

HAS THE SEARCH FOR THE THIRD SHIFT IN MACROECONOMICS BEGUN?

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[Abstract: The last century provoked two notable shifts in macroeconomics when the nature of economic crises could not be explained by the then prevailing economic theory. The first was in the 1930s when high level of unemployment and sustained low output could not be explained by the existing economic theory. Keynes advocated according primacy to fiscal policy and the government intervention, which was adopted by the countries with remarkable success. However, in the 1970s, the Keynesian economic model broke down when the phenomenon of stagflation appeared. It was time for the second shift in macroeconomics when Milton Friedman espoused belief in free market and less government intervention with focus on monetary policy. When this shift was being accommodated it was recognized that the agent may change its behaviour with the change in policy, which gave rise to the concept of Dynamic Stochastic General Equilibrium models. These models guided the central banks regulating the monetary supply. However in 2008 the globalized economy sank into recession from which it is yet to recover fully. The failure to foresee the crises has impelled us to have a relook at the macroeconomic theory. Not only will the risks associated with the financial institutions have to be built in the theory but also surrounding economic problems such as increasing inequality, the impact of climate change, environmental degradation, severe stress on food and water systems, etc., are seeking to be integrated with the macroeconomics theory. Besides, the disruptive technology has impacted on macroeconomics as much as the policy consensus among government manifested by their adoption of sustainable development goals. Approaching economies from the world of finance would be inadequate. Each dimension in the economy has to be included as a system whose elements are continually updating themselves, resulting in constant computation. Work is underway on agent-based modelling concerning a computer simulation, wherein all agents in the system continually interact among themselves and also with the environment. The objective is to transform macroeconomics back into useful and policy relevant social science and bring about the third shift in macroeconomics.]

Macroeconomics is concerned with understanding the economy in its broadest sense on the basis of the prevailing economic models. The crises of the last century provoked two notable shifts when the nature of these economic emergencies revealed defects in the prevailing economic theory. The first was in the 1930s after the Great Depression when high levels of unemployment and sustained low output could not be explained in terms of the then prevalent Marshallian economics. Keynes invented modern macroeconomics which hinged on fiscal policy and the role of government intervention. The economic policies based on Keynesian economics worked well for almost four decades that followed. In the 1970s, there was inversion

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of the relationship between economic growth and inflation, which gave rise to the phenomenon of stagflation. Inflation climbed while economic growth stagnated and unemployment rose. Keynesian economic models broke down. This was to bring about the second shift in economic thought in the middle of 1970s when Milton Friedman espoused his belief in free markets, a focus on money supply, and advocacy of less government intervention which paved the way for the policy of inflation-targeting at central banks, downgrading the importance of fiscal policy and according primacy to monetary policy. Robert Lucas at around the same time came up with his observation—which has come to be known as Lucas Critique—suggesting that an economic model isn't good enough if it ignores the fact that the agents' behaviour changes with the change of policy. This observation led to the development of micro foundations in macroeconomics which meant that economic models would be an aggregation of microeconomic models that account for changes in individual's behaviour. This concept became the basis of Dynamic Stochastic General Equilibrium (DSGE) models which were to guide the central banks in appreciating macroeconomics and crafting monetary policies. Economists developed so much confidence in the DSGE models that Lucas pronounced that the central problem of depression prevention stood solved for many decades. However, this proved to be a misplaced confidence when within a few years the global economy abruptly sank into the worst recession in 2008 since the Great Depression. It has been surmised that a key sector of the economy, i.e. finance, was not given the scrutiny it deserved. The central banks and the policymakers had not conceived that a shock could emanate from the banking sector and failed to consider financial institutions as agents in the economy having their own unique incentives and risks. As a result of the global financial crisis, it is no longer clear what macroeconomic theory should look like and what kind of constructive response should be to this crisis that Keynes produced in the 1930s.¹

The failure to foresee the crisis shifted the focus on the fundamental problems in economics, namely treating people as infallible rational actors, and putting too much trust in the self-correcting nature of markets. Inequality is on the rise despite

¹ Nelson, E. (2018), "The Reinvention of Economics after the Crash," Quartz, December 18.

reduction in global poverty and we are hurtling towards climate-change, environmental degradation, and severe stress on food systems and water.²

