14. Strategic Risk Management

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Abstract/Summary

This presentation will cover several steps in the risk management process. The steps include determining financial health, determining risk preferences, establishing goals, determining risk sources, indentifying management alternatives, estimating likelihoods, and ranking management alternatives. This process is a comprehensive approach to managing risks in today's high risk environment.

Risk Management

Risk and Profit Conference

2013

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Risk Management

- We will cover the Strategic Risk Management Process identified in Applied Risk Management in Agriculture edited by Hoag

Strategic Risk Management Process

Step 1: Determine Financial Health

Step 1: Determine Financial Health

- Refers to assessing the well-being of the financial resources
- Allows a determination of the vulnerabilities to different risk sources
- Sets a baseline that must be considered in determining the "impact" of risk
  - Risk sources potentially have high impact or low impact—how much impact is determined by the financial situation

Step 1: Determine Financial Health

- Basics of determining financial health
  - Calculate net worth
  - Examine profitability
  - Look at cash flow

Step 1: Determine Financial Health

- Examine change in net worth from year to year
  - Key signal of financial progress is "increase" in net worth
  - Then, determine if "increase" is due to profits generated, or due to changes in inventory values
  - Profit over time is what pays the bills and pays off debt

Step 1: Determine Financial Health

- From a net worth statement
  - "Working Capital is King" when it comes to tolerating ***short term*** risk
  - Total net worth is important for determining a base for risk tolerance, and also provides a basis for determining "what is at risk"
    - High net worth might make short term income variability much less risky
    - But high net worth might make liability issues a bigger risk

Step 1: Determine Financial Health

- Analyze the situation
- This is not the place where you let your dreams, desires, or emotions take over
- You want good analysis of the financial situation

Step 2: Determine Risk Preference

- People have different preferences for risk—how much can you tolerate?
- This is an important characteristic of individuals that has a huge impact on
  - investment strategies
  - business decisions
  - selection of a career

Step 2: Determine Risk Preference

- Risk preference can be highly variable among people
- Economists and financial professionals should not offer advice until they know the risk preferences of the individual
- Risk preferences of the spouse or significant other may be important also (retirement plans for example)

Step 2: Determine Risk Preference

- Risk taking may be influenced by whether you are involved in decision making for a business (business dollars) or are investing your own money
- Risking your own money—your own loss
- Risking company money
  - May be part of job, and what you get paid for
  - Might lose job

Step 2: Determine Risk Preference

- You need to experience some risk to get a feel for what your emotional response will actually be
- Projection Bias—when we project that we will behave in some way—usually a rational, reasonable way
- Actual response may be much different—emotions take over and we may not behave as we projected
- Know yourself!!!!!!!!!!!!!

Step 2: Determine Risk Preference

- There are several measurements of risk preferences for individuals
- The questionnaire method uses questions posing different situations and asking for your response
  - Questions include losses and gains
  - Questions include return and risk tradeoffs
  - Results are summarized and compared to other individuals—provides a benchmark for comparison

Step 2: Determine Risk Preference

- Questionnaire method example:
- http://njaes.rutgers.edu/money/riskquiz/

Step 2: Determine Risk Preference

- Another method of determining risk preferences involves the use of gambling situations
- These results classify you as:
  - Risk-neutral—people maximize income without considering risk
  - Risk-averse—people willing to give up some income to reduce risk
  - Risk-loving—people intentionally seek risk

Step 2: Determine Risk Preference

- What about risk appetite of businesses???
- This refers to the level of risk the business is willing to tolerate
- Some businesses are highly risk averse—they expose themselves to as little risk as possible
- Other businesses aggressively pursue profits while tolerating considerable risk

Step 2: Determine Risk Preference

- Gauging the risk appetite of the business requires judgment rather than having any formal procedure

Step 2: Determine Risk Preference

- There are big differences between people and businesses in terms of their risk preferences and their risk appetites
- These differences may have a huge impact on investment strategies, profits, careers and other life choices

Step 2: Determine Risk Preference

- While important, measurement is difficult for both individuals and businesses
  - Risk preferences are not stable for individuals
  - Can be substantially different in different emotional states
  - People have to project their response, but that projection does not take into consideration the emotions that accompany the situation posed

Step 2: Determine Risk Preference

- You need to "know yourself" and that requires experiencing some risk to get a feel for what your emotional response will actually be
- Projection Bias—we project that we will behave in some way—usually a rational, reasonable way, but when emotions kick in, we behave differently

Step 2: Determine Risk Preference

- Conclusion to the matter: Risk preferences and appetite do matter
- We need to consider risk preferences because they are so important
- We have trouble measuring them
- Know yourself!!!!!!!!!!!! If you can't stand the heat in the kitchen—don't become a cook!!!

