The Standard Economic Paradigm is Based on Bad Modeling

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Article

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The New Keynesian Dynamic Stochastic General Equilibrium (DSGE) is a straightjacket for macroeconomics

Mainstream macroeconomics finds itself in a deeply unsatisfactory state, unable to make correct predictions and incapable of providing meaningful longer-term analyses and advice. It clearly needs a major rethink. Regrettably, the dominant response of mainstream macroeconomists so far has been to defend the accepted paradigm: some version of the New Keynesian Dynamic Stochastic General Equilibrium (DSGE) model. People generally laugh when they hear that "after 1968 the restored communist regime required all Czech rock musicians to sit a written exam in Marxism Leninism" (Ferguson 2012, p. 248). But what they don't know is that, in 2021, the *Politburo of Correct Macroeconomic Thinking* requires all Respectable Macroeconomists to frame their argument within the straightjacket of a DSGE model. Those who don't, cannot be a member of the club.

Recognizing this deeply unsatisfactory state of mainstream macroeconomics, David Vines and Samuel Wills brought together a group of critical mainstream macroeconomists to explore the limitations and problems inherent in DSGE models and to consider future pathways for a more relevant macroeconomics. Professors Vines and Wills call their effort the '*Rebuilding Macroeconomic Theory*" project, with a second collection of papers coming out of this project recently published in the Oxford Review of Economic Policy 2020, volume 36 (3).

The two editors have to be admired for sticking out their necks and for arguing that mainstream macroeconomics needs a paradigm shift. They propose "a new multiple-equilibrium and diverse (MEADE) paradigm" as the future of macroeconomics. The way forward for macro, in their opinion, is "to start with simple models, ideally two-dimensional sketches, that explain mechanisms that can cause multiple equilibria. These mechanisms should then be incorporated into larger DSGE models in a new, multiple-equilibrium synthesis. All of this will need to be informed by closer fidelity to the data, drawing on lessons obtained from detailed work on policy models."

Professors Vines and Wills are right in removing DSGE models from their pedestal, but they are quite wrong by keeping the same model approach at the center of macroeconomic analysis. In a new INET Working Paper, I argue that, paraphrasing Lance Taylor and Nelson Barbosa Filho (2021), the macroeconomics profession has to put DSGE models, once and for all, in the *Museum of Implausible Economic Models*. To help the visitors to this museum understand why DSGE models occupy such a central place in its Main Exhibition Hall, I revisit and scrutinize 10 untouchable dogmas of DSGE modeling, which make these models irreparably useless for macroeconomic policy analysis.

Irremediable weaknesses

Quite a few of the 10 flaws have been recognized by DSGE practitioners themselves. For instance, DSGE practitioners are frantically trying to incorporate money in their otherwise money-less models. But so far, these attempts do not go beyond giving money a mere token role, which is not surprising, because money's essentially macro-economic nature and role (under uncertainty) is inconsistent with micro-founded optimization (under rational expectations). Likewise, pithy attempts to incorporate money in DSGE models are bound to fail as long as DSGE practitioners continue to gloss over the role of money-creating commercial banks and remain wedded to models of a market for loanable funds provided by savers. Similarly, in today's *monetary production economies* with substantial unemployment, the idea, central to all DSGE models, that inter-temporal trade-offs are the essence of economic decision-making is simply ridiculous. Households and firms do not face such trade-offs, because they can borrow from commercial banks, capable of creating new money to finance additional spending.

DSGE practitioners are also stumbling over more hurdles. To incorporate income distribution and inequality in their models, they are creating Two-Agent-New-Keynesian (TANK) or Heterogenous-Agents-New-Keynesian (HANK) DSGE's. These HANKY-TANKY models, while challenging to solve, remain of very limited use in the classroom or as an input in policy institutions. This is completely unsurprising because these multi-agent DSGE's can – at most – tell distributional *Just So stories* of how monetary policy decisions affect inequality. These stories are also rather one-sided: they consider the impact of exogenous shocks on inequality, but cannot – by construction – analyze the impact of (rising) inequality on longer-run growth.

