LECTURE 7.0

ORGANISATIONAL ARCHITECTURE

& DECISION MAKING

OUTLINE

7.0 Organisational architecture and decision making (introduction)

7.1 Firms and markets

7.2 Centralisation and decentralisation

7.3 Knowledge

7.4 Decision rights

7.5 Authority structures

7.6 Making better decisions

7.7 Bundling tasks

READING

Jensen and Meckling (1995) “Specific and General Knowledge and Organisational Structure”, *Journal of Applied Corporate Finance*, 8(2), 4-18

Chapter 5, “Decision Making” in Lazear and Gibbs (2007) *Personnel Economics in Practice*

The readings are available in Canvas.

LECTURE 7.1

FIRMS AND MARKETS

MARKETS AND FIRMS

Markets provide a decentralised allocation mechanism

- Prices aggregate demand and supply side information
- Prices balance opportunity cost of sellers and willingness to pay of buyers
- Markets effectively use dispersed knowledge
- Provide incentives for innovation and adaptation

Markets are a form of collective intelligence. They are a powerful information system that is not easily replicated

MARKETS AND FIRMS

Within the firm, authority determines resource allocation

- The price mechanism is (usually) suspended
- Decisions are more centralised
- Authority structures determine the extent of decentralisation

Why are firms needed?

MARKETS AND FIRMS

Markets don't always allocate resources efficiently:

- Market power: economies of scale and natural monopoly
- Public goods
- Externalities (e.g. network externalities or technology spillovers)
- Moral hazard
- Adverse selection

MARKETS AND FIRMS

Firms can use both centralised and decentralised decision making

- Use central and local knowledge
- Coordinate decisions as needed
- Innovate and adapt

MARKETS AND FIRMS

An organisational architecture (structure) is defined by a set of implicit and explicit contracts:

- Specifies decision rights via job descriptions.
- Uses performance evaluations
- Uses compensation schemes to reward (and punish) decision makers.

A key choice in organisation design is whether to centralise or decentralise decisions

- What are the costs and benefits to centralisation?

LECTURE 7.2

CENTRALISATION AND DECENTRALISATION

CENTRALISATION AND DECENTRALISATION

Consider a a firm that operates across two markets: Perth and Sydney. Suppose that there is a CEO (in Sydney) and local managers in Perth and Sydney. How might pricing decisions be allocated?

- The CEO could specify prices in both markets (centralisation).
- The decision could be decentralised to each local manager.
- The decision for both markets could be decentralised to a single local manager.
- Any decentralisation could have limits impose on them.

What are the costs and benefits of such approaches and decentralised versus centralised decision-making more generally?

CENTRALISATION AND DECENTRALISATION

Benefits of centralisation:

- Economies of scale or public goods: they may be ignored at ‘local’ level (e.g. advertising or purchasing decisions)
- Better use of ‘central knowledge: can be used to provide better incentives to local decision makers
- Coordination: allows complementarities and interdependencies to be factored into the decisions

CENTRALISATION AND DECENTRALISATION

Benefits of decentralisation :

- Save management time and resources for important (strategic) decisions: managerial skills are scarce
- Creates a more enriched job environment: opportunities for training and promotion; develop management skills; provide motivation and incentives
- Avoids need to transmit information: this may be costly in time and resources
- Exploits specific knowledge: allowing more rapid responses to changes in market conditions.

LECTURE 7.3

KNOWLEDGE

KNOWLEDGE

Think about some of the knowledge that might be critical in allocating resources in a firm.

- Idiosyncratic knowledge: Knowledge about the skills or preferences of staff, the characteristics of particular machines, the presence of unemployed resources (such as the fact there is space in the back of the truck)
- Scientific knowledge: The knowledge how to make a silicon graphics processing unit. Even if readily available, it is not easily transferred to those without technical skills
- Assembled knowledge: A storekeeper who has worked in a local store for years will have assembled a unique body of knowledge about the needs of local customers, and the local suppliers.

The knowledge for decision making is not held by any one individual. It is distributed across people in the economy.

This specific knowledge is critical in properly allocating resources, yet it is costly to transfer. It can be impossible to aggregate for a central decision maker. Even if it could be aggregated, it would require massive mental ability or computing power to process it.

KNOWLEDGE

General knowledge: knowledge that is inexpensive to transmit. General knowledge can be transmitted quickly through summary stats – prices and quantities are good examples.