The implication of the current wave of technological change at mechanical and commercial levels is fairly well understood and digital technology is being harnessed for better delivery of public services and enhancement of competitive advantage. The interventions at the micro-level—service by service and business by business—have implications for macroeconomics and policy implications at structural level. The levels of macroeconomic policy (interest rates, taxation, public spending) would be surely impacted. Already most of macroeconomic aggregates such as growth, inflation, trade, capital expenditure, productivity and money supply are in a state of flux, the reasons for which are not fully captured. World of micro is begging to be co-related to that of macro.³

The direction in which macroeconomics is heading in response to the disruptive rate of technological change is already on the horizon through the new relationship developing between people and technology and organisations. Breakthroughs in autonomy, extreme connectivity, analytics, simulation, and rapid feedback loops are rewriting these relationships and driving the interplay to create a system approach to most business environments. Current economic models are generally linear and therefore are unprepared for the mesh of interdependencies of these relationships.

Further, the existing models do not take into account the volume of enormous data now available and the speed at which it can be accessed to inform decisions. The arrival of data as a wealth creator is a basic fundamental change for industries and trade and also for the economists because it could help make a difference to the way they perceive value, wealth, and assets.

² Anstey, C. (2019), "We Need an Economic Model that Works for People and the Planet," World Economic Forum, September 23.

³ Siddiqi, L. (2018), "Confronting the Macroeconomic Challenges of the Fourth Industrial Revolution," LSE Business Review, January 17.

The consequent emergence of adaptive intelligent systems throws the existing economic models off course by automating many current processes, thereby stimulating a change in the nature of work. However, it may be biased towards jobs that require creative and relationship skills as routine work would stand assigned to intelligent systems. Such a change in the nature of work would be towards changing the national, regional, and personnel economics.⁴

The major adjustment that indicates a direction of travel for macroeconomics is the changing definition of value and the reduced perception of physical assets as key criterion for business growth. In the 4iR technology regime it is possible to reach a global market without sharing physical assets. For example, the world's largest accommodation provider does not own a single piece of accommodation which has been made possible due to the increasing value of data and the improved performance of analytics. Further, the increasing ability to process greater volumes of data enhances the capacity to draw more and precise intelligence from the integration of disparate data sources and enables the businesses to personalise their products, services, and marketing to reach the targeted audiences in a way that maximises commercial impact. Thus, data has now graduated from being a commodity to a prized asset. Application of data asset is giving birth to shared economy and subscription economy which the global economic models would need to take note of. Shared economy has resulted in improved asset utilisation and lower cost of ownership. Manufacturing is shifting from producing goods to offering solutions, leading to greater share of service sector in the economy. The subscription model shifts the focus of the business from product to customer using data intelligence with a view to ensuring a long tail of committed revenue by using data analytics to create personalised products and services. It is thus apparent that the proportion of value added is increasing in the design/pre-production and the after sales.

Thus, the macroeconomic models will be called upon to shift away from a traditional manufacturing focusing on the productivity of relationships, measured by

⁴ Parkin, E. (2018), "4iR and New Economics," Qinetiq, May 4.

depth of engagement and recurring revenue stream catalysed by high performing intelligent ever disrupting technology.⁵

As the embedded technology diffusion progresses exponentially under the fourth industrial revolution (Industry 4.0), it is bringing forth the socioeconomic impact rigorously. Coping with such transformation would demand a holistic approach encompassing innovative and sustainable system solutions and not just technological ones. Wealth distribution within the developed countries that have been leading industrial revolutions has not been equitable, and certainly not at the global level. Thus, inequality has become one of the key challenges along with climate change and other sustainable issues, e.g. rapid depletion of earth's resources, climate change, and environment issues.⁶

Concepts such as sustainability and social innovation have attracted global attention. The United Nations global initiatives towards the fulfillment of sustainable development goals (SDGs) are committed to inclusive social and economic development universally.⁷

In light of the preceding discussion, macroeconomic and social policy implications at a structural level need to be redesigned comprehensively and it is to be acknowledged that the conventional levers of macroeconomic policy have to be revisited comprehensively. The framework of debate on societal issues has to be widened, much more than the traditional left-right spectrum to include issues like concerns for inequality, environment, and climate change, which have been included forcefully by the nation states in their state policies. We would need macroeconomic models which capture the fast emerging and ever-changing business models which in turn redesign the relationship among the players in the economy and further which

⁵ *Ibid.*

⁶ Morrar, R., I.I. Arman and S. Mousa (2017), "The Fourth Industrial Revolution (Industry 4.0): A Social Innovation Perspective," *Technology Innovation Management Review*, Vol. 7, No. 11, pp. 12–20.

