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Impact of Government Intervention on Inflation Control*
ผลกระทบจากการแทรกแซงของรัฐในการควบคุมเงินเฟ้อ

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Abstract This paper detects the effects of government intervention to control inflation. The long memory fractional parameter was estimated using simulation technique in the presence of additive inliers, which serve as a proxy of government intervention. The data generating process considers the case where there are shock plans, i.e. inliers that are short-lived but important in magnitude. The results show that the level to which inflation falls after the intervention has no impact on the estimate of the fractional parameter and on the persistence of the inflation process. That means any abrupt intervention would have only temporary effect on lowering the inflation rates and the series remain stationary. This implies the need for alternative measures of monetary policy. This paper recommends pursuing the time-consistency economic policy, which provides an explanation in order to combat inflation and to sustain the result for the longer period.

Keywords: additive inliers, fractional parameter, Monte-Carlo simulation, inflation control

บทคัดย่อ บทความนี้ตรวจสอบผลกระทบการควบคุมเงินเฟ้อจากการแทรกแซงของรัฐ โดยใช้เทคนิคพยากรณ์เพื่อคำนวณค่า fractional parameter และให้มี additive inliers ที่สะท้อนถึงนโยบายแทรกแซง การวิเคราะห์พิจารณากรณีให้มีแผนกระตุ้นระยะสั้นที่สำคัญ ผลการศึกษาชี้ว่าการแทรกแซงของรัฐจะเป็นผลต่อการควบคุมเงินเฟ้อเพียงในระยะชั่วคราว การศึกษานี้จึงเสนอทางเลือกในการควบคุมเงินเฟ้อ โดยน่าจะพิจารณาใช้นโยบายเศรษฐกิจที่มีความเหมาะสมกับสถานการณ์เวลาที่สามารถจัดการปัญหาเงินเฟ้อ และขณะเดียวกันสามารถควบคุมเงินเฟ้อได้ในระยะยาว

คำสำคัญ: นโยบายการเงิน การควบคุมเงินเฟ้อ

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Introduction

In recent times, macroeconomic management has been facing a series of challenges that are intertwined with monetary and fiscal policies. Among these are low wages, low employment, high inflation, low output, volatile interest and exchange rates and many others. All these affect everyone in developing and developed economies (Dornbusch, Fischer, and Startz, 2008). Like many other economic parameters, inflation has a direct impact on people's welfare since it is determined by the percentage rate of changes in prices which for some goods are highly volatile and ultimately affect purchasing power of consumers. Besides, the Phillips curve conundrum that links inflation inversely with unemployment raises more questions. Despite further adjustments of the theory through augmented rational expectation, the inflation problem appears to have become more complex lately, inflicting burden on the general public as a levy or tax does. For these reasons, policymakers frequently focus on inflation in order to control it in its desired levels (Langdana, 2002). This has prompted public interventions, the results of which need to be reviewed as to whether they could be sustained. In this regard, this study employs an econometric investigation through recently introduced long memory models for checking that very nature of the policy through simulation process in the presence of additive inliers.

Long memory means having to rely on past experiences; something that happened in the past, is likely to happen again (Teyssiere and Kirman, 2007). Statistically, in the case of a statioary process with long term autocorrelation function, $\rho(k)$ is said to be a long memory process if $\sum_{k=o}^{\infty} |\rho(k)|$ does not converge (Henry, 2007 and Beran, 1994). However, for some models the correlations decay to zero very slowly, implying that observations made far apart are still related to some extent. An intuitive way to describe such behavior is to say that the process has a long memory (Chatfield, 1996).

Several models show persistence in shocks and provide an extension of the concept of nonstationarity. An alternative way to test for nonstationarity models is to use the concept of fractional integration. Kennedy (2003) says that the concept of fractional integration is useful in testing for nonstationarity in econometric models. The traditional analysis examines $(1-\alpha L)y_t = \varepsilon_t$ where $\alpha \geq 1$, whereas the model developed later is $(1-L)^d y_t = \varepsilon_t$ where $d \geq 0.5$. In the second case, d takes on non-integer or fractional values, from which follows the term 'fractional'.

