Inflation in Argentina. Analysis of persistence using fractional integration

by

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Abstract

This paper deals with the analysis of the persistence in the inflation rate in Argentina. For this purpose we use fractionally integrated techniques based on monthly and annual data. The results show evidence of fractional integration and long memory behavior in both cases, being especially noticeable in the case of monthly data with shocks having long-lived effects.

JEL classification: C22, E31

Key words: Inflation; Argentina: persistence; fractional integration

Resumen

Este trabajo aborda el análisis de la persistencia en la tasa de inflación en Argentina. Para este fin, utilizamos técnicas fraccionalmente integradas basadas en datos mensuales y anuales. Los resultados muestran evidencia de integración fraccional y comportamiento de memoria larga en ambos casos, siendo especialmente notable en el caso de datos mensuales con shocks que tienen efectos de larga duración.

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1 Introduction

Throughout most of its recent and not so recent history, the Argentinian economy has been characterized by high inflation rates, not only with respect to the levels that are usually considered acceptable in a stable economy, but also with respect to other countries, both in the region and across the globe. Such is the magnitude of the problem facing the country that in recent years it has been clearly situated among the three economies with the highest levels of annual inflation, when the international tendency is to present moderate or even low levels. But again, this is not new. For at least the last 70 years, Argentina has regularly reported double-digit annual inflation rates, including some years in which three digit inflation was reached, and even two years in which (hyper) inflation levels far exceeded 1000%. In this context, inflation in Argentina seems to have become the norm, while the years in which there was no inflation or there were acceptable levels seem to be the exceptions. Or in other words, inflation in Argentina seems to have a rather important persistence component. Thus, the objective in this paper is to study the statistical characteristics of the inflation series of Argentina to verify if, as expected, there is evidence of persistence and eventually determine the degree of it.

There are several papers in the literature that have analyzed the persistence of the inflation series in Argentina. For instance, D'Amato, Garegnani and Sotes (2007), D'Amato and Garegnani (2013) and Pastor Rueda (2014) have obtained evidence that the inflation series of Argentina are persistent, with the reservation of indicating that the degree of its persistence changes if it is considered a constant mean or variant in time. On the other hand Capistrán and Ramos-Francia (2006), in a broader study involving several countries in Latin America, have found indications of inflationary persistence for Argentina which has declined over time. All these works have two aspects in common, in addition to the results they have reached. The first one is the extension of the series of inflation that they use for their study, since they are concentrated in the period that stretches from the 1970s to the middle of the first decade of the 21st century. The second one, and which is the more important, is that the calculation of inflationary persistence is performed by adding the autoregressive components of the AR(p) model defined for the series of inflation, following both Andrews and Chen (1994) and Marques (2004).

It is in these points where the main difference lies with the approach used in this work which will enable us to contribute to the existing literature. First, the study will be carried out on a larger sample, ranging from 1943 to mid-2017, which is the period for which official statistics exist. Then, in this paper, the persistence of the inflation series in Argentina will be studied through the use of fractional integration, a process that is more flexible than the ARMA processes, which represent I(0) or stationary processes, and the ARIMA processes, or I(1), that is to say, those processes that present a unit root. In this way, in the fractional integrated models, or ARFIMA (p, d, q) models, the integration component "d" can assume any real value between 0 and 1 or even above 1. Thus, these models can identify different degrees of memory of the series, with respect to the influence that past behavior possesses in the posterior values. Moreover, and unlike other measures of persistence that use short-term parameters -autoregressive or moving averages-, the ARFIMA (p, d, q) models analyze the long-term behavior of the series. Thus, in these models, when speaking of persistence, we speak of long memory, which, according to Lemus and Castaño (2013), "*[...] is usually understood as the existence of a not insignificant dependence between observations that are distant from each other for long periods of time*", where "*[...] the degree of memory and stationarity of the process is defined by the fractional differentiation parameter d, which takes values in a continuous range of real numbers.*"

These results reinforce the main hypothesis of this study which is that the time series of inflation in Argentina have statistical persistence or long memory, in terms of fractional integration. Furthermore, the study of the statistical persistence of the inflation series in Argentina may yield results that can be translated into economic policy implications. Thus, determining that the series is persistent, or has long memory, would indicate that not only does the series depend in a non-negligible way on values more or less removed from the variable in the past but that it can also present mean reversion, that is, that the values of the variable will tend to return to its mean value after a shock. Thus, a recommendable policy would be to avoid provoking sudden shocks to try to lower inflation, since inflation would return to its average value in any case and the costs in terms of other variables (production, employment, etc.) could be too high and, ultimately, sterile.