⁷ Sardana, M.M.K. (2015), "A Critical Note on Transition from Millennium Development Goals Agenda to Post 2015 Sustainable Development Goals Agenda," ISID Discussion Note DN2015/07, September.

are sensitive to the policy issues which have universal acceptance across the spectrum of global states.

With the onset of 4th industrial revolution and the arising concerns about social issues, there emerges an incredible paradox. In aggregate, technology has been unfolding to provide everything needed around the globe, across health, education, food and energy, technology is ushering the age of sustainable abundance at marginal surplus cost. However, it is the exacerbating inequalities which are injuring the environment and bringing about climate change which the resultant growth must address and include.

It needs to be acknowledged that the current approach of economic modelling on near linear responses has not been able to keep pace with the technology march and the social concepts.

Economists have been working on overhauling the DSGE models, reference to which has been made previously in this paper. It has been suggested that four key changes need to be made to the core model. These are: (a) stronger appreciation for the costs and risks inherent in the financial system, (b) less reliance on assumption of rational expectation, (c) the inclusion of more diverse agents, and (d) better ways to incorporate micro foundations.

It is believed that the much of the progress has been made in respect of point no. (a), i.e. incorporation of the financial sector, and yet a long way has to be travelled in this sector.⁸ Approaching economics from the world of finance is inadequate. Each dimension in the economy has to be included as a system. The United Nations put forward 17 SDGs that countries and economic entities can use as a yardstick. Fresh, creative thinking from multiple stakeholders can emerge from these systemic approaches.⁹

⁸ *Op. cit.* 1

⁹ *Op. cit.* 3

The economy becomes a system whose elements are continually updating themselves, and which is under constant computation. Such a phenomenon is akin to the process undergone during the evolutionary processes of species under the discipline of biological science which is not developed through mathematical tools. Theoretical formulations of biological science have proven to be sound. Thus, the economic models subserving macroeconomics may be required to overcome the limitations set by analytical approach¹⁰ to forecast the outcomes.

Some economists are already working on agent-based modelling wherein a computer simulation is imagined where all agents in the system behave and interact with one another and react with their environment as well. The decision made by the agents can impact the environment, which in turn makes the agents respond to the changes. This kind of modelling concept resembles the approach followed in mapping the spread of diseases, weather systems, etc. It is argued that the agent-based models are just the thing for economies when it comes to predicting and managing crisis. These models, in theory, would enable economists achieve a better understanding of the granular structure of the economy and interactions among every agent in the economic system. Agent-based modelling is already being practiced for managing the \$120 billion pension and endowment fund at the University of California. Further, the exercise is being tried at the US Treasury department to develop ways to identify systemic risks in the US financial system. However, agent-based models may not be useful to the natural scientists. In an economy, the agent-level behaviour cannot be determined precisely because humans do not act according to the fundamental laws of nature which govern the physical entities like atomic particles. Even so, the agent-based models are being worked on further as these encourage the modellers to include the impact of artificial intelligence on jobs, the way financial systems adapt in response to regulation, and the consequences of climate change, etc.

United Kingdom's Economic and Social Research Council has taken up a research initiative, "Rebuild Macro" which would include questioning everything

¹⁰ Sardana, M.M.K. (2017), "Evolving Economic Thought to Include the Impact of Technology in Economic Development and Economic Theory Overcoming the Limitation Set by the Analytical Approach," ISID Discussion Note DN2017/05, May.

about the economy and spreads its net wide for contributors with new ideas on topics like globalisation, sustainability, the financial system, inequality, and disruptive technology. The objective of the initiative is ‘to transform macroeconomics back into a useful and policy-relevant social science.’ Besides, it seeks to circumscribe the monoculture that marks macroeconomics by including biologists, anthropologists, and physicists alongside economists and policymakers.¹¹

Has the search for the third shift in macroeconomics begun?

¹¹ *Op. cit.* 1