Step 3: Establishing Risk Goals

- This step involves identifying the desires of the individual/family/business, and where the individual/family/business wants to be in the future

Step 3: Establishing Risk Goals

- Outlines a plan for the future
- Provides a plan one can use to
  - Measure opportunities that occur
  - Make adjustments as conditions change
  - Assess the risk that exists
- Strategic planning does not eliminate risk-- it produces a plan that helps you evaluate the risk

Step 3: Establishing Risk Goals

- Establishing plans **helps you measure the severity of the risk that you are facing**

The Planning Process

Traditional Thought Process Flow

Resource Base

The Planning Process

Traditional Thought Process Flow

Resource Base → **Activities Enterprises**

The Planning Process

Traditional Thought Process Flow

Resource Base → **Activities Enterprises** → **Objectives (Maybe)**

The Planning Process

Traditional Thought Process Flow

Resource Base → **Activities Enterprises** → **Objectives (Maybe)** → **Goals (Maybe)**

A huge constraint on achievement is in place from the start

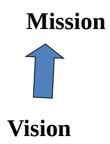
The Planning Process

Planned Thought Process Flow

Vision

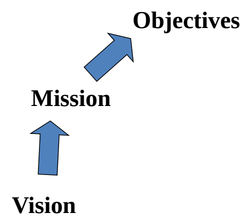
The Planning Process

Planned Thought Process Flow



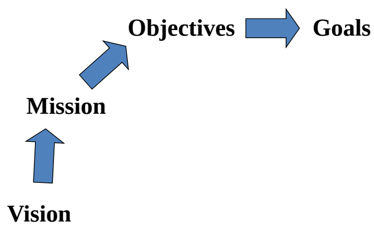
The Planning Process

Planned Thought Process Flow



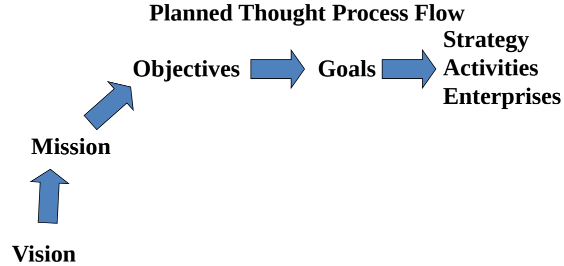
The Planning Process

Planned Thought Process Flow



The Planning Process

Planned Thought Process Flow



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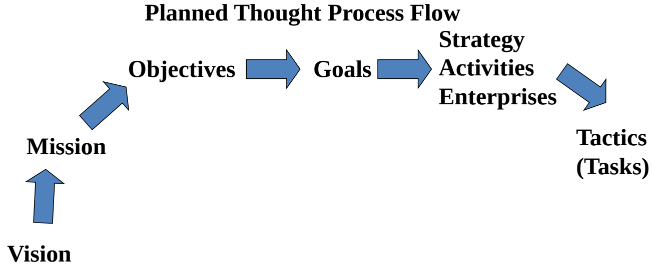

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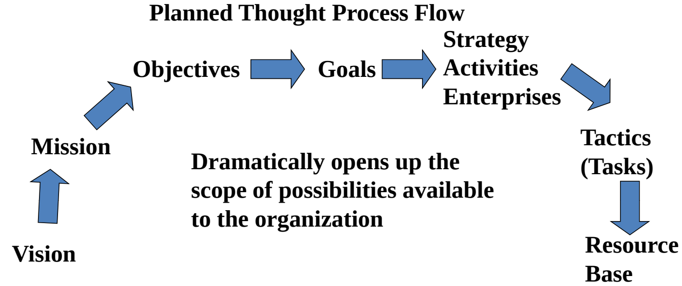


Business Planning

- VISION-VISION-VISION
  - Without vision the people parish
  - Needed everywhere
    - Church
    - University
    - Business
    - Farm
    - Transition planning
  - VISION must be there for success

Business Planning

- VISION-must come from you
  - You have to develop one and communicate it
- Bill Snyder has a vision
  - Also has developed steps to get there!

