Journal of Asian Economics 23 (2012) 476–485

Contents lists available at SciVerse ScienceDirect

Journal of Asian Economics

The interest rate–inflation relationship under an inflation targeting regime: The case of Turkey

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ARTICLE INFO

Article history:
Received 14 April 2010
Received in revised form 1 February 2012
Accepted 5 March 2012
Available online 24 March 2012

JEL classification:
E31
E43
E58

Keywords:
Inflation targeting
Fisher effect
Term structure of interest rates
Cointegration with breaks
Exogeneity test

ABSTRACT

This paper examines the relationship between nominal interest rates and the expected inflation rate for the Turkish economy between 2002 and 2009, a period when the inflation-targeting regime was implemented as monetary policy. We use the test of cointegrating rank with a trend-break (a method introduced by Inoue, 1999) and we also apply exogeneity tests. Empirical findings indicate that monetary policy rates depend on inflationary expectations; long-term interest rates are affected by monetary policy; and the weak form of the Fisher effect is valid. This evidence implies that monetary policy has actually influenced the real long-term interest rates; the inflation targeting regime pursued by the Central Bank of Turkey is reliable; and hence realized inflation has remained close to its targeted level.

1. Introduction

The relationship between interest rates and inflation, first put forward by Fisher (1930), postulates that long-term nominal interest rates in any period can be explained as the sum of the real interest rate and the expected rate of inflation. Fisher claims that there is a one-to-one relationship between inflation and long-term nominal interest rates, if real interest rates are not correlated with the expected rate of inflation and are determined entirely by real factors in an economy. This claim yields a notable prediction if real interest rates are directly related to the expected rate of inflation; changes in the real rate will not lead to full adjustment in nominal rates in response to expected inflation (Cooray, 2003: 135).

It is worth making a distinction between "weak" and "strong" forms of the Fisher effect as it is suggested by some existing empirical studies (Berument & Jelassi, 2002; Cooray, 2003; Mitchell-Innes, Aziakpono, & Faure, 2007, etc.). A long-term coefficient between inflation and nominal interest rates less than unity is consistent with weak form of the Fisher hypothesis. The strong form of the Fisher effect, on the other hand, is characterized by a long-run coefficient, which is greater than or equal to one. The strong form of Fisher hypothesis implies that real interest rates will not respond to the changes in expected inflation in the long run. Thus, the variations in the expected inflation rate will be reflected in the long-term nominal interest rates, and real interest rates remains, ceteris paribus, constant. However, this does not mean that real interest rates are constant over time. On the contrary, the fluctuations in real interest rates may be the result of the changes in real economic

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doi:10.1016/j.asieco.2012.03.001

factors (Kinal & Lahiri, 1988). In other words, if the Fisher hypothesis is supported then the real interest rate is determined only by real factors and cannot be influenced by the monetary policy (Payne & Ewing, 1997: 683).

The crucial question addressed is the extent to which monetary authorities have been able to affect both the real long-term and short-term interest rates through policy action in an environment where inflation expectations are becoming increasingly firmly anchored. The Fisher equation has been used as a behavioral equation to analyze the relationship between expected inflation and nominal interest rates (Mitchell-Innes et al., 2007: 705). Therefore, it should be taken into account by central banks in policy making.

The study by Van Der Merwe (2004) points out that under the inflation targeting monetary policy regime "policy changes depend on the expected development in inflation". Monetary authorities are prompted to adjust short-term interest rates when forecasts show that inflation is likely to breach its targeted level. More specifically, the policy-making adjustments aim short-term interest rates to move in the same direction with the expected inflation. However, if there is no link between the short-term interest rate and the expected inflation, short-term interest rates will be largely determined by the decision-making body of the monetary authorities, such as Monetary Policy Committee. Therefore, the relationship between short-term interest rates and the expected inflation rate should be examined empirically.

