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Fiscal and Monetary Policy Effectiveness in Turkey: A Comparative Analysis

Summary: Relying on the Autoregressive Distributed Lag cointegration technique, this paper assesses the comparative effectiveness of the fiscal and monetary policy on output growth in Turkey for the period 2003:q1-2019:q1. The empirical evidence shows that both policies are effective in promoting output growth but with varying degrees, revealing that the impact of monetary policy on output growth is greater than that of fiscal policy. Overall, based on our empirical evidence, it can be suggested that the Turkish authorities should set sight on monetary policy to achieve higher output growth while seeking ways to improve the output growth-enhancing role of fiscal policy. To that end, among many others, budgetary flexibility can be increased through creating fiscal space and growth-friendly tax and spending reforms can be undertaken without jeopardizing the trade-off between growth and equity while giving priority to proper coordination of fiscal policy with monetary policy.

Keywords: Fiscal and monetary policy coordination, Macroeconomic policy, Macroeconomic policy management, Turkey.

JEL: E52, E62, E63.

This paper concerns with the relative effectiveness of fiscal and monetary policy at the empirical level. More precisely, it seeks to empirically examine which of the two potent macroeconomic policy instruments - that is, fiscal and monetary policy - is more effective in promoting economic activity represented by output growth. Against this background, the paper endeavors to find the answer to the following research questions in the context of the Turkish economy: (i) which of the two potent macroeconomic policy instruments is more effective in spurring output growth?¹ (ii) do their impact on output growth differ in the short- and long-run? (iii) are there any differences among sub-components of fiscal policy (i.e., real government consumption expenditures *versus* real government investment expenditures or direct taxes *versus* indirect taxes) in terms of stimulating output growth? (iv) which of the sub-components of fiscal policy has a greater influence on output growth? and (v) how output growth responds to changes in these policies, overall?

To date, a great many empirical studies have examined the comparative efficiency of fiscal and monetary policies. However, a large proportion of these studies, beyond being producing mixed results, has centered on developed economies, ignoring

¹ Throughout this paper, we use output growth and real GDP growth interchangeably.

the case of emerging markets and developing ones. Put it in another way, the studies undertaking the issue in the context of emerging market and developing economies (EMDEs) in general and of Turkey, in particular, are rather sparse. Notably, Turkey-specific studies are limited to Hüseyin Şen and Ayşe Kaya (2015), Mustafa Özer and Veysel Karagöl (2018), and some other unmentioned studies that suffer from several drawbacks in terms of data-related and/or methodological problems. At this point, it is essential to acknowledge that our paper shows similarities with, in particular, the aforementioned two studies in spirit. However, it distinctly differs from them in terms of data, research questions, model, study period, or all of them. Of course, at this moment, our final aim is to make a further contribution to the existing empirical literature.

This paper empirically investigates the comparative effectiveness of fiscal and monetary policy in Turkey over the period 2003:q1-2019:q1. The paper aims to contribute to the existing empirical literature over such connections in three main ways. First, most of the empirical studies have extensively focused on the fiscal-monetary policy and growth by using only one fiscal or monetary policy tool. In contrast to most previous literature, we use disaggregated data on government expenditures and taxes. The reason for doing so is that the effect of each government expenditure and tax item on output growth, at least in theoretical terms, is different from the other. At this point, it is noteworthy to underline that policymakers' ability and capability have also critical importance in increasing the effectiveness of both policies on economic activity by making an accurate assessment as well as by executing timely intervention. Second, we consider the open economy case. This is why we choose Turkey, which is an open EMDE integrated with the rest of the world. Rather than directionally using the overnight interest rate as an indicator of monetary policy, we use a new monetary policy measure that will capture the effect of monetary policy on output growth - that is, "spread". Moreover, unlike most previous empirical studies, we include reasonably comprehensive control variables in our estimation model. This is because Turkey is an emerging market economy with relatively well-developed financial markets alongside institutions. More importantly, its economy has been highly integrated with the world economy. For that reason, we incorporate the openness to international trade variables into the model as well.

The rest of the paper is designed as follows. Section 1 outlines the recent developments in Turkey's fiscal and monetary policy stance. Section 2 explains the relevant theoretical issues briefly. Section 3 presents the empirical literature related to the comparative effectiveness of fiscal *versus* monetary policy. Section 4 lays out the empirical framework of the paper, while Section 5 reports and discusses the empirical results. Section 6 summarizes and concludes.

1. An Overview of Fiscal and Monetary Policy Developments in Turkey

Fiscal and monetary policies are attractive as well as important topics not only for developed economies but also for EMDEs. The case of Turkey is not an exception from this. Before embarking on the empirical analysis, it would be useful to give some insights regarding the fiscal and monetary policy developments in Turkey.

For quite a long time, ranging from the second half of the 1970s to the first half of the 2000s, Turkey experienced high and chronic inflation. CPI-based inflation reached triple digits in the early 1980s and 1994 shortly after the introduction of two major

stabilization programs. One was *an economic stabilization that was put into practice on January 24, 1980*, and the other was a structural transformation program that took effect on April 5, 1994. The first program aimed to transform the Turkish economy from an import-led growth structure to an export-led one, while controlling aggregate demand to reduce the persistently high inflation reaching triple digits. As to the second program, it came into force as a response to the economic crisis of 1994 as an IMF-supported stabilization program to stabilize the Turkish economy by reducing persistent budget deficits and by implication chronically high inflation.

As a result of these programs, Turkey has kept away from a hyperinflation trap along with avoiding some other economic difficulties. Nevertheless, throughout the 1980s, even throughout the 1990s, inflation remained one of the significant macroeconomic problems with its high level, exceeding the levels of 60% on average. No doubt, the primary reason behind the high and chronic inflation has been persistently widening budget deficits. Strictly speaking, for a quite-long period, an essential source of budget deficits was printing money *via* the Central Bank of the Republic of Turkey (hereafter the CBRT). This was notably a case from the 1970s to 1984. It would not be wrong to say that the CBRT operated like a branch of the Turkish Treasury in that period. Under the time's law of the CBRT, the bank must provide short-term advances to the Treasury at the beginning of every fiscal year, as much as 15% of each year's public allowances. These advances have never been returned or paid back to the CBRT by the Treasury on time. Over the relevant period, in a sense, short-term advances to the Treasury have turned to be a cumulative debt, an unpaid domestic debt of the Treasury. From 1984 onward, the Treasury changed its deficit financing policy by switching from monetization to domestic debt borrowing due to a fear of the possibility of an accelerating-inflationary trap. However, the policy change made the economic situation worse, rather than better.

Consequently, output growth remained weak, while inflation continued its persistence at high levels during the second half of the 1980s and throughout the 1990s. All these developments forced Turkish fiscal and monetary authorities to make a good deal to overcome the gloomy economic outlook. And then, the two authorities decided to make a protocol allowing for proper fiscal-monetary policy coordination. The protocol came into effect in 1997. Since then, using fiscal and monetary policies in concert has become a primary concern of the Turkish authorities.

Under the relevant protocol, the Treasury would no longer demand short-term advances from the CBRT. Soon after putting the protocol into effect, all the loans directly provided by the CBRT not only to the Treasury but also to other public institutions, such as state-owned economic enterprises and municipalities, were removed entirely. Although the protocol made some positive contributions, it was not sufficient to reduce inflation to an acceptable level, e.g., to a single digit. In short, persistently high inflation, along with high government debt, has remained as two major fiscal policy-related problems by the early 2000s. Fiscal dominance not only tended to crowd-out the funds available for the private sector but also hampered the development of domestic currency denominated financial markets (Mehmet Yörükoğlu and Mustafa Kılınç 2012). All these adverse developments led to widespread dollarization not only in deposit and credit markets but also in government debt instruments in the Turkish economy. Increasing dollarization

combined with the dependence of the Treasury on the short-run based direct CBRT advances decreased the effectiveness of monetary policy further, making the exchange rate pass-through tremendous as weakening the credit channel. Eventually, Turkey was hit by twin consecutive economic crises, the banking and currency crises in November 2000 and February 2001. Shortly after these crises, all the articles of the CBRT, based on financing the governmental organization, were repealed, to enhance the independence of the CBRT and thereby to allow for the CBRT to focus on its ultimate goal: achieving and maintaining price stability.

Moreover, a series of structural reforms, ranging from a more robust public finance management to prudential measures, which strengthened the financial sector, were put into practice. All these measures indicated their impact on the economy. Soon after the CBRT's independence degree was enhanced and structural reforms were introduced, not only inflation tended to decline sharply, becoming historically low levels but also interest rates started to come down.

The CBRT adopted an implicit inflation targeting strategy in 2002 and then in 2006, a full-fledged one as a monetary policy strategy (Yeşim Z. Gürbüz, Thomas Jobert, and Ruhi Tuncer 2008). The short-term interest rate served as the primary policy instrument of this strategy while the adopted exchange rate system - that is, floating one - helped get information regarding the role of exchange-rate volatility for inflation. Obviously, under such an arrangement associated with monetary policy, what is expected from focusing on the short-term interest rate that is adjusted in line with deviations of inflation from the targeted path is to provide and maintain price stability.

