

Duvvuri Subbarao: Economic crisis and crisis in economics – some reflections

M Ct M Chidambaram Chettyar Memorial Lecture by Dr Duvvuri Subbarao, Governor of the Reserve Bank of India, at the Indian Institute of Science, Bangalore, 27 August 2010.

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M. Ct. M. Chidambaram

1. Thank you for this kind invitation. It is a pleasure and privilege to deliver the M. Ct. M. Chidambaram Chettyar Memorial Lecture honouring one of the most eminent entrepreneurs and financiers of the early twentieth century.

2. The Chettyar community of Tamil Nadu has made impressive contributions to our national life. The stereotype view is that the Chettyar community is conservative. But Shri M. Ct. M. Chidambaram broke that stereotype. His is the story of a visionary, ahead of his time who, through his thought and action, contributed to laying the foundations for transforming India from an agrarian society to an industrializing nation.

3. M Ct, as he was popularly known, was a true pioneer who did not let the restrictive economic environment of his time restrain his abounding spirit of enterprise. He started the United India Life Insurance, the first national level life insurance company; ventured into general insurance through the United India Fire and General Insurance Company, established a bank – the Indian Overseas Bank, and set up a large manufacturing unit – Travancore Rayon. M Ct thought big. The LIC building on Anna Salai in Chennai that he built remains iconic even today never mind that taller skyscrapers have since come up. I can go on with the list. What is impressive about this remarkable man is that he accomplished all this in an era of controls and regulations, and that too in a tragically short life span of just 46 years. That all these institutions survive to date is a tribute to M Ct's enduring legacy.

4. M Ct was quite the Renaissance man who let his life and work be influenced by learning from across disciplines as well as from listening to a wide range of people. But as with any successful entrepreneur, in the end, he depended on his intuition and judgement – some may call it plain common sense – to determine his course of action. In that sense, M Ct had unwittingly set a role model for policy makers. Good policy makers should get all the technical inputs and advice, but ultimately need to superimpose their judgement on that analysis to reach policy decisions. This is something that M Ct mastered. The best way perhaps to pay tribute to M Ct is to convey to you how we struggle with making judgement calls on top of technical analysis in order to reach policy decisions.

5. For good economic policy, you need good economics. But you also need good judgement because no economic theory can capture the complexity and capriciousness of the real world. And this is what I want to focus on in this lecture. In particular, I want to address two issues. In the first part of the lecture, I will address the question, has economics failed us. And in the second part, I will try to convey to you the dilemmas and the complexities that policy makers confront in making judgement calls.

The Queen at LSE

6. A few months into the crisis, the Queen happened to be at the London School of Economics and asked a perfectly sensible question: “how come none of the economists saw the crisis coming”. The Queen's question resonated with people around the world who felt that they had been let down by economics and economists. As economists saw their profession discredited and their reputations dented, the economic crisis soon turned into a crisis in economics.

Crisis in economics

7. This was a particularly hard landing for the profession. The years before the crisis, in fact, saw economics as a subject gain impressively in clout and popularity. The price stability and macroeconomic stability that prevailed over an extended period – the Great Moderation – enhanced the standing of economics and gave economists an enviable halo; the increasing sophistication of financial markets where risk could seemingly be measured with precision of up to five decimal points gave economics the clout of prophesy; and the way economists were able to raise obscure questions such as why drug dealers continue to live with their mothers, what school teachers and sumo wrestlers have in common, and answered those questions with impressive insights, awed common folk. Economists were being sought out to pronounce on an ever growing number of issues and their opinions were being heard with regard and trust. And then the financial crisis came and crashed all this.

8. The sharp reversal in fortunes raises two questions: what went wrong and what can be done about it. Both questions are complex; the first because it has too many answers and the second because it has too few. What I propose to do in this first part of this lecture is to address these two questions.

What went wrong with economics?

9. Let me turn to the first question. What went wrong with economics? I am not an economist, only a practitioner of economics. I will, therefore, restrict myself to just the bigger maladies that, I think, afflict the discipline.