Specific knowledge: knowledge that is costly to transmit among agents. The more costly knowledge is to transfer, the more specific it is. The less costly it is to transfer knowledge the more general it is. Transfer is more than 'buying a book' – it requires understanding the knowledge and how to use it

Specific knowledge is often accumulated as a by-product of everyday activities

- Leads to dispersion of specific knowledge
- Centralised decision making is costly because it requires information transmission

Specific knowledge creates two challenges:

- The rights assignment problem – who should have a decision right? (Pre-contractual or adverse selection)
- Control or agency problems – how to ensure the decision maker (agent) acts in the interests of the firm (principle). (Post-contractual or moral hazard)

KNOWLEDGE

Knowledge considerations:

- People have a limited capacity to accumulate, store, process, and transmit knowledge. Storing, processing, transmitting and receiving knowledge is costly.
- We may want to colocate knowledge with decision authority (either by moving the knowledge or assigning decision making authority to the knowledge holder)
- We could transmit knowledge to the decision maker (often this means centralisation)
- We could assign decision rights to the knowledge holder (usually decentralisation)

In a market economy – the ‘best’ outcome is achieved by optimising decisions on the part of individuals whereby decision rights are acquired or knowledge is acquired by those with decision rights

LECTURE 7.4

DECISION RIGHTS

DECISION RIGHTS

Decision right: the right to decide on and take an action.

Decision rights are alienable:

- Decision rights can be sold and the proceeds of sale captured by the owner. i.e. decision rights are property rights
- Alienability is the means by which knowledge and decision rights are collocated.

In a capitalist economy (markets) the problem posed by knowledge is solved via alienability. Alienability is the foundation of markets.

DECISION RIGHTS

Alienability solves the rights assignment problem and the control problem. Alienability ensures that markets result in:

- Knowledge co-located with decision rights
- Effectively controls decision makers by determining what they can and cannot do

Alienability and the process of voluntary exchange ensures that knowledge and decision rights are allocated in an optimal way.

Market prices reflect the capital value of those rights and ensure they are allocated efficiently because they:

- Measure performance of those who have the decision rights to how assets are used.
- Effectively reward or punish holders of the decision rights

DECISION RIGHTS

This is not what happens in organisations where decision rights and their alienability are generally not delegated. The market mechanism is suspended.

- So how do organisations solve the rights assignment and control problem?

Ultimately, distribution of knowledge and decision rights is central to understanding organisations and organisational structure

DECISION RIGHTS

What are the benefits of suspending alienability of decision rights?

- Perhaps there are benefits from economies of scale or scope, or the reduction in transaction costs. That is, firms must gain a net benefit from the suppression of the alienability of decision rights.
- Perhaps more importantly, the organisation or firm allows the knowledge to be collated under one ‘hat’.

Nonetheless the problem remains: how to ensure that the benefits associated with alienability are not lost in the firm. That is, the incentives to make good decisions by virtue of the capitalised value of the decision right being incurred by the holder of the decision right.

DECISION RIGHTS

What must firms do?

They must tradeoff or balance:

- Information Costs: centralisation of decision making requires costly information transmission to central decision makers. Information costs will fall as decision rights are assigned to those who have the specific knowledge required to support good decisions.
- Agency costs: the sum of the costs of designing, implementing and maintaining an appropriate incentive control system, plus any residual loss from factors such as inconsistent decisions.

DECISION RIGHTS

The firm will want to minimise total organisational costs – those associated with information and agency costs. This is demonstrated in figure 1 in Jensen & Meckling.

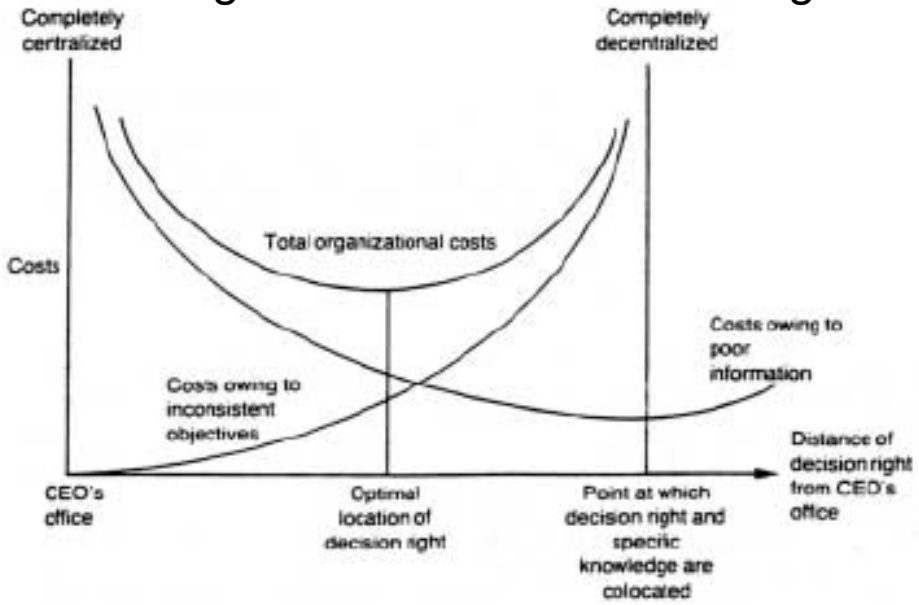


Figure 1 The trade-off between costs owing to inconsistent objectives and costs owing to poor information as a decision right is moved further from the CEO's office in the hierarchy.

DECISION RIGHTS

How?

