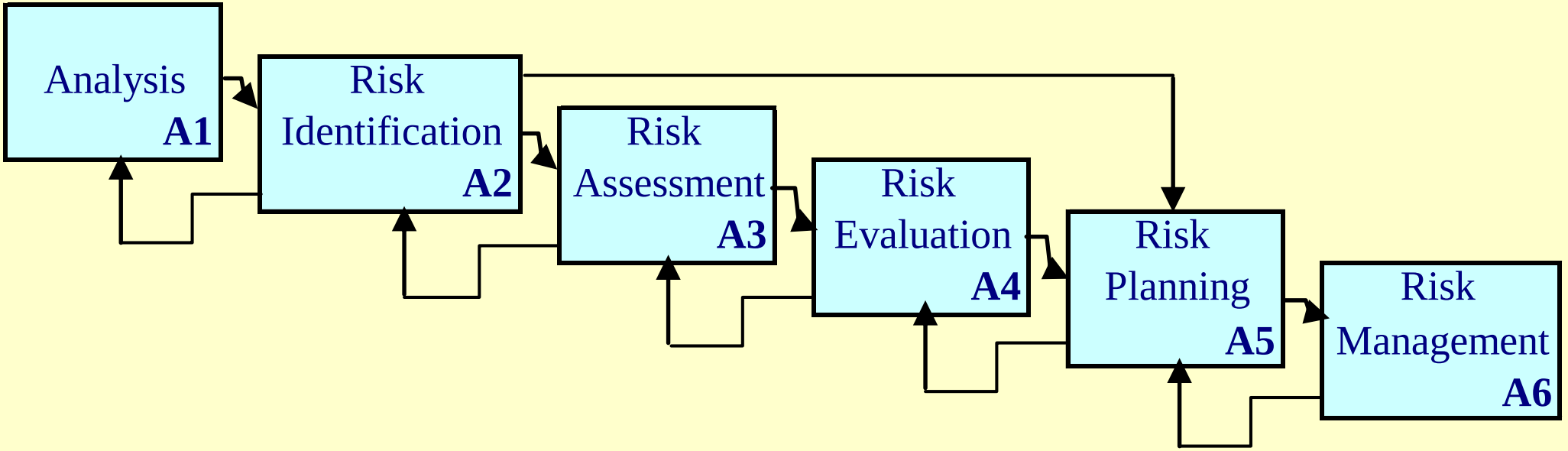
Internal Processes

Business Operating Environment

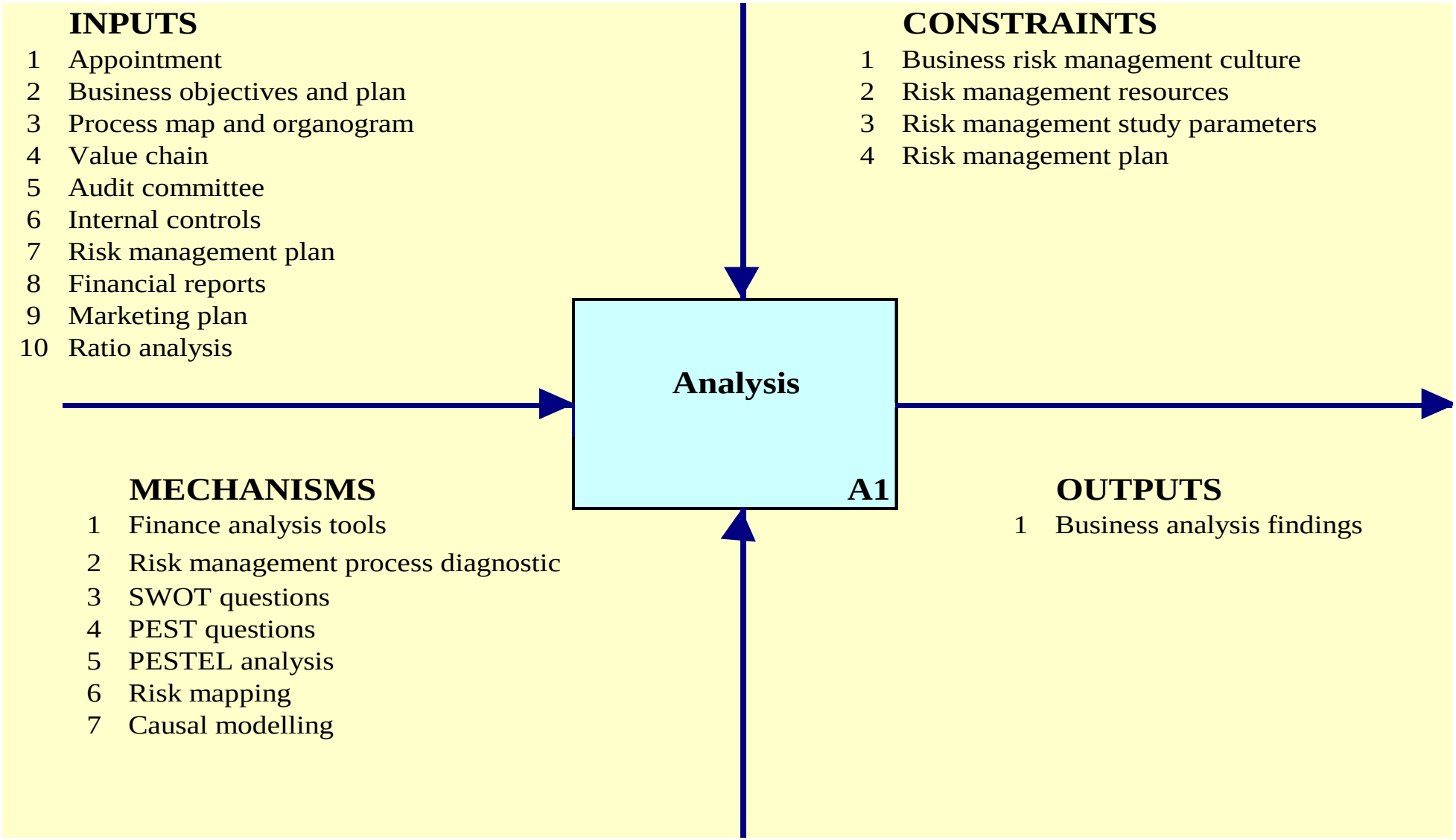

Policy review cycle
Governance review cycle
External
Accountability
- to the company
- to owners
- to regulators
- to legislators
- to other stakeholders
Policy Formulation
- creating the vision
- creating the mission
- creating values
- developing culture
- monitoring the environment
Risk and Opportunity Management
Strategy review cycle
Internal
Supervisory Management
- oversight management
- monitoring budgetary control
- reviewing key business results
- ensuring business capability
Strategic Thinking
- positioning in the changing markets
- setting corporate direction
- reviewing and deciding key resources
- deciding the implementation process
Short-term
Long-term
Operations review cycle