The run-of-the-mill storyline is that one of the agents is for some unspecified reason credit- or cash-constrained, due to which this agent cannot adjust his/her/its consumption in response to changes in interest rates or variables *other than current income*. The attentive reader will understand that this is nothing less than the return of the much-maligned Keynesian assumption of a fixed marginal propensity to consume! Adding nominal rigidities and labor market frictions into the story plot, multi-agent DSGE's may even be able to generate 'endogenous unemployment risk'. Yes, indeed, with all this effort, HANKY-TANKY DSGE models are almost capable of generating …… 'quasi-Keynesian' outcomes!

A further problem of DSGE models concerns the assumed dichotomy between demand-determined short-run fluctuations and supply-determined long-run *potential growth*. With this set-up imposed on the model, monetary policy and fiscal policy cannot have permanent effects on potential growth.

But the dichotomy is false. A large and growing body of empirical evidence shows that demand slumps do lead to *permanent* impacts on potential growth (Girardi, Paternesi Meloni and Stirati 2020; Fontanari, Palumbo and Salvatori 2020; Kiefer, Mendieta-Muñoz, Rada and von Arnim 2020). And this is not happenstance but due to theoretically sound reasons and well-defined mechanisms. DSGE models, by construction, cannot capture any of the relevant mechanisms and, hence, missing the important part of the action, turn into Hamlet without the Prince of Denmark.

The fallacy that models must have 'rational expectations'

DSGE agents endowed with 'rational expectations' know the 'true economic model' and understand that model outcomes that are being forecast do not differ systematically from the equilibrium growth path. By implication, model agents do not make systematic errors when predicting the future.

But one may wonder what the 'true macro model' is when even 'saltwater' U.S. macroeconomists disagree, as, for example, on the required size and shape of President Biden's COVID19 relief package. Lawrence Summers, in an op-ed in the *Washington Post*, argues that the proposed $1.9 trillion COVID relief package is three times larger than the hole it needs to fill and ominously warns about "inflationary pressures of a kind we have not seen in a generation." On the other hand, Paul Krugman (2021) and Jared Bernstein argue that Summers is "flat out wrong". Both support Biden's proposed relief package. If 'saltwater' economists cannot even agree amongst themselves, why would Trump Republicans and Coastal Democrats agree on the 'true' model of the U.S. economy?

It is no secret that the predictive power of rational-expectations DSGE models is a joke. Not one single DSGE model predicted the financial crisis of 2008 beforehand (but to be fair, most could do it, with great effort, afterwards). The predictive failure is far more general. European Central Bank economists Michal Andrle, Jan Brůha and Serhat Solmaz (2017) conclude that "the current vintage of DSGE models lacks a dominant demand shock that would explain the business cycle dynamics. This is no ado about nothing—most [DSGE] models fail to coherently explain up to 80% of key macroeconomic variables." As Paul Krugman (2016) writes, "Were there any interesting predictions from DSGE models that were validated by events? If there were, I'm not aware of it. Yet even while failing to offer any measurable gains in insight, DSGE had the effect of crowding out the stuff that actually did work."

'Rational expectations' have yet another – incurable – shortcoming: they are not rational at all. Why? Rational expectations ignore *known unknowns*. Inter-temporal optimization is possible only when DSGE agents have a complete probability distribution for every possible future state of the world – as in a complete (Arrow-Debreu) general equilibrium

system of present and future markets. This means that the future is known (in a probabilistic sense) as well as 'closed' (since all possible future states have been described). DSGE agents behave 'rationally' by *adapting to the already given future*. But it is not rational to ignore known unknowns and fundamental uncertainty. Doing so is stupid and knowingly doing so is worse – as is tragically illustrated by the unpreparedness to the sudden, but not unexpected, arrival of SARS-Cov-2.

The fallacy that macro-models need micro-foundations

Macro-models allegedly need micro-foundations to ensure that these models satisfy the Lucas Critique and can be used for 'policy-conditional' forecasts. Models should be based on 'deep' or 'structural' parameters which reflect the fundamental, unchanging rules of individual behavior and hence, do not change when macro policy changes.