10. With the benefit of hindsight and by wide agreement, it now seems that by far the most egregious fault of economics, one that led it astray, has been to project it like an exact science. The charge is that economists suffered from “physics envy” which led them to formulate elegant theories and models – using sophisticated mathematics with impressive quantitative finesse – deluding themselves and the world at large that their models have more exactitude than they actually did.

Is economics like physics?

11. As I started thinking about this charge, I realized that there are indeed quite a few parallels between economics and physics. Let me explore these parallels briefly.

- (i) The theory of rational expectations says that wages and prices adjust instantaneously to new conditions because of perfect information just as Newtonian physics says that the gravitational configuration of the universe will change instantaneously in response to any infinitesimal change in the system, an inference that Einstein found troubling because it conflicted with his special theory of relativity.
- (ii) The centerpiece of Keynes’ theory is the existence of inescapable uncertainty about the future which implies that risk cannot be measured precisely beyond a point, and that taking uncertainty seriously has profound implications for how one applies economics. Look at the parallel in physics. The foundation of quantum mechanics is Heisenberg’s Uncertainty Principle which puts an irreducible limit on our ability to simultaneously determine the position and momentum of a particle.
- (iii) Physicists know of “singularities”, or black holes if you will, where the laws of physics break down. In economics, the analogy would be Depression Economics. There is currently a fierce debate, especially in the US, about the quantum of fiscal stimulus and the timing of its withdrawal. Some economists, notably Krugman, have argued that the size of the stimulus should be much larger than what the models suggest simply because “in Depression Economics, the usual laws of economics do not apply”.

Why economics cannot be like physics

12. Striking as these comparisons are, I am sure, you have noticed an obvious flaw in this line of thinking. Similarity in a few laws does not mean similarity in the basic nature of the academic discipline. The fundamental difference between physics and economics is that physics deals with the physical universe which is governed by immutable laws, beyond the pale of human behaviour. Economics, in contrast, is a social science whose laws are influenced by human behaviour. Simply put, I cannot change the mass of an electron no matter how I behave but I can change the price of a derivative by my behaviour.

13. The laws of physics are universal in space and time. The laws of economics are very much a function of the context. Going back to the earlier example, the mass of an electron does not change whether we are in the world of Newton or of Einstein. But in the world of economics, how firms, households and governments behave is altered by the reigning economic ideology of the time. To give another example, there is nothing absolute, for example, about savings being equal to investment or supply equaling demand as maintained by classical economics but there is something absolute about energy lost being equal to energy gained as enunciated by classical physics.

14. In natural sciences, progress is a two way street. It can run from empirical findings to theory or the other way round. The famous Michelson-Morley experiment that found that the velocity of light is constant led to the theory of relativity – an example of progression from practice to theory. In the reverse direction, the ferocious search now under way for the Higgs Boson – the God particle – which has been predicted by quantum theory is an example of traversing from theory to practice. In economics, on the other hand, where the human dimension is paramount, the progression has necessarily to be one way, from empirical finding to theory. There is a joke that if something works in practice, economists run to see if it works in theory. Actually, I don't see the joke; that is indeed the way it should be.

15. Karl Popper, by far the most influential philosopher of science of the twentieth century, propounded that a good theory is one that gives rise to falsifiable hypotheses. By this measure, Einstein's General Theory was a good theory as it led to the hypothesis about the curvature of space under the force of gravity which indeed was verified by scientists from observations made during a solar eclipse from the West African islands of Sao Tome and Principe. Economics on the other hand cannot stand the scrutiny of the falsifiable hypothesis test since empirical results in economics are a function of the context.

16. The short point is that economics cannot lay claim to the immutability, universality, precision and exactitude of physics. Economics is a social science and its predictive power is at a fundamental level influenced by human behaviour and actions. Let me now illustrate how real world behaves in capricious and unpredictable ways posing complex challenges for economic prediction.