Stages in the Enterprise Risk Management process

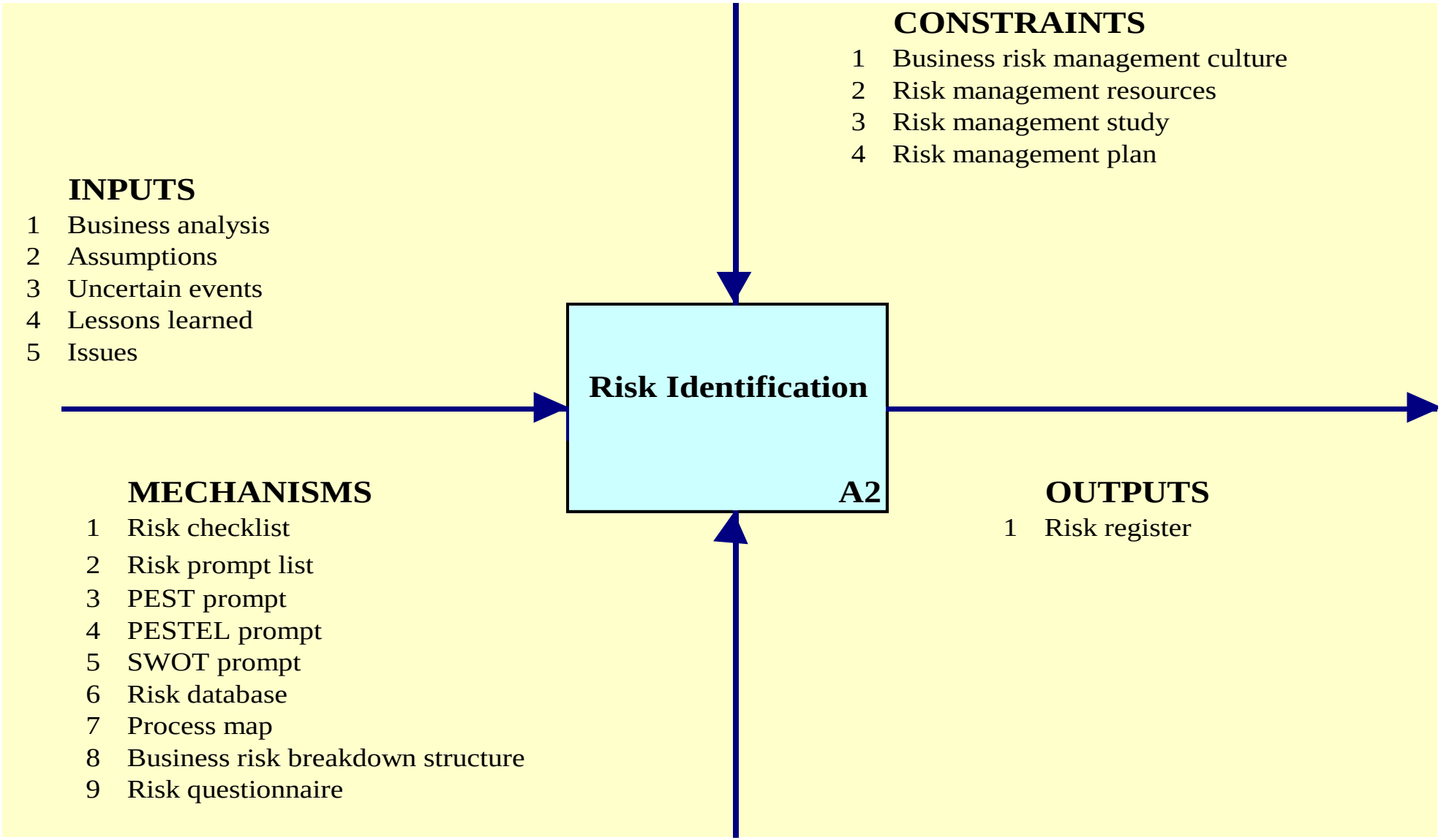




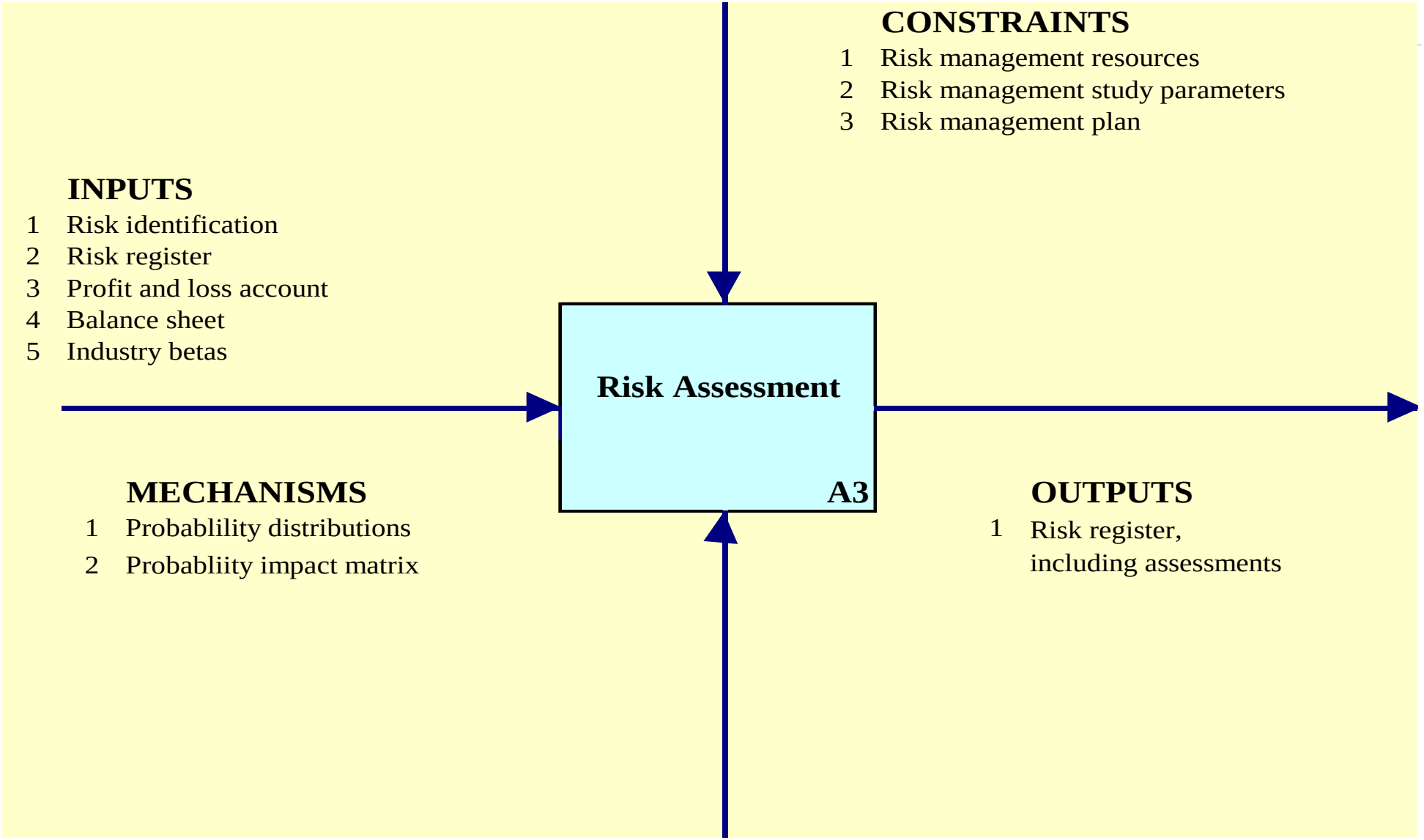