Vision

- **Vision is broad and future oriented**
  - **What we would like to be and where we would like to end up**
- **Vision is what we use to measure the severity of the risk source**

Step 3: Establishing Risk Goals

- A source of risk that can <u>derail</u> you from achieving your vision is a <u>major</u> risk
- A source of risk that <u>delays</u> you achieving your vision is a <u>minor</u> risk
- A source of risk that <u>has little impact on</u> you achieving your vision may not be worth doing anything about

Step 3: Establishing Risk Goals

- Summary
  - Outlines a plan for the future
  - Provides a plan one can use to assess the risk that exists
  - Strategic planning does not eliminate risk-- it produces a vision that helps you evaluate the risk

Step 4: Determine Risk Sources/Prioritize Risks

- Risk has two components
  - Likelihood or probability/Uncertainty
  - Bad Outcomes
- Outcomes may have huge impact or minor impact

Step 4: Determine Risk Sources/Prioritize Risks

- The size of the impact can be measured relative to our "vision"
  - Will impact destroy career?
  - Will impact destroy business?
  - Will impact threaten business vision?
  - Will impact be a nuisance?

Step 4: Determine Risk Sources/Prioritize Risks

- Farmer nearing retirement in Western KS
  - Vision—pass on operating farm to only son
  - $10,000,000 in assets and no debt
- Evaluate impact of Risk
  - Corn price drops to $4.50
  - Buying a quarter next to the operation
  - Divorce of son (married a cutie from Boston)

Step 4: Determine Risk Sources/Prioritize Risks

- Middle Age Farmer in Western KS
  - Vision pass on a viable operation to daughter
  - $5,000,000 in Assets and $2,000,000 in debt
- Evaluate impact of Risk
  - Corn price drops to $4.50
  - Buying a quarter next to the operation

Step 4: Determine Risk Sources/Prioritize Risks

- Beginning farmer
  - Vision—develop a viable farm operation
  - $500,000 in assets and $200,000 debt
- Evaluate impact of Risk
  - Corn price drops to $4.50
  - Buying a quarter next to the operation

Step 4: Determine Risk Sources

What Types of Risks Do Firms Face?

- output price variability

- input price variability

- production risk (reduced production, increased costs)

- inventory risk (loss of inventory or inventory cost),not enough or too much

Step 4: Determine Risk Sources

What Types of Risks Do Firms Face?

- institutional risk (legal, regulatory, and government)

- human resource risk

- financial risk (institution, leverage)

- interest rate risk

- currency exchange rate risk-value of the dollar

- inflation

Step 4: Determine Risk Sources

What Types of Risks Do Firms Face?

- **destruction of assets due to fire or weather events**
- **injury or death to employees or customers**
- **litigation costs and liability judgments**
- **reduction in reputation or consumer confidence**
- **environmental contamination**
- **fraud**

Step 4: Determine Risk Sources

There are an enormous number of risk sources!

No way we can deal with all of them--need to identify the ones to be concerned about--how do we prioritize the risks we face?

Step 4: Prioritize Risks

- Prioritizing Risk is a two stage process.
- Stage 1:
- Evaluate the **impact** of the factor on the risk you or your operation faces.
- This involves translating the risk source to a scale that is meaningful (if possible).

Step 4: Prioritize Risks

- Example of translating risk source to a meaningful scale
  - Price volatility for wheat producer
    - Expected price $7.50/bu
    - Price might be $.50 higher or lower
  - Is price per bushel a meaningful scale?
  - Is return per acre (from a crop budget) a meaningful scale?
  - Is return to the farm from 800 acres a meaningful scale? (800 acres X 50 bu./acre X $.50/bu.=$20,000)

Step 4: Prioritize Risks

- Budgets
  - Foundation for estimating returns
  - Useful for translating risk source into a meaningful scale—if multiplied by the acres or units we have
  - AgManager.Info