This paper is structured as follows: Section 2 describes the evolution of inflation in Argentina during the period under analysis, from a historical perspective. Section 3 briefly reviews the literature regarding the study of the persistence of inflation in Argentina. The explanation of the methodology used, that is the theoretical aspects of ARFIMA (p, d, q) processes, is the subject of Section 4. Section 5 presents the data and the results obtained in the study. Finally, Section 6 presents the main conclusions.

2 Historical Context

Since the 1940s policies have been in place to increase demand; increases that could not be compensated proportionally with corresponding increases for supply, one reason why this rigidity began to become a characteristic of the national economy from then on. On the other hand, the growth of domestic demand brought about both an increase in imports and a decrease in exports as a consequence of the greater volume of the domestic market. Thus, the trade balance started turning negative, which led to a devaluation of the currency to mitigate this situation; devaluation brought about by the rise in domestic prices.

Throughout the 1950s, as a result of the high inflation rates experienced during the previous decade, various governments implemented adjustments mainly through currency devaluation and wage freezing. Nevertheless, in 1959, three-digit annual inflation rate - 114% - (Chitarroni 2014) was surpassed for the first time in the history of the country due to sharp increases in transport and public service tariffs and a devaluation of the order of 50%. In the first half of the 1960s, public expenditure increased considerably to around 15% of GDP, with a parallel growth of 40% in the monetary base, so that inflation began to increase gradually, from 22% in 1964 to 32% in 1966 (Chitarroni, 2014). As of 1966, the fight against inflation was seen as an indispensable tool to attract foreign capital, but in 1973, especially as a result of the oil crisis in the central countries, inflation rose again. In 1975, the government carried out a strong orthodox adjustment that became to be known as "Rodrigazo": a devaluation of approximately 160% and severe increases in transport and fuel tariffs that took inflation to a new historical record of 180%. In the second half of the 1970s, efforts were made to curb inflationary inertia through a freeze in wages, the liberalization of food prices, the external opening of the economy and the revaluation of the peso. Inflation in those years fell from 444 per cent in 1976 to 176 per cent in 1977 and to about 100 per cent in 1980 and 1981, and then rose to 165 per cent in 1982 and to 344 per cent in 1983 (Chitarroni, 2014).

In 1984 inflation remained at the very high value of 626%. In 1985 a series of orthodox measures were taken to curb the rise in prices, such as a sharp devaluation, limited money supply and cutbacks in public spending and tariff increases to prepare the ground for what would be the main tool to attack inflation: the Austral plan, the ideological basis of which was to cut off inflationary expectations to stem the escalation of prices. The currency symbol was changed, the Austral was created, the prices of the economy were frozen, and the Central Bank could no longer finance the government's financial imbalances. The favorable effects of the plan were seen in the following years, in which inflation fell to 90% in 1986 and 130% in 1987 (Chitarroni, 2014). However, in 1989, there was a run against the Austral, which led to a sharp devaluation that quickly transferred to prices, culminating in that year with a (hyper) inflation of 3080%, which would be the historical record for the country and would maintain its effect the following year, when there was a price increase of 2300% despite the measures taken by the government.

In 1991, the convertibility law sought to explicitly combat inflation, as it required that every peso in the economy should have its backing in the US currency to maintain absolute parity. The measure was successful in its objectives since inflation fell sharply from its implementation until 1996 during which it was practically 0%. The international crises of the time involved a strong outflow of capital, so that the amount of money in the economy should be reduced to maintain parity, which generated a strong economic contraction that began to worsen until it became unsustainable. In 2001, a freezing of deposits (known as "corralito") to avoid the exit of dollars resulted in a greater recession and a social outbreak that forced the abandonment of the convertibility soon after. Thus, in 2002 there was a very significant devaluation of the peso, which only partially moved to prices, given the very low level of activity in the economy.

