Chapter 9

INFLATION PERSISTENCE:
EVIDENCE FROM CPI SUBCATEGORIES
- THE SRI LANKAN EXPERIENCE

By
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1. Introduction

Central banks are constantly faced with the challenge of ensuring price stability in their respective economies. Recent developments in the world economy indicate that while most advanced economies have been successful in maintaining inflation at their target levels, some appear to have been faced with the challenge of driving inflation up towards the desired levels. With respect to emerging market and developing economies, a notable moderation in inflation has been observed over the past decade and a half, although inflation remains well above levels seen in advanced economies (IMF, 2018).

It is conceivable that moderation in inflation in many advanced economies and a few emerging markets and developing economies was due to the adoption of inflation targeting as their monetary policy framework. This is reflected in two ways; firstly, through the gradual stabilisation of inflation at the desired levels, and secondly, the waning of the degree of inflation persistence following the adoption of inflation targeting (Gerlach and Tillmann, 2012). In other words, the degree of inflation persistence is relatively high for non-inflation targeting economies or ones that have multiple objectives, as the price stability objective attracts less attention (Bratsiotis et al., 2015). For such economies, it is extremely important to have a gauge of the magnitude of inflation persistence. Higher the persistence of inflation, longer it would take policymakers to bring back inflation to desired levels following an idiosyncratic shock.

1. The authors are thankful to Dr. Peter Tillmann and Mr. David Finck, Project Leaders of the SEACEN research project on “Price-Setting Behaviour and Inflation Dynamics in SEACEN Member Economies and their Implications for Inflation”, Dr. Chandranath Amarasekara, Additional Director of Economic Research Department of the Central Bank of Sri Lanka, participants of the SEACEN Research Seminar held during 13-14 November 2018 and participants of the regular Economic Forum of the Economic Research Department of the Central Bank of Sri Lanka (CBSL) held on 10 January 2019 for their valuable comments. Further, authors are grateful to Mrs. Sachira Perera of the Economic Research Department of CBSL for providing research assistance. The views expressed in this paper are those of the author(s) and do not necessarily represent the views of the Central Bank of Sri Lanka.

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4. There is a continuing debate as to whether inflation being maintained at low and targeted/desired levels is due to good luck or good policy. However, the consensus is that policy has had a significant influence on this trend.
Sri Lanka, which has had historically high levels of inflation in the past (averaging 11.9% during 1978-2008 and 13.7% during 2004-2008), has observed close to a decade of single digit inflation, in spite of it being a non-inflation targeting economy. Such discipline in inflation was largely a result of the continued dialogue between the Central Bank of Sri Lanka and its key stakeholders about their commitment towards maintaining inflation at single digits, making it known that the Central Bank of Sri Lanka is implicitly targeting inflation, while being in a broadly monetary targeting-based policy framework. Nonetheless, Sri Lanka, at times, has found it challenging to maintain inflation within single digits owing to factors such as rising global energy prices, rupee depreciation, rising food prices on account of supply disruptions resulting from adverse weather conditions and loose fiscal policy, *inter alia*. Most notably, past inflation, or inflation persistence has also been a significant factor in the determination of current period’s inflation as well as inflation expectations, and Harischandra (2010) highlights that the degree of inflation persistence in Sri Lanka fell gradually from a high of around 0.90 (with 1 being fully persistent and 0 implying no persistence), on average, during late 1970s through early 1990s to around 0.60, on average, in the 2000s. As Sri Lanka envisions to transition to flexible inflation targeting as its monetary policy framework by 2020, it would be interesting to examine the degree of inflation persistence, particularly in the past decade, and careful scrutiny of inflation persistence in the subcategories of CPI to see the presence of sectoral heterogeneity would be of great importance for policy formulation purposes.

Therefore, in this paper, we examine 15-years of monthly data on inflation and its subcomponents in Sri Lanka to assess the degree of persistence in inflation using an autoregressive process. The contribution of this paper to the available literature is twofold. Firstly, research on examining the degree of inflation persistence in multiple CPI subcomponents and its heterogeneity using Sri Lankan data has not been carried out before. Further, this paper would provide insights on the evolving dynamics of persistence in core inflation, and its implications on monetary policy. Secondly, the Department of Census and Statistics – Sri Lanka follows a regular base change policy and there is no study which analyses inflation persistence using data under the new inflation series (CCPI, Base 2013=100).

The rest of the paper is structured as follows: Section 2 provides a brief review of the relevant literature, followed by Section 3, which details the methodology followed by us to analyse inflation persistence in Sri Lanka and the heterogeneity in inflation persistence in CPI subcomponents. Section 4 presents the results of the study and an interpretation, followed by the concluding section, which summarises the key findings and highlights implications for policy.

