Understanding Economic systems with Roundabout and Swings: Using London Transport Examples

Dr. Kumar Aniket

version 2.01

1. Intersection planning

Roads often have to intersect allowing people to change their direction of travel. The planner could either let people sort themselves out or devise rules that are flexible or rigid. An example of a laissez-faire rule is a road cross-section where there a no rules. You sometimes find this kind of roads in remote rural areas in the UK.

Then there are rules that govern roundabouts. These rules are flexible. The traffic from the right has precedence. When you approach the roundabout, you look to your right and if someone is there, you let them go. If there is no one on your left you enter the roundabout. Everyone now will let you have the precedence. You are free to exit whenever you like. All you have to do is use the indicator to exit. The rules for red light stops are simpler. Red light means stop, yellow means carefully and green means you can go. Now, let's compare the level of initiative required under the three systems. When there are no traffic signs you require a very highest level of initiative, the roundabout requires some initiative but red light require almost no level of initiative. Let's compare freedom to move. With no traffic signs, the drivers have unrestricted freedom to move but a driver has to look out for other careless drivers. With roundabouts, a driver's freedom to move is only partially impeded. The rule is rather flexible and allows the traffic to move freely. With traffic lights, there is very little freedom of movement, though the driver is largely protected from the risk of an accident.

Let's look at the requirement for supervisions of the three systems. In the first case, there are no traffic signs, so there is no supervision required from the traffic planner. In the case of a roundabout, the traffic planner is required to plan the layout of the roundabout but there is no supervision on an hour by hour basis. In the red traffic stop case, the traffic planner not only has to plan the road layout and the traffic stop, she also has to decide on the duration of the time certain lanes stop and other lanes flow. This, of course, depends on the traffic flow at different periods of time during the day, during the week and during the year. Get the time right and the traffic flows unimpeded. Get the timing wrong and you create a gridlock. Further, traffic lights artificially create a staccato flow of traffic, which the rest of the traffic system has to deal with. Thus, designing a traffic stop on its own is not an

option. All traffic systems have to be designed in conjunction with each other and require a tremendous amount of time and effort from the traffic planners. Able traffic planners with sufficient information can potentially create a traffic system beautifully. Less able traffic planners can create mayhem and chaos.

We know from experience that the no traffic sign options only work when there is little traffic. Roundabouts work for medium traffic flow if people are law abiding. Roundabouts become very dangerous if people don't obey laws. Traffic lights, if designed properly, work best in heavy traffic flow areas with of course the caveat that people are law abiding.

To summarise, flexible rules put the burden of effort on individual drivers and reduce the burden of effort on traffic planners. Rigid rules increase the burden of effort on traffic planners and ease the burden on the individual drivers. Rigid rules work with extremely able traffic planners and flexible rules require extremely able drivers. Further, rigid rules give the potential of honing the abilities of the traffic planner if they learn from their own mistake and show initiative. Concomitantly, as the traffic planners get skilled, it unwittingly deskills the drivers. The individual drivers' abilities depreciate in an environment where they are not never called upon to make difficult decision. Driving is not just about acting. It is also about reacting. The more the drivers face the unexpected, the more they learn to react to unexpected changes, the better they become at reacting to unexpected events.

Similarly, with flexible rules, drivers abilities increase over time and the traffic planner's abilities decrease over time. Thus, such systems are best understood as dynamic systems where various abilities determine the rules and the rules determine the various abilities. This is why such systems with human subjects are so difficult to understand. *It is also you have to be careful of believing people who sell you simple beliefs, which do not take the dynamic nature of the system.*

What you need to take away from this is any activity that you commit as an individual can give you some satisfaction but also could potentially harm or benefit others. In a society where people are socially minded and are careful about harming others, supervision is not required. In other instances, where people are less socially minded, rules need to be devised to supervise activities so that they do not harm others. The spate of acid attacks in London has created a need to regulate the sale of acid now after years of no need to regulate the activity.

- There a two distinct nature concept that has impact on how group of homogenous individuals behave
  - Externalities4
  - Complementarities

2. Using Transport in London to Understand Economic Systems

People want to go from one place to another. Everyone knows their own desires but it is impossible to collate the desires of 4 million people who want to commute every day. Further, where they live and how they commute and where they go depends on a lot of factors including the monetary and non-monetary cost of travelling. It is so much information that no one can make sense of it. Can you imagine a set of people or a computer system with artificial intelligence directing traffic across London? The answer is no. Think about why that is not possible.[1]

People have different options if they would like to commute. There are different types of private vehicles, buses, tube and overground railway. Of course, people can also cycle or walk. So, what are our options? On one extreme, you could think of a system where there is a central body (a set of people working in a building) working out how best to run the whole thing. This is exactly how nuclear reactors or a chemical plant is run. Of course, it is easy to create a plan for inanimate objects. Inanimate objects don't have agency and don't react to incentives. They also don't have a tendency to acquire a collective identity. Inanimate objects just follow the plan laid out for them. If you lay out the right plan, then it works. If the plan has mistakes, then you get a disaster and the system comes crashing down.