From 2003 inflation was able to be kept in check because there was a large idle capacity in the national economy that was used to generate strong growth. After 2007, however, as the favorable conditions underpinning the growth cycle were coming to a close, inflation would begin to take on increasing values as both cost inflation and demand inflation were combined and when the external constraint reappeared.

Strong devaluations took place in 2014 and 2015, which moved rapidly to prices, and in the latter year there was also a sharp rise in food prices in the domestic market which also had an impact the following year in which sharp increases in fuels and in utility tariffs as well, caused inflation to reach around 40%.

3 Literature Review

There are several papers in the literature that have analyzed the persistence of the inflation series in Argentina. In those shown in this section, the calculation of inflationary persistence is based on the sum of the autoregressive components of the AR (p) model defined for the inflation series, following both Andrews and Chen (1994) and Marques (2004). In addition, they all use inflation series from Argentina that begin, mostly, in the 1980s and culminate in the middle of the first decade of the twenty-first century. Thus, for example, D'Amato, Garegnani and Sotes (2007) analyze the time series of Argentine inflation from 1980 to 2007 and find that the statistical persistence of inflation for the whole sample is 0.8, a high value of persistence, when considering a constant mean for the series, and that this decreases to 0.56 when they allow changes in the mean, that is to say, when they use a mean variable in time. In a later work, D'Amato and Garegnani (2013) increase the size of the sample and work with a series that begins in 1961 and extends until 2006, again finding evidence of a high degree of persistence for the whole sample, 0.78, considering a constant mean for the series, which decreases considerably to 0.31 when considering a variable mean. Pastor Rueda (2014) extends the first mentioned paper in this section, increasing the sample until 2013, also concluding that there is a high persistence component for the entire series under study, 0.81, again with a constant mean for the sample, which decreases to 0.51 for a time-varying mean of the series.

In a wider-reaching study that involves several Latin American countries, Capistrán and Ramos-Francia (2006) found indications for Argentina of inflationary persistence. Specifically, using a series that also begins in 1980 and ends in 2006, they obtained a persistence value for the entire sample of 0.85, which decreases to 0.58 when the existence of structural breaks in the mean value of the series is considered. In addition, they complemented their study by analyzing the values of persistence for each of the decades covered by their work, finding empirical foundations that show that these diminished over time.

These results reinforce the main hypothesis of the present study that the inflation time series in Argentina have persistence or, in the terms of fractional integration, they present long memory behavior. To the extent of our knowledge this is the first paper studying persistence in the Argentinian inflation using fractionally integrated methods.

4 Methodology

In this paper we look at the degree of persistence of the inflation rate in Argentina by using I(d) or fractionally integrated techniques. Traditionally, persistence has been measured either by using a simple AR(1) model and looking at its coefficient, or alternatively, in a more general way, with an AR(p) process and computing the sum of all the AR coefficients. Nevertheless, this approach imposes that inflation is an integrated of order 0 (I(0)) process and persistence is simply described by the AR structure. This is quite restrictive in the sense that inflation might follow a unit root or I(1) process, or more generally, it might be I(d) where d can be a value constrained between 0 and 1 or even above 1. Thus, we suppose that inflation follows an I(d) structure of the form:

$$(1 - B)^d x_t = u_t , \qquad t = 1, 2, ..., \qquad (1)$$

where B refers to the backshift operator ($Bx_t = x_{t-1}$); u_t is an I(0) process (and thus, it may incorporate weak autocorrelation of the AR(MA) form) and, to allow more degree of generality, x_t can be the errors in a regression model that may incorporate deterministic terms such as an intercept or a linear time trend, i.e.,

$$y_t = \beta_0 + \beta_1 t + x_t; \qquad t = 1, 2, ..., \qquad (2)$$

where y_t refers then to the inflation rate series.