- A hierarchy: The allocation of decision rights.
- A set of rules: an appropriate incentive and control system.

An incentive and control system

- Partition decision rights: through job descriptions, budgeting, rules and regulations within the firm
- Create a control system with incentives: specify performance measurement and rewards/punishment

DECISION RIGHTS

Decisions can be characterised in four stages:

- Initiatives: identify options (e.g. cut staff, renegotiate supplier contracts).
- Ratification: choose among different options.
- Implementation: ask what tactics to use, i.e. how to achieve desired outcome.
- Monitoring

Suppose a plant manager is told to cut costs by 10 percent. You may wish to:

- Decentralise option identification and implementation – sometimes referred to as decision management.
- Centralise ratification and monitoring.

This balances use of specific and general knowledge and recognises incentives.

DECISION RIGHTS

Consider the a board of directors in some organisations.

- While the CEO has responsibility for decision management (the initiation and implementation of major projects for example), the board exercises decision control by ratifying and monitoring decisions.

Such an arrangement has the potential to mitigate potential incentive problems.

Of course, this may not be an option in smaller organisations, but in those cases, the incentive problem is often muted.

LECTURE 7.5

AUTHORITY STRUCTURES

FLAT VERSUS HIERARCHICAL STRUCTURES

What type of decision making structure should a firm adopt?

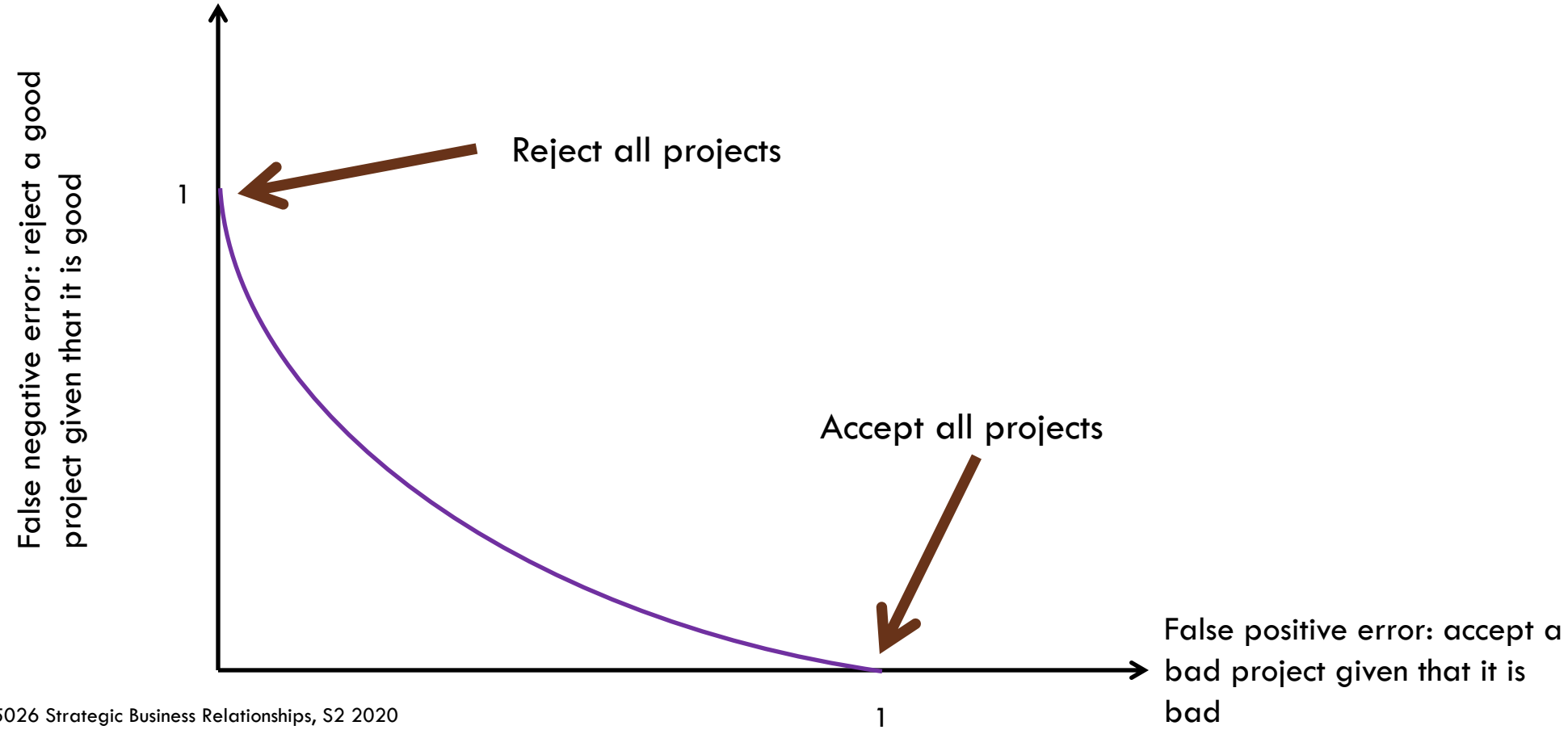
- Flat structures give individuals control over decision making.
- Hierarchical structures allow ‘higher levels’ to veto lower level decisions

An organisation’s structure influences the types of error made The error trade-off:

- False positive: accept an unprofitable option.
- False negative: reject a profitable option.