ERM Process - Stage 1: Analysis



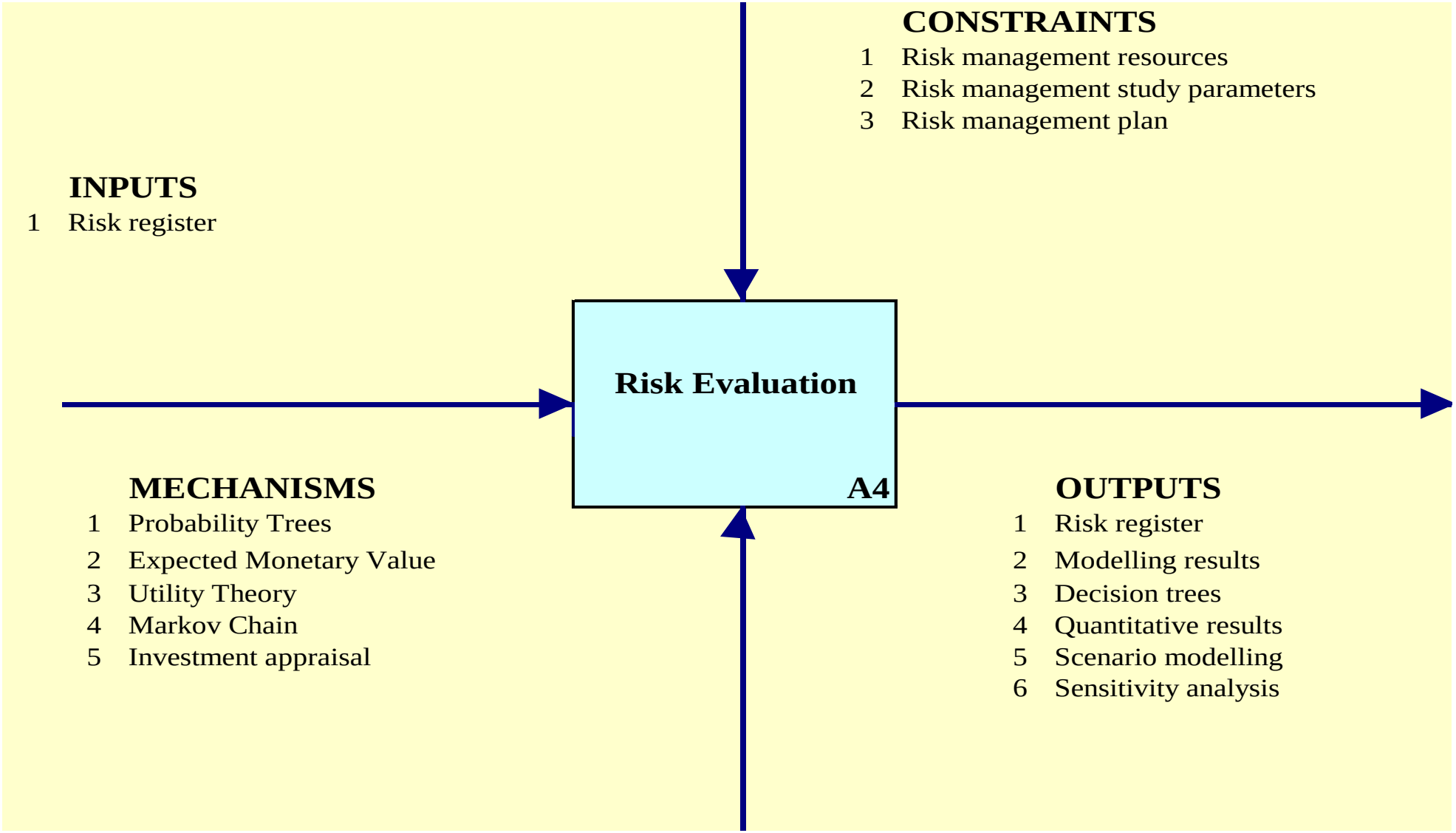
ERM Process – Stage 2: Risk Identification