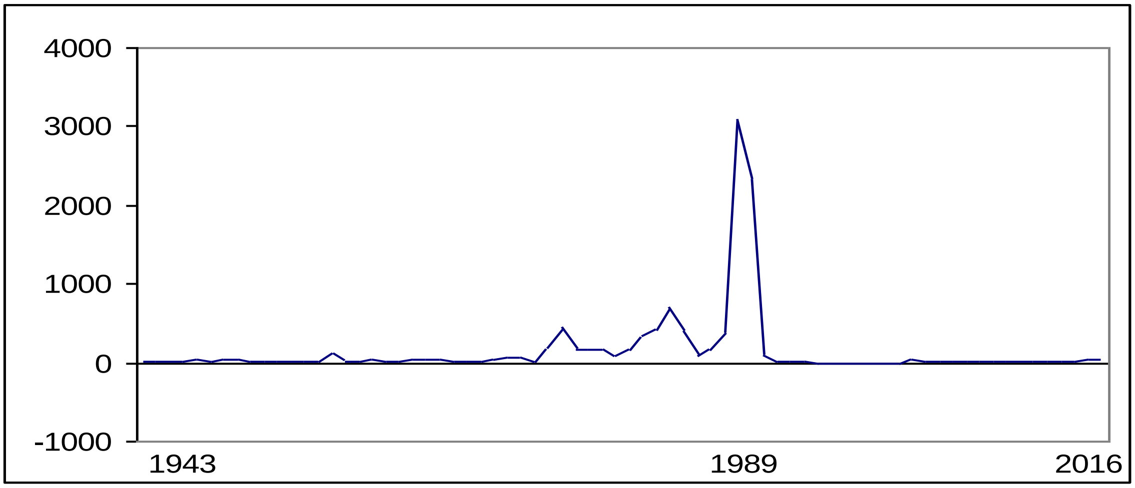
Note that if u_t in (1) is an ARMA(p, q) process, x_t becomes ARFIMA(p, d, q), which includes the standard ARMA and ARIMA models as particular cases of interest with d = 0 and d = 1 respectively. However, by allowing d to be a fractional value, we allow for a much higher degree of flexibility in the dynamic specification of the series, and the higher the value of d is, the higher the level of persistence is. Moreover, the series may be covariance stationary though with long memory behavior (in the case of $0 < d < 0.5$) and even nonstationary though mean reverting if $0.5 \leq d < 1$. These types of processes were introduced in the 80s by Granger (1980; 1981), Hosking (1981) and Granger and Joyeux (1980) but it was not until the late 90s that they became popular in the analysis of macroeconomic series, (see, e.g. Baillie, 1996; Gil-Alana and Robinson, 1997; Michelacci and Zaffaroni, 2000; etc.), including the analysis of inflation rates (Hassler and Wolters, 1995; Baillie et al., 1996; Baum et al., 1999; Hyung et al., 2006; Kumar and Okimoto, 2007; Hassler and Meller, 2014; Canarella and Miller, 2017; etc.). Nevertheless, most of the papers have focused on developed countries, such as the UK, the US, France, Germany and Switzerland (Hassler and Wolters, 1995), the US (Hyung et al., 2006; Hassler and Meller, 2014), the G7 countries (Baillie et al., 1996; Kumar and Okimoto, 2007), etc., and little attention has been paid to developing countries. Among the few papers in which we find studies on fractional integration with inflation rates are Carcel and Gil-Alana (2017) for the Central American countries and Gil-Alana and Mudida (2017) for the Kenyan economy. This paper is the first attempt to examine this issue in a South American country such as Argentina.

5 Data and empirical results

The data examined in this paper correspond to the series of historical inflation of Argentina since the country started presenting official statistics up to the present, both with annual and monthly periodicity. In the annual series, data are from 1945 to 2016 and have been obtained from the "Instituto Nacional de Estadísticas y Censos" (INDEC), which is the official body responsible for carrying out price index measurements and, from these, inflation rates in the country. The monthly series, for its part, starts in February 1943 and reaches June 2017, and was obtained from the portal inflacionverdadera.com, which is a source widely consulted and respected in the country when regarding calculations of inflation and which, among others, uses the INDEC´s data.[1]

[1] For a detailed description of both the source and the methodology used for the construction of the monthly series, see http://www.inflacionverdadera.com/argentina and, more precisely, http://www.mit.edu/~afc/papers/FillingTheGap_es.pdf

Annual data (1945 – 2016)



Monthly data (01/02/1943 - 01/06/2017)