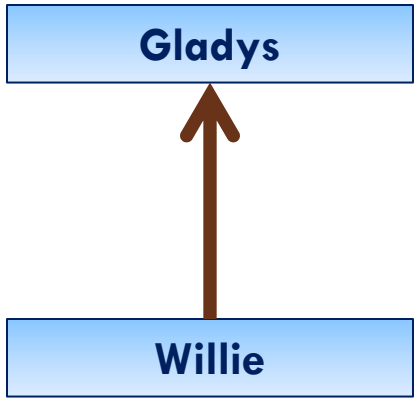
It is always possible to avoid one type of errors. ‘Always reject’ means there is no false positives; ‘always accept’ means there is no false negatives.

THE ERROR TRADE-OFF



AUTHORITY STRUCTURES

Hierarchy



Under a hierarchical structure, the lower level employee makes recommendations that are accepted or not. That authority lies 'further up' the hierarchy with Gladys.

Flat

Under a flat structure, both employees can make a decision to accept or not.

AUTHORITY STRUCTURES

Hierarchical:

- Reduces false positives (accept a bad project): projects are scrutinised by more people
- Increases false negatives (reject good proposals): decision making is slower, so fewer projects are evaluated

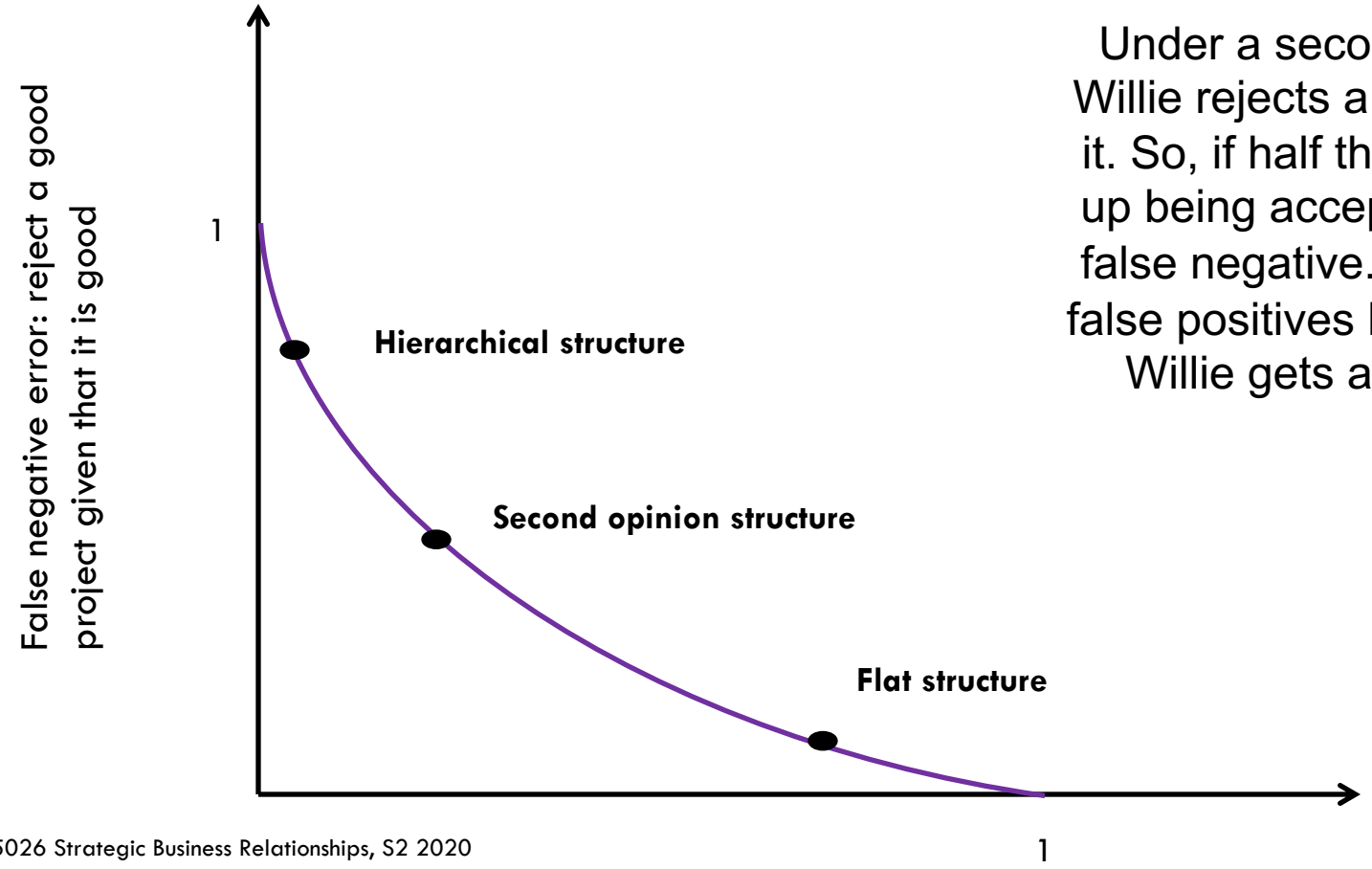
Flat:

- Reduces false negatives
- Increases false positives

An alternative might be a ‘second opinion’, whereby both review all projects:

- Agreement means decision is made.
- Disagreements resolved by some other rule.

