Analysis of game theory

ASSIGN BUSTER

Introduction

Economists always seek to achieve Pareto-efficient market, however market failures are inevitable when dealing with economics. That is why different mechanisms are introduced to rectify the externalities in market failures to achieve economic efficiency. For this part of the paper, the nitty-gritty of Ronald Coase's renowned concept will be dissected and discussed – to which the paperagreesthat ' bargaining does lead to inefficiencies in decision-making processes'.

Coase theorem debunks the effectiveness of the Pigou's tax, citing that the latter is flawed and inefficient because it fails to recognise the reciprocal nature of transactions. He believes that negotiation is more viable in solving disputes between two parties as every individual is [assumed to be] economically rational and equally skilled in bargaining to achieve his or her own objective. The essence of the theory is for individuals to collaborate for their respective mutual benefit[1]with the assumption of clear and defined property rights to search for the lowest-cost avoider.

However, this theory is tailored in a way where there are low to zero transaction costs. This is obviously not the case in reality – major costs will be incurred in negotiating such as searching costs, enforcement costs and bargaining costs. The first includes the resources required to look for suitable candidates to engage in the transaction, whilst enforcement costs may include the avenues for rights to be exercised and appropriate laws to be enforced with regards to property rights and exchanges. The bargaining

aspect is more complicated – there are too many variables to be factored in before an efficient outcome can be achieved.

Game theory

John von Neumann introduced the ‘ game theory’ in an attempt to assert strategic interaction into transactions, in illustrating how transaction costs work. Strategic behaviour is where each player’s action takes account of the other’s behaviour upon coming to a decision by acting according to what the other person is expected to do.[2]Bargaining is essentially a non-cooperative game which in order to achieve efficient outcome must resort to cooperation between both parties.

Transaction costs

1. *Information asymmetries*

The first issue about the bargaining problem is the cost of having information asymmetries between the parties. In every transaction, it is inevitable that one party has better to information compared to the other party[3]– *Van den Esschert v Chappell* [4]illustrates the problem of information asymmetries. The defendant failed to inform the plaintiff that the property he was selling had termites in it. In property exchanges, the existence of pests affects the value of property significantly as well as impedes the plaintiff from making a rationally economic decision. Hence, the lack of perfect knowledge by one of the parties leads to an inefficient outcome as the parties’ bargaining power is imbalanced. The example of termites also illustrate the additional resources and cost needed to ensure the pests are completely gotten rid of – which, of course, incurs even more cost. Evidently bargaining when both

parties do not have the same level of knowledge in the transaction leads to inefficient decisions.

In the popular illustration of the Prisoner's Dilemma, assume Player 1 has standard selfish preferences while Player 2 has either selfish or nice preferences – hence Player 2 knows his own choice but Player 1 does not know the other's decision. This illustrates imperfect information. Had both players known each other's choices, a Nash equilibrium would be achieved. However, in reality, this is unlikely to occur. Strategic interactions are bound to lead to moral hazard: those who are aware of the other's actions have the incentive to behave inappropriately and chances are the ultimate outcome will be in his favour.

2. *Bilateral monopolies*

The second issue is the risk of bilateral monopolies – a market consisting only one supplier and one buyer, for instance an avid watch collector purchasing one of the earliest time-pieces created in the world. The watch-seller will seek to maximise his profits, and seeing as he is the monopolist in the market due to the originality of the product, he will attempt to charge the highest possible price to the buyer. However the sole buyer will obviously seek to pay the lowest possible price. This forms a conflicting goal between the two parties and bargaining must take place in order for an agreed final price which benefits both parties.

Significant costs are incurred in bilateral monopolies due to the lack of competitive forces pushing for economic efficiency in the market. These costs can take in the form of wasted and delayed time and opportunity costs,

where the seller of the watch might have been able to find another purchaser who is willing to pay a higher price had he not stay and bargain with the current purchaser.

On the flipside, the element of threat may come from the buyer as well. Imagine a poor farmer who lives in a rural village desperately need some cash to treat his daughter's illness. The only asset of value he possesses is a tractor which is at least ten years of age, and coincidentally he met a stranger in a neighbouring village willing to purchase his tractor, but arguably at a much lower price which the farmer is willing to offer because, well, the cheaper the better of course! This puts the farmer in a difficult position as he has no other choice but to sell his asset at a much lower value. Granted this may not happen frequently, nonetheless it does illustrate the reality of the element of threat in negotiations – which causes bargaining to be inefficient.