- (i) Take the recent financial crisis. It is not as if no one saw the pressures building up. There were a respectable number of economists who warned of the perilous consequences of the build-up of global imbalances, said that this was simply unsustainable and predicted a currency collapse. In the event, we did have the system imploding but not as a currency collapse but as a melt down of the financial system.
- (ii) Again, there was widespread apprehension that the financial crisis would be followed by a sovereign debt crisis under the weight of unprecedented government borrowing to finance the fiscal stimulus. We did get a sovereign debt crisis but not because of stimulus led debt burden but because of fiscal profligacy in some European countries, notably Greece, made possible by the umbrella cover of a monetary union.

Economic models

17. Moving on with what went wrong with economics, another flaw, actually one related to “physics envy”, is the obsession of economists with models so much so that they convinced themselves that if something cannot be modeled, it is not fit enough for academic pursuit. Indeed, with the benefit of hindsight, it is now possible to see that one of the basic causes of the crisis was that the models used by central banks, such as even the sophisticated Dynamic Stochastic General Equilibrium (DSGE) models, remained confined to the real sectors of the economy and did not capture the complexities of the financial markets. It is not surprising that economists missed seeing the crisis brewing in the underbelly of the financial sector.

18. Yes, it is possible to construct beautifully precise models but only if you assume that rational economic agents with perfect information are operating in free markets that always return to equilibrium. But none of these assumptions holds true in the real world; models of economists are mere abstractions of reality that are useful for understanding but woefully inadequate for prediction. That is why good economists are those who superimpose judgement on the predictions thrown up by models, a subject to which I will return in the second part of my lecture.

19. Of all the economic theories that came under attack after the crisis, the one that got the most grilling was the efficient market hypothesis put forward by Eugene Fama of the Chicago School. Its central tenet is that the price of a financial product captures all available information about it. The efficient market hypothesis did away with the unrealistic assumption of perfect information but it assumed perfect information about risk. An obvious inference of the theory is that risk is perfectly measurable, and if it can be measured perfectly it makes eminent sense to use that measurement in economic decisions.

20. Not surprisingly, the efficient market hypothesis spurred furious model building based on the assumption that the distribution of risk is captured by the Gaussian bell curve. The spectacularly, albeit briefly, successful Black-Scholes model for option pricing too was based on the normal distribution of risk and ignored the possibility of extreme events.

21. With the benefits of hindsight, it is now clear that the models used by governments, central banks and economic agents were flawed in many ways. First, the models assumed that the real world exhibits stability over time, and by extension that the future can be predicted from an extrapolation of the past and present trends. Students of physics will notice that this is akin to the Newtonian world view that God is, in fact, a clock-maker and the universe is nothing more than clockwork. Knowing the initial conditions, it is possible to predict the precise configuration of the universe for any point of time into eternity.

22. The second flaw was to believe that risk follows a normal distribution – a flaw that became evident by a series of failures, most prominently by the spectacular collapse of the hedge fund Long Term Capital Management (LTCM) based on the Black-Scholes model. As the much celebrated author Nassim Taleb argues, conventional models used by financial economists not only didn’t capture, but even refused to acknowledge, the possibility of black swans – low probability, high impact events.

23. The third major flaw of financial models was that instead of fitting the models to the real world, they tried to fit the real world to the models. In the process, they assumed away the models’ limitations and caveats. Convenience, and not conviction, dictated the choices that economists made. As the Economist magazine put it so well, economists got seduced by their models, fooling themselves that what the models leave out does not matter. This penchant of economists to build models determined more by what they can rather than what they should is best illustrated by the joke that I am sure most of you heard – about a drunkard who lost his keys and was searching for them under a lamp post not because he lost the keys there but because that is where light was.

What can be done about it?

24. I realize I have straddled economics and physics somewhat erratically to convey to you what went wrong with economics. Now let me turn, if only briefly, to the follow on question about what can be done about it.

25. The first thing is for economics to give up the pretence of being an exact science and striving for false precision. While there is value to models for furthering understanding of economic phenomena, economists should, however, be sensitive to the limitations of their models and use judgement in interpreting model results. And we clearly need to get back to emphasizing the importance of economists “getting their hands dirty” with empirical work.