Step 4: Prioritize Risks

- Consider two timeframes when identifying "impact"
- Short term "impact" (within the coming year)
  - Short term volatility, random fluctuations, white noise
- Longer term "impact"
  - Due to gradually changing competitive environment, longer term price trends, changes in market structure

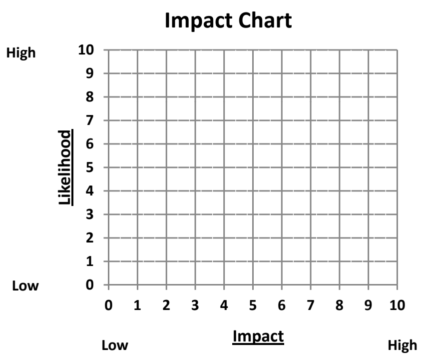
Step 4: Prioritize Risks

- To measure the "impact" of the risk source
  - Keep in mind the financial health (Step 1)
  - Keep in mind risk preferences of individuals involved or the company appetite for risk (Step 2)
  - Measure "impact" relative to the "vision" identified in the business plan (Step 3)

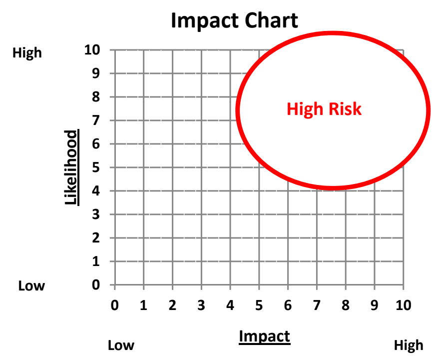
Step 4: Prioritize Risks

- As part of this first stage, also estimate the likelihood or probability that the poor outcome might happen
- Put these two factors together in the following graph:

Step 4: Prioritize Risks



Step 4: Prioritize Risks



Step 4: Prioritize Risks

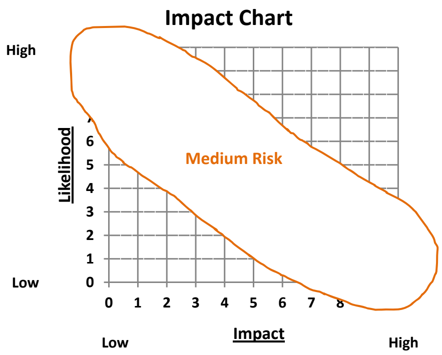
- High Risk
  - Events that are highly likely, and that have a large impact (as measured on a meaningful scale)

- Your skill at identifying these risk sources is critical to the risk management process (risks ignored in this stage are lost and forgotten)

Step 4: Prioritize Risks

- Risks you ***will*** overlook
  - Black Swan events—events that ***no one*** thinks about or ever expects to happen
- Risks you ***may*** overlook
  - Combinations of events
    - Pay particular attention to events across different divisions of the business that might come together to cause problems for the business as a whole (enterprise risk management)

Step 4: Prioritize Risks



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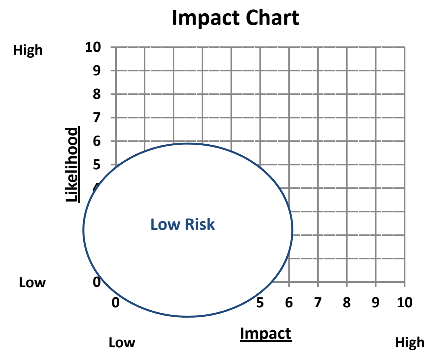


Step 4: Prioritize Risks

- Low risk sources are both
  - Low impact AND
  - Low likelihood

- These will be included in the analysis, but they are not a high priority place to invest resources (unless it is really easy to influence and very cheap to influence)

Step 4: Prioritize Risks

- Stage 2 of the process involves Identifying the risk sources from the first graph
  - High risk in the upper right quadrant
  - Medium risk in the middle diagonal area
  - Low risk in the lower left quadrant
- Then considering how much influence you can have over that risk source—ARE THERE THINGS YOU CAN DO ABOUT THE RISK???