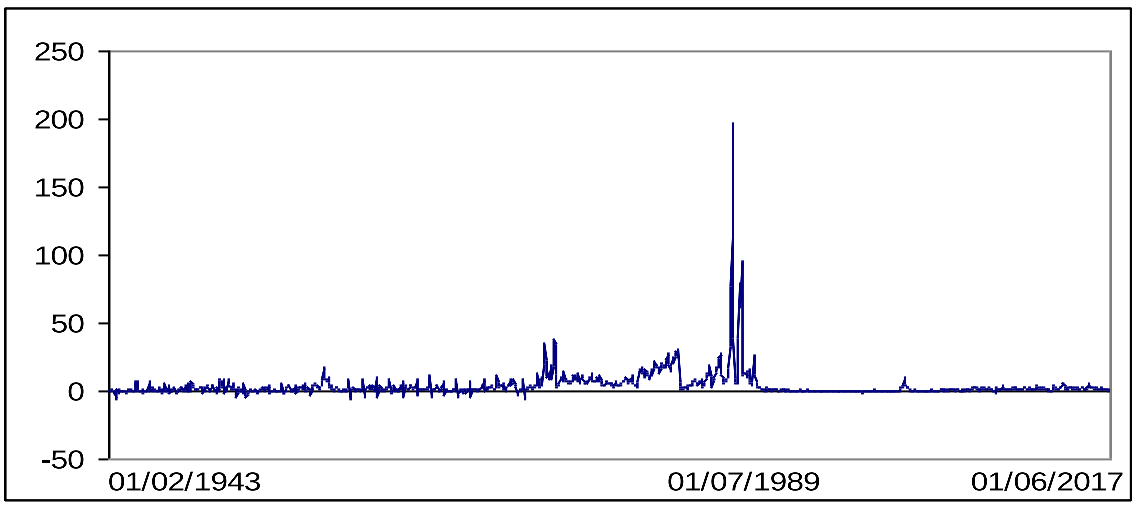


Figure 1. Time series plots of Argentina´s inflation

Figure 1 graphically depicts the behavior of both series. As can be seen, the very high inflation rates recorded in the late 1980s and early 1990s raise the scale too much, making it difficult to interpret the graphical behavior of the series as a whole. Nevertheless, it is possible to observe that inflation in Argentina has been present for practically the last 70 years, beginning to assume really high values from the 1970s onwards and mainly during the 1980s, until reaching the maximum peaks in 1989 and 1990. Then, from 1991, it is reduced practically to 0 for approximately 10 years, only to begin to reappear in the 2000 and to rise gradually until the present time.

As earlier mentioned we examined two data frequency, annual and monthly. Thus, we start with the annual data.

5.1 Annual data

As a preliminary step in this section, we examine persistence in the Argentinian inflation by looking at simple autoregressive structures, first assuming a simple AR(1) process, and then, considering a general AR(p) with p selected by standard likelihood criteria. The results here indicate that for the simple AR(1) model, the estimated coefficient is equal to 0.542, and the sum of the AR coefficients in various AR(p) type process is displayed in Table 1. We see here that the values range between 0.401 (p = 2) and 0.595 (p =5) suggesting a medium-low degree of persistence.

Table 1. Measure of persistence using the AR models

P	Sum of AR coeffs.	AIC	BIC	HQ
1	0.54287	1065,76	1072,59	1068,48
2	0.40106	1059.81	1068.92	1063.44
3	0.52280	1058.66	1070.05	1063.19
4	0.49327	1060.37	1074.03	1065.80
5	0.59567	1059.16	1075.10	1065.51
6	0.55858	1060.47	1078.68	1067.73

In the fractional context, we first consider the model given by (2) and (1), i.e,

$$y_t = \alpha + \beta t + x_t, \quad (1 - B)^d x_t = u_t, \quad t = 1, 2, ..., \tag{3}$$

testing the null hypothesis:

$$H_o : d = d_o, \tag{4}$$

in (3) for d_o-values equal to -1, -0.99, …. -0.01, 0, 0,01, … , 0.99 and 1 under different modelling assumptions for the I(0) error term u_t. For this purpose, we use a version of the Lagrange Multiplier (LM) tests of Robinson (1994), which is fairly convenient, first because it allows us to test any real value, including those values which are away from the stationary region ($d \geq 0.5$). Moreover, its limit distribution is standard N(0, 1) and it is the most efficient test in the Pitman sense against local departures from the null.[2]

Among the assumptions for the error term, we first suppose u_t is a white noise process; then, we also consider AR(1) and AR(2) processes along with a non-parametric specification proposed by Bloomfield (1973) that approximates ARMA processes with very few parameters. This latter method accommodates extremely well in the context of the tests of Robinson (1994) and it is stationary across all its values (see, e.g. Gil-Alana, 2004). With respect to the deterministic terms, we consider the three standard cases examined in the literature, that is, i) with no terms, ii) with a constant, and iii) with a constant and a linear time trend, and choose the one that produces statistically significant coefficients.

