

Broken

Economist Insights

As the UK finds itself staring into the unknown, how can we bring clarity to what is an otherwise deeply uncertain situation? One of the gravest uncertainties is the UK's new-found position as a potential partner in global trade negotiations. Here, the application of game theory gives some very clear insights, all of which point to one, inescapable conclusion.



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In a momentous, and surprising, result the UK voted to take a leap into the unknown. We have moved from a binary situation where one outcome was known (remain) and the other unknown (leave). Now the UK faces multiple potential outcomes, all of which have unknown consequences. One of the biggest uncertainties is the nature of the UK's trading relationships with the EU and the rest of the world.

Trade negotiations are always complicated: there are so many vested interests and so many potential trade-offs. When faced with complexity it is always useful to simplify as much as reasonable, and then ask if the complications change the simple conclusions. And in trade negotiations the simple question is one of bargaining power, which means we can use game theory to give us the simple conclusions.

To start with, consider a negotiation between two parties with equal or similar bargaining power, such as the EU and China. To keep things simple, we assume that they both want some sort of deal; it is simply a question of how many concessions you can get from the other party. The payoffs are the same for each party since they have equal bargaining power; in other words the trade deal is equally important to both. In all four of the possible outcomes (chart 1a) the preferences are listed in order from 1 to 4, with 4 the most favourable. To solve a game like this, each player should consider what their opponent will do in response to any of their moves, and choose between the available outcomes.

The EU knows that if China does not offer concessions, then they themselves are better off not offering concessions. And the EU knows that if China does offer concessions, they should take advantage of that by not offering concessions. In short, regardless of what strategy China takes, the EU should adopt a strategy of no concessions. Since China has the same payoffs, both end up making an agreement without unilaterally

offering any concessions. They may decide to do a direct trade-off of one concession for another, but there is no chance of either side offering concessions without anything in return. This is why bargaining power is equal.

Chart 1: Goliath beats David

Illustrative game theory structure for trade negotiations (numbers are ordinal preference 1-5, with highest being best). Payoffs are shown as (EU, China) or (UK, China).

a. With symmetric bargaining power: EU and China

		China	
		Concessions	No concessions
EU	Concessions	(3,3)	(1,4)
	No concessions	(4,1)	(2,2)

b. With asymmetric bargaining power: UK and China

		China		
		Concessions	No concessions	No deal
UK	Concessions	(4,2)	(2,5)	(1,4)
	No concessions	(5,1)	(3,3)	(1,4)

Source: UBS Asset Management

What about when the bargaining power is asymmetric, such as a trade negotiation between China and a UK that has left the EU (chart 1b). In the symmetrical negotiation both sides wanted a trade deal so it was just a question of whether to give any concessions. The asymmetric bargaining power comes about because China does not really need the trade deal. So China can choose to withhold the deal. If the UK offers concessions, the best response for China is to offer no concessions. If the UK offers no concessions, China's best response is to offer no deal. But the UK prefers a deal with concessions to no deal at all, so the UK will have to offer concessions.

By striking out on its own the UK places itself in a fundamentally weaker negotiating position for the trade deals it will be forced to renegotiate. It is hard to imagine any of the specifics of the individual cases that will change that. Anyone who thinks that China (or any other large economy) will agree to a trade deal with the UK because it is in both of their interests is correct; but it will be skewed against the UK.

So you've got to let me know...

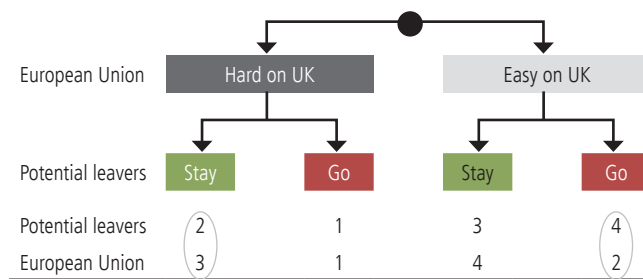
What about the negotiations between the UK and its previous partners in the EU? This becomes a different game, and the UK is no longer the most important player. This is because the EU is worried about the knock on consequences of other countries beyond the UK that might choose to have a referendum to leave the EU. There is a very real fear that the EU could unravel; imagine if the Netherlands, France or Italy were to vote to leave.

Of course it is in the EU's interest to be easy on the UK, because this would ensure the best continuation of trade. But if this encourages sceptical voters in other countries to decide it is not too painful to leave the EU, then they are more likely to vote to leave. Yet at first glance it looks like the EU would always rather be easy on the UK: if the potential leavers stay the EU gets a better pay-off from being easy, but should those potential leavers decide to exit then the EU is also better off being easy on the UK (chart 2). So surely the EU will be easy on the UK? This is what some in the Leave campaign had argued.

Unfortunately it is not that simple. Not all of those outcomes will be available, and this is because of how potential leavers might react (what are their dominant strategies in each case?). If the EU is easy on the UK, then potential leavers will prefer to go since the precedent is established that leaving the EU is relatively painless. If on the other hand the EU is hard on the UK, they will realise that they are better off staying. So now we can rule out two possible outcomes: easy and stay, hard and go. So the choice left to the EU is between being easy on the UK and watching the potential leavers go, or being hard on the UK and having potential leavers stay. Given a choice between these two outcomes, the only solution for the EU would be to maintain a hard stance on the UK.

Chart 2: ...should I stay or should I go?

Illustrative game theory structure for the EU stance to take with the UK in the context of other countries potentially leaving the (numbers are ordinal preference 1-4, with highest being best).



Source: UBS Asset Management

The nature of this tough negotiation line could vary depending on how the EU estimates the probability of potential leavers going. But at the very least, the UK cannot hope for any special treatment, such as access to the single market without free movement of people and contributions to the EU budget. But for the UK to accept single market access along with free movement and budget contributions would make a mockery of the Leave result. The UK would be in exactly the same situation of having to follow EU law but would not even have a vote: this would mean less sovereignty than the UK had as an EU member.

The UK's negotiating position with both the EU and the larger global economies is effectively broken. Game theory tells us that the UK should not expect to get an easy ride from the EU, nor will it get favourable trade deals with the rest of the world. In that way, its experience is most likely to be similar to that of other mid to small sized economies cast adrift on the seas of global trade. This also means the promises of the leave campaign for a better trading outcome are likely to be broken as well.

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