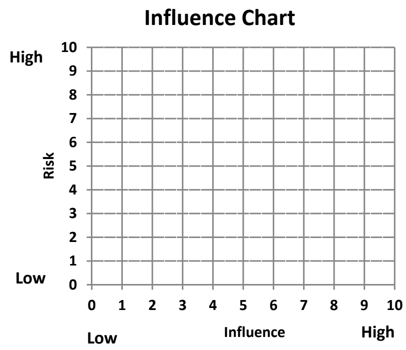
Step 4: Prioritize Risks

- Examples of influence
  - High influence examples:
    - Crop insurance for crop production (short run)
    - Liability insurance to cover liability
  - Low influence examples:
    - Government policy changes or tax law changes
    - Changes in consumer demand due to problems caused by a competitor

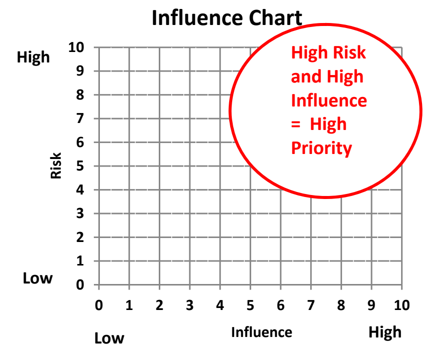
Step 4: Prioritize Risks

- Identify a place on the following graph for each risk source
- Risk-- high, medium or low is on the left axis
- Influence--what can you do about it is on the horizontal access

Step 4: Prioritize Risks



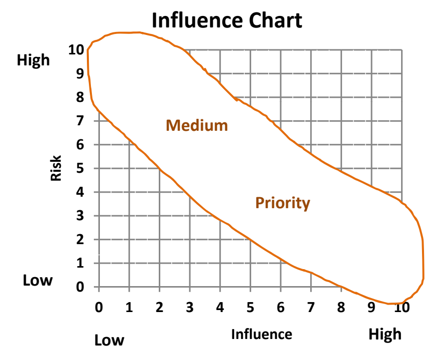
Step 4: Prioritize Risks



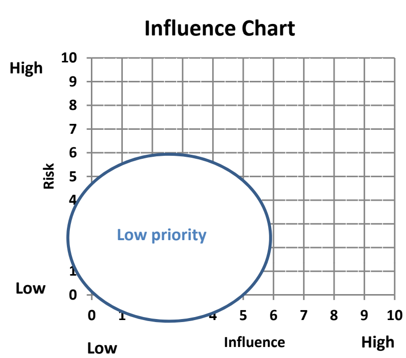
Step 4: Prioritize Risks

- Resources are always limited -- identify which risk sources should be managed
- Influence chart shows (in upper right hand corner), the risk sources which should be a priority—high risk (due to being likely and having a big impact) and high influence (there is something we can do to influence this risk)

Step 4: Prioritize Risks



Step 4: Prioritize Risks



Step 4: Prioritize Risks

- While thinking about prioritizing risks, it is also important to work on the high risk short term risks first
- You may be able to delay addressing longer term risks if you have other more pressing risks to address
- However, do not neglect the high risk long term risks—if you do it might too late

Step 4: Prioritize Risks

- Summary
- We now have a procedure for identifying the risk sources that should be high priority, medium priority, and low priority
- Next step looks at the risk management options that are available to operations

Step 5 Identify Risk Management Alternatives

Step 5 Identify Risk Management Alternatives

- Strategic Approaches to Managing Risk
  - Avoid—in some lists, but generally, it is not possible to avoid risk
  - Reduce
  - Transfer
  - Share
  - Assume or retain risk

Step 5 Identify Risk Management Alternatives

- “Risk” has two components:
  - Outcomes—some of which we do not like—losses
  - Likelihoods or probabilities

Step 5 Identify Risk Management Alternatives

- Be a low cost producer -- decreases the likelihood that losses will occur

Step 5 Identify Risk Management Alternatives

- Government program participation
- Debt level management
- Good production practices

Step 5 Identify Risk Management Alternatives

- Cash/Credit reserves
- Investments in other businesses
- Specialization in management

Step 5 Identify Risk Management Alternatives

- Crop and Revenue Insurance
- Forward Contracting
- Futures and Options

Step 5 Identify Risk Management Alternatives

- Diversification
- Technology
- Flexibility

Step 5 Identify Risk Management Alternatives

- Excess Capacity
- Off-farm employment or income from another source
- Information