Table 2. Estimated values of d for the annual inflation rates

	No terms	An intercept	A linear time trend
White noise	0.485 (0.256, 0.921)	**0.486 (0.262, 0.921)**	0.487 (0.259, 0.921)
AR (1)	0.039 (-0.160, 0.217)	**0.043 (-0.172, 0.224)**	0.033 (-0.178, 0.226)
AR (2)	0.289 (-0.114, 0.962)	**0.302 (-0.097, 0.962)**	0.298 (-0.088, 0.962)
Bloomfield autoc.	-0.161 (-0.324, 0.072)	**-0.197 (-0.422, 0.088)**	-0.218 (-0.461, 0.074)

In bold, selected coefficients according to the deterministic terms.

Table 2 displays the estimated value of d along with the 95% confidence band of the non-rejection values of do in Ho in (4) using Robinson's (1994) tests for the four types of disturbances. The first thing we observe is that the time trend is found to be statistically insignificant in the four cases examined, the intercept being sufficient to describe the deterministic terms. Starting with the case of white noise errors, the estimated value of d is 0.486 with a confidence band (0.262, 0.921), and thus, rejecting the two hypotheses of I(0) and I(1) behavior. According to this initial result,

[2] See Robinson (1994).

inflation in Argentina, though stationary and mean reverting, is highly persistent showing long memory behavior. However, if (weak) autocorrelation is permitted, the estimated values are 0.043 (AR(1)); 0.302 (AR(2)) and -0.197 (with Bloomfield errors), and the I(0) hypothesis cannot be rejected in any single case, thus implying short memory behavior. Because of this, we further examine the short run dynamics of the series and propose a battery of ARFIMA(p, d, q) models, with p and q smaller or equal than 3 and choosing the best one through likelihood criteria. The results are displayed in Table 3.

Table 3. Estimates of ARFIMA(p,d,q) models

(p, q) values	d	Log likelihood	AIC	BIC
(0, 0)	0.395	-534.930	1069.86	1069.86
(1, 0)	0.017	-529.879	1061.75	1064.03
(0, 1)	**0.042**	**-521.769**	**1045.53**	**1047.81**
(1, 1)	0.048	-521.768	1047.53	1052.09
(2, 0)	0.229	-525.221	1054.44	1058.99
(2, 1)	-0.107	-521.516	1049.03	1055.85
(0, 2)	0.046	-521.768	1047.53	1052.07
(1, 2)	-0.778	-521.029	1048.06	1054.89
(2, 2)	-0.742	-521.029	1050.06	1059.16
(3, 0)	-0.492	-523.863	1053.72	1060.55
(3, 1)	-0.854	-520.938	1049.87	1058.96
(3, 2)	-0.710	-520.993	1051.98	1063.36
(0, 3)	-0.083	-521.484	1048.96	1055.79
(1, 3)	-0.902	-520.993	1049.98	1059.08
(2, 3)	-0.003	-521.289	1052.57	1063.96
(3, 3)	0.071	-521.228	1055.45	1068.12

In bold, selected model according to the likelihood criteria.

