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Multiple policy interest rates and economic performance in a multiple monetary-policy-tool environment[☆]

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ABSTRACT

This paper assesses the individual effects on economic performance of different monetary policy interest rates for a central bank. To measure these effects, we employ an extension of existing Factor-Augmented Vector Autoregressive (FAVAR) models, such that the number of monetary policy variables can be captured with a few unobservable factors, as well as economic state variables with other unobservable factors. The empirical evidence from Turkey suggests that the four interest rates we consider as policy tools for the central bank affect economic state variables in different magnitudes. Thus, selecting different policy tools provides an environment that allows determining the effects of each tool for differentiated economic outcomes.

1. Introduction

Prior to the 2008 financial crisis, the short-term interest rate was the main tool for central banks to conduct their monetary policies with. In the post-2008 era, central banks have developed a new set of policy tools to cope with new challenges. For example, one of the main challenges for emerging markets was excess liquidity created by the central banks of developed economies, especially after late 2010. This situation led to excessive capital inflows in developing economies, excessive credit growth in the banking system, domestic currency appreciation and current account deficits, all of which threatened market stability. Within this framework, the short-term interest rate alone was not an effective policy tool for ensuring price and financial stability. Increasing interest rates did not slow economies, but stimulated them due to excess capital flows, and thus expanded credit in the banking system and increased risk in the financial system. Therefore, post-2008, central banks, especially in developing economies, have diversified their monetary policy approach by adding macroprudential tools into an unconventional monetary policy framework (Borio, 2011; Agénor and Da Silva, 2013; Sahay, Arora, Arvanitis, Faruqee, N'Diate and Griffoli, 2014). These different tools have different effects on economic variables in different channels, and affect economic state variables to different degrees due to different financial frictions. Chen, Cúrdia, and Ferrero (2012) suggest using multiple monetary policy tools for multiple monetary policy goals. For example, due to financial frictions, different interest rates may not have the same effects on variables such as consumption/saving and investment. To the extent that central banks differentiate among these effects, the adverse effect of capital flows or other policy-induced changes might be decreased (see Medina and Roldos, 2014; Ghilardi & Peiris, 2016; Turner, 2016; Cerutti, Claessens and Leaven, 2015; Cerutti, Correa, Fiorentino, & Segalla,

2016).

The financial environment just after the 2008 crisis forced central banks to consider not only price stability but also financial stability as their main monetary policy objectives. Since the last quarter of 2010, one such bank, the Central Bank of the Republic of Turkey (CBRT), designed an unconventional monetary policy framework employing instruments such as multiple interest rates for monetary policy setup, a reserve option mechanism (ROM),[1] interest rate corridors, differentiated required reserve ratios for time deposits for commercial banks across different maturities and selling/purchasing foreign currency with options. Furthermore, the CBRT employs these different policy tools to influence different components of commercial banks' balance sheets, which affects different economic state variables differently (CBRT, 2012).

The purpose of this paper is to provide empirical evidence regarding the distinct effects of four short-term interest rates on different economic state variables. The four interest rates we consider are the Borsa Istanbul (BIST) Interbank Overnight Repo and Reverse Repo Auctions Interest Rate (BIST Overnight Interest Rate hereafter), Average Funding Cost Interest Rate, Overnight Lending Interest Rate (Lending Rate hereafter) and Overnight Borrowing Interest Rate (Borrowing Rate hereafter). We chose these four interest rates because of the emphasis the CBRT placed in their reports and academic work on the distinct effects of these rates on economic performance, which we discuss in detail later in the manuscript. Here, we focus on the effects of short-term interest rates rather than on the effects of other monetary policy tools because tools such as Reserve Option Coefficient (ROC) for the ROM, or required reserve ratios for different maturities of time deposits, are constant for long periods, and thus, the evidence gathered on these variables are subject to Type II error – not rejecting the null when it is false.[2]