### 2. Literature Review

While there is a large amount of literature on inflation persistence at aggregate and subcomponent levels, we have meticulously chosen a few which were crucial in motivating our understanding on how to conduct a similar study for Sri Lanka. Among these articles, the study by Pivetta and Reis (2007) investigate the persistence of inflation in the US using three approaches, namely the largest autoregressive root (LAR), the sum of autoregressive roots and half-life, defined as the number of periods where inflation stays above half its initial value following a shock (i.e. 0.5 following a unit shock). They find inflation to be highly persistent in the US during the sample period of 1965 to 2001 and no evidence of a change in the degree of inflation persistence over this period, although highlighting that there is some intercept shift in the inflation process in the early 1990s.
Along the same lines, Clark (2006) examine consumer price inflation in the US using data from 1959 to 2002. He finds that inflation persistence (measured as the sum of the autoregressive coefficients) at the disaggregate level is constantly below that at the aggregate level, although a notable fraction of the disaggregate series remains highly persistent. However, the degree of inflation persistence is much lower, both at the aggregate and disaggregate level, when the series is restricted to 1984-2002 and after allowing for a break in the data in early 1990s. Most importantly, the degree of inflation persistence at the disaggregate level is almost similar to that of the aggregate level after accounting for a mean break. Most importantly, failing to account for structural breaks in the inflation series could produce high estimates on the magnitude of persistence, which would largely be flawed and spurious. (Perron, 1990) (Levin and Piger, 2004).

Investigating aggregate and sectoral inflation dynamics in the Euro area, Altissimo et al. (2006) find evidence of high inflation persistence among countries in the region in addition to sectoral heterogeneity in inflation persistence. They also find inflation persistence to be smaller at disaggregated levels (i.e. subcomponents of inflation and at country level), when compared to the aggregated level (i.e. at country level and euro area, respectively).

The study by Gerlach and Tillmann (2012) extends the literature on inflation persistence to the Asia Pacific region, where they compare the change in the degree of inflation persistence in selected countries in the region following the adoption of inflation targeting with those who followed other monetary policy regimes. They find that the persistence of inflation in inflation targeting economies declined noticeably with the adoption of inflation targeting, while that of non-inflation targeting economies continued to remain high, and on certain instances increased, in the period after the Asian Financial Crisis.

Another study by Tillmann (2012) examines how the adoption of inflation targeting changed the dynamics of inflation persistence in Korea. This study, which uses disaggregated quarterly data presents three main findings; firstly, the degree of persistence in aggregate inflation and most of the subcategories decline following the adoption of inflation targeting. Secondly, he finds evidence of varying degrees of inflation persistence in disaggregate level data, indicating sectoral heterogeneity. Lastly, he also finds evidence that inflation persistence at the aggregate level was higher than the combined disaggregated levels during the early part of the sample, which however, changes displaying a “reverse aggregation effect” in the latter part of the sample.

Using quarterly data from 1960 to 2009, Harischandra (2010) examines the degree of inflation persistence in Sri Lanka by employing an array of modelling and estimation techniques, and finds evidence of high inflation persistence during the 1970s and 1980s as inflation dynamics during this era are primarily driven by shocks to its trend component. However, a gradual moderation in persistence is observed thereafter towards the end of the sample period as inflation is driven mainly by shocks to its transitory component. He also finds evidence of a notable easing of variance in both inflation and real GDP growth in the latter years, indicating that inflation persistence is time varying.

Harischandra (2009) uses the degree of inflation persistence as a criterion to examine inflation performance across different exchange rate regimes in Sri Lanka using quarterly data from 1960 to 2005. He uses three types of measures of inflation persistence for this analysis, where in Type 1, which uses autocorrelation properties, he finds evidence of an increase in inflation persistence in the flexible exchange rate regime when compared to the fixed exchange rate regime. Inflation persistence, measured by the lag between a change in monetary policy and its peak effect on
inflation, referred to as Type 2, yields similar results as in Type 1. In type 3, inflation persistence is measured by impulse responses following shocks to monetary aggregates, and this indicates that effects of such shock tend to last longer in a flexible exchange rate regime, while inflation response to an innovation in short term interest rates provides weak evidence on inflation persistence.

Sivarajasingham and Applanaidu (2015) find strong evidence of persistence in food inflation in Sri Lanka highlighting that focusing on a measure such as core inflation, which excludes food prices, for policymaking purposes might be inappropriate as food prices have long term memory, hence not transitory, thereby ultimately leading to higher inflation expectations. This study confirms the findings by Ratnasiri (2009), which highlights that the price of rice is the most important determinant of inflation in Sri Lanka, both in the short run and the long run, indicating the high degree of persistence in rice (price) inflation.

3. Methodology

Following large amount of literature, we deploy the univariate measure of persistence in inflation, to gauge inflation persistence. Accordingly, inflation persistence is calculated as the sum of autoregressive coefficients in a univariate process of AR(q) in inflation rate ($\pi_t$) as follows (see Tillmann, 2012):

$$\pi_t = c + \sum_{k=1}^{q} \beta_k \pi_{t-k} + \varepsilon_t$$

(1)

where $c$ denotes the intercept term, $\varepsilon_t$ is a serially correlated shock. This equation can be rewritten as follows:

$$\pi_t = c + \rho \pi_{t-1} + \sum_{k=1}^{q-1} \gamma_k \Delta \pi_{t-k} + \varepsilon_t$$

(2)

where $\rho = \sum_{k=1}^{q} \beta_k$ and $\Delta \pi_t = \pi_t - \pi_{t-1}$

For $\rho=1$, the inflation process contains a unit root while $\rho > 1$ is an explosive process, meaning the monetary authority has only a little or no control over inflation. If the absolute value of $\rho$ is lower than the unit, the monetary authority has some control over inflation. The appropriate lag length of the autoregressive process is chosen based on Akaike Information Criteria (AIC), subject to maximum lag length of 8 months in the empirical analysis conducted in this study.