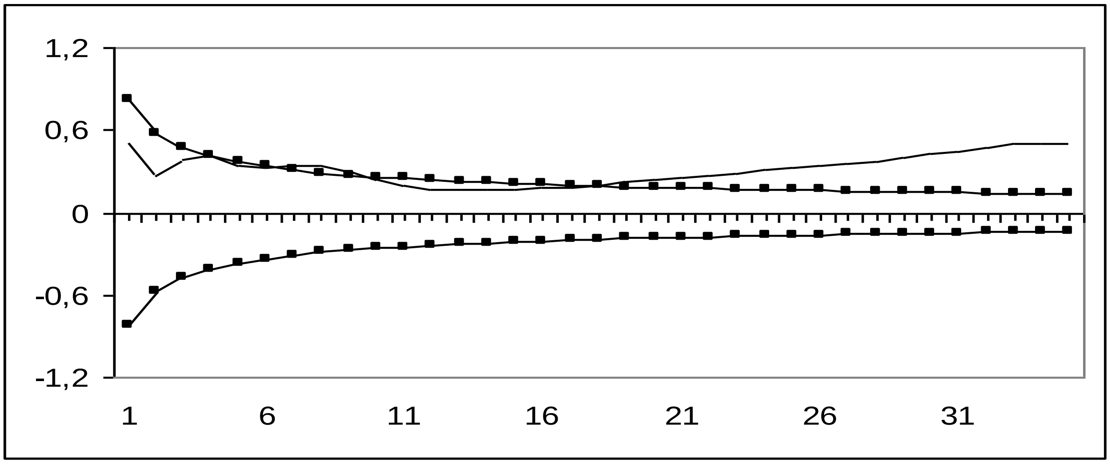
We observe in Table 3 that the estimated values of d are extremely sensitive to the choice of the short run (ARMA) components, and according to the likelihood criteria, the ARFIMA (0, d, 1) is chosen, with an estimated value of d of 0.042 and thus, showing lack of long memory behavior. Nevertheless, and based on the lack of robustness of our results, we also estimate the value of d using a semiparametric approach, where no functional form is imposed on the error term. In other words, we simply assume that u_t is I(0) and focus mainly on the differencing parameter. We use here a "local" Whittle estimated in the frequency domain, as initially proposed by Robinson (1995) and later extended and improved by Velasco (1999), Shimotsu and Phillips (2005), Abadir et al. (2007) and others.

Table 4. Estimates of d based on a semiparametric method

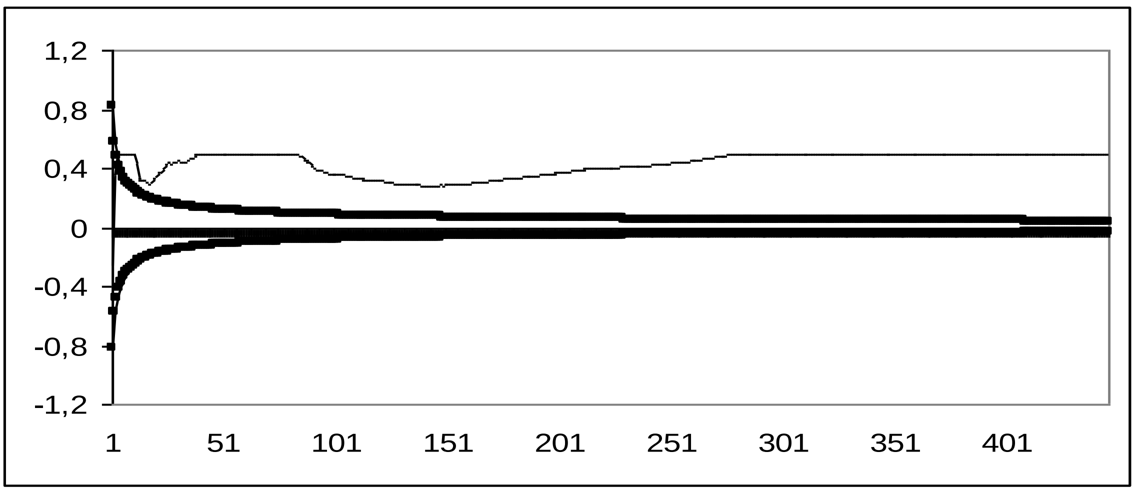
m	d
6	0.330
7	0.337
8	0.344
9	0.298
10	0.245
11	0.196

Table 4 displays the estimated values of d for a selected group of bandwidth numbers from m = 6 to 11. We see that the estimated values of d range now between 0. 196 (m = 11) and 0.344 (m =8) suggesting stationary and mean reverting long memory behavior. The choice of m is quite important in this context since the estimates of d can be very sensitive to this number. It reflects the trade-off between bias and variance: the asymptotic variance is decreasing with m while the bias is growing with m.

Annual data (1945 – 2016)



Monthly data (01/02/1943 - 01/06/2017)



The thick lines refer to the 95% band for the I(0) hypothesis.