Overall, in the second half of the 1980s and 1990s, as in many other EMDEs, the Turkish economy was characterized by a fragile banking sector, a monetary authority with a low degree of independence, poor and mismanaged fiscal policy, and double-headed economic management. All these negative factors created an unpleasant and gloomy macroeconomic picture: extremely high-interest rates, persistently high inflation, immense and still widening budget deficits, volatile exchange rate, unequal income distribution, low investment, high unemployment, and so on. Thanks to the favorable external conditions along with comprehensive economic and political reforms supported by the IMF, World Bank, and EU, from 2001 onward, the Turkish economy has made remarkable progress from several perspectives.

All the above-mentioned positive developments, along with favorable fiscal consolidation and the development of the domestic currency denominated credit markets enhanced the operational capacity of the CBRT, providing an improvement in monetary policy effectiveness. As a consequence, long-lasting inflation incredibly dropped to single digits, while real GDP growth showed remarkable high progress. Although all these developments put Turkey in a relatively better place among competitive emerging market economies, the Turkish economy has more recently had a high current account deficit, along with high unemployment and slowing growth. Like many other countries, the 2008/2009 global crisis adversely affected the Turkish economy through various channels, at least, worsening the main macroeconomic indicators. Since then, in general terms, and like many other countries, regardless of whether industrialized or EMDEs, Turkey has shown a weak performance economically. Several undesirable political and economic developments that emerged in upcoming years, such as the long-lasting Syrian

civil war and massive immigrants fleeing to Turkey from this country, local and international terrorism, and, most importantly, the failed coup attempt of July 15, 2016, and the reflections to the economy are just some factors that have led to weak economic performance. From 2017 onward, the economic outlook of Turkey deteriorated further. First, the Turkish economy overheated and then encountered shrinking global financial conditions, coming up with the Turkish economy against the recession-inflation and debt overhang.

2. Theoretical Issues

Discussions on the comparative effectiveness of fiscal *vis-à-vis* monetary policy are not a new story in the literature. The origin of the discussions at the theoretical level goes back to the Keynesians *versus* monetarist debate of the early 1960s on the comparative effectiveness of the two policies. A 1963 study by Milton Friedman and David Meiselman - that is widely accepted as a pioneering contribution to the debate (see Roger N. Waud 1974; Peter E. Kretzmer 1992; Mohammed Nur Hussain 2014) - sparked off the fiscal *versus* monetary policy debate on their relative effectiveness. Monetarists, of whom the leading exponent is Milton Friedman, argue that money supply, as a vital monetary policy instrument, plays a crucial role over economic activity. They contend further that variations in the money supply are the primary determinant of output in the short-run and the price levels over more extended periods.

As for Keynesians, they hold the view that in comparing the two, fiscal policy has a greater impact on economic activity than monetary policy. Keynesians explain the superiority of fiscal policy on the ground that due to the existence of liquidity trap - this is an extreme case that emerges in the economy in recession or deflation -, monetary policy does not work. Yet, fiscal policy works. If the economy falls into the liquidity trap, any increase in the money supply does not create any positive impact on the economy's output level. This is because the interest rate is already being at its lowest level, which does not allow using it as an effective monetary policy instrument in promoting private investments and thereby, growth. This means that in the presence of a deep recession and liquidity trap, the expansionary monetary policy will be ineffective in stimulating interest-sensitive private investments and therefore providing full-employment output. However, fiscal policy, in contrast to monetary policy, works fully without creating any crowding-out effect, raising the level of output through the fiscal multiplier mechanism while lowering involuntary unemployment.

The discussion concerning the relative effectiveness of fiscal *versus* monetary policy is still a hot topic among academics and policymakers, remaining an unresolved issue even today between the two opposing views. In more recent decades, especially two economic episodes - one is the Stability and Growth Pact of the EU, and the other is the global crisis of 2008/2009 - have led to renewed attention to the comparative effectiveness of fiscal and monetary policy.

3. Related Empirical Literature

The relative effectiveness of fiscal and monetary policies is still an unresolved issue on the empirical ground as well. Hitherto, numerous empirical studies have been conducted

on their relative effectiveness. However, these studies have yielded inconclusive results, suggesting that none of these policies are superior to the other. In the following, we review the related empirical literature to shed light on our study. We begin with two pioneering studies, one by Friedman and Meiselman (1963) and the other by Leonall C. Andersen and Jerry L. Jordan (1968).

In response to the Keynesians' long-lasting argument that fiscal policy has a greater effect on economic activity, monetarists asserted that monetary policy performs better than fiscal policy. To prove this, they showed evidence from the empirical study of Friedman and Meiselman (1963), investigating simple correlations between consumption *versus* money and consumption *versus* fiscal variables based on annual US data for the period 1897-1958. Based on the findings of the study, they reported that changes in the money supply exerted a more significant impact on the economy than changes in fiscal variables. Friedman and Meiselman (1963) put this in their words: “[e]xcept for the early years of the Great Depression, money is more closely related to consumption than is autonomous expenditures” and “[t]he results are strikingly one-sided” (pp. 165-166). Based on this evidence, they argued that the money supply, that is, a vital monetary policy instrument, plays a crucial role in determining economic performance. The Friedman-Meiselman study had a great repercussion among academic and policy circles. With the words of Bennett T. McCallum (1984), “[i]t was welcomed by profession about like an unexpected slap in the face” (p. 11), although it was believed that it contains some methodological shortcomings.

A follow-up study examining the relative effectiveness of fiscal and monetary policy is the Andersen and Jordan's (1968) classic article that appeared in the November 1968 issue of “Federal Reserve Bank of St. Louis Review”. The Andersen-Jordan study carried the arguments of Friedman and Meiselman one step further (1963) at the empirical level. Because the results of the Friedman-Meiselman study “were in the process of being shrugged off” when it has first appeared in that journal (McCallum 1984, p. 11). Since then, many empirical studies have been conducted to examine the relative effectiveness of fiscal and monetary policy. In exploring the relative effectiveness of the two primary macroeconomic policy tools, Andersen and Jordan (1968) used a dynamic econometric model. They concluded that monetary policy has a stronger, more predictable, and faster impact on economic activity than fiscal policy. Indeed, Andersen and Jordan's (1968) paper took the ongoing discussion one step further. However, until the late 1980s, various empirical studies, at least in the context of the US, provided evidence in favor of the monetary policy, suggesting that monetary policy has superiority over fiscal policy in terms of magnitude, predictability, and lag of influence (Waranya Atcharyachanvanich 2007).

What we see from the available literature at first glance is that almost all of the earlier studies on the effectiveness of fiscal and monetary policies mostly studied industrialized countries, especially the US. In this regard, the studies conducted by Andersen and Jordan (1968), Waud (1974), William G. Dewald and Maurice N. Marchon (1978), Dallas S. Batten and Rik W. Hafer (1983), and Abdur R. Chowdhury (1988) are just a few cases in point. An earlier study by Waud (1974) investigated the relative effectiveness of fiscal *vis-à-vis* monetary policy on GNP in the US. As opposed to what Andersen and Jordan (1968) argued that the impact of monetary policy on the economic activity

was stronger than that of fiscal policy, Waud (1974) found evidence supporting that the impact of both policies on economic activity was not only significant but also of equal importance. However, Batten and Hafer (1983), working on industrialized countries by employing the St. Louis model, reached almost a similar result to Andersen and Jordan (1968), confirming that while monetary actions had significant and permanent effects on nominal GNP growth, fiscal actions exerted no statistically significant and lasting effect. In a time-series econometric model with three equations suggested for the US by Andersen and Jordan (1968), which is well-known as the St. Louis model, the relative effectiveness of fiscal and monetary policies in providing output stabilization was empirically examined. The model-related changes in nominal GNP are associated with the changes in fiscal and monetary policy actions. Another study on the US by Dawit Senbet (2011) that explored the relative effectiveness of the two policies found that monetary policy had a more significant positive impact on the real output *vis-à-vis* fiscal policy. In brief, with few exceptions, virtually all related empirical studies on industrialized countries suggest that monetary policy has superiority over fiscal policy in terms of effectiveness.

The existing empirical literature related to the relative effects of fiscal and monetary policies, as we highlighted earlier, overwhelmingly concentrates on developed countries. However, this should not be taken as an argument that there is no empirical study examining the comparative effectiveness of fiscal and monetary policies on economic activity in the context of EMDEs. Of course, there are some studies but not in terms of adequate numbers, compared to those studies on developed countries. So, in line with the purpose of the present paper, we focus solely on such a sort of studies in what follows.

In a study on 12 developed and developing countries, Atcharyachanvanich (2007) analyzed the relative efficacy of fiscal and monetary policies on the output level. The author found evidence that the impact of these policies on output growth is not distinguishable, even when countries categorized as countries with monetary policy dominated, with fiscal policy dominated, and with fiscal and monetary policies mixed. A more recent multiple-country study by Goran Petrevski, Jane Bogoev, and Dragan Tevdovski (2016) used data from three South-Eastern European economies (Bulgaria, Croatia, and Macedonia) showed that monetary policy acts as a strategic substitute to tight fiscal policy, while in the case of monetary tightening; fiscal policy reacts in a countercyclical manner.