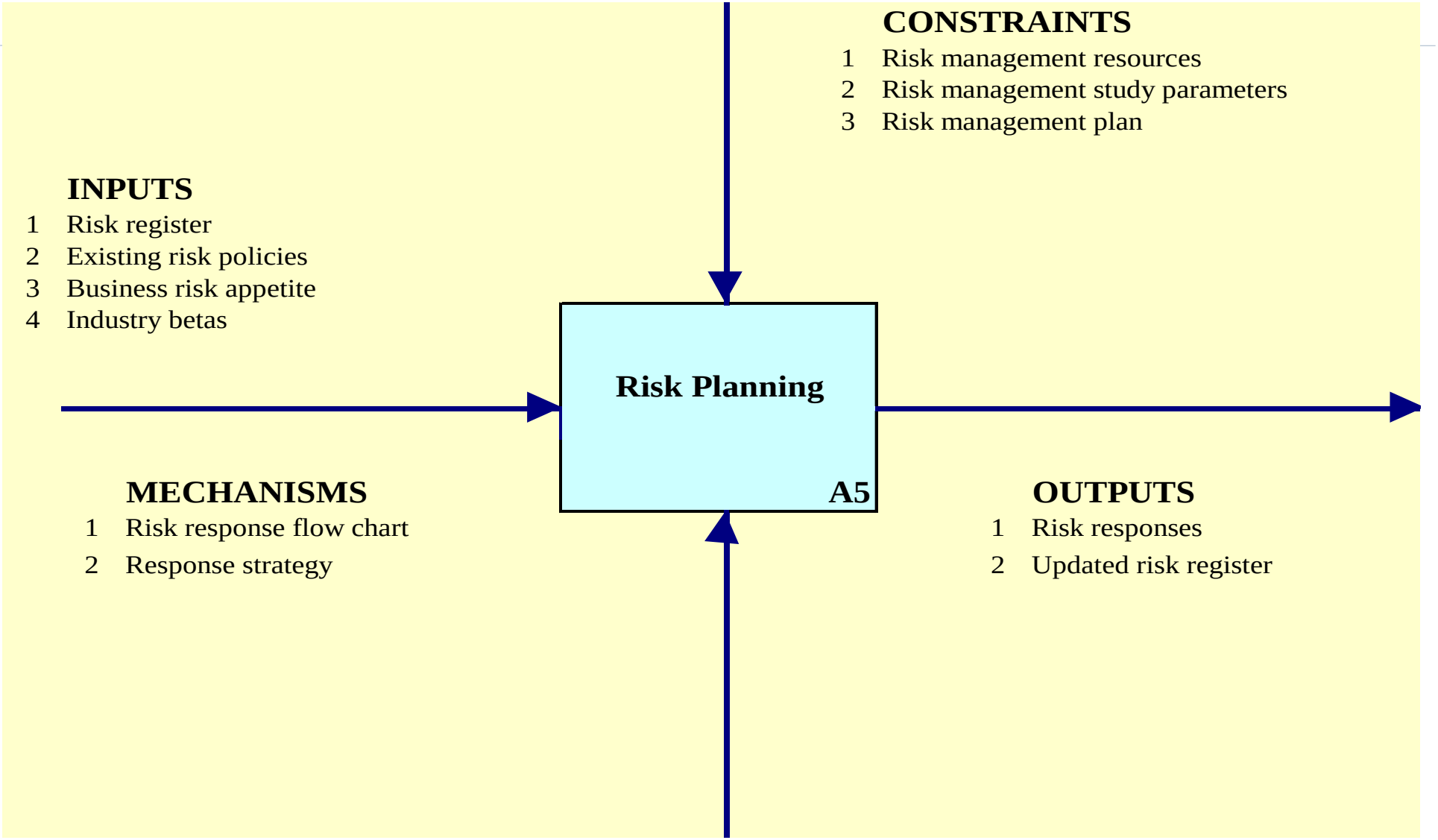
ERM Process – Stage 3: Risk Assessment



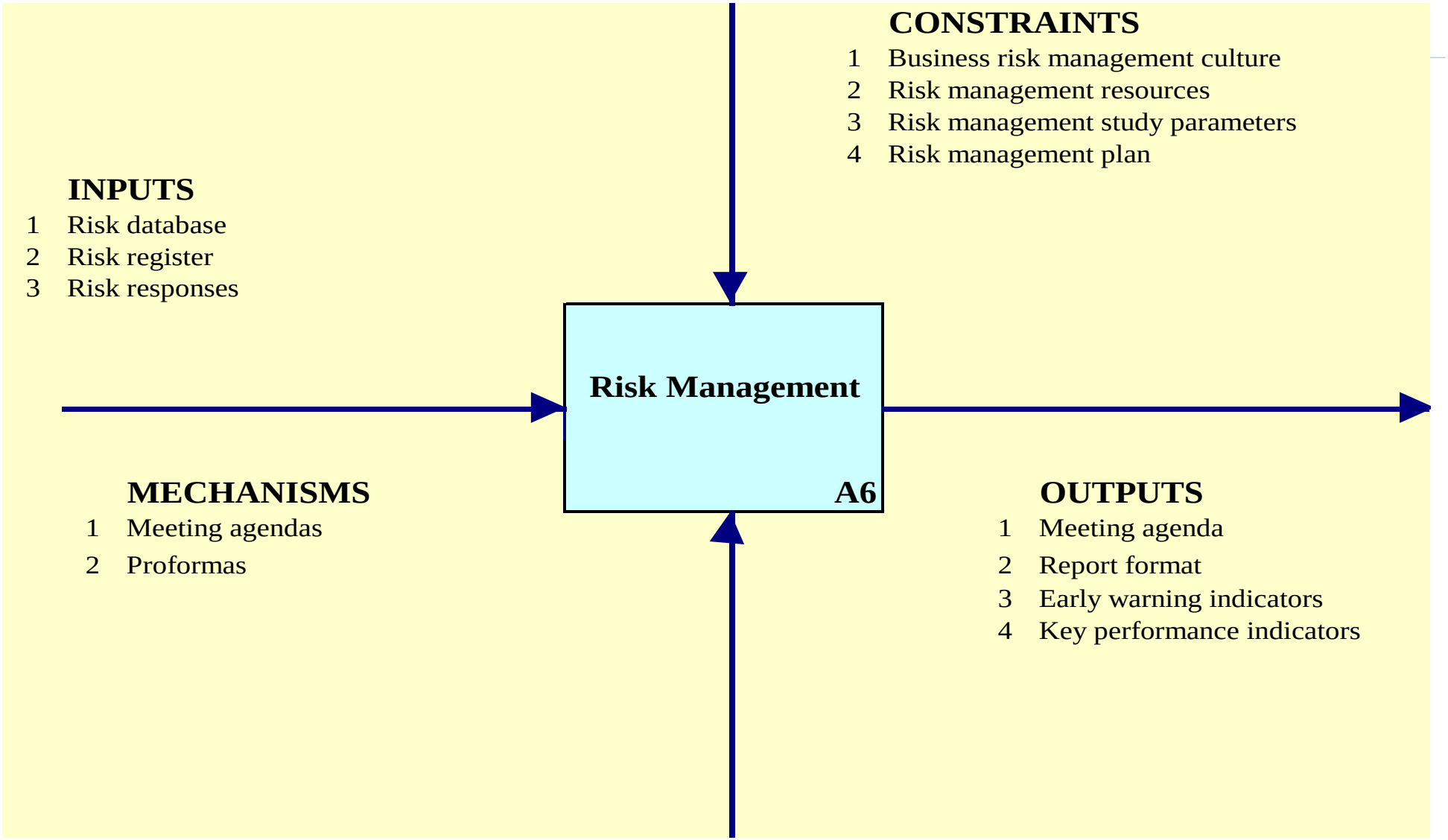
ERM Process – Stage 4: Risk Evaluation



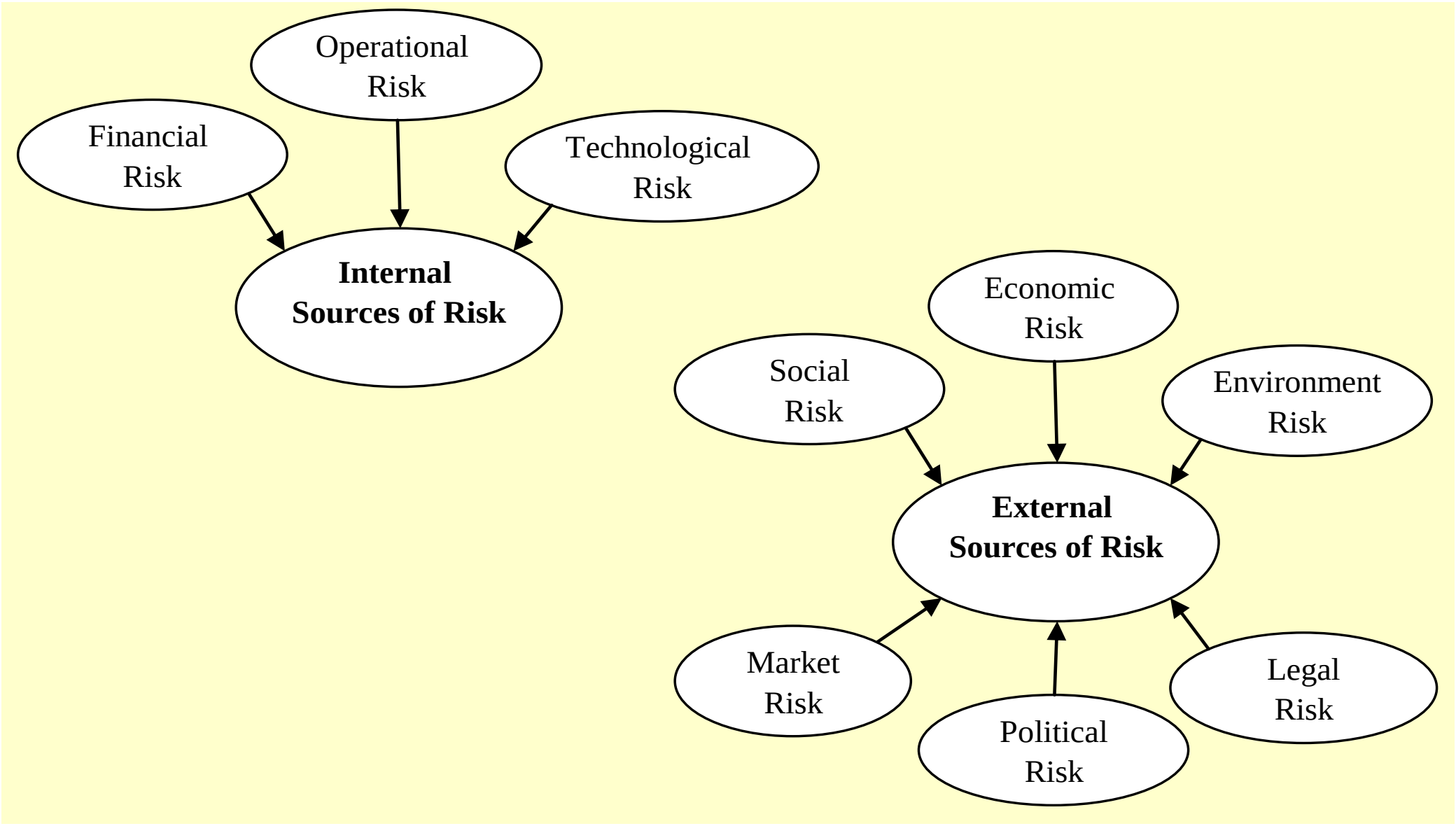
ERM Process – Stage 5: Risk Planning



ERM Process – Stage 6: Risk Management



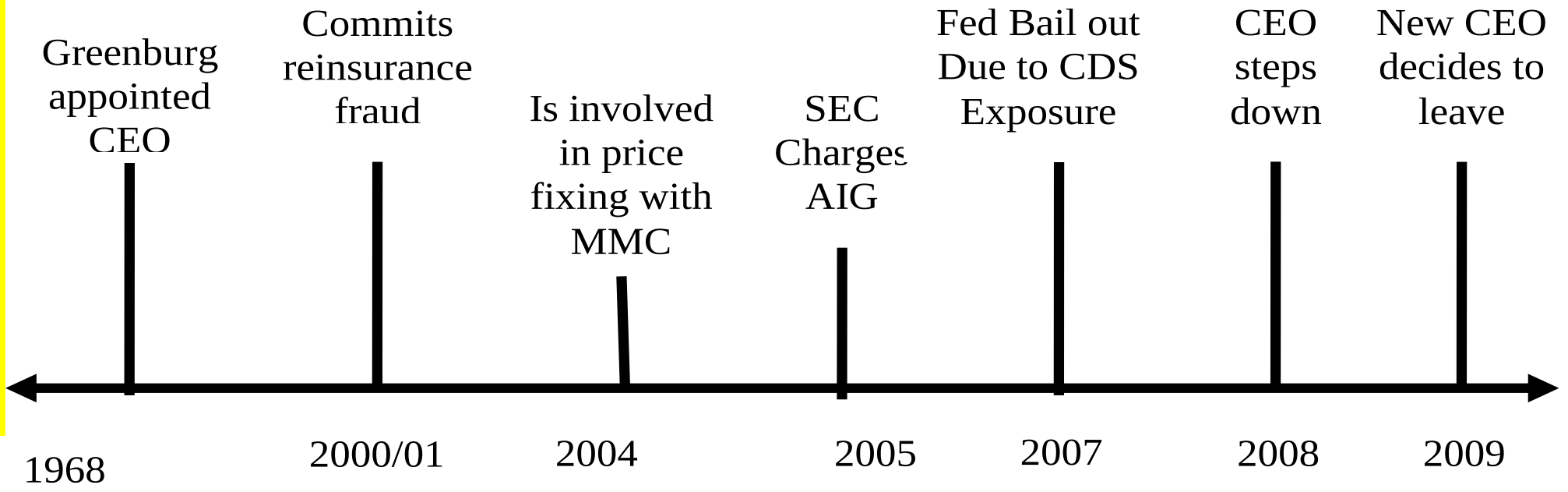
External and Internal Sources of Risk



Case Studies

Case	Enterprise
1	American International Group
2	Long Term Capital Management
3	Union Carbide

CS 1 AIG (American International Group) Timeline



CS 1 AIG - Lessons Learned

1. A controlled corporate culture could have prevented employees going too far. The culture at AIG was heavily focused on succeeding at any cost. Adjusting accounting figures and dealing illegally with insurance companies could have been avoided if the company employed an effective corporate ethics policy.
2. A single business unit can bring down a whole organisation. A chain is only as strong as its weakest link.
3. Always consider all risks regardless of how unlikely they are to occur.
4. Effective management controls could have prevented the disaster.
5. Effective risk monitoring could have identified over exposure to certain risks.
6. With the benefit of hindsight, the organization had lost sight of its core business model, which was that of an insurance firm and not an investment bank.

