

# Policy Packages: Challenge and Opportunity for DSGE Research\*

**Fabio Ghironi**<sup>†</sup>

University of Washington, CEPR, and NBER

Director, Research Program in International Trade and Macroeconomics, Central Bank Research Association

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Calls for comprehensive policy packages have become the latest mantra in the world of policymaking. Policymakers around the world are urged (or they promise) to deploy wide menus of instruments to lift economies out of the doldrums where they have been stuck since the 2008-09 crisis. Draghi (2016a), G20 (2016), Lagarde (2016a,b), and Praet (2016) are some of the latest examples of high-profile speeches or communiqués featuring such calls or promises. In many instances, calls for multi-pronged policymaking are combined with exhortations (or promises) to engage in stronger international coordination of economic policies (for instance, see G20, 2016, and Lagarde, 2016a,b). Draghi (2016b) contains an explicit call for research on “interdependence in interdependence”: How monetary policy interacts with the other policies that are part of the menu he and other policymakers have been calling for. These calls (or promises) present a challenge, but also an opportunity for policy-relevant macroeconomic research—a challenge that I believe DSGE models are well-suited to rise to.

Analysis of policy packages presents a challenge for macroeconomic modeling because it requires models to include all those features that are key to disentangle and understand the effects of different policies, and how they interact with each other. Coordination of policies across countries—or across policymakers within a given country—requires attention to specifying strategy spaces, policymaker objectives, and asymmetries across countries (or policymakers) that can impinge on the evaluation of possible gains from coordinating policies.

DSGE models have the potential to fulfill these tasks successfully. By building on the appropriate level of microfoundation, they stand the best chance of disentangling the various channels through which the policies that are called for (usually packages of monetary and fiscal policies, and structural reforms) are transmitted and interact with each other. By being dynamic, the models can help us understand the differences between short- and long-run effects of different policy actions—and how different parts of policy packages can complement or substitute for each other over time. By being stochastic, the models recognize that policy operates in an uncertain environment, where consumers, firms, and policymakers take their decisions without perfect knowledge of the future, the effects of reforms can depend on business cycle conditions, and reforms themselves can alter the characteristics of the business cycle. Finally, general equilibrium implies that prices and quantities are jointly determined by the constraints and optimality conditions of the model, with no imposition of a-priori assumptions on how policy should affect any price or quantity.

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<sup>†</sup> Department of Economics, University of Washington, Savery Hall, Box 353330, Seattle, WA 98195, U.S.A. E-mail: [ghiro@uw.edu](mailto:ghiro@uw.edu). URL: <http://faculty.washington.edu/ghiro>.

Importantly, the defining characteristics of DSGE modeling that I just mentioned (microfoundation—even if, strictly speaking, there is no M in DSGE—, dynamics, uncertainty, and joint determination of prices and quantities by the model’s constraints and optimality condition) do *not* necessarily include rational expectations, reliance on exogenous productivity shocks as the sole source—or even as *a* source—of cyclical fluctuations (nor do DSGE models impose reliance on a plethora of shocks to fit a desired number of data series as in Bayesian estimation exercises). DSGE analysis does *not* require the most standard Euler equation that ties expected growth in the marginal utility of consumption to the ex-ante real interest rate; it does *not* require equilibrium uniqueness, complete markets, no meaningful role for financial intermediation, frictionless market clearing with zero unemployment, fully flexible prices and wages or Calvo-style nominal rigidity. It does *not* require that monetary policy be described by a Taylor rule. Finally, DSGE research does *not* require solving models by using log-linearization or other low-order approximations. These are all ingredients (or solution techniques) for which DSGE research has become the object of a barrage of criticism from academics, bloggers, and journalists.<sup>1</sup> We *may* want to use some or all of those ingredients and techniques because, after all, models are never meant to be photographs of reality, and it is useful to establish benchmark, transparent results in simplified frameworks that can then guide our understanding of the implications of working with more realistic assumptions. But nothing in the DSGE approach *constrains* us to using any of those ingredients. Even the level of microfoundation we want to embed in our models is ultimately a decision that must be taken based on the balance between complication, clarity, and empirical plausibility of results.<sup>2</sup>

In this context, the calls for policy packages that have been raining on us provide a great occasion for thinking about what model-ingredients we would *need* in order to make a start at studying the consequences of such policy packages while preserving the most important mechanisms through which those policies will operate.