If we assume, for the moment, that Lucas-robust models can be built, the question is: how do we unearth the fundamental rules of individual behavior? In DSGE models, 'micro-foundations' are assumed to consist of individual optimization under conditions of risk. These axiomatic 'micro-foundations' are taken to be so self-evidently true, that they do not need to be justified. This is a truly astonishing act of self-deception because from the Sonnenschein-Mantel-Debreu (SMD) theorem we know that it is not possible to derive the characteristics of the aggregate market demand curve on the basis of individual rationality. The SMD theorem is actually quite unsurprising. After all, higher-order outcomes cannot be directly extrapolated from lower-order individual behavior, because the higher-order outcomes are most strongly determined by the interactions between individuals, rather than by the aggregation of individual rules of behavior of single individuals considered in isolation. Macro-economic phenomena are, in the language of complex systems theory, largely *emergent* (Keen 2017). Furthermore, much of individual decision-making is influenced, if not determined, by macro-economic factors – as I explain for the case of money and liquidity preference in the Working Paper.

The fallacy that macro-models must pass the Lucas critique

The Lucas critique targeted Keynesian macro-econometric models that used fixed behavioral parameters, such as the marginal propensity to consume or the parameters of the Phillips-curve. Lucas argued that the estimated 'macro' parameter values of these models are unstable and may change with shifts in policy regime because they depend on the economic policy pursued during the estimation period – and by implication, such macro-econometric models are useless for counter-factual policy analysis. Lucas's point is, in fundamental ways, much ado about almost nothing.

A first way to interpret the Lucas critique is to see it as a *positive statement* concerning model application (Goutsmedt, Pinzon-Fuchs, Renault and Sergi 2016; Sergi 2016) – that is, as a critique of econometric models used for out-of-sample counter-factual analysis. Lucas's *positive* point was long known, and it was also widely understood that the impact of changes in policy regime on model parameters is mostly negligible, and traditional macro-econometric models still perform well for policy evaluation (Sergi 2016).

The alternative is to interpret the Lucas critique in a *prescriptive manner* (Goutsmedt, Pinzon-Fuchs, Renault and Sergi 2016). In this interpretation, the Lucas critique represents a 'purist' methodological norm and a theoretical absolute: "no policy evaluations without deep parameters!" With ideology triumphing over common sense, micro-founded DSGE models are claimed to be Lucas-robust. The extreme 'purist' position is well expressed by Christiano, Eichenbaum and Trabandt (2017) who write: "The *only* place that we can do experiments is in dynamic stochastic general equilibrium (DSGE) models", adding that people "who don't like dynamic stochastic general equilibrium (DSGE) models are *dilettantes*. By this we mean they aren't serious about policy analysis." (*italics added*). Using a standard rhetorical trick, Kehoe *et al*. (2018, p. 164) add: "[Macroeconomists] agree that a disciplined debate rests on communication in the language of dynamic general equilibrium theory", while Chari (2010, p. 32) adds insult to injury, stating: "If you have an interesting and a coherent story to tell, you can do so within a DSGE model. If you cannot, it is probably incoherent." Chari forgets to mention that one can also tell a lot of uninteresting and incoherent stories within a DSGE model.

But these specific claims do not logically follow from the general critique. The reasoning used is tautological:

Premise 1: Lucas-robust models feature deep model parameters which are invariant to changes in policy regime.

Premise 2: Only macro-models which are Lucas-robust, are useful.

Premise 3: Let us assume that the parameters of DSGE models are deep parameters.

Therefore: DSGE models are Lucas-robust and useful.

The conclusion is, to say the least, not very surprising. It is also wrong because premise 3 is incorrect: the parameters of micro-founded DSGE models are not deep enough, because DSGE preference and technology parameter estimates are found to be unstable in the face of changes in policy regime (Estrella and Fuhrer 2003).

This failure has strengthened efforts to identify even deeper and/or more 'micro-foundations' for DSGE models, but these efforts are pointless – driving macroeconomics further down a dead-end street. In reality, the estimated model parameters of economic systems are continuously changing and evolving and, as Boulding (1981) argued with deep insight, one "cannot predict the future without changing it." This is the crux of the matter: Lucas-robust models do not exist, because – for reasons of performativity and reflexivity – individual rules of behavior may change in response to a change in policy regime. Human beings are, as far as I know, not mechanical robots or closed algorithms.