AUTHORITY STRUCTURES

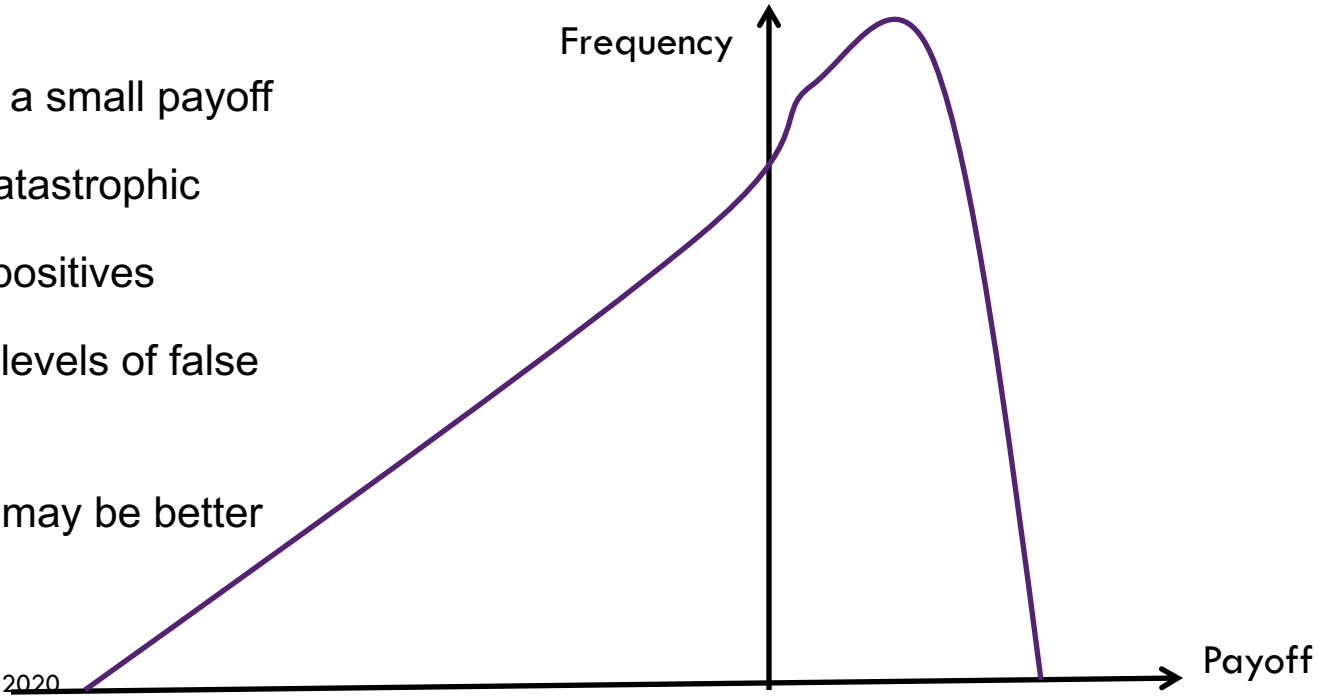


Under a second opinion structure, even if Willie rejects a proposal Gladys still reviews it. So, if half the time the good projects end up being accepted, then there will be fewer false negative. But there may also be more false positives because a project rejected by Willie gets a second look and might be accepted.

AUTHORITY STRUCTURES: PAYOFFS

Consider a firm facing a small upside risk and a large downside risk.

- doing the job well gives a small payoff
- doing the job badly is catastrophic
- want to minimise false positives
- willing to accept higher levels of false negatives
- a hierarchical structure may be better



AUTHORITY STRUCTURES: PAYOFFS

Example: $bn loss in the case of Exxon Valdez where alcohol was a consideration. The ‘project’ here is deciding to proceed before being sober.