Seminally, the idea of long memory models appears to have developed its roots in the physical sciences in the 1950s. A particular reference in this respect is Hurst (1950). This reference broached the question of the effect of very long term autocorrelation in observed time series analysis, which subsequently came to be known as a long memory process applied in econometric studies (Ashraf, 2006). This astounding model of a long memory process has attracted the attention of econometricians since around 1980. The pioneering works in this area of econometrics include Taqqu (1975), Granger and Joyeux (1980), Granger (1981), Hosking (1981), Geweke and Porter-Hudak (1983) and Baillie and King (1996). Later those have been advanced among many others by Giraitis and Robinson (2003), Robinson and Henry (2003), de Peretti (2007) and Henry (2007).

A variant of causal forecasting is simulation. The impact on the economy of a policy change is simulated by using an econometric model to forecast into the future. With the advent of computer software packages, standard dynamic simulation techniques have become popular for studying macroeconomic policies (UNO, 2002). In the macroeconomic context, particularly in research on real business cycles, simulation procedure is often employed as an alternative to traditional econometric analysis. In this procedure economic theory plays a key role providing ingredients to a general equilibrium model designed to address specific economic questions (Kennedy, 2003). One such major question may, for example, be: "Do one-time inflationary shocks give rise to long term persistence?" This issue is important, because the persistent behavior of inflation rates is crucial to choosing the appropriate economic policy, and long memory models are commonly used tools to embody highly persistent time series data (Balcõlar, 2003).

In recent years, the analysis of persistence of some time series has become a topic of sustained research of the inflationary process. The paradigm of trend stationarity versus difference stationarity, which involves thinking of persistence as transitory effects versus permanent effects, has been one of looking at this topic. At the core of this paradigm is the analysis of persistence using the fractional integration process. Very often, time series data are contaminated because of the presence of aberrant observations which originate in data base or in true data generating process but not in time series modeling. These observations are called inliers. The example is the Brazilian inflation, which is a time series contaminated by many aberrant observations. These observations are considered to be additive inliers associated directly with many government shock programs to stop high inflation. Whenever inflation is very high, an intervention by the government would bring inflation down for a short period of time and the peak can be considered as additive inliers.

Cati, Garcia, and Perron (1999) considers inliers as equivalent to the observations associated with the application of government shocks in order to stop the high inflation process as was the case in the Brazilian economy. Essentially government shocks can be seen as creating inliers whose magnitude is related to the current level of the series. As is the case with unit root tests, the conjecture is that the presence of these inliers contaminates the estimates of the fractional parameter by reducing its magnitude and then showing a tendency towards the stationary case. This argument is, in fact, the flip-side of the argument of Perron (1989), who concluded that shocks have persistent effects. The idea behind the relationship between inliers and the unit root hypothesis is the fact that estimates of the autoregressive parameter are biased towards zero and then size distortions are found when unit root test is used. A similar hypothesis can be considered for the case where the fractional parameter is estimated, but more details about the behavior of this parameter (stationary or nonstationary case) are needed.

There have been several methods to estimate the fractional parameter such as in the time domain and frequency domain based on OLS estimation or MLE. In this paper, OLS estimation is used considering frequency domain. The main intent of this paper is, therefore, to analyze the effects of government interventions on controlling the high inflationary situation prevailing in an economy. To attain this objective, the study applies Monte Carlo simulation, which provides the evidence of whether or not additive inliers (which stand here as proxies of government interventions) affect the bias and the MSE of the fractional parameter, d.

The rest of the paper is organized as follows. In the first section, significance of this relationship between inflation control and government intervention and its usefulness in macroeconomic management has been discussed. The second section presents the methodology. In the third section, simulation technique has been provided. The forth section presents the simulation results. In the fifth section, time consistent economic policy has briefly been discussed as an alternative measure of controlling inflation and the last section ends with conclusions.

Inflation Control and Government Intervention

For hundreds of years before the 20th century the value of the pound had remained almost the same (Twigger, 1999). There were some fluctuations, which were always balanced by the appreciation. Then during the First World War the pound decreased in its value massively (Baxter, 1998). Although during the recession pound appreciated again, after the 2nd World War depreciation had been remarkable, leaving the pound with a buying power of less than 2% of its value in 1900 (Twigger, 1999). This phenomenon was called inflation and since 1970s the main aim of the conservative government has been to reduce it. By and large, the official measure of the inflation is the increase of the general level of prices measured over a period of time (usually one year). The measuring tools are of different kinds such as Retail Price Index (RPI), Tax and Price Index (TPI) and Consumption Expenditure Deflator (CED). According to Elliot (2007), RPI is equivalent to TPI.