To sum up, in reviewing the literature, one can easily see that although there has been an enormous but still growing body of studies concerning the effectiveness of fiscal and monetary policies, empirical evidence so far is highly far from producing clear-cut results. In other words, the existing studies do not provide a clear-cut persuasive result on the relative effectiveness of the two powerful macroeconomic policy tools. For instance, a branch of studies, such as Chowdhury (1986a) for South Korea, Kretzmer (1992) for the US, Shahid Ali, Somia Irum, and Asghar Ali (2008) for four South Asian countries (Pakistan, India, Sri Lanka, and Bangladesh), Senbet (2011) for the US, presented evidence in favor of the monetary policy. In contrast, others, such as Ali F. Darrat (1984) for five Latin American countries (Brazil, Chile, Mexico, Peru, and Venezuela), Chowdhury (1986b) and Ehsan Latif and Md. Hadayet Ullah Chowdhury (1998) for Bangladesh reported opposite results. When it comes to some other studies, such as Batten and Hafer (1983) for six industrialized countries, and Md. Habibur Rahman (2009) for

Bangladesh, all held the view that a unique, useful macroeconomic policy tool in stimulating output growth is monetary policy. However, few studies, such as Chowdhury (1986b), argued that fiscal policy is the sole effective macroeconomic policy instrument in promoting output growth. Over and above these, however, some studies, but their number is few, like Syed Tehseen Jawaid, Arif Imtiaz, and Syed Muhammed Naeemullah (2010), found that both policies have a positive and statistically significant impact on output growth.

Some other studies, especially those that were conducted on country groups, yielded highly mixed results. For instance, a study by Chowdhury (1988) on six European countries (Austria, Belgium, Denmark, the Netherlands, Norway, and Sweden) showed that monetary policy, rather than fiscal policy, appears to have a stronger and more predictable effect on GNP in Denmark, Norway, and Sweden. However, in the case of Belgium and the Netherlands, the fiscal policy seems to have a more considerable influence on economic activity, but the results are inconclusive for the case of Austria. Similarly, Oluwole Owoye and Olugbenga A. Onafowora (1994) on a set of ten African countries covering Burundi, Ethiopia, Ghana, Kenya, Morocco, Nigeria, Sierra Leone, South Africa, Tanzania, and Zambia also yielded conflicting results. Accordingly, monetary policy has a more critical role in stimulating growth compared to fiscal policy in half of the countries. For the other half of countries, however, the case is the opposite.

Turning to the case of Turkey, and to the best of our knowledge, there is no study examining the comparative effectiveness of the fiscal and monetary policy on output growth. However, as mentioned earlier, some studies deal entirely with the optimal mixture of the two potent policies. A more recent study by Şen and Kaya (2015) provided somewhat different empirical evidence. In their study, the authors consider the comparative efficacy of the two policies on growth by applying the Structural Vector Autoregression (SVAR) model to quarterly Turkish data during the period 2001:q1-2014:q2. Their empirical findings show that both fiscal and monetary policies exert a significant effect on growth. However, according to the authors' findings, monetary policy is more effective than fiscal policy in stimulating growth. More specifically, the interest rate - a monetary policy variable - is the most potent instrument in affecting growth in Turkey. In terms of influencing output growth, this variable is followed by a fiscal policy variable; that is, budget deficit. These findings suggest that although the relative effectiveness in boosting growth is different, both policies significantly influence growth, suggesting that they should be used jointly but efficiently. Another more recent study by Özer and Karagöl (2018) found that monetary policy has a positive short-run effect on output growth, while fiscal policy exerts an impact on it in both the short- and long-run.

Taken together, the available empirical literature does not allow us to generalize about the effectiveness of fiscal and monetary policy in boosting output growth. Namely, extant empirical studies produced mixed results. These mixed results arise from the review of the literature, which may be justified on the grounds of several factors; some of them are related to country-specific factors (institutional, developmental, and political characteristics of the country under consideration). In contrast, the others are related to data and methodological factors (the model adopted and its assumptions, and so on). All these factors and the like may have yielded conflicting results. What is clear from the available

literature is that further studies that treat the topic from different perspectives in a broader sense are indispensable.

4. Data, Model Specification, and Methodology

4.1 Data and Model Specification

In this paper, we use quarterly time-series data, spanning from the first quarter of 2003 through the same quarter of 2019. The study period is determined by the data availability. The variables employed in the estimation model consist of the followings: (i) the real GDP growth rate proxied for output growth; (ii) spread; (iii) real government investment expenditures; (iv) real government consumption expenditures; (v) direct taxes; (vi) indirect taxes; (vii) openness to international trade. The data are compiled from domestic and international organizations' databases. More specifically, data on output growth are taken from the IMF Financial Statistics' database, while data on the spread is based on our calculation by using real interest rates and real exchange rate data acquired from the Ministry of Industry and Technology's and the CBRT's databases; and data on openness to international trade is also our calculation and based on import and export data. They are all collected from the CBRT's database. As for public finance data, they are abstracted from the Ministry of Treasury and Finance's database.

The justification for taking the above variables into account can be explained as follows. To begin with the monetary policy variable, we consider a single variable as the proxy indicator of monetary policy by following the long tradition of monetary economics that works with "a single policy variable - perhaps a monetary aggregate, perhaps an interest rate - that is almost controlled by policy and stably related to economic activity" (Eric M. Leeper, Christopher A. Sims, and Tao Zha 1996, p. 1). Despite this, there is still no consensus in the literature on what is the best single indicator of the monetary policy that will reflect its effect on output growth well (see, in particular, Ben S. Bernanke and Ilian Mihov 1998). Suggestions in this regard range from short or long-term interest rate to credit to the private sector, net credit to the government, a monetary aggregate (M1, M2, reserve money, and so on), borrowed/non-borrowed reserves, and even inflation in some cases (for further alternative suggestions for the monetary policy indicators, see Bernanke and Mihov 1998). Alternatively, for example, McCallum (1983), Bernanke and Alan S. Blinder (1992), in which the authors contend that this indicator is the interest rate, whereas David B. Gordon and Leeper (1994) argue that it is monetary aggregates. A subsequent study by Bernanke and Mihov (1998) recommends that total bank reserves, non-borrowed reserves, and federal funds are the best indicators of monetary policy stance for the US. By contrast, some others, including David O. Cushman and Zha (1997), and Ben S. C. Fung (2002), propose the exchange rate in describing changes in monetary policy. Sims (1992) claims that the best indicator of monetary policy is the short-term interest rate in contrast to, for instance, Fabio C. Bagliano and Carlo A. Favero (1998), in which the authors suggest that the long-term interest rate is the best one. In a word, there is no clear-cut consensus among academic economists regarding what the best monetary policy indicator is.

As is well known, monetary authorities (i.e., central banks) have an instrument that can influence the economy by manipulating the money supply. By doing so, central banks

can influence the nominal interest rate. However, in today's world, central banks traditionally prefer to set an interest rate directly rather than setting a given quantity of money. For this purpose, for instance, the CBRT uses an overnight interest rate (i.e., interbank interest rate). Nonetheless, it is a fact that how the overnight interest rate influences the economy in the short- and long-run is ambiguous. Put it in another way, in setting a nominal interest rate at the overnight interest rate, the CBRT does not usually give any commitment to how much cash it will provide tomorrow for a given amount today.

On the other hand, there is no guarantee as to how much that future cash will be worth in real terms, owing to the possibility of price changes. If inflationary expectations increase, move one-for-one every increase in the nominal interest rate, leaving real interest rates unchanged - that is, the so-called "Fisher equation". In a nutshell, monetary policy is constrained in its ability to institute permanent changes in real interest rates, particularly in the presence of globally integrated financial markets.

Rather than directionally using the overnight interest rate as an indicator of monetary policy, we consider a new policy measure that is "spread". This policy measure refers to the extent to which interbank interest rates exceed the depreciation rate of the national currency, the Turkish lira's. Following Hakan Berument (2007), we take into account innovations in the spread between the CBRT's interbank interest rate and the depreciation rate of the domestic currency as an indicator of monetary policy. The spread can be used as an indicator of the stance of the central bank's monetary policy for a highly inflationary small and open developing country (Berument 2007, p. 412). It is essential to remind us that, following Berument (2007), using the spread as an indicator of the CBRT's monetary policy does not mean that the bank controls both of these instruments simultaneously, but rather the bank may control one of the two and merely watch the other. The author argues that even if there exists such a case, it is possible to use the spread as an indicator of monetary policy for Turkey. To defend the spread as an indicator of monetary policy, the author goes further to suggest that this measure is also robust when the CBRT switches between pure-exchange rate targeting and interest rate targeting regimes. In light of the above explanations, we consider the spread for Turkey as a proxy for monetary policy actions that can explain the variation in output growth more accurately.