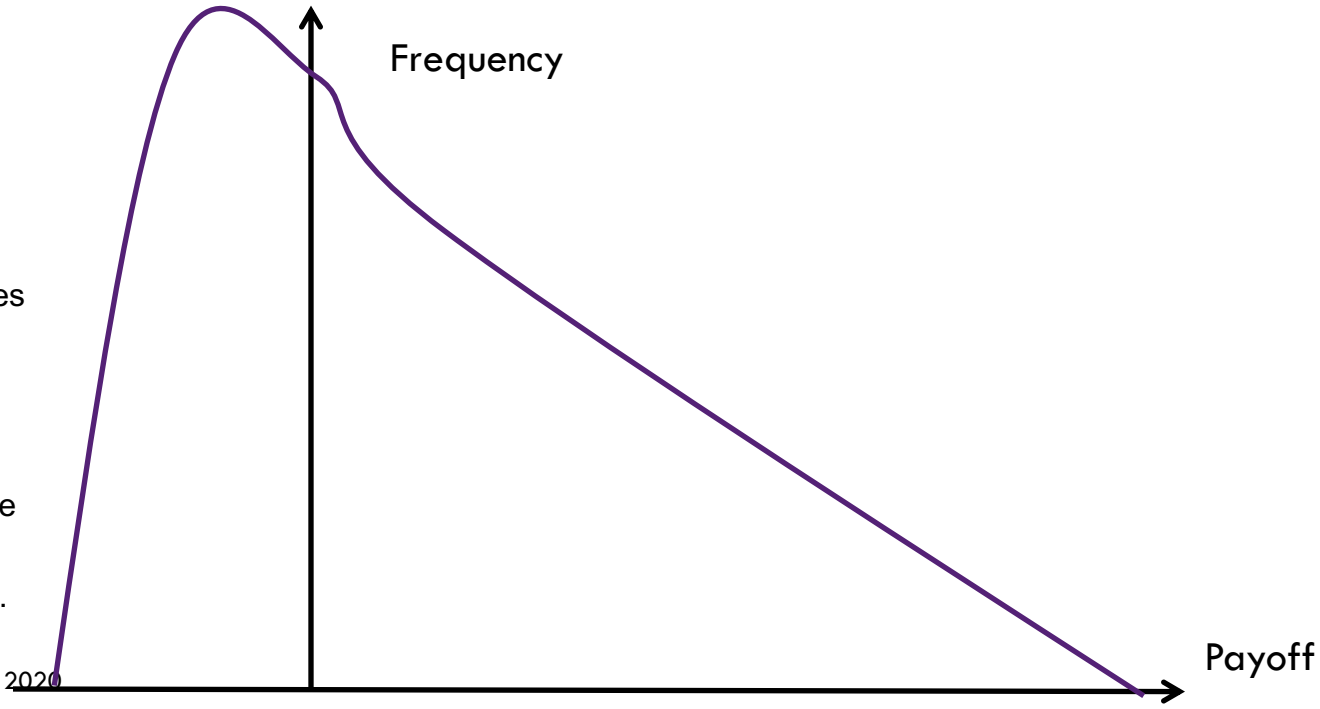
- Want to minimise false positives (accepting an unprofitable ‘project’) and willing to accept higher levels of false negatives (rejecting profitable options).
- Proceeding while intoxicated and having an accident is a false positive (i.e. accept the ‘challenge’ of going through straits even though it leads to an accident)
- Sobering up before proceeding when proceeding would not have led to an accident is a false negative (reject proceeding even though you may make it through the strait without an accident)

In this situation wat to reject false positives because they are so costly, therefore a hierarchical structure is better.

AUTHORITY STRUCTURES: PAYOFFS

Consider a firm facing a small downside risk and a large upside risk.

- Big payoff to a good job
- Small cost to a poor job (e.g. investment in project is limited)
- Want to minimise false negatives
- A flat structure encourages creativity. Individuals have the opportunity to make decisions. Think about start up firms where there are opportunities that can potentially lead to large payoffs.