CS 2 LTCM Summary Timeline

1993 — LTCM was hedge fund founded in 1993 by John Meriwether. Its Board of Directors included Myron Scholes and Robert C. Merton, who shared the 1997 Nobel Memorial Prize in Economic Sciences.

1995 — Mathematical models → relative value or convergence arbitrage trades. Trading strategies made returns > 40% in 1995/96. Leverage ratio was 25:1. Off balance sheet position from swaps, options and derivatives. Credit spreads narrower and convergence trades → less profitable.

1996 — Mortgage-back securities market fell - returns from the fund were -6.42% and -10.14% and increasing leverage to 31. Exit of Salomon Brothers from the arbitrage business in July 1998 also had an adverse effect.

1997 — Russia defaulted on its government debt. Investors sold Japanese & European bonds to buy U.S. treasury bonds. LTCM lost $550 mn 21 Aug and by 31 Aug fund had lost $1.85 bn capital. leverage was 55:1.

17 Aug — Meriwether advised investors that the fund had lost $2.5 bn or 52% of its value over 1998; $2.1 billion in August; its capital base was just $2.3 billion. The fund required new investment of around $1.5 bn. No new investment was forthcoming.

21 Aug — External inspection of balance sheet shows assets of $125 bn, leverage. $1 trillion off balance sheet business

2 Sep — Lost $550 mn from equities. Counter parties concerned LTCM could meet future margin calls → liquidate their repo collateral.

1998 20 Sep — FRBNY bailout $3,625 mn by creditors to avoid collapse in financial markets → 14 banks got 90% share; LTCM partners had 10% stake absorbed by their debts

21 Sep

23 Sep

CS2 LTCM - Lessons Learned

1. An organisation is only as strong as its weakest link.
2. Strategic thinking on business model could have prevented the disaster.
3. **VaR** has proved to be unreliable as a measure of risk over long time periods or under abnormal market conditions. The danger posed by exceptional market shocks can be captured only by means of supplemental methodologies.
4. The catastrophic losses were caused by systemic risks that LTCM had not foreseen in its business model. The failure of the hedge fund LTCM provides a classic example of model risk in the financial services industry.
5. LTCM provides a reminder of the notion that there is no such thing as a risk-free arbitrage. Because the arbitrage positions they were exploiting were small, the fund had to be leveraged many times in order to produce meaningful investment returns. The problem with liquidity is that it is never there when it is really needed.
6. As LTCM's capital base grew, they felt pressed to invest that capital and had run out of good bond-arbitrage bets and led it to undertake more aggressive trading strategies.
7. LTCM failed because both its trading models and its risk management models failed to anticipate the cycle of losses during an extreme crisis when volatilities rose dramatically, correlations between markets and instruments became closer to 1, and liquidity dried up.
8. Risk control at LTCM relied on a VaR model. However, LTCM’s risk modelling was inappropriate and let it down.
9. The theories of Merton and Scholes took a public beating. In its annual reports, Merrill Lynch observed that mathematical risk models "may provide a greater sense of security than warranted; therefore, reliance on these models should be limited."
10. Effective management controls could have prevented the disaster.

CS3 Union Carbide Timeline

Indian Government -22% stake - & UCC establish UCIL Bhopal pesticide plant

1970

Changes in UCIL business model i.e. backward integration, tries to sell plant, decides to move relocate processes whilst keeping plant operating.

1984

Strategic thinking on the business model is input to ERM. ERM should map the business model and the entire value chain as it changes and evolves.