26. Then there is the crucial aspect of economic history. Much of economic thinking has been handicapped by economists not having a sense of economic history. In their painstakingly researched book, *“This Time is Different: Eight Centuries of Financial Folly”*, Kenneth Rogoff and Carmen Reinhart show how over eight hundred years, all financial crises can be traced to the same fundamental causes as if we learnt nothing from one crisis to the next. Each time, experts have chimed that “this time is different” claiming that the old rules do not apply and the new situation is dissimilar to the previous one. If only training in economics had included a study of economic history, perhaps we could have avoided repeating history, never mind as a farce or as a tragedy.

27. Finally, economics, perhaps more than other social sciences, has suffered from “group think”. Group think is best illustrated by the simulated game of a beauty contest where prizes are awarded if your choice matches the aggregate choice of the group. Under this rule, you get rewarded not for original thinking but for mastering the art of thinking like others. Keynes made the point a long time ago, comparing market psychology to a beauty contest: “It is not the case of choosing those which, to the best of one’s judgement, are really the prettiest, nor even those which average opinion genuinely thinks are the prettiest ... we devote our intelligences to anticipating what average opinion expects the average opinion to be.” Might it be the case that economics is suffering from too much inbreeding? Economists all read the same books, browse the same journals and use the same data because that is what gets professionally rewarded. And that inevitable leads to “group think” and all the associated follies.

Applying economics to real world policy

28. While I have spoken about the follies of economics, I am hardly suggesting that we can do away with economics. Indeed economics needs to be pursued as an academic discipline even more vigorously but we need to be more intelligent and aware in translating textbook economics to practical policy making. In applying economics to practical policy, a sound economic background is necessary. Models too are needed to capture the complexities of the real world. But these are not sufficient. In making economic decisions, practical policy makers need to superimpose judgement on the inferences thrown up by analysis and models. I want to illustrate this by presenting to you the rationale behind the Reserve Bank’s calibrated exit from the expansionary monetary stance of the crisis and the policy dilemmas that we confront.

Calibrated exit from expansionary monetary stance

29. Not unsurprisingly, emerging market economies (EMEs) recovered from the global crisis sooner than advanced economies – an outcome attributable in part to the relatively limited exposure of their banking systems to tainted assets and in part to the self-insurance they had built up through foreign exchange reserves.

India's recovery

30. On the recovery trail, India has been an outlier even compared to other EMEs. Our recovery has been swifter reinforcing the fact that the drivers of our growth are largely domestic. We have been an outlier on the inflation front as well. Even as most advanced economies were flirting with deflation, price pressures caught up with us and headline inflation started inching up.

31. Sensing our unique growth-inflation dynamics, the Reserve Bank began managing market expectations by signalling the need to exit from the crisis triggered expansionary stance even as the rest of the world was still struggling with crisis management. Ironically, we had to begin this messaging about exit as early as August 2009, when our headline inflation was still in the negative territory and some analysts were even talking about a risk of deflation.

October–December 2009

32. Sure enough, WPI inflation surfaced into positive territory by September 2009, and soon started increasing. Even as the reversal owed partly to the base effect, inflationary pressures were also fuelled by supply shocks arising from a deficient monsoon. The challenge for the Reserve Bank during the October–December quarter of 2009 was to respond to a hardening inflation situation even as recovery was still fragile.

33. The arguments for not yet reversing the policy stance were clear enough: recovery had yet to take firm root and also that monetary policy is not an effective tool against inflation emanating from supply constraints. There was an equally persuasive case to the contrary – of tightening the monetary stance to combat inflation. Given that monetary policy acts with a lag – a lag that can be as long as 12–18 months – the argument was that the Reserve Bank needed to look ahead and curb incipient inflationary pressures. The Reserve Bank, it was contended, also had to keep a watch on inflation expectations since the inflation outlook will be shaped by what people expect will happen to inflation as much as by the actual inflation itself.

