

## The Transmission of Monetary Policy Shocks

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Despite fifty years of research, and many methodological advances, there is still a lot of uncertainty around the effects of monetary policy. Not just the magnitude and the significance, but even the sign of the responses of crucial variables such as output and prices that are reported in the literature depend on the identification strategy, the sample period, the information set considered, and the details of the model specification (see, for example, Coibion, 2012, Ramey, 2016).

We reassess the empirical evidence on the effects of monetary policy shocks by adopting a new identification strategy that accounts for the presence of informational rigidities in the economy, and a novel econometric method that is robust to model misspecifications of different nature. Specifically, we allow the monetary authority and private agents to have imperfect information and to entertain different beliefs about the state of the economy. Building on this approach, we identify monetary policy shocks as shifts in the policy instrument that surprise market participants, are unforecastable given past information, and are not taken in response to the central bank's own assessment of the economic outlook.

We study the dynamic transmission of the shocks over time by employing a novel flexible method that spans the space between vector autoregressions (VAR) and local projections (LP, Jordà, 2005) and, in doing so, it imposes minimum restrictions on the shape of the estimated impulse response functions (IRFs). We call this new method Bayesian Local Projections (BLP). Intuitively, BLP builds on the prior that a VAR provides a reasonable description of the behavior of most macroeconomic and financial variables. However, BLP IRFs are allowed to deviate from the restrictive, iterative VAR prior, and move towards direct LP IRFs, whenever the prior is poorly supported by the data.

Our results are as follows. First, we show that most of the unstable and puzzling responses reported in the literature can be traced down to the compounded effects of the unrealistic assumptions of full

information that are often made when identifying the shocks, and the use of severely misspecified models for the estimation of the dynamic responses.

Second, we use our method and identification to study how monetary policy shocks transmit to the economy, how they affect financial conditions, and how do agents' expectations react to them. We document that responses obtained with our proposed methodology are consistent with standard macroeconomic theory, compatible with many of the standard channels of monetary transmission (Mishkin, 1996), are stable over time, and seldom display puzzles. We find that a monetary contraction is unequivocally and significantly recessionary. Output and prices both contract. We find that the strong real effects are registered despite very short-lived reactions of the yield curve: while short and medium-term interest rates respond significantly to the shock, the long and very long end of the curve are unaffected (Romer and Romer, 2000; Ellingsen and Soderstrom, 2001). The reaction of economic variables is thus likely magnified by the existence of a powerful credit channel, of which we find significant supporting evidence (Bernanke and Gertler, 1995; Gertler and Karadi, 2015; Caldara and Herbst, 2016). Lending conditions deteriorate, asset prices fall along several asset classes, and borrowing costs surge dramatically after the shock, with detrimental effects on wealth, investments and consumption decisions. Moreover, we document a deterioration of the external position sustained by a significant appreciation of the domestic currency. Finally, the expectational channel is activated. Once we control for the signaling channel of monetary policy (Melosi, 2013), we find that agents revise their macroeconomic forecasts in line with the deteriorating fundamentals.

Finally, we document that BLP responses optimally deviate from the VAR responses as the horizon grows. As a result of this, BLP IRFs revert to trend much faster than VAR IRFs do. This has potentially important implications for the policy debate, and particularly in relation to the length of the policy horizons, the duration of which is typically calibrated on VAR evidence.