Figure 2. Estimates of based on a semiparametric method

The upper part of Figure 2 displays the estimates of d for the whole range of values of m. We see that apart from some initial values of m (which are within the I(0) interval), most of the values are in the upper limit or above, suggesting some degree of fractional integration and long memory behavior. Next we move to the monthly frequency

.

5.2 Monthly data

As expected, monthly data presents higher volatility than the annual data (see Figure 1). We start this section by computing various AR(p) processes with p descending from 12 to 6 and computing the sum of all its coefficients and then the sum of only those which are statistically significant. The results are reported in Table 5.

Table 5. Estimates of AR coefficients with the monthly data

AR(p)	Sum of coeff.	Sum* of coeff	AIC	BIC
12	0.8708	0.9945	6002.68	6069.82
11	**0.8711**	**0.9936**	**6000.69**	6063.03
10	0.8587	0.8917	6006.08	6063.62
9	**0.8478**	**0.9958**	6008.90	**6061.65**
8	0.8651	1.0393	6022.91	6070.87
7	0.8316	0.7965	6058.80	6101.97

In bold the selected models according to the AIC and BIC.

We see in the table that persistence in relatively high in all cases. The AIC chooses the AR(11) while the BIC the AR(9). The sums of their respectively coefficients are 0.8711 and 0.8478, and including only the significant coefficients 0.9936 and 0.9958, which are values substantially higher than those observed with the annual data.

If we focus on a fractional structure (Table 6) we display the results for white noise errors, Bloomfield and seasonal (monthly) AR. In the three cases the intercept seems to be the only deterministic term required, and the estimated value of d is found to be statistically significant in the three cases ranging from 0.332 (Bloomfield) to 0.564 (white noise and monthly AR). Using the semiparametric local Whittle approach of Robinson (1995) the values of d are also high ranging from 0.430 (m = 26, 27) to 0.463 (m = 35). The lower part of Figure 2 displays the estimates for all bandwidth numbers and we see that all the estimates of d are considerably above the I(0) interval. Thus, the monthly inflation rates also display fractional integration and long memory behavior, implying persistence and long-lived effects of shocks.

Table 6. Estimated values of d for the monthly inflation rates

	No terms	An intercept	A linear time trend
White noise	0.564 (0.502, 0.640)	**0.564 (0.501, 0.640)**	0.564 (0.502, 0.641)
Bloomfield autoc.	0.332 (0.279, 0.407)	**0.332 (0.281, 0.407)**	0.332 (0.281, 0.407)
Monthly AR(1)	0.564 (0.502, 0.641)	**0.564 (0.502, 0.641)**	0.564 (0.502, 0.641)

In bold, selected coefficients according to the deterministic terms.

Table 7. Estimates of d based on a semiparametric method

m	d
25	0.434
26	0.430
27	0.430
28	0.439
29	0.447
30	0.454
31	0.447
32	0.443
33	0.447
34	0.451
35	0.463

6 Concluding comments

In this paper we have examined annual and monthly inflation rates in Argentina by means of fractional integration or I(d) methods and using both parametric and semiparametric techniques. The results for the annual data were a bit ambiguous, finding support for both short memory (d=0) and long memory (d > 0) models depending on the specified model, though in general some evidence of persistence is found in the majority of the cases. For the monthly data, the results are more conclusive in favor of long memory models, with orders of integration substantially above 0 in all cases.

The identified long memory condition (d > 0) characterizes inflation in Argentina as statistically persistent, so that the present and, especially future, values of the series depend on its entire history. This implies, in terms of economic policy, that it is not advisable to take shock measures to reduce inflation levels, since the future values of the variable will be statistically very related to their historically high values. The mean reversion characteristic of the series (d < 1) reinforces this conclusion, since it implies that the effects of eventual shock measures will eventually revert over time and inflation will return to its mean value, leaving only the negative effects that such measures may have on other variables remaining (level of employment, GDP, etc.). It is considered more appropriate, on the contrary, to take more gradual measures to try to produce permanent effects on inflation and aimed at gradually lowering inflation levels, so that the mean value of the variable is reduced over time and the medium-long-term values begin to depend more on these lower ones, until reaching a level at which the persistence stops being so high.

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