

Contract Design 101

1) Welcome to this introductory episode on Contract design.

2) Let's get started by asking a very fundamental question:

What are contracts, and why do contracts exist? [Why do contracts exist?]

3) Imagine the following scenario:

a. Amy wants to **ship goods** to Ben [show parcel].

i. Ben has two warehouses [show two warehouses].

ii. Neither Ben nor Amy care about which warehouse the goods are delivered to.

iii. However, Ben needs to be present to take delivery of the goods.

b. Do we need a contract – or a **binding agreement** -- to make this happen?

i. No!

ii. There is **no conflict of interest [no binding agreement]** between the two parties: All they care about is being at the same location, at some future point in time.

iii. Therefore, the parties only need to **coordinate [coordinate]** -- Once the parties know which warehouse to go to, it is in their own self-interest to be there.

- iv. This is the reason why we don't need an enforceable contract to hold parties to their word. It is sufficient for them to engage in what economists refer to as "**cheap talk**". [cheap talk]
- c. It is easy to think about other situations where cheap talk is enough:
 - i. When you want to **meet a friend**, you mostly care about being at the same place at the same time.
 - ii. When you drive **your vehicle in road traffic** and learn that everybody is driving left you will happily agree to drive left as well as otherwise you risk a serious accident.
- d. Here is the insight to keep in mind: Whenever there is no conflict of interest between parties, we need no contract. Cheap talk is enough.**

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Spot transaction

4) Let's now move to a different example:

- a. Imagine you buy an apple at a Farmer's market [Show market]**
- b. There is a seller, who wants to sell the apple at as high a price as possible. There is a buyer, who wants to buy the apple at as low a price as possible.

- c. **There is clearly a conflict of interest.**
- d. So, do you need an **enforceable agreement**?
 - i. Not really!
 - ii. This is a so-called **spot transaction**.
 - iii. The exchange “money against product” happens **instantaneously**.
 - iv. Once the exchange is done, there is nothing more you want of the other party.

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The Farmer and the Viper

- 5) Let me now tell you a story where contracts **do matter**
 - a. The story is an ancient **fable by Aesop, a Greek writer of the 6th century BC**, called the **Farmer and the Viper**
 - i. It is winter, the **Viper is in a ditch**, all stiff because of the cold, and about to die.
 - ii. The Farmer is **compassionate** and wants to save the Viper.
 - iii. However, he is concerned that the **Viper could bite him** once he saves it.
 - iv. The **Viper promises** that this would never happen, whereupon the **Farmer saves the Viper** taking it to his home to warm it in front of his fireplace.

v. As soon as the Viper regains its mobility, **it bites the farmer and the farmer dies.**

b. Let's now analyze the interaction between the farmer and the viper in more detail. For that, **we are drawing a game tree**, a tool that game theorists often use [build up game tree]:

i. The numbers you see represent the utility or the payoff that the farmer and the viper derive from different outcomes of their interaction.

1. The farmer's payoff is given by the upper number,...

2. and, the viper's payoff is given by the lower number.

ii. Let's first consider the **Farmer's decision whether or not to save the viper.**

iii. If the Farmer decides not to save the viper, the viper will die.

1. This is a very bad outcome for the viper. For the sake of the argument, assume this means that the viper derives a payoff of -20.

2. But this is also not a great outcome for the farmer. We said the farmer was compassionate, and thus would derive a warm glow from saving the viper. If he does not save the Viper he only derives a utility of 0.

- iv. Let's now look what happens if the Farmer decides to save the viper. Given that the viper does not die in this scenario, it can now decide whether or not to bite the farmer.
 - 1. If the viper does not bite, the viper derives a utility of say 5 from surviving, and the farmer derives the warm glow from having done a good deed (also leaving him with a payoff of 5).
 - 2. If the viper bites the farmer, the viper has the benefit of surviving, but on top of this derives the extra joy of having bitten the farmer deriving a utility of 10. But the outcome is very bad for the farmer: He dies, deriving a utility of -20.
- v. The problem, the parties face in Aesop's story is that both parties know that, once the viper is saved, there is going to be a conflict of interest between the farmer and the viper.
 - 1. The viper prefers to bite, and the farmer prefers not to be bitten.
 - 2. But the farmer still trusts the Viper's promise that it will not bite.