Conversely, you could let everyone do whatever they wanted. Basically, a free for all in London as far as travel was concerned. In the case, there would be no traffic rules and no mechanism to enforce that people pay for their travel. What do you think eventually would happen?

The first extreme case is one of Centralised planned rules-based systems. The system is driven by rules that guide the resource allocation within it. Good examples of these systems are families, firms and universities. Yet, if you extend a strict rule-based system to the whole society, it turns into a big brother society where every human action is controlled. It slowly dampens human initiative and turns them into mechanical robots with no agency or initiative.

The second extreme case is one of anarchy or a feral society. Good examples are civil war or societies where there is no state or no governing structure. Then there is a whole space in the middle where have the society with some rules and humans have some residual agency. That is, if a rule governs something, then humans have no discretion in terms of what they

[1]We have started speculating that artificial intelligence could possibly collect information about people's desires, process all the information and direct people to their destination. It is especially difficult because each person's decision has an impact on congestion and through this process has an impact on everyone else's decision. If you understand artificial intelligence, you will also understand its limitation. Artificial intelligence can play chess but cannot distinguish between cats and dogs in photos yet. Basically, artificial is a gigantic calculator. It can compute really fast but it makes decisions in a very mechanical way. It cannot come up with a creative solution to a tough and complicated problem.

would like to do. Conversely, if an action is not prescribed by a rule, the human can use their own agency.

Here is where it starts getting complicated. But, why not? Humans are complicated creatures on their own. Put them together in a group, they get even more complicated. So, understanding how humans govern themselves is naturally going to be complicated. Human agency reacts to rules and agency. Some rules encourage agency. So, in case of driving, red lights encourage agency by allowing people to move. What would happen without red lights? People would have to look where they are going. In low-density traffic areas, drivers would become more skilled at driving and look out for other drivers. In high-density areas, you would get gridlock.

Every time you make a rule that people have to follow, you solve some problems but you also create other problems. Rules facilities activities but once people are used to the rules, then it also de-skills the people and curtails their initiative. This can be in some cases be a good thing and in other cases be a bad thing. Humans are messy and any discipline that studies humans has to deal with their messiness.

The relationship between rules and agency can be understood by looking at how people drive in countries where either there are no rules or people don't follow rules. This is why you can find some really skilled drivers in developing countries where they are no rules. These are drives have the reaction times of top-notch formula one drivers. They acquire these skills over time because their life depends on it.

There are social rules about government rules. As a society, we decide whether we would like to follow the rules set up by the state. The state sets up de jure rules. Whether they are then followed or not, it is up to the society. So, de facto rules can be different from the de jure rules.

The difference between the de facto and de jure laws are best understood by a George Stigler quote in Freidman (2016) Friedman and George Stigler visited London and Paris for the first time just after the second world war. Friedman quotes Stigler and saying:

> "I've discovered the fundamental difference between the English and the French and the Americans ... The fundamental difference is this. The English obey all laws, good, bad or indifferent. The French obey no laws, good, bad, or indifferent. The Americans obey the goods laws."

Needless to say that Stigler is a bit biased and this is not the point. The point to take away from this quite is the intricate relationship between de facto and de jure rules. There is no point of making a rule that no one is going to follow. Think about the Poll tax. The government came up with the Poll tax. There was public protest and government had no option but to withdraw it. Research the Milly Dowler case and how it led to the Leveson

Inquiry. Within a week of the revelation in the Milly Dowler case, the phone hacking inquiry accelerated and Rupert Murdoch was giving evidence and apologising in front of Parliamentary Committee, which he had previously refused to do. Think of MP's expense scandal. It was legal, yet, there was such public opprobrium that the rules were changed immediately.

The state can make de jure rules but its ability to influence the de facto rules are more limited. These de facto rules have come up after centuries of humans trying their best to function alongside others in the society. Thus, there are many types of economic systems where there are some set of rules and these rules leave space for humans are take initiative and use discretion. Rules that allow markets are one such set of rules. Rules that facilitate the functioning of markets is another set of rules. Resource allocation where markets would never work would require another set of rules. The objective of the next lecture would be to understand what we mean by markets and more importantly understanding exactly what the limitations of markets are.

Incidentally, being careful with what we mean by markets is important here. We use the word market for a lot of things. A street full of shops. A place where you can buy things. This could be online or on a high street. In Economics, market means something entirely different. It is important not to confuse Economics meaning of markets with the colloquial usage of markets. Most commentators in the media remain confused between the colloquial meaning of markets and the economics meaning of markets. Understanding the market mechanism and its limitations will become much easier if you distinguish between the colloquial meaning of market and Economics meaning of market.

References

Freidman, M. (2016). *Milton Friedman: The Essential Collection*. Bowker.

Bartlett School of Construction & Project Management