Consider the repeated calls for structural reforms in conjunction with more traditional, demand-side policy support. The menu of structural reforms that policymakers have advocated is wide. It includes, but is not restricted to, reforms of product and labor markets, reform of financial markets, and changes in trade policy—such as the TPP agreement—that go much beyond standard tariff-based trade policy and are best characterized as structural reforms.<sup>3</sup> I will focus on product and labor market reforms.

These reforms are intended to improve economic performance by facilitating business creation and the reallocation of resources; they are intended to make economies more flexible and resilient to shocks—capable of absorbing them more quickly and with less cost to households and firms. Reforms are supposed to achieve these objectives by reducing bureaucratic barriers to market entry, by combating monopolies, by reducing (or removing) counterproductive labor market regulation that impinges negatively on firms’ incentives to create jobs and on workers’ incentives to take them. Any macro model of structural reforms ought to

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<sup>1</sup> I am sure I am forgetting other sins for which DSGE models have been criticized. I apologize to the authors of such criticisms for unintentionally omitting their points. Since the barrage of criticism has been so wide, and, frankly, the media coverage so blatantly unbalanced across differing views, rather than failing to do justice to anyone specific by forgetting to cite the authors of some criticisms, I will do injustice to all critics by not citing anyone in the limited space of this column. Quick Google searches for “DSGE critics” and “trouble with macroeconomics” will give you the names and contributions of many authors,

<sup>2</sup> This implies that, contrary to widespread claims, there is nothing that prevents us from writing DSGE “toy” models that can be solved with pencil and paper.

<sup>3</sup> See Ghironi (2016).

include features that make it possible to study how these policy changes affect the markets they are intended to affect—and how effects spill over to other markets in the model. Models should be dynamic, to inform us about short- versus long-run effects of reforms; they should be stochastic, to allow us to evaluate the impact of reforms on properties of the business cycle, and on welfare; and they should determine prices and quantities within the model rather than confounding policy actions and policy outcomes by assuming that reforms automatically cause prices (or markups, or quantities, or anything else that should be endogenously determined by the economy) to move in a certain direction. To accomplish this, the models should include a characterization of micro-level product and labor market dynamics that allows for producer entry and exit, job creation and job destruction. Cacciatore and Fiori (2016—CF below) give us an excellent starting point for this type of analysis by extending Bilbiie, Ghironi, and Melitz (2012) to include search-and-matching labor market frictions and studying the consequences of lowering entry barriers and/or reducing firing costs and unemployment benefits.<sup>4</sup>

Consider now the task of studying the implementation of labor and product market reforms in conjunction with the conduct of monetary policy. Eggertsson, Ferrero, and Raffo (2014—EFR below) addressed this question in a plain vanilla New Keynesian (NK) model with no underlying micro-level product and labor market dynamics, and in which the reforms are modeled as, de-facto, exogenous cuts to price and wage markups. Not surprisingly, they find that reforms are deflationary (and they automatically depreciate the terms of trade and improve the trade balance). Because the reforms are deflationary, they can exacerbate the problem posed by the zero lower bound on interest rates for the conduct of monetary policy: At the zero lower bound, reforming can be costly because deflation causes the real interest to rise, and this reduces aggregate demand.

EFR's plain-vanilla NK-DSGE analysis of structural reforms and monetary policy is a useful starting point for discussion, and it has received much attention in the policy world, but the very reduced-form modeling of structural reforms confounds outcome (a reduction in markups) and policy actions (the reforms—intended, as policymakers think of them, as reductions in entry barriers, or increases in labor market flexibility). If we embed CF-type product and labor market modeling in the NK model and we study the effects of reducing product entry barriers or making the labor market more flexible at the zero lower bound, we find striking differences in results.<sup>5</sup> Most notably, reforms need not be deflationary. In fact, they can help the economy move away from the zero lower bound on interest rates by having an inflationary effect. (Specifically, this is the case of a product market reform, which increases aggregate demand by boosting investment in producer entry and product creation.) Moreover, in an international context, reforms do not necessarily imply terms-of-trade depreciation (because increased demand for domestic factors of production can cause the price of domestic goods to rise) nor an improvement in the external balance (because, for instance, it is optimal to borrow to finance increased producer entry after a reduction in entry barriers). Price markups do decline, but they do so endogenously and gradually, as increased producer entry reduces markups by making products closer substitutes.