34. Balancing these arguments for and against reversal was the crux of the judgement call that the Reserve Bank had to make in the October 2009 policy review. If we were to begin the reversal of the accommodative stance, we had to be credible. And this is where real life policy differs from physics. Once a central bank credibly commits to a reversal of an expansionary stance, firms and households change their behaviour. How this behaviour changes also needs to be factored in by the central bank. In the event, we reversed the expansionary stance by raising the SLR requirement to the pre-crisis level of 25 per cent of net demand and time liabilities (NDTL) of scheduled commercial banks. This was admittedly a modest step but helped us in signalling the beginning of the reversal of our monetary stance.

January–March 2010

35. By the time of our January 2010 policy review, it was clear that we had to take more substantive steps towards rolling back the stimulus. Our main dilemma was that premature exit could derail the as yet fragile growth, but delayed exit could potentially engender inflation expectations. The task was about the precise calibration of the policy action. Increase in policy interest rates cannot be effective if there is a large systemic liquidity. We determined therefore that the right sequencing would be to withdraw the excess liquidity before raising policy rates. Accordingly, we raised the cash reserve ratio (CRR) by 75 basis points from 5 per cent to 5.75 per cent of NDTL.

36. The growth-inflation dynamics changed markedly after the January 2010 policy review. Economic recovery was taking firm hold as evidenced by expanding exports, improvement in industrial production and sustained increase in financing from banks and

non-banks. On the other hand, there were distinct signs of the inflation process getting more generalized. Information then available indicated that the contribution of non-food to WPI inflation (excluding food articles and food products) which was zero in November 2009 surged to nearly 50 per cent by February 2010. Also, year-on-year non-food manufacturing products inflation, with a weight of 52 per cent in the WPI basket, which was (-) 0.4 per cent in November 2009 rose sharply to 4.5 per cent by February 2010 evidencing incipient demand side pressures. We determined that we had to act quickly before inflation expectations get further entrenched. Accordingly, in an unscheduled and mid-quarter policy action, we raised the policy interest rates by 25 basis points raising the reverse repo rate to 3.5 per cent and the repo rate to 5.0 per cent.

April 2010 and beyond

37. Monetary theory tells us that if prices come under pressure because of strengthening demand, monetary tightening has to take place. But monetary policy does not offer a template for when to tighten, how to tighten and how much to tighten. This remains a judgement call. We face this dilemma all the time but did so most acutely during the Annual Policy Review in April 2010. Year-on-year WPI non-food manufactured products inflation had moved up further from 4.5 per cent in February 2010 to 5.4 per cent in March 2010 evidencing clearly that demand side pressures on inflation were strengthening.

38. To understand the demand side pressures in perspective, we need to go back two years to August 2008, a month before the global crisis struck. At that time inflation in the country was raging well above double digits. Some of it was due to the unprecedented rise in global crude and commodity prices, but a significant portion of it was also due to sizzling growth in an economy that was structurally capacity constrained across the entire spectrum – infrastructure, agriculture, industry and services. Then came the crisis and the monetary and fiscal stimuli in response. A part of the stimulus was aimed at supporting investment, and public and private infrastructure investment did indeed increase, but much of the stimulus ended up supporting consumption. This helped the economy weather the crisis but the supply constraints remained. As a result, when recovery started and demand pressures started building up, capacity constraints started becoming increasingly evident.

39. So, at the time of the April 2010 policy review, we had to balance the by now well-known arguments in managing the growth-inflation dynamics. Some analysts had argued that we were already behind the curve and that unless we tightened substantively, the economy ran the risk of a hard landing – which is to say that we were boxing ourselves into a corner, that delayed response would mean much sharper increase in interest rates later on and that will severely impair growth.

40. Even as we were managing the macroeconomic situation at home, we had to be mindful of global developments. The Great Recession in the advanced economies appeared to have reversed course by mid-September 2009 and some calm seemed to return to the global markets. It was widely expected that the recovery would be sluggish; but subsequent developments belied even these modest expectations. While recovery prospects in Europe remain clouded by sovereign debt concerns, recovery in US appears constrained by consumer spending and private investment not picking up sufficiently to offset the impact of the waning stimulus. We had to factor in these developments too in calibrating our exit path.