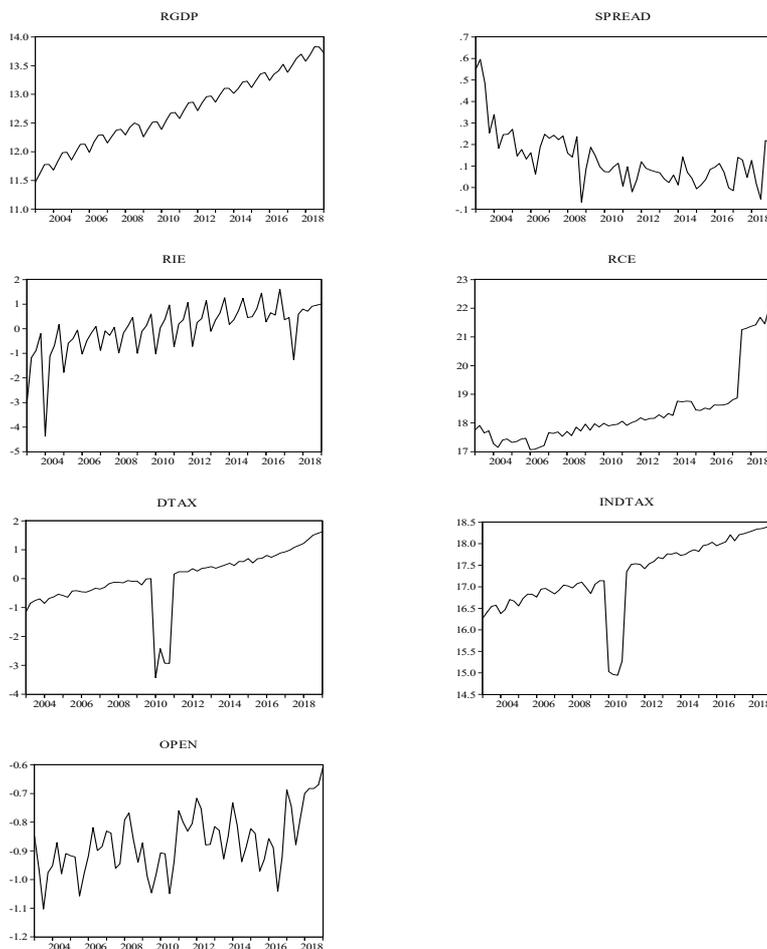
Unlike the monetary policy for which we consider a single variable, for the fiscal policy, we employ four variables. These are: (i) real government investment expenditures; (ii) real government consumption expenditures; (iii) direct taxes; (iv) indirect taxes.

The reason for doing so is that the effect of each expenditure and tax item on output growth, at least theoretically, is different from the other. At this point, it is noteworthy to underline that policymakers' ability and capability are also critically important in increasing the effectiveness of both macroeconomic policy instruments on economic activity by making an accurate assessment, but also by executing timely intervention.

If we now turn to the sample country, Turkey is an emerging market economy with relatively well-developed financial markets. More importantly, its economy has been highly integrated with the world economy since the early 1980s. Considering this fact, we incorporate the openness to international trade variable into the model as well. Figure 1 plots the evolution of the variables over the study period from 2003:q1 to 2019:q1.

A preliminary analysis is made of the statistical properties of the series. Table 1 reports both summary statistics and pair-wise correlations of the variables. The maximum

of real consumption expenditure is larger than all variables. There is a significant disparity between the minimum and the maximum values of real consumption expenditure. Compared with the other variables, the dispersion of openness to international trade as a percentage of GDP is relatively low. The variables of real investment and consumption expenditures display higher volatility relative to the other variables. All the variables but taxes and spread are positively correlated with real GDP growth.



Notes: RGDP: the real GDP growth rate, SPREAD: the spread, RIE: the real government investment expenditures, RCE: the real government consumption expenditures, DTAX: the direct taxes, INDTAX: the indirect taxes, OPEN: the openness to international trade.

Source: Authors' estimation.

Figure 1 The Line Graphs of Variables, 2003:q1-2019:q1

Table 1 Summary Statistics and Pair-Wise Correlations

	RGDP	SPREAD	RIE	RCE	DTAX	INDTAX	OPEN
Mean	12.71	0.13	15.45	18.34	16.61	17.25	-0.87
Median	12.68	0.11	15.67	17.98	16.77	17.34	-0.88
Maximum	13.83	0.59	17.42	22.02	18.26	18.41	-0.61
Minimum	11.47	-0.06	10.12	17.07	13.14	14.94	-1.10
Std. dev.	0.62	0.12	1.22	1.20	1.01	0.82	0.10
Skewness	0.01	1.50	-1.70	1.85	-1.34	-0.93	0.23
Kurtosis	2.00	6.18	7.89	5.59	5.65	3.90	2.75
Jarque-Bera	2.69	51.88	96.39	55.41	38.53	11.68	0.73
Probability	0.25	0.00	0.00	0.00	0.00	0.00	0.69
Sum	826.49	8.74	1004.88	1192.48	1080.12	1121.70	-56.55
Sum sq. dev.	24.73	1.02	95.38	92.82	65.70	43.58	0.69
Observations	65	65	65	65	65	65	65
RGDP	1						
SPREAD	-0.338	1					
RIE	0.307	-0.600	1				
RCE	0.797	-0.263	0.389	1			
DTAX	-0.484	-0.324	0.420	0.615	1		
INDTAX	-0.359	-0.394	0.491	0.629	0.580	1	
OPEN	0.503	-0.297	0.190	0.581	0.516	0.509	1

Notes: RGDP: real GDP growth rate, SPREAD: spread, RIE: real government investment expenditures, RCE: real government consumption expenditures, DTAX: direct taxes, INDTAX: indirect taxes, OPEN: openness to international trade.

Source: Authors' estimation.

The specific form of our base model for output growth can be written as:

$$\ln RGDP = \beta_0 + \beta_1 SPREAD + \beta_2 \ln RIE + \beta_3 \ln RCE + \beta_4 \ln DTAX + \beta_5 \ln INDTAX + \beta_6 \ln OPEN + \varepsilon_{t1}, \quad (1)$$

where \ln represents the natural logarithm, RGDP is the real GDP growth rate, SPREAD is the spread as defined above, RIE is the real government investment expenditures, RCE is the real government consumption expenditures, DTAX is the direct taxes, INDTAX is the indirect taxes, and OPEN is the openness to international trade. The standard theory postulates that in Equation (1) $\beta_1 > 0, \dots, \beta_6 > 0$. The error (disturbance) term (ε_{t1}) is assumed to be normally distributed. The coefficients, $\beta_1 \dots \beta_6$, are, respectively, the elasticity of the real GDP growth rate with respect to SPREAD, RIE, RCE, DTAX, INDTAX, and OPEN.

Positive innovations in the spread between the CBRT's interbank interest rate and depreciation of the Turkish currency, lira, refers to the tight monetary policy, whereas the opposite denotes lax monetary policy. The former refers to the decreasing case in output growth, whereas the latter implies its increasing case. Similarly, we also expect a positive correlation between RGDP and sub-fiscal policy instruments, RIE and RCE, with varying degrees. Contrary to government expenditures, we expect that taxes would be in a reverse relationship with output growth. However, openness to international trade (OPEN), will increase the effectiveness of monetary policy while reducing that of fiscal policy under a

flexible exchange rate regime. In an open emerging market economy like Turkey with a flexible exchange rate regime, at least theoretically, it is expected that the effect of fiscal policy on output growth will be relatively lower than that of monetary policy.

4.2 Methodology

In the recent past, considerable attention has been given to testing for the possible existence of relationships in levels between variables in an econometric model. Several methods have been developed and then implemented for performing the cointegration test. Among them, the most commonly used methods are the residual-based test on Robert F. Engle and Clive W. J. Granger (1987) test and the maximum likelihood-based test on Søren Johansen and Katarina Juselius (1990) and Johansen (1991, 1995) tests. Owing to the low power and other problems associated with these methods, the OLS-based autoregressive distributed lag (ARDL) cointegration technique, also known in the literature as the bound cointegration method, has become popular in recent years.

While the other cointegration methods, including Engle and Granger (1987), Johansen and Juselius (1990), Johansen (1991, 1995), focus on the cases in which the variables are integrated of the order of one, the ARDL bounds testing procedure can be implemented with purely $I(0)$, purely $I(1)$, or mutually integrated variables. In opting for an appropriate time series model, it is critically important to examine whether the results of stationarity and cointegration tests are stationary or not. This paper employs M. Hashem Pesaran and Yongcheol Shin's (1999) ARDL bounds testing procedure to determine the most effective macroeconomic policy instrument on real GDP growth.