3. The morale of Aesop's fable is, of course, that his trust was misplaced as **one should not trust a vile and wicked creature like a Viper.**

c. But, let's **tweak the story a little bit.**

- i. Imagine that the farmer is **not gullible or naïve** as in Aesop's story.
- ii. Assume the farmer anticipates that the viper will bite him once saved.
- iii. In this case, he will choose not to save the viper.
- iv. This means we are stuck in a **bad equilibrium** in which the viper dies and the farmer any warm glow from having saved the viper.
- v. Of course, what we would like to achieve is the **far more desirable outcome** where the farmer saves the viper and the viper does not bite, thus resulting in a joint surplus of 10.

d. **So what can we do to reach that equilibrium?**

- i. One possibility would be for the viper to agree to put a **muzzle** around its mouth that will prevent the Viper to bite the farmer. Another possibility would be for the viper to agree to have its **poisonous tooth pulled out.**
- ii. Both of these ways to create commitment are, of course, **very costly.**

- iii. But even if the viper clearly prefers not to have a muzzle once saved, it knows that in the **absence of a credible way to commit not to bite the farmer it will die.**

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- 6) This is a simple story. But, it actually contains a rather deep idea that is not necessarily intuitive.
- a. When I teach **Contracts in Law School**, I often ask my students whether a particular **clause in a sales contract is good or bad.**
 - b. They would then normally ask: For whom? **For the buyer or for the seller?**
 - c. This is because lawyers often look at contracts from a **litigation perspective**, where, of course, a clause is either good or bad for the client.
 - i. Take the example of a warranty term. If it is generous, it is bad for the seller and good for the buyer.
 - ii. Therefore the question ‘for whom?’ makes total sense.
 - d. Similarly, in our story the viper **after having been saved** prefers NOT to have the muzzle and NOT to have its tooth pulled.

- e. **But, when in the ditch**, this is not the choice the Viper gets to make.
 - i. The Viper only has a **choice between accepting the muzzle and being saved, or dying in the ditch.**
- f. Similarly, for the warranty example:
 - i. After having sold the product, a seller might wish not to have given the generous warranty.
 - ii. However, he prefers to give the warranty over not selling the product in the first place
 - 1. (and that might be the consequence of not offering the warranty, as the buyer recognizes that the seller has better information on the good and that the fact that he does not offer a warranty means he knows the good is of a low quality.)
- g. So, the confusion of my students is about whether to take an **ex ante or an ex post perspective.**
 - i. Do we look at a contract from an ex ante perspective: where the parties contemplate to make a deal and when the viper is still in the ditch.
 - ii. Or, do we look at a contract from an ex post, perspective: once the farmer has performed his part of the bargain and the viper is saved.

7) **Analytically speaking**, here is the problem we have to solve:

- a. Although there is **one point in time where the two interests align** (the viper wants to be saved/ the farmer wants to help),
- b. There is **another point in time where the interests diverge** (the viper wants to bite/ the farmer does not want to get bitten).
- c. So we have two elements here:
 - i. First: Different from coordinating to meet a friend, **there is a conflict of interest.**
 - ii. Second: Different from buying an apple on the farmers market, **this is about sequential exchange:** The farmer performs first and therefore makes himself vulnerable.
- d. **This is the problem that an enforceable contract tries to solve.**
 - i. A contract is a way for the viper to commit, because it allows the viper to make a promise that is enforceable.
 - ii. That is, if the viper breaks its promise not to bite the farmer, and this promise is enforced by a court, the court will force the viper to **compensate** the farmer for killing him **[show graph]**
 - iii. Forcing the viper to compensate the farmer will change payoffs in a way that will make it in the

viper's self-interest not to bite the farmer, and the desirable equilibrium can be reached.

iv. This is obviously a rather bad example, as it will be difficult to compensate somebody for the **loss of a life -- but the principle should be clear enough.**

v. **Contracts allow us to move beyond cheap talk.**

This is because not doing what you promised you would do, makes you liable to pay **damages**. A contract therefore allows us to credibly commit, in order to overcome a future conflict of interest.

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8) Now, I told you this story about the farmer and the viper because its strategic structure is actually the same as in many real world situations:

a. **Take, for example, an inventor and a venture capitalist.**

i. Shall the inventor **reveal his idea to the venture capitalist?**

ii. Well, on the one hand, it would be a good idea to do so as the venture capitalist can **accelerate the growth** of the inventor's business.

iii. On the other hand, it might be that the inventor just **steals the idea**, in which case it would be better not to reveal it.

- iv. It will therefore be crucial for the venture capitalist to commit to not stealing the idea, because, otherwise, the venture capitalist and the inventor will never come into business.
 - b. In class, we will discuss many other examples. But the bottom line is:
 - i. **If parties engage in exchange over time...**
 - ii. **And know that there will be a conflict of interest down the road.**
 - iii. **There is a value in committing to a future course of action by constraining your future behavior.**
 - iv. **A contract gives parties a tool to achieve just that.**
- 9) I might have now have convinced you why it is useful for parties write a contract.
- 10) In the next episode we will discuss another very basic question. **Namely, why a state has an interest to lend its power to parties and enforce their contract. Stay tuned.**