There have been different types of inflation. The first type is cost-push inflation, which basically means that increasing costs of factors of production (rent, wages, interest, and cost of raw materials) push up the general level of prices. In turn, this induces workers to demand higher wages, which increases the production costs even further. Another type is *demand-pull inflation.* This occurs when aggregate demand exceeds the value of output (measured in constant prices) at full employment. This is shown in Figure 1.

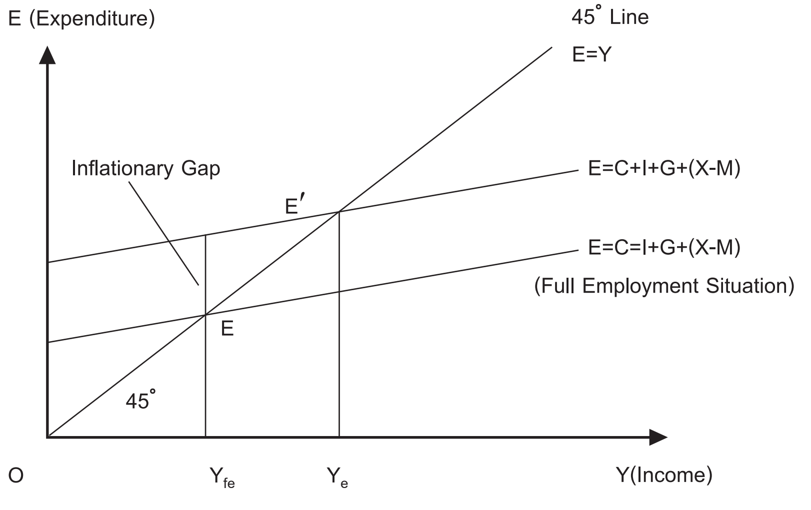

Figure 1 Inflationary gap due to demand-pull inflation

If the expenditure line C+I+G+(X-M) increases (for example due to an expansionary budget), then the new equilibrium shifts from Y_{fe} to Y_e leaving an inflationary gap. This thing happens because the economy cannot produce anymore. So the capacity of excess expenditure is eliminated by the higher prices. Keynesians and monetarists alike believe that this phenomenon involves money supply, but only Keynesians think that demand brings about this increase in money supply, whereas monetarists think that an increase in money supply causes this rise in demand (Friedman, 1983). The third type of inflation is called *monetary inflation.* According to the monetary principle, $M V = P Y$ where M is the money stock, V is the velocity of money, P is the general price level, and Y is the output. The equation could be transformed as $m + v = \pi + y$ or, where $\pi = m - y - v$ monetarists believe that v and y are closed to constants in the short run or the effects of changes of v and y are small, which implies that money supply and inflation are directly related. In this type of inflation, government is the sole player who creates the money, called high powered money. This proves that government is directly involved in the inflation phenomena. Identifying the real culprit that created the inflationary problem is hard, but the inflation issue is undoubtedly complex and is goaded by multidimensional factors that operate persistently in the economy. Thus it can be difficult to find a real pattern of inflation in any economy.

The consequences of inflation are serious: it has a pervasive effect on economic growth, because it increases uncertainty and discourages savings in the economy; it is detrimental to the balance of payment, and income distribution, because it makes imports cheaper and distributes incomes in favor of profit earners putting the income away from fixed earning pensioners, whose real income will eventually fall. Following this fact, inflation is often referred to as the “cruellest tax” (Easterly and Fischer, 2001), even though they are estimated to be small. One estimate is that reducing inflation in the United States from 10 percent to zero would, in the long run, be equivalent to increasing output by 1 percent (Lucas, 2000). Besides, there is clear cross-country evidence that high rates of inflation are associated with low rates of sustained growth (Dornbusch *et al.,* 2008). The negative link is not due to costs of inflation *per se.* Rather, as Fischer (1993: 487) says: “The inflation rate serves as an indicator of the overall ability of the government to manage the economy. Since there are no good arguments for very high rates of inflation, a government that is producing high inflation is a government that has lost control.”