The bottom line is that it is not rational to insist that macro-models must be Lucas-robust. Is this a problem? No, not at all: the impact of changes in policy regime on parameters is generally negligible. What is needed, is an awareness that practitioners must be cautious drawing out policy conclusions when it could be reasonably expected that the estimated coefficients will be upset by policy change. But for all practical purposes, we may as well ignore the much over-hyped Lucas critique.

The fallacy that multiple equilibria are a big step toward greater 'realism'

In the MEADE paradigm, DSGE models should be rethought so that these models can generate different equilibria instead of one unique equilibrium path, around which the economy fluctuates. Martin Sandbu (2021), writing in *The Financial Times* (January 28, 2021), calls this proposal 'revolutionary'. In his view, multiple-equilibria DSGEs will generate scenarios presenting multiple "central" outcomes, and enable "a discussion of the factors that could bring the economy to one or other equilibrium. Such a change would do wonders for an informed economic policy debate." Sandbu writes that "a focus on multiple equilibria is transformative. […..] Once we acknowledge multiple equilibria, and that the economy can jump from a good to a bad state or vice versa, it becomes clear that by far the most important policy question is equilibrium selection: how to get the economy out of a self-reinforcing bad state, or prevent disruptions that tip it out of a good state."

Sandbu's claim that multiple-equilibria DSGEs would do wonders for an informed policy debate must be taken with not just one, but a few pinches of salt. First, adding more complexity to a flawed model will not improve the model, because the GIGO principle applies: '*garbage in, garbage out*'. There is simply no reason why 'more complexity' would mean 'better suited' for forecasting or policy advice.

Secondly, Sandbu's emphasis on *equilibrium selection* is at odds with the logic of rational expectations. DSGE agents endowed with rational expectations know the 'true' model. If the 'true' model features multiple equilibria, agents will know this by assumption. Since these agents are capable of distinguishing a bad state from a good state, they will immediately opt for the good state. Hence, the only way in which to force the 'all-knowing' automatons populating the DSGE universe to settle in a bad state (rather than a good state), in response to some exogenous shock, is by imposing more ad-hoc restrictions, all inconsistent with the axiomatic 'first-best' micro-foundations of these models. It is also rather mysterious how governments are supposed to know how to bring an economy from a bad to a better state, when omniscient private agents cannot do this.

But don't worry. One does not need 'perfect foresight' to know what will happen: never mind the inconsistencies, DSGE practitioners will think of new ad-hoc tweaks and squeezes to force their models to produce the desired ('bad', 'better', 'best') multiple equilibria. Hundreds of PhD theses will be written doing this, careers will be built, hundreds of journal articles on these tweaks will be published in *Very Respectable Journals*, prizes and awards will be bestowed on the most distinguished of these innovations, and after a decade or two and one or two non-trivial, unanticipated macroeconomic crises, it will finally dawn on the profession that multiple-equilibria DSGE's were a *cul-de-sac* right from the start. But hey, nothing learned, but also nothing lost – and the *Band of Respectable Macroeconomists* will (again) move on to greener pastures.

The way forward

Progress is possible only if we abandon attempts to derive macroeconomics from the wrong end—that of the individual rather than the economy—and by proceeding from aggregate national accounting identities, which are true by definition, and then by disaggregating these statements to reflect the technological and institutional structures of the economy. In the Working Paper, I briefly review a few viable alternative macro-approaches.

Mainstream macroeconomics can only progress if it gets rid of the DSGE albatross around its neck. It is better to do it now than to wait for another 20 years because the question is not whether but *when* DSGE modeling will be discarded. DSGE modeling is a story of a death foretold. As Joseph Stiglitz (2018, p. 76) argues, "…most of the core constituents of the DSGE model are flawed – sufficiently badly flawed that they do not provide even a good starting point for constructing a good macroeconomic model." DSGE models are thus unsuited to do what Vines and Wills want them to do, namely "to allow model builders to take a quick first pass at important questions."

Getting rid of DSGE models is critical because the hegemonic DSGE program is crowding out alternative macro methodologies that do work, as was stressed by Krugman. DSGE practitioners, who with a mixture of bluff and bluster act as gatekeeper, judge, jury, and executioner in all macroeconomic matters, are a block on the road to progress. The roadblock has to be removed. The failed and failing DSGE models have to go if mainstream macroeconomics wants to become a force for the common good again.

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