The aforementioned technique has several advantages over the alternative estimation techniques such as Engle and Granger (1987) and Johansen (1991) in that: (i) compared to the Johansen and Juselius (1990) cointegration technique, the ARDL bounds testing technique ensures more consistent estimates in particular for small samples, as pointed out by Pesaran and Shin (1999); (ii) this technique avoids the classification of variables as $I(1)$ and $I(0)$ by developing bands of critical values, which identifies the variables as being stationary or non-stationary processes. Unlike other cointegration techniques (e.g., Johansen's procedure), which require certain pre-testing for unit roots and that the underlying variables to be integrated are the same order, the ARDL cointegration method provides an alternative test for examining a long-run relationship regardless of whether the underlying variables are purely $I(0)$ or $I(1)$, even fractionally integrated. Pesaran, Shin, and Richard J. Smith (2001) contend that the ARDL can be employed to determine the existence of a long-run equilibrium relation regardless of whether the variables used in the cointegration analysis are stationary. Therefore, previous unit root testing of the variables is unnecessary; (iii) this technique is appropriate in that the tested model takes sufficient lags to capture the data generating process in a general-to-specific modeling framework. It allows for the variables to have different optimal lags that are not applicable to other techniques; (iv) it estimates the long- and short-run components of the model simultaneously, removing problems that are associated with omitted variables and autocorrelations; (v) traditional cointegration methods may suffer from the problems of endogeneity, while the ARDL cointegration technique can clearly distinguish the dependent and explanatory variables. Thus, estimates obtained from the ARDL cointegration technique are unbiased and efficient since they avoid the problems that may arise in the presence of serial correlation and

endogeneity; lastly, (vi) the ARDL cointegration technique employs a single reduced form equation to determine both long and short-run relationships among variables.

Having discussed the advantages of the cointegration technique, the present paper employs the ARDL cointegration technique to reveal the existence of possible cointegration among the variables under scrutiny. To examine the cointegration among the variables expressed in Equation (1), a general ARDL relationship among variables can be written in the following form:

$$\begin{aligned}
 \Delta \ln RGDP_t = & \beta_{01} + \sum_{i=1}^{n1} \beta_{11} \Delta \ln RGDP_{t-i} + \sum_{i=0}^{n2} \beta_{12} \Delta SPREAD_{t-i} + \\
 & + \sum_{i=0}^{n3} \beta_{13} \Delta \ln RIE_{t-i} + \sum_{i=0}^{n4} \beta_{14} \Delta \ln RCE_{t-i} + \sum_{i=0}^{n5} \beta_{15} \Delta \ln DTAX_{t-i} + \\
 & + \sum_{i=0}^{n6} \beta_{16} \Delta \ln IND TAX_{t-i} + \sum_{i=0}^{n7} \beta_{17} \Delta \ln OPEN_{t-i} + \theta_{11} \ln RGDP_{t-1} + \\
 & + \theta_{12} SPREAD_{t-1} + \theta_{13} \ln RIE_{t-1} + \theta_{14} \ln RCE_{t-1} + \theta_{15} \ln DTAX_{t-1} + \\
 & + \theta_{16} \ln IND TAX_{t-1} + \theta_{17} \ln OPEN_{t-1} + \varepsilon_{t1}.
 \end{aligned} \tag{2}$$

RGDP, SPREAD, RIE, RCE, DTAX, IND TAX, and OPEN are as defined earlier. All variables other than spread (due to having negative values) are measured in logarithmic form and expressed as a share of GDP. In Equation (2), Δ represents the first difference operator; β_{01} is the constant term; and β_{11} through β_{17} represent the short-run, $\theta_{11}, \dots, \theta_{17}$ are the long-run coefficients, n_1, \dots, n_7 are the lag length and ε_{t1} represents the white noise error term. To diagnose whether there exists a cointegrating relationship among RGDP, SPREAD, RIE, RCE, DTAX, IND TAX, and OPEN in the long-run, we test the null hypothesis, $H_0 : \beta_1 = \dots = \beta_7 = 0$ and its alternate hypothesis, $H_1 : \beta_1 \neq \dots \neq \beta_7 \neq 0$, by calculating the F -test of Pesaran, Shin, and Smith (2001) and then its modified version proposed by Paresh Kumar Narayan (2005).

Pesaran, Shin, and Smith (2001) present a new approach for testing for the possible presence of a long-run relationship, which is applicable irrespective of whether the underlying regressors are $I(0)$, $I(1)$, or mutually cointegrated. Pesaran, Shin, and Smith's (2001) approach provides two asymptotic critical value bounds for the F -test for large samples, both in the case where all the regressors are $I(1)$, and when one or more of the regressors are individually $I(0)$. The calculated F -statistics value is compared with the upper and lower critical values, which are provided by Pesaran, Shin, and Smith (2001). If the calculated F -value is higher than the upper critical value, the null hypothesis of no cointegration will be rejected whether or not the variables are $I(0)$ or $I(1)$. The statistic underlying the procedure is the Wald or F -statistic in a generalized Dickey-Fuller type regression, which is used to test the significance of lagged levels of the variables in use in a conditional unrestricted equilibrium correction model (ECM).

To uncover the long-run relationship, we follow a two-step procedure. At the first step, we explore the existence of a long-run relationship predicted by theory among the variables in question. At the second step, we estimate both the short- and long-run parameters, if the long-run relationship is established in the first step.

As suggested by Pesaran, Shin, and Smith (2001), once we can establish the existence of cointegration among the variables, we proceed to estimate the ECM. The ECM representation of the ARDL cointegration technique is written as:

$$\begin{aligned} \Delta \ln RGDP_t = & \beta_{01} + \sum_{i=1}^{n1} \beta_{11} \Delta \ln RGDP_{t-i} + \sum_{i=1}^{n2} \beta_{12} \Delta SPREAD_{t-i} + \\ & + \sum_{i=1}^{n3} \beta_{13} \Delta \ln RIE_{t-i} + \sum_{i=1}^{n4} \beta_{14} \Delta \ln RCE_{t-i} + \sum_{i=1}^{n5} \beta_{15} \Delta \ln DTAX_{t-i} + \\ & + \sum_{i=1}^{n6} \beta_{16} \Delta \ln IND TAX_{t-i} + \sum_{i=1}^{n7} \beta_{17} \Delta \ln OPEN_{t-i} + \alpha ECM_{t-1}. \end{aligned} \quad (3)$$

5. Empirical Results and Discussion

The ARDL model does not require testing of the orders of integration of variables. Nevertheless, as expressed by Pesaran, Shin, and Smith (2001), for bounds testing, the dependent variable should be $I(1)$, and the regressors should be $I(0)$, $I(1)$, or fractionally integrated. To add robust testing of the statistic series to guarantee robustness, two different unit root tests are employed to assess the integration order of the series: (i) the Augmented Dickey-Fuller Test (ADF) proposed by David A. Dickey and Wayne A. Fuller (1979); and (ii) Phillip-Perron (PP) unit root test proposed by Peter C. B. Phillips and Pierre Perron (1988). The results of these tests are shown in Table 2. The results from the table indicate that all variables are integrated of order one $I(1)$. From these results, it can be deduced that the null hypothesis of unit root for the variables in the level form cannot be rejected. However, when the test is applied to the variables with the first differences, the null hypothesis is rejected. This implies that the variables are stationary at the level of order one $I(1)$.

Since the dependent variable is $I(1)$ and none of the independent variables appear to be integrated at an order higher than one, we can legitimately use the ARDL bounds test approach as our empirical model. The order of lag length is obtained from unrestricted vector autoregressive (VAR) by utilizing the Akaike Information Criterion (AIC), the Schwarz Information Criteria (SCI), and Hannan-Quinn Information Criteria (HQ). Table 3 displays the lag order selection criteria.

We then focus on the cointegration relationship. The existence of a cointegration relationship is tested through the bounds test, which tests the null of no cointegration relationship against alternative. The cointegration test results are reported in Table 4. The test results reveal that the null hypothesis of no cointegration relationship is rejected at 1%, 5%, and 10% statistical levels of significance. In other words, the bounds test proves the existence of a long-run relationship when the real GDP growth rate is the dependent variable. When we conducted the bounds tests specifying SPREAD, RIE, RCE, DTAX, IND TAX, and OPEN individually as a dependent variable, we fail to reject the null hypothesis of no cointegration. As a consequence, based on the results given in Table 4, we can safely argue that there exists a long-run relationship among the variables RGDP, SPREAD, RIE, RCE, DTAX, IND TAX, and OPEN.

Table 2 ADF and PP Unit Root Tests and Stationary Results

ADF unit root test						
Variables	Level Constant	Critical value		First difference Constant and trend	Critical value	
		1%	5%		1%	5%
lnRGDP	-1.544	-2.700	-1.880	-4.120*	-3.506	-3.441
SPREAD	-2.358	-3.500	-2.570	-5.230**	-4.763	-3.962
lnRIE	-0.679	-2.609	-1.870	-5.110**	-4.117	-3.466
lnRCE	-0.250	-2.704	-1.690	-3.450*	-2.165	-1.955
lnDTAX	-0.477	-2.554	-1.916	-5.860**	-4.155	-3.553
lnINDTAX	-0.680	-2.604	-1.953	-8.670**	-2.570	-1.977
lnOPEN	-0.730	-2.701	-1.959	-3.500*	-2.640	-1.967

PP unit root test						
Variables	Level Constant	Critical value		First difference Constant and trend	Critical value	
		1%	5%		1%	5%
lnRGDP	-1.116	-2.780	-1.817	-5.379**	-4.570	-3.347
SPREAD	-1.880	-2.519	-2.990	-5.780**	-4.220	-3.670
lnRIE	-1.440	-2.570	-1.885	-5.450**	-4.230	-3.450
lnRCE	-1.350	-2.716	-1.870	-6.230**	-4.155	-3.557
lnDTAX	-0.957	-2.647	-1.800	-7.230**	-2.400	-1.870
lnINDTAX	-0.550	-2.791	-1.750	-8.680**	-4.155	-3.583
lnOPEN	-0.563	-2.563	-1.866	-4.490**	-2.467	-1.872

Notes: RGDP: real GDP growth rate, SPREAD: spread, RIE: real government investment expenditures, RCE: real government consumption expenditures, DTAX: direct taxes, INDTAX: indirect taxes, OPEN: openness to international trade. Lags are chosen based on the Akaike Information Criterion (AIC). The critical values are obtained from James G. MacKinnon (1991) for the ADF test. ** $p < 0.01$, * $p < 0.05$.