In an inflationary economy, inflation is so pervasive a problem that it completely dominates daily economic life. People spend significant amounts of resources minimizing its damage. They have to go to the stores often before the prices go up. Their main concern in saving or investing is how to protect themselves from inflation. They reduce holdings of real balances to a remarkable extent in order to avoid the inflation tax but have to compensate by going to the bank more often -- daily or even hourly instead of weekly, for instance -- to withdraw money. Wages are paid very often -- such as towards the end of the German hyperinflation -- several times a day (Dornbusch *et al.*, 2008).

The government has several ways to control inflation: One is by means of fiscal policy, which manages the aggregate demand by using government spending. To reduce inflation government reduces expenditure and raises taxes. This policy works only against demand-caused inflation and faces great opposition from the people as they are made worse off by the reduced spending on healthcare etc. The fiscal policy is very unpopular. The other measure to fight inflation after 1970 has been monetary policy, which was widely used by the Conservatives in the UK. The main policies have included controlling interest rates (dear money policy) and medium-term financial strategy. Also the real inflation is fuelled by people's expectations of future inflation. Thus, reducing the expectations of inflation in the future has been one of the governments' aims.

A very effective way to reduce the cost push inflation is by direct intervention on prices and wages. Government applies measures to restrict the increase in wages (incomes) and prices. There are two types of direct intervention, namely, statutory, by which government freezes wages and prices, and voluntary, by which government, through argument and persuasion, tries to make firms adopt smaller prices and wages. The problems associated with direct intervention are the confrontation with trade unions and employers; because prices are much more easily controlled in the public sector, this measure tends to discriminate in favor of private sector. It also distorts market forces, because expanding sectors have difficulty hiring new workers at a low wage, while declining sectors hold on to theirs. Direct intervention policy is more effective in the short-term, but it stores up trouble for the future, because prices tend to rise rapidly as soon as the policy is lifted.

Methodology

There are a variety of ways to estimate the parameter d. In the present study, the estimation procedure followed the one proposed by Geweke and Porter-Hudak (1983), which generalized the definitions of fractional Gaussian noise and integrated or fractionally differenced series and showed that the two concepts are equivalent. Here, the procedure is based on estimation in the paradigm of frequency domain. For the model $(1 - L)^d x_t = \epsilon_t$, where $\{x_t\}$ is assumed to be a time series process, $d \in (-0.5, 0.5)$ and ϵ_t is serially uncorrelated, the spectral density of the time series $\{x_t\}$ is:

$$f_2(\omega; d) = (\sigma^2/2\pi)\,|1 - e^{-i\omega}|^{-2d} = (\sigma^2/2\pi)\{4\sin^2(\omega/2)\}^{-d} \quad (1)$$

A time series with the spectral density $f_2(\omega; d)$ is called an integrated or fractionally differenced series, which suggests that $\lim_{\omega\to 0} \omega^{2d} f_2(\omega; d) = (\sigma^2/2\pi)$ and the autocorrelation function (for $d \neq 0$) is $\rho_2(\tau; d) = \Gamma(10d)\,\Gamma(\tau + d) / \Gamma(d)\,\Gamma(\tau + 1 - d)$, which leads to $\lim_{\tau\to\infty} \tau^{1-2d} \rho_2(\tau; d) = \Gamma(1 - d) / \Gamma(d)$.

Now consider $(1 - L)^d y_t = u_t$, where u_t is a linear and stationary distributed process with the spectral function $f_u(\lambda)$, which is supposed to be finite, bounded away from zero and continuous on the interval $\{-\pi, \pi\}$. Based on this methodology, one has

$$\log\{f_y(\omega_j)\} = \log\{f_u(0)\} - d\log\{4\sin^2(\omega_j/2)\} + \log[f_u((\omega_j)/f_u(0)] \quad (2)$$

and d can be estimated from a regression based on the above equation using spectral ordinates $\omega_1, \omega_2, \ldots, \omega_m$, from the periodogram of y_t, that is $I_y(\omega_j)$:

$$\log\{I_y(\omega_j)\} = a - d\log\{4\sin^2(\omega_j/2)\} + v_j,\ j = 1,2,3,\ldots,n \quad (3)$$