How *should* macroeconomic policy be conducted in response to structural reforms? In Cacciatore, Fiori, and Ghironi (2016—CFG below), we address this question with reference to monetary policy by the central bank of a model-monetary union. We show that the optimal

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<sup>4</sup> It would not be complicated to extend the Cacciatore-Fiori model to incorporate rationing unemployment along the lines of Michailat (2012).

<sup>5</sup> This is what we do in Cacciatore, Duval, Fiori, and Ghironi (2016b).

policy response to reform is expansionary, to smooth transition costs and to bring forward the long-run gains from reforms. An optimizing policymaker anticipates that reforms will result in higher GDP and consumption in the long run, and expands policy in order to bring those long-term gains closer to the present. This result is exactly in line with Draghi's (2015) argument that policy expansion brings forward the gains from reforms. Intuitively, the same result should hold for the Ramsey-optimal fiscal policy response to structural reforms, as the policymaker would face the same incentive to bring forward long term gains. This result (as well as others in our research) has been echoed in a plethora of IMF documents in the last year—often incorrectly attributing the results to “IMF research.”<sup>6</sup>

Since the April 2016 issue of the *World Economic Outlook* (IMF, 2016a), the IMF has been giving advice on structural reforms and their interdependence with macroeconomic policy that builds explicitly on the results of these and other papers.<sup>7</sup> The IMF advises that attention should be paid to economic conditions at the time of reform implementation; that this makes it important to prioritize and sequence reforms; and that reforms should be combined with expansionary monetary and fiscal policy. We obtained those results in DSGE models that include many ingredients that have been the target of scathing criticism. I would challenge any of those critics to tell me that the policy advice the models have provided is unreasonable and should be discarded because grounded also in DSGE analysis. From my perspective, our results show that DSGE models can rise to the challenge of studying policy packages and delivering eminently sensible policy guidance.<sup>8</sup>

Much needs to be done. The work I did with Cacciatore, Fiori, and Duval, and other work I am aware of, does not address the issue of optimal structural reforms and the optimal level of product and labor (or financial) market regulation; it does not address strategic interactions between policymakers within a country (or a monetary union); and it does not address strategic interactions across countries and several dimensions of possible gains from international coordination.<sup>9</sup> These are all questions for the next stages of this research agenda—for us or other scholars to address. So is to modify the models by making them more realistic in other directions mentioned by the many critics of DSGE analysis. For now, I view it as a significant success that our DSGE research delivered mechanisms and prescriptions in line with the intuitive thinking of “non-DSGE” policymakers. And if the more complicated, more realistic models to come ultimately deliver the same prescriptions, I will be quite satisfied to continue working with the simpler framework, mindful that models are never meant to be photographs of reality and of the KISS principle: “Keep It Simple... Sir (or Señorita).”

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<sup>6</sup> See, for example, IMF (2016b,c) and Lipton (2016). More recently, implications of our research have been reiterated by Gaspar, Obstfeld, and Sahay (2016)—with references to some of our work.

<sup>7</sup> In particular, see Cacciatore, Fiori, Duval, and Ghironi (2016a).

<sup>8</sup> El-Erian (2016) refers to the combination of structural reforms with supportive monetary and fiscal policies, and international coordination, as “better economics” relative to the basic Washington Consensus of the 1990s and 2000s. Our models provide theoretical backing for this intuitive, “better economics.”

<sup>9</sup> In CFG, we show that it is desirable to synchronize reforms across countries, but we stop short of a full-fledged analysis of strategic policy interactions. Similarly, in Cacciatore, Fiori, and Ghironi (2015), we show that international coordination of monetary policy responses to reforms maximizes the benefits from reforming, but again, we stop short of a full analysis of strategic interactions between governments and central banks.

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