Source: Authors' estimation.

Table 3 Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SCI	HQ
0	-56.303	n.a	1.88e-08	4.075	2.317	2.170
1	180.234	411.032	4.06e-11	-4.073	-2.135	-5.313
2	231.472	77.2776	4.01e-11	-4.146	-0.513	-4.722
3	329.732	125.643	9.41e-12	-5.761	-0.432	-4.673
4	467.161	44.187*	2.32e-13*	-3.661*	-1.636*	-3.907*

Notes: * denotes lag order selected by the criterion, LR: sequential modified LR test statistic (each test at 5% level of statistical significance), FPE: final prediction error, AIC: Akaike Information Criterion, SCI: Schwarz Information Criterion, HQ: Hannan-Quinn Information Criterion.

Source: Authors' estimation.

Table 4 Bounds Cointegration Test Results

Lag length	F-statistic
ARDL (2, 2, 2, 2, 0, 0, 0)	5.17
Significance level (%)	Lower bounds $I(0)$
1	2.88
5	2.27
10	1.99
	Upper bounds $I(1)$
1	3.99
5	3.28
10	2.94

Notes: The F -statistics critical values are obtained from Table CI (ii) Case II: Restricted intercept and no trend in Pesaran, Shin, and Smith (2001, p. 300). ($k = 6$), k denotes the number of independent variables.

Source: Authors' estimation.

Having detected the long-run relationship, we proceed to analyze the ARDL estimates, focusing on the analysis of the quality of the estimations. Given the conclusive evidence of cointegration for our model, we proceed to estimate their long- and short-run dynamics, applying the AIC and SCI for selecting the optimal lag length. Table 5 presents the results of the estimated long- and short-run ARDL cointegration model (2, 2, 2, 2, 0, 0, 0) that selected automatically by applying the AIC and SCI (for further details, see Pesaran, Shin, and Smith 2001). In this paper, we consider the maximum lag number as four and both the Akaike, Schwarz and Hannan-Quinn information criteria select the ARDL (2, 2, 2, 2, 0, 0, 0) model. In brief, the results obtained from ARDL models for the output growth are tabulated in Table 5.

Table 5 ARDL Model: Long- and Short-Run Results

Long-run (dependent variable = RGDP)		ARDL (2, 2, 2, 2, 0, 0, 0)	
Regressor	Coefficient	t-statistic	p-value
SPREAD	1.137	3.144***	0.001
lnRIE	0.788	2.660***	0.001
lnRCE	0.240	3.450***	0.001
lnDTAX	-0.555	-2.130**	0.001
lnINDTAX	-0.260	-2.150**	0.005
lnOPEN	1.117	2.140**	0.577
Short-run (dependent variable = Δ RGDP)			
Δ SPREAD _t	0.870	3.551***	0.034
Δ lnRIE _t	0.770	2.358**	0.014
Δ lnRCE _t	0.530	3.120***	0.001
Δ lnDTAX _t	-0.470	-2.519**	0.004
Δ lnINDTAX _t	-0.345	-3.280***	0.005
Δ lnOPEN _t	0.800	2.325**	0.317
ECM _{t-1}	-0.230	-2.570**	0.001
Model diagnostics			
F-stat.	11.22		
95% lower bound	4.83		
95% upper bound	5.01		
SE of regression	0.01		
SBC	93.50		
Adjusted R ²	0.978		
Durbin-Watson stat.	2.11		
Residual diagnostics			
Serial correlation ¹		0.164[0.1277]	
Functional form ²		2.310[0.255]	
Normality ³		1.504[0.344]	
Heteroscedasticity ⁴		0.311[0.145]	
F-statistics		452.413[0.000]	

Notes: RGDP: real GDP growth rate, SPREAD: spread, RIE: real government investment expenditures, RCE: real government consumption expenditures, DTAX: direct taxes, INDTAX: indirect taxes, OPEN: openness to international trade. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. ¹ Breusch-Godfrey Lagrange multiplier test of residual serial correlation. ² Ramsey's RESET test for omitted variables/functional form. ³ Jarque-Bera normality test, based on a test of skewness and kurtosis of residuals. ⁴ White's test for heteroscedasticity based on the regression of squared residuals on squared fitted values.

Source: Authors' estimation.

It is pretty clear from Table 5 that the coefficient of SPREAD is positive and significant at the 1% level of statistical significance. This result indicates that in the short- and long-run, SPREAD is the crucial macroeconomic policy variable that exerts the most substantial positive impact on real GDP growth in Turkey. The variables DTAX and INDTAX have the expected signs and parameters that are significant in both the long- and short-run. Our long- and short-run results suggest that these variables negatively affect output growth.

The results also indicate that there are positive and significant relationships between RIE, RCE, and RGDP in both the long- and short-run. Consistently with the theoretical expectations, the coefficients on real government investment and consumption expenditures are positive and statistically significant at the 1% and 5% levels of significance in both the short- and long-run. Numerically, the coefficients indicate that in the long-run, a 1 percentage point increase in the ratio of real government investment expenditures to GDP is associated with an increase in output growth by about 0.78 percentage points. However, a 1% rise in the same ratio is correlated with by almost 0.77 percentage point increase in output growth in the short-run. Besides, they are statistically significant in both the short and long-run model specifications. The coefficient on real government consumption expenditure has the expected sign in both the short- and long-run horizons and is statistically significant at the 1% level of statistical significance. In particular, a 1% increase in the real government consumption expenditure increases output growth by approximately 0.24 percentage points in the long-run. However, the corresponding short-run coefficient is only 0.53%. This denotes that the government's real consumption expenditures are the third important explanatory variable in explaining output growth after spread and real government investment expenditures.

The coefficients on taxes also have a negative sign as expected and are statistically significant at both the 1% and 5% level of statistical significance. This is because taxes have a negative and statistically significant impact on output growth. This is true for both short- as well as long-run. In the long-run, a 1 percentage point hike in direct taxes is associated with a 0.55 percentage point decrease in output growth, while in the short-run it leads to a 0.47% decrease in output growth. When it comes to indirect taxes, a 1 percentage point increase in indirect taxes leads to 0.26 and 0.34 percentage point decreases in output growth in the long- and short-run, respectively.

Our findings also reveal that international trade openness has a positive impact on output growth. This purports that the association between OPEN and RGDP is positive and statistically significant in both the short- and long-run. The coefficient on the openness to international trade variable has an expected sign and is statistically significant at the 5% level of significance in both the short- and long-run, respectively. In the long-run, a 1% rise in openness to international trade leads to a 1.11 percentage point increase in output growth. However, in the short-run, a 1% increase in trade openness raises growth by a 0.80% percentage point.

In terms of the error correction terms (ECM_{t-1}), they show the speed of adjustment back to equilibrium in the estimated model. The estimated lagged error correction term ECM_{t-1} is negative and significant. The ECM_{t-1} is the one period-lagged value of the error term, derived from the equilibrium relationship, and points out the elimination rate of short-run disequilibrium in the long-run. The ECM_{t-1} coefficient is estimated to

be -0.23 , implying that approximately 23% of disequilibrium from the previous year shock will be removed in the current term. This means that there is a long-run relationship between all variables under consideration.

The empirical results we obtained also suggest that in the short-run, the effects of all variables on output growth are statistically significant. Thus, the results show that Turkey's output growth path moves toward the steady-state equilibrium.

The robustness of the variables is obvious from the short-run diagnostic test. The attribute of the error correction model is to show the speed of adjustment back to the long-run equilibrium after a short-run shock. To ensure the goodness of fit of the model, we perform several diagnostic tests, as reported in Table 5. These tests examine the serial correlation, the functional form, normality, and heteroscedasticity associated with the selected model.

As pointed out by Pesaran, Shin, and Smith (2001), the stability tests (CUSUM and CUSUMQ) provide useful information relating to the stability of the coefficients of the regression. At this point, it is essential to acknowledge that these tests are updated recursively and plotted against the breakpoints. The results of the CUSUM and CUSUMQ tests indicate that all variables are cointegrated. Moreover, the results show that neither the CUSUM nor the CUSUMQ test exceeds the critical values, which ensure that all models are stable and correctly specified².

On balance, the empirical results of this paper suggest that both fiscal and monetary policies have a significant effect on output growth, but with various degrees. Based on this finding, it can be safely argued that appropriately coordinated fiscal and monetary policies - that is, a policy mix of expansionary fiscal policy and accommodating monetary policy³ - would deliver much better outcomes for boosting output growth in Turkey's case.