where

$$v_j = \log[f_u(\omega_j)/f_u(0)] \quad (4)$$

and v_j is supposed to be i.i.d. with zero mean and variance $\pi^2/6$. Thus, the least square estimator of d is asymptotically normal. If the number of ordinates n is chosen such that $n = g(T)$, where $g(T)$ is such that $\lim_{T\to\infty} g(T) = \infty$, $\lim_{T\to\infty}\{g(T)/T\} = 0$ and $\lim_{T\to\infty}\{(\log(T)^2 / g(T) = 0$ then the OLS estimator of d in (3) takes the limiting distribution as follows:

$$(\text{est } d - d) / \{var(d)\}^{1/2} \quad \sim N(0,1) \quad (5)$$

when the OLS estimator d is significantly different from zero, the sample of the specific size is fractionally integrated. Here, in this estimation, $n = g(T) = \sqrt{T}$.

Monte-Carlo Design

A standard procedure for dealing with this subject is to analyze the results using Monte-Carlo experiment. The Monte-Carlo experiment consists of generating repeated samples of artificial data (according to some characteristic or properties) for some sample size and then analyzing the behavior of the relevant statistics. In this case, for example, the behavior of the estimates of the fractional parameter is under investigation. One way to do this is to calculate some characteristics of this estimate such as the mean square error (MSE) and the bias. When the size and power of one statistic is the principal object, the number of rejections of the null hypothesis found in all the replications is used.

The data generating process considers the case where there are shock plan or inliers that are short-lived but important in magnitude. In this case, the design follows the procedure of data generating process presented by Cati *et al.* (1999), but modified in the context of fractional integration process. Thus, the procedure is as follows:

$$y_t=\mu + u_t, \qquad \text{for} \qquad t \notin \{t_{i,j}\} \tag{6}$$

$$(1-L)^d u_t=v_t \tag{7}$$

$$y_t=a \qquad \text{for} \qquad t \in \{t_{i,j}\} \tag{8}$$

where, j=1,2,3,…,s and i = 1,2,3,…,n_j. Here, $t_{i,j}$ refers to the time index of the i th observation of plan j. There are s shock plans and each contains n_j observations. The series is a fractional integrated process with a drift μ except when the plan is in effect, in which case the level of the series drops to a value a. For this data generating process $\mu \in [-0.8, 0.8]$ is considered along with a step of 0.4. The parameter a = 0.4. This parameter can be interpreted as the threshold level to which the time series is driven when additive inliers exist or the level to which the time series of inflation is driven after the application of a government shock. Finally, the integration parameter is set at $d \in [-0.96, 0.96]$ with a step = 0.24. The study did not include d = 1, because this case corresponds to the case of unit root and had been previously analyzed by Franses and Haldrup (1994) and Vogelsang (1999). The case where d = -1 is not included either, because it corresponds to the case of an over-differenced time series.

The sample sizes considered in the study are T = 50 and T = 100. We think that these sample sizes are fairly common as in empirical work. For example, sample sizes like T = -50 or T= 100 are frequently found in macroeconomic research. The number of replications considered for each set of parameters was 1000 and a seed = 12345 was used. The number of simulations used is similar to those used in literature (de Pedro, 2001).

The study includes the effect of aberrant observations using three indicators such as the bias, the MSE and the exact size of t-statistic of the estimated fractional parameter d. Bias is defined as the difference between the true parameter value and the expected value of the estimate. In formal expression: bias = $E[\hat{d} - d]$, where E denotes the expectation operator. The MSE is calculated as: MSE $(\hat{d}) = bias^2 - var(\hat{d})^2$, where var denotes variance.

Empirical Results

Results are presented in the Table 1 and Table 2. Let us consider, for example, the case where T = 100 and d = -0.96. In this case, it is observed that the bias and MSE are important, but their magnitude does not change for different values of μ or a. That implies that there is no particular effect of the dimension of the drift parameter or the threshold parameter on the behavior of the bias and the MSE for a particular size of the fractional parameter and a particular sample size. In this particular context, the size distortions are also not very strongly affected, especially for the case of the t-statistic for the null hypothesis that d = 1.

