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Indeterminacy, aggregate demand, and the real business cycle ☆

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Abstract

We show that under indeterminacy aggregate demand shocks are able to explain not only aspects of actual fluctuations that standard RBC models predict fairly well, but also aspects of actual fluctuations that standard RBC models cannot explain, such as the hump-shaped, trend reverting impulse responses to transitory shocks found in US output (Cogley and Nason, Am. Econom. Rev. 85 (1995) 492); the large forecastable movements and comovements of output, consumption and hours (Rotemberg and Woodford, Am. Econom. Rev. 86 (1996) 71); and the fact that consumption appears to lead output and investment over the business cycle. Indeterminacy arises in our model due to capacity utilization and mild increasing returns to scale.
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1. Introduction

General equilibrium real business cycle models have been subject to a number of criticisms. A basic criticism is the heavy reliance of such models on technology shocks to explain business cycle facts (for example, Blanchard, 1989, 1993; Cochrane, 1994; Evans, 1992; Gordon, 1993; Mankiw, 1989; Summers, 1986). Another is the lack of an endogenous amplification and propagation mechanism, which has resulted in the failure of standard RBC models to explain the large hump-shaped, trend-reverting output responses to transitory shocks (Cogley and Nason, 1995; Watson, 1993).[1] Third, real business cycle models have been criticized for failing to match the forecastable movements and comovements of basic macroeconomic variables observed in the data (see Rotemberg and Woodford, 1996). Finally, standard RBC models cannot explain why consumption appears to lead output and investment over the business cycle.

These problems could be related. From a Keynesian view point, demand shocks are thought to be important for generating business cycles because the slow adjustment in prices may cause resources (such as labor or capital) to be underutilized, making possible the expansion of output without significant increases in marginal costs in response to a higher aggregate demand. In contrast, resources in standard equilibrium business cycle models are fully utilized because prices adjust quickly to clear markets. Therefore, transitory demand shocks tend to generate a strong crowding-out effect, resulting in negative comovements among the components of aggregate demand and in having only a minimal impact on aggregate output and employment. Consequently, standard RBC models have relied on supply shocks to explain the business cycle.

Despite significant empirical evidence favoring demand shocks as the main source of the business cycle (e.g., see Blanchard, 1989, 1993; Blanchard and Quah, 1989; Cochrane, 1994; Wen, 2002), "it is not as easy as it seems to specify a consistent dynamic model in which consumption (demand) shocks generate business-cycle fluctuations" (Cochrane, 1994). The assumption of sticky prices coupled with demand shocks may not be enough to account for the propagation mechanism through which shocks to real demand generate persistent and trend reverting output dynamics.[2]

[1] Much effort has been made recently to find ways to enrich the internal propagation mechanisms of RBC models driven by technology shocks. Prominent examples include Burnside and Eichenbaum (1996), Andolfatto (1996), Carlstrom and Fuerst (1997), Chang et al. (2002), and Bernanke et al. (1999), among many others.

[2] Monetary shocks, on the other hand, do not appear to be quantitatively important for explaining the business cycle (e.g., see Cochrane, 1994). Models with nominal rigidities can have rich propagation mechanisms to transmit monetary shocks. But real shocks in these models apparently do not lead to hump-shaped output dynamics. For example, Dufourt (2000) shows that in a sticky price model monetary shocks can potentially resolve the Cogley and Nason (1995) and the Rotemberg and Woodford (1996) puzzles. But it is clear from his analysis that real shocks alone cannot do the job. Similar results can also be found in Christiano et al. (2001).

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