UCIL Safety and procedures are inferior to UCC standards and deteriorate further. Local Government doesn't want to rock the boat.

Corporate culture needs to encourage and promote adherence to risk management. UCIL culture led to degraded safety procedures and equipment.

Risk Incident – Pressure rises in methyl isocyanate (MIC) storage tank and leak reported. Non functioning Vent Gas Scrubber (VGS) so unable to neutralise the toxic MIC leak. No Action is taken.

1984 2nd Dec:

23:00:00

Effective internal controls and risk incident reporting should have alerted management i.e. critical equipment and process failures, risk of an exothermic reaction.

Faulty valve allows water to mix with MIC. Coolant from the MIC tank refridgeration unit had been used elsewhere. The VGS was out of action.

1984 3rd Dec:

00:00:00

The safety valve gave way sending out a plume of MIC gas – exposing 521,000 and killing 3,800 people. No emergency procedures. No warning sirens. Public services had no info on what the gas was or on its effects.

01:00:00

Rigorous ERM engenders transparency and disclosure to its stakeholders in order that they can make informed decisions and consider their own risk appetite

CS3 Union Carbide - Lessons Learned

1. An organisation is only as strong as its weakest link.
2. Reputational damage travels swiftly and is difficult to salvage.
3. Strategic thinking on business model could have prevented the disaster.
4. Corporate ethics policy based on best practice could have prevented the disaster.
5. The court proceedings revealed that management's cost cutting measures had effectively disabled safety procedures essential to prevent or alert employees of such disasters.
6. The severity and impact of the event were also made worse by the lack of safety standards and effective containment measures at the factory in Bhopal. The physical manifestations of these failures included unreliable monitoring equipment, inoperative safety equipment, unsuitable and inadequate gas suppression equipment and alarm systems which failed.
7. Although Dow Chemical has since taken over Union Carbide and denies responsibility for this disaster, the fact that it is much larger than what was once Union Carbide and its Union Carbide India Ltd. subsidiary, ongoing litigation continues to haunt the parent company.
8. Each operational business unit needs to recognise the likelihood and consequences of the risks that they face. A risk event at a small foreign subsidiary can bring down the entire enterprise - risk management at all levels should recognise that the potential for catastrophes always exists and that their impact can have both a large scale and a long-term impact.
9. We can never predict risks of this major consequence, but an enterprise should accept that the risk always remains of a catastrophic disaster. The foundation of a risk management strategy needs to be strong in its fundamentals, such as adherence to appropriate safety standards.
10. Effective management controls could have prevented the disaster.

	Early Warning Indicators	AIG	LTCM	Union Carbide
1	Corporate culture analysis, monitoring and tracking	1	1	1
2	Corporate ERM governance policy and implementation	2	2	2
3	Corporate ethics policy and its implementation	3	3	3
4	CRO reports on ERM implementation progress and issues	4		
5	Strategic thinking on business model (value chain, process)	5	5	5
6	Reputational loss exposure watchlist (stakeholders, risks)		6	6
7	Investigation of 'stars' (e.g. business units, individuals)	7	7	
8	Whistle blowing reports, analysis tracking	8	8	8
9	Internal audit reporting, training, compliance culture	9	9	9
10	Risk incident reporting, training and culture	10	10	10
11	Management controls on all material risks	11	11	11
12	Business model systems and internal controls	12	12	12


RISK
CONTROL
MANAGEMENT

Conclusions – ERM Framework Model

- **6-stage iterative process model with feedback loops**
- **Corporate governance essential → lead from top**
- **Internal systems and controls essential**
- **Internal and external sources of risk**
- **Upside & downside → risk & opportunity management**

Conclusions – ERM process model that might have helped

- **Effective corporate governance, systems & controls**
- **Management awareness of business model &value chains**
- **Corporate culture assessment → regulatory review**
- **Scenario planning → stress testing extreme conditions**
- **Opportunity management of upside potential**

Conclusions – Timelines for Unexpected Events

- **The future is largely unpredictable**
- **The future unfolds rapidly for adverse risk incidents**
- **The historical perspective is often post-rationalised**
- **Timelines are rarely within the management's control**
- **Timely service recovery requires agile management team**

Conclusions – Emerging Risks from Unexpected Events

- **The future is not what is used to be**
- **Black swans and fallacy of inductive logic**
- **The trap of false enthusiasm**
- **Emerging risks pro-activity versus re-activity**
- **Emerging risks with the benefit of hindsight**

Conclusions - Lessons Learned

- **Lessons from internal risk incident reviews**
- **Lessons from historical reviews and post-mortems**
- **Lessons from management role play exercises**
- **Lessons from scenario planning → team decisions**
- **Lessons from survival training → team decisions**

Conclusions – Early Warning Indicators that might have helped

- **Every early warning indicator should be actionable**
- **Real-time early warning indicator dashboards**
- **Solvency II ‘Use Test’ → in the driving seat**
- **Indicator dashboard as a tool for management action**
- **Less can be more …**

Conclusions – Corporate Governance that might have helped

- **Early warning indicators for the governing body**
- **Pictures and storyboards → the ‘elevator’ test**
- **Solvency II ‘Use Test’ → can not be delegated**
- **Not just a ‘box ticking’ exercise**
- **No excuses for not understanding the business model**

Questions or comments?

Expressions of individual views by members of The Actuarial Profession and its staff are encouraged.

The views expressed in this presentation are those of the presenter.