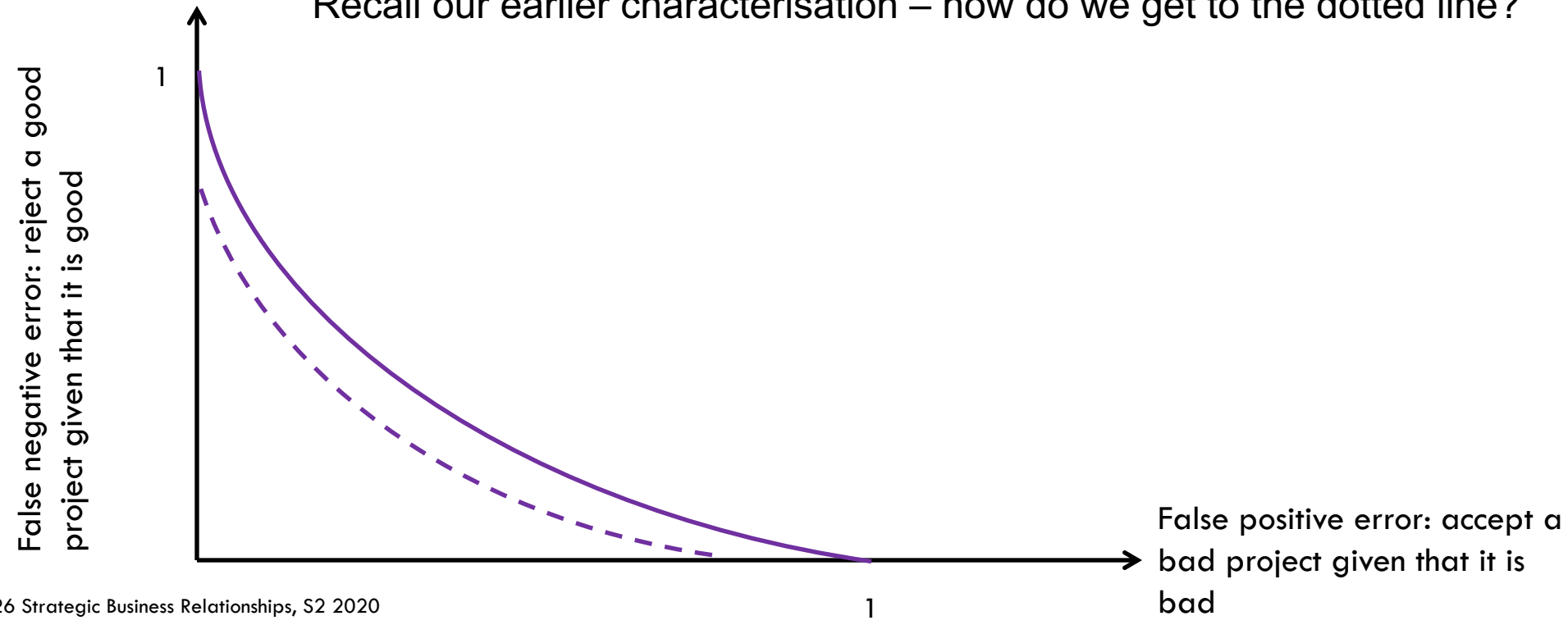


LECTURE 7.6

MAKING BETTER DECISIONS

MAKING BETTER DECISIONS

Recall our earlier characterisation – how do we get to the dotted line?



MAKING BETTER DECISIONS

Doing so is costly and requires investing in some ‘technology’ such as better evaluators.

Consider the example discussed in Lazear (pp. 134-36)

- Planes can take the ‘quick route’ through a storm but at the risk of an accident.
- Alternatively, they can take the long way around the storm.
- Assume that a crash is associated with a large loss of $1bn.

We previously suggested that a hierarchical structure works best here because of the large downside risk. But here the situation is a little different.

WHY?

Hint: think about the pilots our interests and how they align with that of the airline.

MAKING BETTER DECISIONS

Consider the expected cost of going through the storm: the cost of the crash (probability weighted) and the fuel.

$$\textit{Expected cost} = (10^{-5})(-\$1bn) + \$17,000$$

$$= \$10,000 + \$17,000$$

$$= \$27,000$$

Consider the expected cost of going around the storm:

$$\textit{Expected cost} = (10^{-9})(-\$1bn) + \$20,000 = \$20,001$$

Here it is all good and a hierarchical arrangement (where the pilot radios in for instructions) is not needed. A flat structure works fine.

MAKING BETTER DECISIONS

Here the probability of a false positive is zero. An unprofitable choice is not taken when it would have resulted in a crash.

But a false negative occurs with probability close to 1. The shorter route is always rejected even when it would not have led to a crash.

Now suppose that the firm can buy some technology that helps determine if it is safe to avoid a storm. Assume that the technology forecasts that the route through the storm be taken 9999/10000. Hence the probability of crash when the a 'fly through the storm recommendation' is equal to 1 in 100 million. But if the advice to avoid the storm is rejected, then the probability of a crash is 1 in 10.

			Probability crashing when going	
			Through	Around
Probability recommendation	Go through	0.9999	10^{-8}	10^{-9}
	Avoid	10^{-4}	10^{-1}	10^{-9}

MAKING BETTER DECISIONS

The technology allows better decisions to be made.

With a positive recommendation (fly through the storm) the expected cost of the trip through the storm is:

$$Expected\ cost = (10^{-8})(-\$1bn) + \$17,000 = \$17,010.$$

It is still the case that the expected cost of going around the storm:

$$Expected\ cost = (10^{-9})(-\$1bn) + \$20,000 = \$20,001$$

MAKING BETTER DECISIONS

Two questions to consider:

- Should the technology be purchased? This will depend on its cost.
- If purchased what type of authority structure should be put in place? No longer necessarily the case that the a flat structure is ideal. The pilot may not make the same assessment as the technology.

MAKING BETTER DECISIONS

The lesson:

- The interplay between information, decision making structures and incentives is critical.
- With central information available, a hierarchical structure is more likely to make sense.
- When not decentralisation is better.
- But decentralisation works when the interests of the decision maker (the agent) and the principal are aligned.

LECTURE 7.7

BUNDLING TASKS

BUNDLING TASKS

How should tasks be bundled together?