41. Keeping these domestic and external developments in view, in our April 2010 Policy review, we raised the CRR by a further 25 basis points to 6 per cent and the policy rates too by 25 basis points each. We followed that up with two policy actions in July 2010 further raising the policy interest rates.

42. To summarize, as part of crisis management starting October 2008, we reduced the CRR by 400 basis points, the repo rate by 425 basis points and the reverse repo rate 275 basis points. As part of the calibrated exit starting October 2009, we raised CRR by 100 basis points, the repo rate by 100 basis points and the reverse repo by 125 basis points.

It must be noted that on top of this, there has been some autonomous tightening of 150 basis points because of the tightened liquidity and the consequent shift of the operative policy rate from the bottom of the LAF corridor (absorption mode) to the top of the corridor (injection mode).

43. Some critics contend that the Reserve Bank is “behind the curve”. Others put it differently saying that we are yet a distance away from the “neutral rates”. This criticism obviously presumes a notion of the shape of the curve or the neutral rates. This is a complex debate to pursue in the Indian context. Technically, the “neutral rate of interest” is an important concept in monetary policy and a potentially useful guide to monetary policy stance. The neutral rate is defined as a rate that is consistent with the economy’s potential growth and low and stable inflation. The actual policy rate will, therefore, differ from the theoretical neutral rate if the underlying parameters – actual growth and inflation – are away from their respective potential or target rates. The neutral rate evidently varies over time as the potential growth rate of the economy changes – which in turn is typically a function of the demographic profile, the fiscal stance of the government and technological changes. In a rapidly growing economy like that of India, the structural changes make the potential growth rate even more variable. That makes the neutral rate even more difficult to estimate and a less useful policy guide.

Policy Rates – During and After Crisis

September 2008–August 2010

Variable	Crisis Management			Calibrated Exit	
	Rates in September 2008 (before crisis)	Reduction as part of crisis management (Oct. 2008–Sept. 2009) (basis points)	Rates in September 2009	Increase as part of calibrated exit (Oct. 2009–Aug. 2010) (basis points)	Rates in August 2010
CRR	9%	400	5%	100	6%
Repo	9%	425	4.75%	100	5.75%
Reverse Repo	6%	275	3.25%	125	4.50%

Outlook

44. What is the outlook? There is evidence that growth is getting more broad based. Inflationary pressures too are easing because of improved supply position as also the impact of monetary tightening effected by the Reserve Bank. Going forward, the Reserve Bank will calibrate policy action to the evolving growth-inflation dynamics. Given the uncertainty in the world and the lags in monetary transmission, it is not possible to offer more precise guidance. All I can say is that our guide post is *festina lente* – as the Romans used to say – make haste slowly.

45. One final point as I close this issue. The Reserve Bank has to balance between the objectives of growth, price stability and financial stability with the *intersé* prioritization determined by the macroeconomic context. Determining this prioritization is the judgement call of the Reserve Bank. People who apprehend that monetary tightening will hurt growth must remember that even if there is some sacrifice of output in the near-term, we are better off curbing inflation since inflation can be inimical to sustainable and equitable growth in the medium term.

Conclusion

46. Let me now conclude. I started with the Queen's query to economists about the shortcomings of their trade, went on to sketch the perils of economics positioning itself as an exact science and argued that economic thinking has to be conditioned by human behaviour. I then explained how, in economic policy formulation, we need to use judgement over the results of analysis and modeling to decide among policy choices.

47. Since so much of my talk has been shaped by comparing economics to physics, let me also conclude with a parallel between the two disciplines. Physics, an exact science, explores known unknowns. Economics, a social science, deals with unknown unknowns. We all know that all through his life, Einstein remained skeptical about quantum mechanics. In particular, he could not reconcile to the probabilistic nature of the physical world implied by quantum physics and famously said that "God does not play dice". Less well known perhaps is the retort of Neils Bohr who told Einstein, "Albert, stop telling God what he can or cannot do". Economists have a much humbler remit. They cannot even tell man, let alone God, what he can or cannot do. They just have to take human behaviour as given and pursue their trade on that fundamental premise.