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Booms and busts in economic activity: A behavioral explanation

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ABSTRACT

Booms and busts in economic activity are a regular occurrence. They lead to a strong empirical regularity, i.e. that output gaps and output growth are non-normally distributed. Mainstream macroeconomic models explain this phenomenon by invoking exogenous shocks that are non-normally distributed. This is not a very satisfactory explanation as it shifts our ignorance one step further. I propose an explanation based on a behavioral macroeconomic model, in which agents are assumed to have limited cognitive abilities and thus develop different beliefs. This model produces waves of optimism and pessimism in an endogenous way (animal spirits) and provides for a better (endogenous) explanation of the observed non-normality in output movements. I also analyze the implications for monetary policy.

1. Introduction

One of the most robust empirical regularities in the movements of the output gap and the growth rates of output in industrialized countries is the fact that these movements are non-normally distributed. We show, as an example, the US output gap data and their distribution during 1960–2010 in Figs. 1 and 2. The latter clearly illustrates that the distribution is non-Gaussian, exhibiting excess kurtosis and fat tails. A simple Jarque–Bera test rejects normality. The same regularity has been analyzed in great detail by Fagiolo et al. (2008, 2009). These authors confirm that output growth rated in most OECD-countries are non-normally distributed, with tails that are much fatter than those in a Gaussian distribution and that fat tails in the distribution of these series is a robust feature. Fagiolo et al. (2009) find the same features in the US output gap data.

The fact that output gap and output growth are non-normally distributed exhibiting excess kurtosis and fat tails is an important property of the dynamics of the business cycle. It implies that business cycle movements are characterized by periods of relatively small changes in output interrupted by (infrequent) periods of large changes. Thus much of the time tranquillity reigns followed (unpredictably) by bursts of booms and busts. The financial and economic crisis of 2007–09 was preceded by a period of tranquillity that was characterized as a period of "Great Moderation".

Mainstream DSGE-models have been struggling to provide a good explanation. In these models the existence of occasionally large booms and busts is explained by the occurrence of large exogenous shocks. This is not a very attractive theory. The explanation comes as a "Deus ex Machina" in which nothing in the macroeconomy tends to lead to non-normality. The

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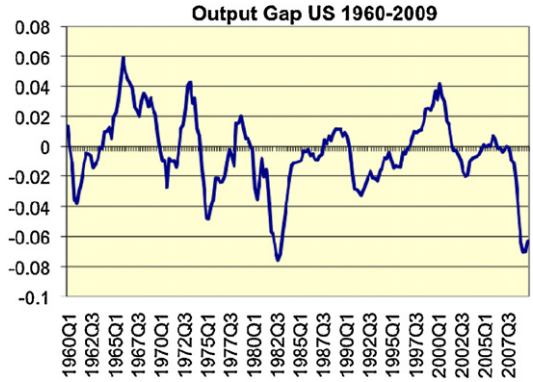

Fig. 1. *Source*: US Department of Commerce and Congressional Budget Office.

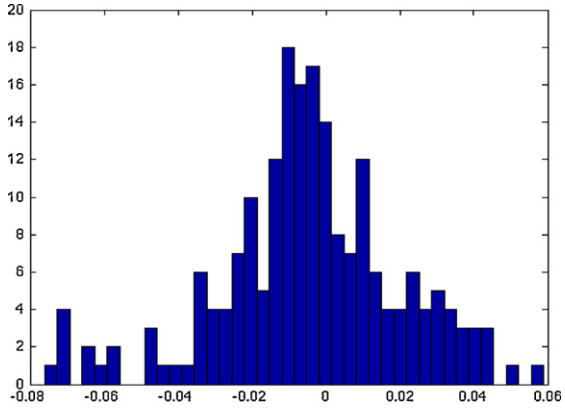

Fig. 2. Frequency distribution of US output gap (1960–2009).
Source: US Department of Commerce and Congressional Budget Office.

latter comes from the outside world. This shifts the burden of explanation one step further leading to the question of why the outside shocks are not normally distributed.

A satisfactory macroeconomic theory should try to explain the occurrence of non-normality in the movements in output from within the theory. This is what I attempt to do in this paper using a behavioral macroeconomic model in which endogenously generated "animal spirits" take center stage. Section 2 presents the behavioral macroeconomic model. Its basic assumption is that agents have cognitive limitations, i.e. they only understand small bits and pieces of the whole model and use simple rules (heuristics) to guide their behavior. I will introduce rationality in the model through a selection mechanism in which agents evaluate the performance of the rule they are following and decide to switch or to stick to the rule depending on how well the rule performs relative to other rules.

The approach presented in this paper is not the only possible one to model agents' behavior under imperfect information. In fact, a large literature has emerged attempting to introduce imperfect information into macroeconomic models. These attempts have been based mainly on the statistical learning approach pioneered by Sargent (1993) and Evans and Honkapohja (2001). This literature leads to important new insights (see e.g. Gaspar et al., 2006; Orphanides and Williams, 2004; Milani, 2007; Branch and Evans, 2009). However, I feel that this approach still loads individual agents with too many cognitive skills that they probably do not posses in the real world.[1]

[1] See the fascinating book of Gigerenzer and Todd (1999) on the use of simple heuristics as compared to statistical (regression) learning.