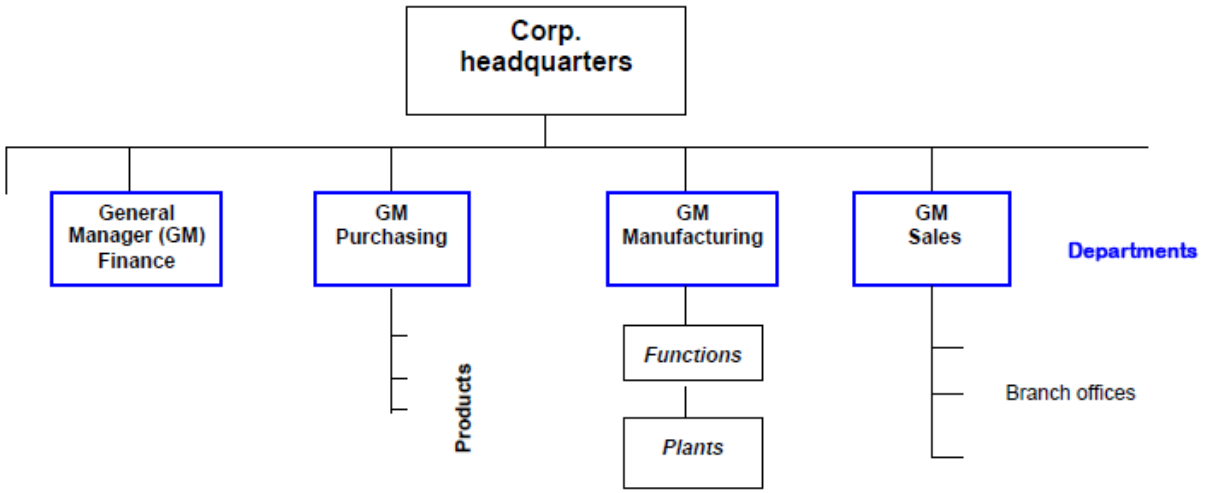
- Complementary tasks are better performed together

One option is functional grouping of tasks

- E.g. manufacturing, sales, finance
- Gives rise to the U-form organisation
- Benefits: coordination within functional units; develops functional expertise and career paths, economies of scale
- Costs: coordination across units: workers focus on their function and ignore other functions

BUNDLING TASKS

U-form organisation:



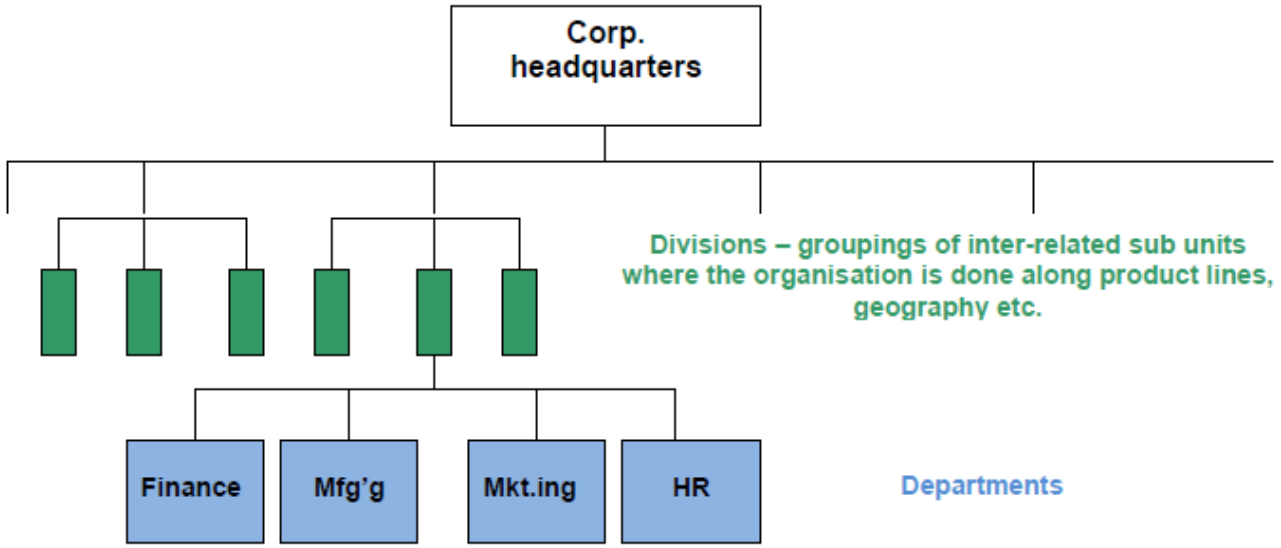
BUNDLING TASKS

Another option is by product or geography:

- Gives rise to the M-form organisation
- Benefits: decision rights are co-located with specific knowledge; rewards can be based on local performance, improving incentives
- Costs: territory disputes; interdependencies might be ignored

BUNDLING TASKS

M-form or multi-division organisation:



BUNDLING TASKS

There are other alternatives

- Network organisations
- Matrix organisations