6. Summary and Conclusion

In this paper, we investigated the comparative effectiveness of fiscal and monetary policies in fostering output growth in Turkey. To this end, we applied the ARDL bounds testing procedure to Turkey's quarterly time-series data set for the time frame ranging from the first quarter of 2003 through the same quarter of 2019.

Overall, our empirical results show that both macroeconomic policy instruments - fiscal and monetary policies - a matter for having higher output growth. Accordingly, the two macroeconomic policy tools alike have positive and statistically significant effects on real GDP growth. However, monetary policy exhibits relatively better performance than fiscal policy in influencing output growth. Looking closely, what appears from the empirical results we obtained is that fiscal policy is a relatively less effective macroeconomic policy instrument on output growth compared to monetary policy. This finding may be attributed to several factors that substantially hamper the success of the fiscal policy. Just

² The results of the CUSUM and the CUSUM of square tests are not reported, to save space. They are, however, available from the authors upon request.

³ Fiscal and monetary policies are used in the same direction or opposite direction, subject to the state of the business cycle. Speaking in broad terms, there are four alternative policy mix options for policymakers: (i) loose fiscal policy-easy monetary policy; (ii) loose fiscal policy-tight monetary policy; (iii) tight fiscal policy-easy monetary policy; and (iv) tight fiscal policy-tight monetary policy.

two of them that we should essentially count here are how government spending is financed and whether fiscal policy is accompanied by accommodating monetary policy.

Our empirical findings can be justified on the ground that in the open economy case, under a floating exchange rate regime, monetary policy is more effective than fiscal policy - that is, a theoretical argument based on the Mundell-Fleming model. As is known, Turkey has been an open EMDE integrated with the rest of the world for more than 40 years. As part of this, in general terms, it has been pursuing a floating exchange rate regime since the early 1980s. So, the Mundell-Fleming model is well enough to explain the case of Turkey in the context of the relative effectiveness of fiscal and monetary policies.

To enhance the performance of fiscal policy further, indeed, the coordination of fiscal and monetary policies is significantly important. Namely, the two policies should work together to obtain better economic outcomes. Primarily, to achieve and maintain output stabilization, in our view, it is essential to have coherent coordination between two chief tools of macroeconomic policy. Of course, we are aware that they are rival policies, not only in terms of scope, transmission mechanisms, and time in affecting the macroeconomic variables but also in terms of their specific objectives. However, it is also a reality that they are the tools of the macroeconomic policy family and complement each other in reaching macroeconomic policy targets. Besides, the two policy instruments are in interaction with each other through several channels. Interest rates and deficit financing are just two notable cases in point. Indeed, in an economy, the stance of monetary policy is determined by the stance of fiscal policy. It is highly unlikely that, for example, in an economy with persistent and high deficits, the monetary authority can appropriately conduct monetary policy. This is because budget deficits downgrade the success of monetary policy in controlling interest rates, inflation, and even reducing volatility in exchange rates, all of which are closely related to how government deficits are financed.

It would be highly probable that fiscal and monetary policies implemented without the appropriate fiscal-monetary policy mix end up with widening budget deficits and high real interest rates that will discourage interest-sensitive-private investments and thus economic activity. A further point, relevant in today's globalized world, is that many countries' domestic financial markets have integrated with the international financial markets. Due to this scenario, the content of macroeconomic stabilization has expanded and covers financial stability. Consequently, financial stability is a significant ingredient of macroeconomic stability. In the absence of efficient macroeconomic policy coordination, financial stability may not be successfully conducted, resulting in high-interest rates and low output growth along with accelerating inflation and high volatile exchange rates. Also, well-coordinated fiscal and monetary policies become important, especially in times when countries embark on structural reforms and liberalization in their financial sector. To succeed in such reforms, there is a need for a supportive fiscal policy, which ensures fiscal discipline. Without having fiscal discipline, undertaking such reforms would be an unsuccessful attempt since, during the reform process, interest rates may tend to increase sharply. Even if it is artificially kept under control, some other serious problems, such as inflation, high demand for credit, and significant distortions in resource allocations, are likely to arise.

Of course, the coordination of the two policies may not always deliver desirable policy outcomes. At this point, the roles of the authorities responsible for conducting fiscal

and monetary policies come into prominence. Namely, what would be the bargaining power of the authorities, i.e., who dominates whom, conducting these policies to attain the best macroeconomic policy outcomes becomes essential. This requires a coordinating establishment that will be in charge of the distributing of the roles of related organizations pursuing fiscal and monetary policy. However, this is not a matter for macroeconomic policy designers. Instead, it is a matter of those who are responsible for the optimal design of governmental institutions. In this regard, notably, the development levels of the country's financial markets and institutions are an essential matter that should not be ignored. Apart from this, enhancing the degree of CBRT independence is also a great matter. It is quite probable that fiscal policy that works in harmony with monetary policy that primarily focuses on providing and maintaining price stability can boost output growth, or, at least, provide better outcomes compared to alternative policy options.

All in all, the success of fiscal policy in promoting output growth critically depends on whether it is accommodated with monetary policy, among others, or *vice versa*. To obtain desirable macroeconomic policy outcomes (including output growth, whatever their relative effectiveness is), we strongly corroborate with the notion that fiscal and monetary policies should be appropriately coordinated, except, of course, of some particular circumstances. The lack of coordination would tend to produce poor economic performance. However, the coordinated use of the two policies in concert, along with the exchange rate policy, guaranteed by institutional arrangements, can provide a stronger economic performance compared to their separate and isolated effects.

To enhance the growth-promoting role of fiscal policy, embarking on a reform strategy involving both revenue and expenditure sides of the government budget can be fruitful. In this context, one good option could be considering fiscal space; that is, the amount of budgetary room created either through additional revenue or through reductions in unproductive government spending or through additional borrowing that would only transitorily worsen the government budget balance without undermining fiscal sustainability. It can increase productive spending that would spur long-run growth, such as health and education expenditures. In this regard, higher public spending allocated for infrastructure investments would also be beneficial.

For public investment, the investment's return, together with the investment process (ranging from projects' selection to their implementation, auditing, and return), should not also be ignored. In case of a lack of adequate fiscal space or complementary to it, comprehensive fiscal reforms can be focused on because fiscal reforms are critically important for promoting output growth. In this regard, especially growth-friendly tax and government spending reforms would be highly beneficial.

To start with taxes, several things can be done. Without deteriorating the growth-equity trade-off, minimizing distortions (e.g. tax exemptions and preferential tax regimes), rationalizing distortionary tax expenditures, improving tax compliance, correcting negative externalities especially linked with consumption and production and, when needed, introducing new taxes in this regard, shifting in the tax structure from direct taxes to indirect taxes to have a relatively less distortionary tax system, broadening the tax base by removing tax exemptions and preferential regimes are just some strategies that can be followed. Of course, revenue-raising tax administration reforms, targeting

to reduce the size of the informal sector, to simplify tax laws and other tax-related procedures, to segment taxpayers, to minimize tax compliance costs, and so on, should not be ignored. It is expected that all these would improve the taxpayer's compliance while enhancing revenue collection by the government along with equity. When it comes to government spending reforms, they can focus on, inter-alia, minimizing quasi-fiscal activities, investing in people further through health, education, and nutrition expenditure programs, removing untargeted subsidies, changing the composition of government spending in favor of higher public investment by reducing the share of unproductive spending, and the like. All these growth-friendly fiscal reforms can positively affect output growth by enhancing the labor supply, investment in physical capital and human capital, and total factor productivity.