On the other hand, it has been observed that the bias and the MSE decrease when the fractional parameter is closer to zero. When d = 0, again, no particular impact on the bias and the MSE is observed when the values of μ or a are changing. The same conclusion is drawn for the size distortions. When the fractional parameter d > 0, the bias and the MSE are higher. In particular, the bias exhibits more negative value, which implies that the fractional parameter is underestimated. In this case, some changes in the behavior of the bias and the MSE are observed when the drift parameter goes to unity or to -1. In these cases, the bias and the MSE are higher. Any problem is not observed when a = 0 or a = 4, which implies that the threshold parameter has no significant impact on the estimation of the fractional parameter.

A similar behavior is observed in the case of size distortions of the t-statistic. In effect, there are greater distortions when the drift parameter goes to unity or to minus unity. The size distortions of t-statistic of the null hypothesis that d = 1 is more evident when the drift parameter is zero and when a = 0 or a = 4. When the fractional parameter is closer to unity, there is no possibility of rejecting the null hypothesis that d = 0, especially when the drift parameter goes to unity or minus unity. A similar problem in rejecting the null hypothesis that d = 1 is observed, especially when the drift parameter is equal to zero and a = 0 or a = 4.

A different result is observed when the drift parameter is different from zero. In fact, when the drift parameter goes to unity or minus unity, the exact size of the t-statistic of the null hypothesis that d = 1 is correct, including the case when the fractional parameter is closer to unity.

Table 1 Bias, MSE of parameter d, and size of t-statistic with inliers and sample size 50

Parameter d	μ	a	Bias	MSE	Size of t-statistic $H_0 : d = 0$	Size of t-statistic $H_0 : d = 0$
-0.96	-0.8	0	1.12	1.41	0.11	0.65
	-0.4	4	1.04	1.25	0.11	0.69
	0	0	1.01	1.17	0.12	0.72
	0.4	4	1.03	1.24	0.11	0.71
	0.8	0	1.15	1.48	0.10	0.66
-0.72	-0.8	0	0.88	0.94	0.10	0.63
	-0.4	4	0.82	0.83	0.12	0.67
	0	0	0.79	0.77	0.11	0.70
	0.4	4	0.81	0.82	0.10	0.69
	0.8	0	0.92	1.00	0.09	0.65
-0.48	-0.8	0	0.64	0.57	0.11	0.64
	-0.4	4	0.60	0.51	0.11	0.65
	0	0	0.57	0.48	0.11	0.66
	0.4	4	0.59	0.51	0.09	0.66
	0.8	0	0.68	0.60	0.09	0.66
-0.24	-0.8	0	0.40	0.31	0.11	0.64
	-0.4	4	0.38	0.30	0.12	0.65
	0	0	0.38	0.29	0.12	0.65
	0.4	4	0.39	0.31	0.12	0.64
	0.8	0	0.43	0.32	0.12	0.64
0	-0.8	0	0.18	0.18	0.15	0.63
	-0.4	4	0.19	0.19	0.15	0.63
	0	0	0.19	0.19	0.15	0.63
	0.4	4	0.20	0.20	0.15	0.63
	0.8	0	0.21	0.21	0.15	0.63
0.24	-0.8	0	0.06	0.13	0.17	0.53
	-0.4	4	0.03	0.15	0.19	0.55
	0	0	0.04	0.15	0.21	0.57
	0.4	4	0.05	0.13	0.20	0.58
	0.8	0	0.06	0.14	0.18	0.54

Table 1 (Continued)

0.48	-0.8	0	-0.12	0.09	0.07	0.35
	-0.4	4	-0.13	0.14	0.19	0.46
	0	0	-0.08	0.16	0.30	0.46
	0.4	4	-0.12	0.14	0.21	0.44
	0.8	0	-0.12	0.10	0.06	0.32
0.72	-0.8	0	-0.42	0.22	0	0.28
	-0.4	4	-0.36	0.23	0.11	0.34
	0.4	0	-0.21	0.18	0.38	0.32
	0.4	4	-0.39	0.22	0.10	0.31
	0.8	0	-0.42	0.22	0	0.60
0.96	-0.8	0	-0.72	0.53	0	0.32
	-0.4	4	-0.66	0.49	0.04	0.34
	0	0	-0.39	0.28	0.38	0.25
	0.4	4	-0.65	0.47	0.03	0.33
	0.8	0	-0.72	0.53	0	0.32

