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**VOICE OF AMERICA****Rational Expectations in a Pandemic****Ayan Bhattacharya**

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Gary Becker, a pioneering economist based at the University of Chicago, was famous for applying principles of economic theory to questions hitherto considered outside of core economics. In doing so he expanded the oeuvre of economics appreciably, while bringing a new level of rigor to many important questions in sociology and human affairs. Followers of Becker choose economic ideas with universal appeal and then apply them to social questions to obtain new insights. In today's world, the most important social question seems to be the pandemic along with its unending cycles of lockdowns. While economists justifiably worry about the economic fallouts of the situation, could principles from the dismal science provide new insights into how we the frame broader social rules in these embattled times?

**1. Rational Expectations**

An economy, at the most basic level, is simply a group of humans that decide to work together, because doing so is to the mutual advantage of everyone in the group. But working together requires the members of the group to anticipate one another's behavior. And anticipation implies the formation of expectations. Thus, expectations form a primitive ingredient of any economic model. In fact, it would hardly be an exaggeration to say that most of economics is about understanding, managing or manipulating expectations to attain objectives that are acceptable to members of groups.

Despite the fundamental importance of expectations, many early economists struggled with this notion. John Maynard Keynes, arguably the most influential of last century's economists, spent many years thinking about the origin of probability and expectations before embarking on a full-time career in economics, and many of his influential macroeconomic theories demonstrate a deep appreciation of human expectations. Yet, he never

managed to put forward a rigorous formulation. It took many years and a number of false starts before the field hit upon a novel, mathematically sensible ways to handle expectations.

In a pioneering paper in 1961, John Muth, then at Carnegie Mellon University, proposed the idea that rational economic agents' prognosis about the future should be consistent with the economic models used to predict the future. This was the birth of the concept of rational expectations. The underlying principle behind Muth's idea was one of consistency. Sitting today if an agent posited a model of the future that included the agent himself, yet did not behave according to his own model's prediction when the future actually unfolded, he would be irrational. Such irrational agents would surely not be interesting economic agents, it was believed, since they would fall a prey to Darwinian survival. A similar idea animated Harsanyi's extension of game theoretic equilibrium to incomplete games. Thus, economic agents' expectations of the future were encapsulated in the models they built today, and at the same time, the models they built today had to be accurate descriptions of the future, since all agents were rational. In effect, economists had managed to replace the neurobiological mechanism of expectation formation with the logical apparatus of consistency.

## **2. Rational Expectations in Economics**

The effect of rational expectations theory on economics was swift and dramatic. In the deft hands of Robert Lucas, another Nobel Prize winning economist at the University of Chicago, rational expectations theory soon developed into a mathematically sophisticated toolset that could provide fundamental insights into formerly puzzling macroeconomic phenomena like the Phillips curve. The famous Lucas critique posited that estimated parameters which were previously regarded as structural in analysis of economic policy actually depended on the economic policy pursued during the estimation period. In simple terms, models that didn't allow for human beings to adjust their behavior in response to the model rationally could not provide good macroeconomic predictions, because people were bound to alter their behavior until the models in question no longer worked. Finn Kydland and Edward Prescott carried forward Lucas' argument even further, attacking the problem of inflation using the tools of rational expectations theory. And many of the widely influential theories of finance that explain asset prices, starting with the Capital Asset Pricing Model, also rely on the rational expectation logical apparatus.

## **3. Rationally Expecting a Reopening**

Perhaps the biggest question facing policy makers today is the best way to re-open our shuttered economies. This is a fraught issue with many dimensions. At the most basic level, we still remain unsure about the microbiology of the virus, the efficacy of projected vaccines, the timeframes for their commercial availability,

and a host of such variables. Yet come to think of it, is the management of lockdowns that very different from managing inflation? There are multiple uncertainties and unknowns in case of price rise, too, and whether lockdown or interest rate hike, what really matters is altering the expectations of agents.

In case of inflation, the expectations at stake are the rational expectations of agents anticipating their economic future. Only when a central bank credibly manages to signal that it will do all it will take to slay future price rise does the inflation today begin its downward slide. In case of lockdown, the expectations at stake are the rational expectations of agents anticipating their social future. A close look at the spread of the pandemic reveals that only governments that have managed to credibly signal that they will do all it takes to stamp out the pandemic – no matter what the costs – managed to bring the infections under some sort of control.

Credible signaling by governments has taken various forms under the pandemic. At one end, we've had countries like China that have been ruthless in the imposition of lockdowns whenever and wherever a new outbreak has raised its head. At the other end, there have been countries like Korea that have relied more on soft closings backed up by extremely well-managed contact tracing and quarantine efforts. In either case, citizens know that there is a credible plan ahead, and because they factor this into their current expectations, the plan becomes credible even today. On the other hand, countries that have dawdled, or started with one plan and shifted midstream to another, seem to be paying huge tolls.

#### **4. Masking Incentives**

Another knotty issue seems to be the wearing of masks. The science seems to indicate that wearing a mask is an effective antidote most likely because it prevents a carrier from spreading the infection to onlookers. However, this justification for wearing masks once again seems to violate rational expectations theory. Polluting industries have known for ages that if they stop polluting it will lead to a cleaner environment. Yet they continue to pollute, because doing so begets gains to the polluters while the costs are borne by the wider society. Such effects are termed “externalities” in the lexicon of economics, and mask wearing in many countries has emerged as a practice associated with externalities. If the only advertised benefit of wearing a mask is the greater social good, it is indeed going to be tricky to convince healthy, rational individuals to don the mask, given the inherent discomfort it causes.

There are many ways out of these tricky situations, however, and economics has been studying them for a long time. One way out of externalities are taxes; thus, polluting firms are taxed for the pollution they cause. For masks, this means strict fines for not wearing a mask, and we've already seen countries like Australia adopt such a path. Another way out is subtle behavioral nudges. If there is a stigma associated with pollution, or an emphasis on

how it destroys local communities, it forces polluting industries to reform. Similarly, if mask wearing becomes a social norm, or if there is attention brought to the fact that wearing masks helps an individual protect his/her younger and older loved ones, this fundamentally changes the dynamics at play.

## 5. Conclusion

One could go on in this fashion, almost endlessly. Distributing scarce supplies in the absence of well-developed markets is a specialty that economics has worked out in great detail in recent decades under the rubric of Market design. Administration of scarce resources such as hospital beds or ventilators, or even costly medicines, among the vast number of deserving in these times of pandemic can benefit greatly from the insights in market design. Countries have now begun to work out protocols for airspace bubbles – bilateral agreements to allow resumption of flights; but what are the best ways to design these bubbles? Again, vital clues lie in network economics that investigate how one must add nodes to an existing node to maximize everyone's welfare. The list goes on.

There is no doubt that our times have become extremely challenging due to the unprecedented circumstances we find ourselves in. Who would have imagined that we'd have to go months on end holed up in our burrows, in fear of something we cannot even see with bare eyes! Yet, this is also an opportunity because the existing order of things has been put in complete disarray. No one knows what new order will emerge at the other end of the tunnel. Nevertheless, understanding and applying economic principles like rational expectations might be the key separator between the ultimate victors and the vanquished.

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