References

- Ali, Shahid, Somia Irum, and Asghar Ali.** 2008. "Whether Fiscal Stance or Monetary Policy Is Effective for Economic Growth in Case of South Asian Countries." *The Pakistan Development Review*, 47(4): 791-799.
- Andersen, Leonall C., and Jerry L. Jordan.** 1968. "Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization." *Federal Reserve Bank of St. Louis Review*, 68(8): 11-24.
- Atcharyachanvanich, Waranya.** 2007. "International Differences in the Relative Monetary-Fiscal Influence on Economic Stabilization." *Journal of International Economic Studies*, 21: 69-84. <http://dx.doi.org/10.15002/00002047>
- Bagliano, Fabio C., and Carlo A. Favero.** 1998. "Measuring Monetary Policy with VAR Models: An Evaluation." *European Economic Review*, 42(6): 1069-1112. [http://dx.doi.org/10.1016/S0014-2921\(98\)00005-1](http://dx.doi.org/10.1016/S0014-2921(98)00005-1)
- Batten, Dallas S., and Rik W. Hafer.** 1983. "The Relative Impact of Monetary and Fiscal Actions on Economic Activity: A Cross-Country Comparison." *Federal Reserve Bank of St. Louis Review*, 65(1): 5-12. <http://dx.doi.org/10.20955/r.65.5-12.mbu>
- Bernanke, Ben S., and Alan S. Blinder.** 1992. "The Federal Funds Rate and the Channels of Monetary Transmission." *American Economic Review*, 82(4): 901-921.
- Bernanke, Ben S., and Ilian Mihov.** 1998. "Measuring Monetary Policy." *The Quarterly Journal of Economics*, 113(3): 869-902. <http://dx.doi.org/10.1162/003355398555775>
- Berument, Hakan.** 2007. "Measuring Monetary Policy for a Small Open Economy: Turkey." *Journal of Macroeconomics*, 29(2): 411-430. <http://dx.doi.org/10.1016/j.jmacro.2006.02.001>
- Chowdhury, Abdur R.** 1986a. "Monetary Policy, Fiscal Policy, and Aggregate Economic Activity in Korea." *Asian Economies*, 58: 47-57.
- Chowdhury, Abdur R.** 1986b. "Monetary and Fiscal Impacts on Economic Activities in Bangladesh: A Note." *The Bangladesh Development Studies*, 13(2): 149-154.
- Chowdhury, Abdur R.** 1988. "Monetary Policy, Fiscal Policy and Aggregate Economic Activity: Some Further Evidence." *Applied Economics*, 20(1): 63-71. <http://dx.doi.org/10.1080/00036848800000036>
- Cushman, David O., and Tao Zha.** 1997. "Identifying Monetary Policy in a Small Open Economy under Flexible Exchange Rates." *Journal of Monetary Economics*, 39(3): 433-448. [http://dx.doi.org/10.1016/S0304-3932\(97\)00029-9](http://dx.doi.org/10.1016/S0304-3932(97)00029-9)
- Darrat, Ali F.** 1984. "The Dominant Influence of Fiscal Actions in Developing Countries." *Eastern Economic Journal*, 10(3): 271-284.
- Dewald, William G., and Maurice N. Marchon.** 1978. "A Modified Federal Reserve of St. Louis Spending Equation for Canada, France, Germany, Italy, the United Kingdom, and the United States." *Kredit und Kapital*, 11: 194-210.
- Dickey, David A., and Wayne A. Fuller.** 1979. "Distribution of the Estimators for Autoregressive Time Series with a Unit Root." *Journal of the American Statistical Association*, 74(366): 427-431.
- Engle, Robert F., and Clive W. J. Granger.** 1987. "Co-integration and Error Correction: Representation, Estimation, and Testing." *Econometrica*, 55: 251-276. <http://dx.doi.org/10.2307/1913236>

- Friedman, Milton, and David Meiselman.** 1963. "The Relative Stability of Monetary Velocity and the Investment Multiplier in the United States, 1887-1957." In *Commission on Money and Credit: Stabilization Policies, Englewood Cliffs*, 165-268. New Jersey: Prentice-Hall.
- Fung, Ben S. C.** 2002. "A VAR Analysis of the Effects of Monetary Policy in East Asia." Bank for International Settlements Working Paper 119.
- Gordon, David B., and Eric M. Leeper.** 1994. "The Dynamic Impacts of Monetary Policy: An Exercise in Tentative Identification." *Journal of Political Economy*, 102(6): 1228-1247. <http://dx.doi.org/10.1086/261969>
- Gürbüç, Yeşim Z., Thomas Jobert, and Ruhi Tuncer.** 2008. "The Turkish Experience in Inflation Targeting: Uncertainties and the Efficiency of Monetary Policy." *International Economics*, 116: 127-146. <http://dx.doi.org/10.3917/econ.116.0127>
- Hussain, Mohammed Nur.** 2014. "Empirical Econometric Analysis of Relationship between Fiscal-Monetary Policies and Output on SAARC Countries." *The Journal of Developing Areas*, 48(4): 209-224. <http://dx.doi.org/10.1353/jda.2014.0072>
- Jawaid, Syed Tehseen, Arif Imtiaz, and Syed Muhammed Naeemullah.** 2010. "Comparative Analysis of Monetary and Fiscal Policy: A Case Study of Pakistan." *Nice Research Journal*, 3(1): 58-67.
- Johansen, Søren, and Katerina Juselius.** 1990. "Maximum Likelihood Estimation and Inference on Cointegration - With Applications to the Demand for Money." *Oxford Bulletin of Economics and Statistics*, 52(2): 169-210. <http://dx.doi.org/10.1111/j.1468-0084.1990.mp52002003.x>
- Johansen, Søren.** 1991. "Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models." *Econometrica*, 59(6): 1551-1580. <http://dx.doi.org/10.2307/2938278>
- Johansen, Søren.** 1995. *Likelihood Based Inference in Cointegrated Vector Autoregressive Models*. Oxford: Oxford University Press.
- Kretzmer, Peter E.** 1992. "Monetary vs. Fiscal Policy: New Evidence on an Old Debate." *Economic Review*, 76: 21-30.
- Latif, Ehsan, and Md. Hadayet Ullah Chowdhury.** 1998. "Relative Effectiveness of Monetary and Fiscal Policy: A Study of Bangladesh." *Bank Parikrama*, VXXIII: 97-105.
- Leeper, Eric M., Christopher A. Sims, and Tao Zha.** 1996. "What Does Monetary Policy Do?" *Brookings Papers on Economic Activity*, 27(2): 1-78. <http://dx.doi.org/10.2307/2534619>
- Mackinnon, James G.** 1991. "Critical Values for Cointegration Tests." In *Long-Run Economic Relationships*, ed. Robert F. Engle and Clive W. J. Granger. Oxford: Oxford University Press.
- McCallum, Bennett T.** 1983. "A Reconsideration of Sims' Evidence Regarding Monetarism." *Economic Letters*, 13(2-3): 167-171. [http://dx.doi.org/10.1016/0165-1765\(83\)90080-0](http://dx.doi.org/10.1016/0165-1765(83)90080-0)
- McCallum, Bennett T.** 1984. "Monetary versus Fiscal Policy Effects: A Review of the Debate." National Bureau of Economic Research Working Paper 1556. <http://dx.doi.org/10.3386/w1556>
- Narayan, Paresh Kumar.** 2005. "The Saving and Investment Nexus for China: Evidence from Cointegration Tests." *Applied Economics*, 37(17): 1979-1990. <http://dx.doi.org/10.1080/00036840500278103>
- Owoye, Oluwole, and Olugbenga A. Onafowora.** 1994. "The Relative Importance of Monetary and Fiscal Policies in Selected African Countries." *Applied Economics*, 26: 1083-1091. <http://dx.doi.org/10.1080/00036849400000124>

- Özer, Mustafa, and Veysel Karagöl.** 2018. "Relative Effectiveness of Monetary and Fiscal Policies on Output Growth in Turkey: An ARDL Bounds Test Approach, Equilibrium." *Quarterly Journal of Economics and Economic Policy*, 13(3): 391-409. <http://dx.doi.org/10.24136/eq.2018.019>
- Pesaran, M. Hashem, and Yongcheol Shin.** 1999. "An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis." In *Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium*, ed. Steinar Strøm. Cambridge, M. A.: Cambridge University Press. <http://dx.doi.org/10.1017/CCOL521633230.011>
- Pesaran, M. Hashem, Yongcheol Shin, and Richard J. Smith.** 2001. "Bounds Testing Approaches to the Analysis of Level Relationships." *Journal of Applied Econometrics*, 16(3): 289-326. <http://dx.doi.org/10.1002/jae.616>
- Petrevski, Goran, Jane Bogoev, and Dragan Tevdovski.** 2016. "Fiscal and Monetary Policy Effects in Three South Eastern European Economies." *Empirical Economics*, 50(2): 415-441. <http://dx.doi.org/10.1007/s00181-015-0932-0>
- Phillips, Peter C. B., and Pierre Perron.** 1988. "Testing for a Unit Root in Time Series Regression." *Biometrika*, 75(2): 335-346. <http://dx.doi.org/10.2307/2336182>
- Rahman, Md. Habibur.** 2009. "Relative Effectiveness of Monetary and Fiscal Policies on Output Growth in Bangladesh: A VAR Approach." *Bangladesh Journal of Political Economy*, 22(1-2): 419-440.
- Senbet, Dawit.** 2011. "The Relative Impact of Fiscal versus Monetary Actions on Output: A Vector Autoregressive (VAR) Approach." *Business and Economic Journal*, 25: 1-11.
- Şen, Hüseyin, and Ayşe Kaya.** 2015. "The Relative Effectiveness of Monetary and Fiscal Policies on Growth: What Does Long-Run SVAR Model Tell Us?" Munich Personal RePEc Archive Paper 65903.
- Sims, Christopher A.** 1992. "Interpreting the Macroeconomic Time Series Facts: The Effects of Monetary Policy." *European Economic Review*, 36(5): 975-1000. [http://dx.doi.org/10.1016/0014-2921\(92\)90041-T](http://dx.doi.org/10.1016/0014-2921(92)90041-T)
- Waud, Roger N.** 1974. "Monetary and Fiscal Effects on Economic Activity: Reduced Form Examination of Their Relative Importance." *The Review of Economics and Statistics*, 56(2): 177-187.
- Yörükoğlu, Mehmet, and Mustafa Kılınc.** 2012. "Globalisation of the Interaction between Fiscal and Monetary Policy." In *Fiscal Policy, Public Debt and Monetary Policy in Emerging Market Economies*, 335-350. Basel: Bank for International Settlements.

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