The main policy instrument of targeting inflation is short-term interest rates. In fact, there is a consensus in economics literature that aggregate demand depends more on long-term rates than short-term ones. The extent of short-term policy rates in affecting long-term rates reflects its power in not only steering aggregate demand but also managing expectations. Hence, the assessment of monetary policy effectiveness also needs a careful consideration of the link between short-term policy rates and long-term yields (Basci, Ozel, & Sarikaya, 2007: 4). It is somewhat difficult to evaluate the effect of short-term interest rates on long-term rates. The most powerful and widely accepted theory regarding the relationship between short and long-term interest rates is the expectations theory of the term structure of interest rates. According to this theory, long-term interest rates are described as functions of the weighted averages of expected future short-term rates, plus a term premium. A rise/fall in the current short-term rates will lead to an increase/decrease in long-term rates. However, if monetary policy reveals information about the central bank's policy preferences, short-term and long-term rates move in opposite directions. An increase in short-term interest rates should reduce inflation, and hence sufficiently reduce long-term interest rates. Romer and Romer (2000) show that if the Federal Reserve has private information on inflation, unexpected changes of the policy rate will reveal information on the future path of inflation. As the Federal Reserve unexpectedly tightens policy, inflation expectations are revised upwards, leading to a stronger response from long rates than symmetric information. Ellingsen and Söderström (2001) built a model for the US in which the mechanism of Romer and Romer (2000) works. Ellingsen and Söderström (2001) used Svensson's model (1997), a dynamic version of a simple aggregate supply–aggregate demand model and they added an equation for the term structure of interest rates. They suggest that short-term and long-term interest rates should move in the same direction whenever monetary policy reacts against the economic changes (endogenous policy), and in opposite directions whenever a policy responds to the changes in policy preferences (exogenous policy). Peersman (2002) provides empirical evidence on the relationship between short-term and long-term interest rates using the Structural Vector Autoregressive model for Germany. Using monthly observations from 1979 to 1998, the study demonstrates that both short-term and long-term interest rates move in the opposite direction after a monetary policy crisis. He also found that short and long-term interest rates move in the same direction after a supply and demand crisis. His findings are consistent with the theory of Ellingsen and Söderström (2001). If a co-integrating relationship does not exist between the monetary policy rate and the long-term interest rate, then long-term interest rates will not be affected by the monetary policy, and hence monetary policy will not be an efficient tool for inflation targeting. Therefore, the relationship should be considered empirically by using a co-integration analysis and a weak exogeneity test. It was New Zealand that pioneered inflation targeting in 1989, and as of 2011 twenty-four countries, both developed and developing, have implemented the targeting regime. The implications of the inflation-targeting regime differ due to differing conditions across countries. Inflation targeting parameters vary across countries, and to some degree in time, vary in the numerical specification of the inflation target time horizon over which the target is meant to be achieved, and the definition of the inflation measure being targeted (Roger & Stone, 2005: 7).

There is no unique and best application for countries that implement an inflation targeting policy. In this study, we analyze the relationship between interest rates and inflation in Turkey since there are differences among the implementations of the inflation targeting monetary policy across countries. Turkey's experience may provide valuable insights into other countries especially into the emerging European economies and developing countries. In addition, as an official candidate for EU membership, Turkey has been pursuing an inflation-targeting regime, consistent with the Maastricht criteria in order to join the European Monetary Union (Akyürek & Kutan, 2008).

Empirical studies using data from Turkish economy have found ambiguous results in the relationship between interest rates and inflation. Kesriyeli (1994) examines the validity of the Fisher hypothesis using Johansen's co-integration procedure for the post-1980s period. He suggests that there is a long-term relationship between inflation and nominal interest rates. Berument and Jelassi (2002) test whether the Fisher hypothesis is valid. They assess the long-term relationship between nominal interest rates and inflation, consider short-term dynamics of interest rates, and report evidence in favor of the Fisher effect for monthly data from 1966 to 1998. Turgutlu (2004) applies fractional integration and Engle–Granger co-integration tests over the period of 1978–2003 by using quarterly data. His results are contradicting; Engle–Granger co-integration test rejects the hypothesis, but fractional co-integration analysis confirms the hypothesis. Gul and Ekinci (2006) perform Johansen co-integration technique and Granger causality test to investigate the relationship between nominal interest rates