Overview of Course

The course provides the background necessary to understand and conduct research at the frontier of monetary-fiscal policy interactions. Even the briefest of reflection on recent economic developments around the world makes it clear why, more than ever, it is essential to study monetary and fiscal policies jointly. So-called “unconventional” monetary policy operations that many central banks undertook are, in fact, fiscal policy in the sense that the assets the central banks acquired are ultimately backed by the government’s taxing authority. In addition, many governments implemented substantial fiscal stimulus plans in response to the worldwide recession. Those plans, coupled with aging populations in many advanced economies, portend substantial fiscal stress in coming decades. Sovereign debt problems among Eurozone nations are placing unforeseen and poorly understood pressures on the monetary union project.

The course describes the theoretical underpinnings and empirical implications of monetary-fiscal policy interactions in formal economic environments. Part I focuses on simple models to emphasize the basic intuition behind policy interactions. Part II turns to develop the numerical techniques needed to solve more complex—and plausible—models that embed essential nonlinearities. Part III relaxes the assumption of rational expectations to examine how policy impacts change when agents must learn the prevailing policy regime.

Part I: Fundamentals of Monetary-Fiscal Policy Interactions (Eric M. Leeper)

Much research studies monetary policy in isolation from fiscal policy, and vice versa. Doing so implicitly imposes strong maintained assumptions on policy behavior that may not hold in practice. When those assumptions do not hold, the resulting equilibria can look very different. The course uses a variety of dynamic stochastic general equilibrium models to develop the economic reasoning behind this logic. Models will range from simple “toy” models whose solutions can be derived analytically to more complex models that must be solved numerically.

Fiscal stress can undermine the ability of central banks—even inflation targeting central banks who are firmly committed to achieving their targets—to control inflation and to anchor inflation expectations. One well-understood mechanism is Sargent and Wallace’s (1981) “Unpleasant Arithmetic”: if net-of-interest surpluses do not adjust to back the value of debt, then money creation must do the adjusting. Many economists regard this outcome as relevant only to hyperinflations in countries that do not have the institutions in place to prevent the central bank from caving into fiscal pressures. According to this reasoning, an independent central bank with a mandate of price stability ensures the Sargent-Wallace outcome will not occur.

But Unpleasant Arithmetic is only one mechanism by which fiscal stress can produce inflation. Most government debt is denominated in nominal terms, as in the country’s domestic currency. And debt is priced like equities: it derives its value from the expected discounted streams of surpluses and seigniorage. Like equities, the price of debt can adjust to absorb expected fluctuations...
in those expected streams. News about lower future surpluses reduces the expected backing of debt and, therefore, reduces the value of debt today. Debt’s value can fall either because the current price level jumps, reducing the real value of outstanding debt, or because the price of bonds declines (or some combination of the two). Lower bond prices, in turn, raise expected inflation, spreading out the inflation consequences and propagating the effects of news over time.

Whereas Sargent and Wallace’s mechanism leads to high and growing inflation, the second mechanism—sometimes called the “fiscal theory”—need not generate high or even especially volatile inflation. The fiscal theory mechanism does, however, imply that inflation is no longer under the control of the central bank.

Implications of the fiscal theory extend well beyond the impacts of fiscal policy. Changes in monetary policy produce profoundly different effects as well. A fiscal theory perspective also leads to sharply different interpretations of time series, including the correlations between inflation and money growth that underlie Friedman and Schwartz’s (1963) influential work and Lucas’s (1972; 1973) explanations for shifting Phillips curve relations.

Part II: Nonlinear Solution Techniques for Rational Expectations Models (Todd B. Walker)

The Great Recession, the prospect of exponentially rising government debt, interest rates at the zero lower bound, and sudden changes to policy make clear that nonlinearities are a crucial element to policy analysis. With little or no indication from policymakers about how future policy will adjust, agents are forced to condition on a broad set of outcomes including sovereign default, sudden fiscal contractions, significant modifications to the tax code, monetization of government debt, and large changes to entitlement spending. Each of these outcomes would create large and persistent deviations from the original equilibrium, invalidating the results of a model that is approximated around the original deterministic steady-state. Moreover, the possibility of each of these (discrete) policy changes creates expectational effects that cannot be accounted for in a linear model. The goal of this lecture is to provide a set of analytical and numerical tools to solve and evaluate nonlinear dynamic rational expectations models so that these effects can be taken into account. The emphasis will be on solving and evaluating macroeconomic models with monetary and fiscal interactions but the techniques extend to many other settings.

Much of the material will be taken from Richter, Throckmorton, and Walker (2011), which advocates for policy function iteration as a solution technique. Policy function iteration methods for solving and analyzing dynamic, stochastic general equilibrium models are powerful from both a theoretical and a computational perspective. Despite obvious theoretical appeal, significant startup costs and a reliance on grid-based methods have limited the use of policy function iteration as a solution algorithm. One goal of this lecture is to reduce these costs by providing a user-friendly suite of MATLAB functions that introduce multi-core processing and Fortran via MATLAB’s executable function. I will demonstrate why policy function iteration is particularly useful in solving models with regime-dependent parameters, recursive preferences, and in capturing key expectational effects associated with policy changes. I will show how to implement the computational routines and highlight the attractiveness of this algorithm using the canonical real business cycle model and a new Keynesian model that features regime switching in policy parameters and Epstein-Zin preferences. I will compare our advocated approach to other more familiar computational methods, highlighting the tradeoffs between accuracy and speed.

Several numerical examples written in Matlab and Fortran will be provided. I will assume participating students have working knowledge of Matlab and limited or no experience with Fortran.
Part III: Monetary and Fiscal Policy under Imperfect Knowledge (Bruce Preston)

The US financial crisis of 2007-2009 has engendered extraordinary policy responses in many economies around the world. In the US, the scale and scope of fiscal stimulus is unprecedented in postwar history. And considerable monetary accommodation has been afforded by the reduction of the federal funds rate to a target range of 0 to 1/4 percent, together with a substantial expansion in the scale and scope of credit policies aimed at mitigating financial market dislocation and providing much needed liquidity. An important question concerns the efficacy of such policy initiatives when households and firms have imperfect understanding of the details of the policy regime in place? Does this limit the effectiveness of stabilization policy?

A theory of imperfect knowledge is proposed based on learning dynamics. In periods in which agents have little familiarity with announced policy frameworks, about which information is scarce, it is reasonable to suppose agents might infer policy actions from historical data. By extrapolating from these patterns households and firms forecast policy developments relevant to their spending and pricing plans. As new data become available beliefs are revised. Specifying beliefs in this way provides a flexible theory of policy uncertainty. Beliefs need not be consistent with the monetary and fiscal policy strategy currently in place. The fact the beliefs may entertain policy regimes that are inconsistent with current policy goals affects macroeconomic dynamics in interesting ways. This is shown to matter for policy design

The lecture has two goals. The first goal is to develop a set of results demonstrating that under imperfect knowledge fiscal policy imposes more stringent constraints—in the sense that fewer policies are consistent with macroeconomic stability relative to a perfect knowledge environment — on monetary policy when compared to a perfect knowledge environment. Mechanisms related to the fiscal theory of the price level, delineated in the first lecture of this course, induce dynamics in which debt has monetary consequences, and managing this requires modification of standard results on stabilization policy under simples rules. More generally the environment permits development of a theory of debt management policy, having predictions about the desirable scale and composition of the public debt. For example, higher debt economies are shown to make stabilization policy more difficult. The second goal is to develop the analytical and conceptual toolkit required to study models under imperfect knowledge.

References