To assess the effect of different short-term interest rates on economic performance then, we gather data from Turkey for the period between December 2001 and April 2016. For several reasons, Turkey provides a unique environment in which to assess the above-noted relationships: (i) Before and after the global financial crisis, the CBRT had multiple monetary policy tools and was using them simultaneously. However, the use of and the scope of this tool set has expanded since the end of 2010. (ii) Turkey is the first country to use tools such as the ROM and the Average Funding Cost Interest Rate simultaneously to conduct its monetary policy. (iii) Turkey is a market-oriented economy and economic variables do respond to policy changes (e.g. for the period we consider, Turkey did not freeze prices or fix exchange rates). (iv) Turkey is one of the few countries that have had long-term high and volatile inflation without running to higher inflation. Thus, the evidence gathered from Turkey, at least on interest rates, has a lower probability of having Type II error in its inferences. (v) In Turkey, interest rates have never reached the zero bound. Thus, an asymmetric result for policy variables on interest rate will not cause biased/inconsistent estimates. (vi) As of 2015, the Turkish economy was the eighteenth-largest in the world. This reason alone is significant, as it means we are studying a relatively important player in the global economy.

To assess monetary policy stance, conventional Vector Autoregressive (VAR) models such as Sims' (1992) and Bernanke and Blinder's (1992) use single monetary policy tools such as short-term interest rate, non-borrowed reserves or narrow money aggregates. The first contribution of our paper is to use factor analysis to account for a large number of monetary policy tools that central banks employ for conducting monetary policy. The second contribution of our paper is to employ an econometric approach that accounts for these multiple monetary policy tools that central banks may use. To be specific, we employ Bernanke, Boivin and Eliasz's (2005) Factor-Augmented Vector Autoregressive (FAVAR) models for the policy tools and economic state variables; however, those authors measure a large number of the latter only with a few factors, and we use these factors both for the economic state and policy variables. Thus, we assess the effects of different short-term interest rates on economic performance, and our approach differs from previous FAVAR studies, where a single monetary policy tool is used (e.g. Bernanke, Boivin, and Eliasz (2005), Stock and Watson (2005), Blaes (2009), Boivin, Kiley, and Mishkin (2010), Baumeister, Liu, and Mumtaz (2010), Gupta, Jurgilas, and Kabundi (2010), Igan, Kabundi, Nadal de Simon and Tamirisa (2013), Soares (2013), He, Leung, and Chong (2013) and Fernald, Speigel and Swanson (2014)).

Our empirical evidence suggests that the four policy rates affect different economic state variables at different magnitudes. The BIST Overnight Interest Rate is slightly more effective for CPI inflation; the CBRT's Average Funding Cost Interest Rate is more effective for Treasury bond interest rates, consumer credit interest rates, time deposits and portfolio investments (hot money) and the Borrowing Rate is more effective for time deposits, capacity utilization ratio, current account deficits and portfolio investments than the Lending Rate is. Thus, in that capacity, we claim that a multiple-policy environment may deliver a more diverse set of outcomes compared to a single-policy setup. This fact might enable policy makers to micromanage the aspect of economic state variables they are most concerned with.

Our paper is organized as follows: In Section 2, we briefly explain the CBRT's conventional and unconventional policy interest frameworks. In Section 3, we introduce our extension of the FAVAR methodology employed by Bernanke et al. (2005). In Section 4 we present the data sets, in Section 5 we report the empirical evidence for our specification on Turkey and in Section 6 we conclude.

2. The CBRT's interest rate policy: a brief account

This section provides a background on the practices and developments of the monetary policy setup in Turkey between December

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[1] The ROM allows commercial banks to meet part of their domestic currency liabilities in the CBRT with foreign currency or gold. The CBRT does not pay interest on these liabilities; the interest rate on Turkish Lira (TL)-denominated deposits is above the foreign exchange (FX)-denominated deposits in the markets. Thus, with the ROM, the CBRT allows commercial banks to decrease the cost of meeting these obligations. As the CBRT requires higher amounts of FX or gold depending on the level of TL-denominated obligations by increasing the Reserve Option Coefficients (ROC), it tightens the country's monetary policy stance. See Sahin et al. (2015) for the details and workings of the ROM in Turkey.

[2] We also gathered the estimates for these policy variables (not reported here but available on request), and indeed, the gathered impulse responses had wide confidence bands.