Source: Based on simulation results

Table 2 Bias, MSE of parameter d, and size of t-statistic with inliers and sample size 100

Parameter d	μ	a	Bias	MSE	Size of t-statistic $H_0 : d = 0$	Size of t-statistic $H_0 : d = 0$
-0.96	-0.8	0	0.94	0.96	0.07	0.94
	-0.4	4	0.89	0.88	0.09	0.95
	0	0	0.88	0.85	0.10	0.96
	0.4	4	0.89	0.87	0.09	0.96
	0.8	0	0.93	0.94	0.07	0.95
-0.72	-0.8	0	0.69	0.55	0.07	0.95
	-0.4	4	0.65	0.49	0.09	0.95
	0	0	0.64	0.48	0.10	0.95
	0.4	4	0.65	0.49	0.10	0.95
	0.8	0	0.68	0.54	0.08	0.95
-0.48	-0.8	0	0.44	0.26	0.07	0.95
	-0.4	4	0.42	0.24	0.08	0.96
	0	0	0.41	0.24	0.10	0.96
	0.4	4	0.42	0.25	0.09	0.95
	0.8	0	0.44	0.26	0.08	0.96
-0.24	-0.8	0	0.22	0.11	0.06	0.94
	-0.4	4	0.21	0.11	0.07	0.95
	0	0	0.22	0.11	0.07	0.96
	0.4	4	0.22	0.11	0.07	0.94
	0.8	0	0.22	0.12	0.08	0.94

Table 2 (Continued)

0	-0.8	0	0.06	0.06	0.07	0.93
	-0.4	4	0.06	0.06	0.07	0.93
	0	0	0.06	0.06	0.07	0.93
	0.4	4	0.06	0.06	0.07	0.93
	0.8	0	0.06	0.06	0.07	0.93
0.24	-0.8	0	-0.09	0.09	0.13	0.87
	-0.4	4	-0.06	0.08	0.16	0.83
	0	0	-0.04	0.07	0.16	0.85
	0.4	4	-0.06	0.07	0.16	0.88
	0.8	0	-0.10	0.09	0.11	0.88
0.48	-0.8	0	-0.35	0.16	0.04	0.95
	-0.4	4	-0.25	0.12	0.17	0.83
	0	0	-0.10	0.08	0.36	0.68
	0.4	4	-0.26	0.14	0.17	0.83
	0.8	0	-0.36	0.17	0.04	0.95
0.72	-0.8	0	-0.54	0.3	0	1
	-0.4	4	-0.51	0.29	0.09	0.93
	0.4	0	-0.23	0.12	0.52	0.51
	0.4	4	-0.51	0.30	0.07	0.93
	0.8	0	-0.54	0.30	0.01	1
0.96	-0.8	0	-0.72	0.53	0	1
	-0.4	4	-0.72	0.53	0.03	0.99
	0	0	-0.46	0.28	0.51	0.52
	0.4	4	-0.72	0.54	0.03	0.99
	0.8	0	-0.72	0.53	0	1

Source: Based on simulation results

In summary, when there are additive inliers, the bias and the MSE are higher when the drift parameter goes to unity or to -1, especially when d > 0. On the other hand, no particular effects are observed on the exact size of the t-statistic caused by the behavior of the parameter a. This means that the threshold parameter has no important effects on the estimation of the fractional parameter. Following the example of inflation analyzed by Cati *et al.* (1999), it is reconfirmed that the level to which inflation falls after the application of a government program (i.e. an inlier) has no bearing on the estimation of the fractional parameter or the persistence of the inflation process. Size distortions for the t-statistic of the null hypothesis that d = 0 are observed and they are higher when the drift parameter is close to the unit circle. On the contrary, the exact size of the t-statistic of the null hypothesis that d = 1 is vulnerable when $\mu = 0$.

In recent years, there has been considerable debate about the time series properties of inflation rates. The issue is relevant for estimation, policy making and forecasting. The behavior of inflation rates is crucial for choosing the appropriate economic policy (Balcõlar, 2003). Some view that inflation rates are unit root time series. Thus, shocks have a permanent impact on inflation. The unit root inflation rates construe the orthodox anti-inflation policies as inappropriate as well as complicating the derivation of optimal monetary policy (McCallum, 1988).