3. *Collective Action*

The other aspect of bargaining costs is the problem of collective action. More often than not, transactions involve a number of people against the firm – for instance, where the firm's factory polluted the river and the people living the neighbourhood seeks for an action against the firm. This might serve a problem as it may be difficult to locate all who are involved. Different people may also have different perspectives or preferences of what they are seeking as compensation. The negotiation thus may fail because the people seeking for an action may not be able to come to a consensus, leading to the holdout problem.

A typical example of a holdout problem is where a house developer seeks to purchase the land which is currently being occupied by a number of residents – the developer will be required to negotiate with every single resident for their respective agreed price, and from the pool residents there will be a few whom believes that the longer they hold out to reaching an agreement, the higher their quotation for their properties will be. This is because the developer will be anxious to complete everything before the contracted completion date – which otherwise he might incur a breach of contract for failing the complete the construction within the contract period.

Hence, bargaining may not be the best solution for efficient decision-making after all.

4. *Free rider problem*

Similarly the problem of free rider is evident. The issue arises when those whom did not pay for the product enjoys freeloading on the benefits of the product, which may have been paid in a massive sum by one buyer – and everyone loves free stuff! This problem is apparent when every person wishes to free ride on others' contributions – the good may end up not being purchased or provided at an optimally efficient level.

This problem is usually evident in public goods – goods which are non-excludable and subject to non-rivalry. The former meant that the one responsible for the good or service will not be able to stop anyone from enjoying the free good. Non-rivalry of a good is where a person benefiting from the good or service does not reduce the benefit available to others. Public goods tend to be provided by the State due to the amount of

resources required to fulfil these two characteristics as well as the inability of public goods meeting private firms' aim for profit-maximisation.

An example of a public good would be street lighting provided by the government. Street lamps are installed by the Road Transport Department, to provide lighting on roads and motorways during night-time. Arguably the public paid taxes which became the source of income for the government to provide such amenities – but the problem usually lies when there is an overconsumption of shared resources. This situation is dubbed the ' Tragedy of the Commons' – overfishing is a perfect example. Individual fishermen have the incentive to attain as many fish catch as possible. However, should every fisherman continue to pursue this objective without waiting for the fish stocks to be replenished in the seas, there is a danger of over-fishing and depletion of fish stocks.

Putting this into the perspective of transaction costs, the potential depletion of scarce resources signify the alarming problem of inefficient resource allocation.[5]There are of course ways to prevent the free-riding problem from persisting, including charging for the good or service. This allows the producer of the good to charge those whom utilise the benefit of the good, ensuring the monies paid is used to fill in the gap in the market, which would otherwise become the welfare loss in the society. Then again, it is difficult to identify every single who is going to use the product – hefty costs may be incurred to ensure that, for instance, a communal lawnmower is secured in the buyer's garage hence inaccessible to those whom have not paid the farmer. Nevertheless, it cannot be denied that the free rider problem poses yet another cost and inefficient decision-making.

Evidently these are the possible transaction costs arising from bargaining through Coase theorem – it further cements the argument that with the presence of these costs, Coase theorem is inefficient in solving the actual problem. He assumes all parties are rational and conscious individual, whom are aware that everyone is rationally seeking to pursue their own objectives. [6][7]However, these assumptions quickly degenerate into a flawed and inefficient theory after factoring in the inevitable transaction costs as well as the possibility of bilateral monopolies hindering the efficiency of the concept. [8]There is, therefore, no perfect mechanism to rectify market failures – at least not yet.

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[1]John Nash, ‘ The Bargaining Problem’ (1950) 18 Econometrica 155

[2]David Friedman, *Law’s Order* (Princeton University Press 2000) 85.

[3]Douglas Baird, Robert Gertner and Randal Pickner, *Game Theory and the Law* (Harvard University Press 1998) 245.

[4][1960] WAR 114.

[5]Guido Calabresi and Douglas Melamed, ‘ Property Rules, Liability Rules, and Inalienability: One

View of the Cathedral’ (1972) 85 HLR 1089, 1095.

[6]Friedman, (n 2) 84.

[7]Leif Johansen, ‘ The Bargaining Society and The Inefficiency of Bargaining’ (1979) 32 KYKLOS 497, 498.

[8]David Friedman, *Price Theory: An Intermediate Text* (Thomson South-Western 1986) 521