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A Taylor Rule for EU members. Does one rule fit to all EU member needs?

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ABSTRACT

The recent global financial crisis has unsettled the broad acquiescence that has predominated concerning the goals of a Central Bank for years. The viewpoint that the monetary policy makers have to ignore financial stability has started to decay. This paper examines to what extent the ECB's monetary policy decisions are determined by the signals of the financial sphere. This goal is achieved by using the Taylor Rule augmented by variables that can attribute the financial element in order for the behavior of the ECB to be described. This way gives us the opportunity to compare the rates proposed by the Taylor Rule by those that were finally observed not only for the Eurozone in total, but also for some of its member countries individually. The estimations that come from the GMM for the periods before and during the financial crisis provide us with indications concerning the effects of the financial sector over the conduct of the ECB's Monetary Policy as well as the defective operation of the Eurozone. It seems that a common rule does not fit to all members given several observed asymmetries across some members.

1. Introduction

From the beginning of the global financial crisis in 2007, concerns about the financial stability/instability have grown up. Considering the role of monetary policy, it has not been determined whether Central Banks (CB) should be responsible not only for the conventional targets but also for the financial stability. The question has been thoroughly discussed and analyzed by the global economic research community, without any explicit conclusion.

A widespread view asserts that while seeking the objective of price stability, the CB in fact promotes better financial stability (Schwartz, 1995). The opposing view contends that the financial system is inherently fragile and the CB has occasionally endangered the objective of price stability when financial stability is threatened (Kent & Debelle, 1998). Practically, these studies gave birth in two search directions developed throughout the next section.

This paper has a dual purpose. Initially, it is investigated if and to what extent the decisions of the ECB monetary policy guided by economic instability signals. For this reason, a backward-looking monetary policy rule is preferred while forward-looking models have been used recently. Recently, Chortareas, Magonis, and Panagiotidis (2012) provides evidence for the asymmetry of the New Keynesian Phillips Curve in the euro-area using both forward and backward looking inflation variable. However, as Albulessu, Goyeau, and Pépin

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(2013) points out, the choice of backward-looking model may be considered more realistic in the case of the ECB, due to the complexity and heterogeneity of the Eurozone elements that are surveyed in the second phase of this study. In order to achieve the first goal, the widely spread Taylor Rule is used. This rule indicates whether Central Bank will have to change the short-term rates in deviations of inflation and output from inflation target and GDP's potential level respectively. With a view to attribute the financial aspect describing the conduct of the ECB, the rule is augmented with variables that reflect this aspect. In the present study these variables are the money supply, the price index of real estate, the stock price index, the exchange rate of the euro against the dollar and the interest rate spreads.

The estimation of the above relationship was made for the period 1999–2014 with the Generalized Method of Moments (GMM). In addition, the sample was divided into two periods, one relating to the period before the crisis, and the second with the time of crisis. The attempt was made to detect a possible change of the ECB's policy at the beginning of the crisis. In order to have sufficient evidence, monthly data were used.

Having assessed the relationship(s) which may describe ECB' behavior, the next step is an attempt to estimate for seven Eurozone's member states (Germany, France, Greece, Ireland, Spain, Italy and the Netherlands) the interest rate provided by Taylor rule. The aim is to answer the second issue regarding the heterogeneity within the Eurozone.

There are several researchers who have examined whether the ECB follow or should follow the Taylor rule. Indicatively, the Gerlach and Schnabel (2000), Gerdesmeier and Roffia (2003), Belke and Polleit (2007), Fendel and Frenkel (2009) are some of them. From the review of this literature, it seems that some versions of Taylor rule adequately describe ECB's monetary policy. That is why the rule is widely used in order to study the monetary policy of ECB. Of course, the rule's effectiveness varies depending on the period considered and the precise form of the rule used.

The rest of the work is structured as follows: Section 2 consists of Taylor's rule theoretical framework and formulation. Section 3 develops the literature on the Taylor rule augmented with variables that try to deliver the financial instrument. In section 4 data and empirical methodology are introduced. The results of Taylor rule estimations are represented in section 5. Finally, section 6 summarizes.

2. The Taylor Rule

2.1. The general form of the Taylor Rule and its critics

Taylor rule results from the empirical study (Taylor, 1993) of the actual monetary policy of the FED, during the period 1987–1992. In the general form the rule can be stated as a short-term interest rate rule, which takes the following form:

$$i_t = \pi_t + r^* + \alpha(\pi_t - \pi^*) + \beta(y_t - y^*) \quad (1)$$

In accordance with this equation, the determination of short-term interest rate depends on the current level of inflation π_t , the equilibrium real interest rate r^* , the gap between inflation and inflation target as well as output gap. The aforementioned study disclosed that equation (2) adequately describes the FED's policy of adjusting short-term interest rates during the period 1987–1992:

$$i_t = \pi_t + 2 + 0.5(\pi_t - 2) + 0.5(y_t - y^*) \quad (2)$$

The above equation means that, in the questioning period, real interest rate and inflation target had been set at 2%, while FED's policy seemed to focus equally to deviations of inflation and output giving to variables α and β the same price.

The suggestions arising from Taylor Rule are a restrictive monetary policy of high interest rates when inflation exceeds the target or when output exceeds its potential level exerting inflationary pressures. In the same way, an expansionary monetary policy of low interest rates is indicated when inflation ranges at levels below the target or when the production's level is less than potential output levels. Moreover, it is worth mentioning that the real interest rate should be increased more than the rate of inflation to stabilize the economy. Thus the coefficient α should be greater than unity ($\alpha > 1$). This is known as the "Taylor principle". If the opposite occurs ($\alpha < 1$), the real interest rate will fall as inflation rises, leading to even greater inflationary pressures in the future.

However, since the publication of the corresponding article until today the Taylor Rule has been criticized by a significant number of economists each of whom have focused on different points of this rule highlighting some shortcomings and discovering new assumptions.

Initially, Clarida, Gali, and Gertler (1998), and a large number of researchers pointed out that the real interest rate is more important for economic decisions than the nominal interest rate. The relationship for the real interest rate is given by the following equation:

$$r_t = (i_t - \pi_t) = r^* + \alpha(\pi_t - \pi_t^*) + \beta(y_t - y_t^*) \quad (3)$$

Another major assumption is the forward-looking Taylor rule. It is widely accepted that monetary actions affect the economy with long term lags (Bofinger, 2001). The ECB (2000) reported that an unexpected, temporary rise in the short term interest rate of about 0.25 percentage points tends to be followed by a temporary fall in production six months later. Subsequently, the anticipated fall in prices will be 1.5 years later as it is known that these do not change easily. Therefore, the assessment of a forward-looking rule is more appropriate than the evaluation of a backward-looking as was the original Taylor rule (Clarida et al., 1998). Such a form of Taylor rule focusing on the nominal interest rate can be stated as follows:

$$i_t = r^* + \beta(E_t \pi_{t+k} - \pi^*) + \gamma E_t y_t \quad (4)$$

In this equation the term i_t^* is the target nominal interest rate of CB at time t . Even, the term π_{t+k} represents inflation in period $t + k$

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