The essence of the overall results of the simulation implies that the level to which inflation falls after the application of a government programs (in other words, there are additive inliers) has no impact on the estimates of the fractional parameter or on the persistent of the inflation process. That means any abrupt government intervention would have temporary rather than permanent effects on lowering the inflation rates, and the series remains stationary. The findings affirm the conclusion that the stochastic behavior of the inflation rate is indeed unstable. Therefore, it is found that any government intervention is merely a temporary measure to control high inflation, which highlights the need for alternative measures of monetary policy. In this regard, Kydland and Prescot (1977) could be recommended as an alternative policy measure to pursue. They marshaled time-consistent policy in their studies based on which Kydland and Prescot won the Nobel Prize for Economics in 2004. and the gist of which has been briefed in the following section.

Time-Consistent Economic Policy

In the late 1950s and early 1960s, the conventional wisdom, summarized in the so-called Phillips curve, was that economic policy could permanently reduce unemployment by allowing for high inflation. In the late 1960s and early 1970s, however, several economists began to question this view. Milton Friedman, 1976 Economics Nobel winner and Edmond Phelps showed that there exists a long-run equilibrium level of unemployment independently of the rate of inflation. Unemployment can be reduced below this equilibrium level through higher inflation, but only in the short run. In the long run, inflationary expectations and wage increases adjust to actual inflation, which then brings unemployment back to its equilibrium level (Friedman, 1994).

Kydland and Prescott (1977) studied aggregate economic phenomena, such as inflation, fluctuations in production and employment, and long-run growth. They showed that economic policymakers who cannot commit to a rule in advance often will conduct a policy that gives rise to high inflation, despite their stated objective of low inflation. They presented this as one of several examples of a general problem in economic policymaking: *the time consistency problem.* The essence of this time consistent monetary policy given by the Nobel Committee (2004: 2) is worthwhile citing here in this respect:

> " [It] is a policy which economic policymakers regard as the best option in advance,when it can influence households' and firms' expectations about policy, will often not be implemented later on, when these expectations have already formed and shaped private behavior. Economic policy makers will therefore revise their decision; so that the policy they ultimately conduct will be worse than if they had had less discretion in policy choice. This result does not hinge on policymakers being guided by objectives different than those of citizens at large; rather, the difference appears in the constraints on the economic policy problem at different points in time."

A noteworthy example of time consistency problem is provided here for better understanding. Assume that the objective of the policymakers is low inflation and that they announce such a policy. Assume further that this results in low inflationary expectations and therefore small wage increases. In retrospect, it may be tempting to conduct a more inflationary monetary policy (through low interest rates), as this would reduce unemployment in the short run. Kydland and Prescott stated that such temptations could result in the economy getting trapped in high inflation without no effect on unemployment. If employers and wage-earners understand the policymakers'motives, the announcement of low inflation loses its credibility: high and self-fulfilling inflationary expectations give rise to large enough increases in wages that unemployment never declines. Nonetheless, there have been other possibilities to explore in this regard. Policy makers should understand the short term effects of government control on inflation and adopt pragmatic measures to attain the goals under the existing inflationary monetary condition in the economy.

Conclusion

This article analyzed the impact of additive inliers on the estimated long memory fractional parameter and their implication on controlling inflation, which can pose a serious threat to aggregate output, employment and wage rates as well as the stability of an economy. The simulation results suggest that additive inliers or government action plans have only short-run effects on the fractional parameter; it has no impact on the persistence of the inflation process. In other words, government intervention is only a short-term remedy. If this is the case, it is imperative to pursue potential alternatives for monetary policy particularly for inflationary control. In this respect, the theory of time-consistency offered by the Nobel Laureates in Economics in 2004 could be explored as a second-best alternative. This measure adheres to nominal anchor that forces a nation's monetary authority to adopt a monetary policy that confines inflation rates within a narrow range. Thus, adopting the measure would avoid the inconsistency problem as it provides a constraint on discretionary policy, which would bring the persistent effect on lowering the high inflation rate on the economy in order to sustain a healthy monetary policy.

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