Step 5 Identify Risk Management Alternatives

- Low-risk enterprises
- Low-risk production practices
- Land Leasing arrangements
- Renting or Leasing Equipment

Step 5 Identify Risk Management Alternatives

- Forward Pricing Inputs
- Spreading out sales

Step 5 Identify Risk Management Alternatives

- Business Structure
- Insurance
  - Property
  - Liability
  - Health
  - Life

Step 5 Identify Risk Management Alternatives

- Management and Key Personnel Backup Plans
- Estate Planning

Step 6: Estimate Likelihoods

Step 6: Estimate Likelihoods

- Estimating Likelihoods is difficult
- Several sources of probabilities

Step 6: Estimate Likelihoods

- There are several sources of probabilities
  - For gambling games, there are logical processes that give us probabilities
    - Drawing a card from a full deck, probability= 1/52
    - Rolling 2 as the sum of two dice, probability=1/36
  - For economic applications, history provides data
    - Lots of data series for prices
    - Footnote for investments— **past returns are no guarantee of future results**
    - Particularly questionable when prices/fundamentals are outside of traditional ranges

Step 6: Estimate Likelihoods

- Subjective estimates of probabilities
  - We pull together information about history
  - Use current information
  - Supplement with intuition
- Both using history and using subjective probabilities have major issues
  - History does not repeat itself (from an economic standpoint)—always in uncharted territory
  - Subjective probabilities are subject to some biases we should be aware of

Step 6: Estimate Likelihoods

- Biases we should be aware of:
  - our thoughts and behavior are greatly influenced by the environment of the moment
    - Will select high probabilities if outcome comes to mind easily
    - Will select low probabilities if outcome does not come to mind easily

Step 6: Estimate Likelihoods

- When we "like" something, we rank it as having great benefit and low risk
- When we "dislike" something, we rank it as having low benefits and high risk
- Emotions drive both so they are consistent

Step 6: Estimate Likelihoods

- Estimating likelihoods or probabilities is very difficult

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Step 7: Rank Management Alternatives

Step 7: Rank Management Alternatives

- Step 1 Financial Health
- Step 2 Risk Preferences
- Step 3 Establish Goals
- Step 4 Determine Risk Sources
- Step 5 Identifying Risk Management Alternatives
- Step 6 Estimate Likelihoods

Step 7: Rank Management Alternatives

- A Payoff matrix may be helpful in selecting a risk management strategy
- Payoff matrix has 3 major parts
  - Management strategies
  - States of Nature
  - Payoffs for each combination of strategy and state of nature

Step 7: Rank Management Alternatives

- Payoff matrix looks like:

	Management Strategies along the top
States Of Nature	Payoffs for each combination

Step 7: Rank Management Alternatives

- Management Strategies are options that you can pursue in your business
  - They influence the outcomes of different states of nature
- Examples might include:
  - Forward contracting
  - Selling futures contracts
  - Selling for cash at harvest

Step 7: Rank Management Alternatives

- States of nature reflect “things that can happen”
  - Bad yields due to mother nature
  - Low prices due to markets
  - Low sales due to competitors

Step 7: Rank Management Alternatives

- States of Nature may have probabilities associated with them
  - Likelihood of a dry summer
  - Likelihood of frost
- States of Nature in some cases do not have probabilities
  - Likelihood that your competition will make adjustments to their marketing plan

Step 7: Rank Management Alternatives

- The payoff section of the payoff matrix represents the outcomes for each combination of management strategy and state of nature
- Payoffs should be in the scale that is most meaningful
  - Net income for the firm
  - Not price of product or return per acre

Step 7: Rank Management Alternatives

- Payoff matrix example:

	No Insurance	Revenue Insurance
High yield and price	High payoff	High payoff -premiums
Low yield and price	Low payoff	Medium payoff

Step 7: Rank Management Alternatives

- Payoff matrix may help eliminate some strategies

- Your decision also depends on your risk preference

Strategic Risk Management Process

Step 8: Implement Plans

- "Just do it" is good advice, but not that easy

- Status Quo Bias
  - We do not do anything because we feel less responsible if something bad happens
  - We are just as responsible if we do nothing as if we do something, and a bad outcome occurs

Strategic Risk Management Process