Since least squares estimates of $\rho$ suffer from a downward bias as sum autoregressive coefficients approaches unity, median unbiased estimator of Hansen (1999) and the grid bootstrap approach is used to construct confidence intervals.5

Further, we deploy rolling-window regressions to CPI and main subcomponents to examine the behaviour of inflation over time.

5. We are grateful to Peter Tillmann for sharing his RATS code of Tillmann (2012) to construct median unbiased estimator and related confidence intervals. The bootstrap calculations are based on 999 draws and 101 grid points over a range spanned by the sample estimate of persistence surrounded by four OLS standard errors.
3.1 Data

We use monthly data on year-on-year headline inflation measured by the percentage change in the Colombo Consumer Price Index (CPI) and its 12 subcategories\(^6\) from January 2004 to September 2018, published by the Department of Census and Statistics – Sri Lanka. Core inflation, which excludes volatile food, energy and transport is also taken into account in this study. We have inadvertently chosen the above sample period primarily because this study focuses on analysing inflation persistence using subcategorical data and CPI data prior to 2003 contain fewer and broader subcategories thereby limiting its use for analysis in the current study. Further, over the selected sample period, CPI data has been rebased three times, i.e., CPI data under three base years, namely 2002, 2006/07 and 2013, have been used and a combined (single) series has been generated by splicing (or retropolating) the CPI data, where past CPI data has been regenerated to be expressed in terms of the 2013 series.

Although the Central Bank of Sri Lanka conducted its monetary policy under a monetary targeting framework since the early 1980s, the notion of bringing inflation to single digits and managing it sustainably at mid-single digit levels became a greater priority for the Central Bank of Sri Lanka since 2007/08 and was therefore known to have been implicitly targeting inflation.\(^7\) As a result, a taming of inflation was observed since early 2009, averaging around 5% during this period. The low levels of inflation, post-2009, has created a conducive environment for policymakers to successfully transition towards adopting a flexible inflation targeting framework by 2020. Therefore, in order to capture this development, we segment the full sample to two, the first being a pre-2008 sample that spans from January 2004 to end 2008, while the next, a post-2009 sample spanning from January 2009 to September 2018 with a view of investigating any change in the dynamics of inflation persistence.\(^8\)

Descriptive statistics, including the weights of each subcategory in the CPI are shown in Table 1. The subcategory of Housing (31.98%) accounts for the largest share of the overall CPI basket, followed by the Food subcategory (28.24%). It is clearly visible that movements in overall headline inflation mimics the movements in food inflation (See Figure 1). Table 1, which shows the mean and variance of inflation for the pre-2008 and post-2009 periods reveal that both the level

6. The exact subcategories are: Food and Non-Alcoholic Beverages (food), Alcoholic beverages, Tobacco and Narcotics (alcohol), Clothing and Footwear (clothing), Housing, Water, Electricity and Fuel (housing), Furnishing, Household equipment & Routine household maintenance (furniture), Health (health), Transport (transport), Communication (communication), Recreation and Culture (recreation), Education (education), Restaurant and Hotels (restaurants), Miscellaneous goods and services (miscellaneous). In CPI (Base: 2006/07=100), Alcoholic beverages, Tobacco and Narcotics division was not included and Restaurants and Hotels division was included under the food group.

7. In 2007, the Central Bank commenced announcing key monetary and financial sector policies for the medium term through a policy document known as the “Road Map” which was produced annually thereafter. This approach enhanced the dialogue between the Central Bank and its stakeholders, thereby increasing transparency and clarity of future policy actions and objectives.

8. The unit root with break test on overall CPI returned June 2008 as the break date, while the Quandt-Andrews Breakpoint test returned February 2010 as the break date. However, considering the developments in inflation over the years and changes in the policy approach of the Central Bank of Sri Lanka during 2007/2008, we decided to choose December 2008 as the structural break date. Moreover, visual inspection of the CPI movements would also support our choice of the break date. These results are not presented to preserve space, but can be made available upon request.
of inflation and the variance in most subcategories of CPI are lower in the post-2009 subsample. In terms of subcategories, the Transport subcategory exhibits the highest average rate of inflation, followed by Food, then Housing in the pre-2008 period, while the subcategory of Alcohol exhibited the highest average rate of inflation in the post-2009 period, followed by Health and Clothing. Likewise, volatility of inflation in certain subcategories were reportedly higher compared to aggregate inflation, particularly in the subcategories of Health, Communication, Food and Transport during the pre-2008 period and in subcategories of Transport, Health and Alcohol in the post-2009 period. Volatility among those subcategories were largely as a result of the volatility in oil prices and certain government policy decisions, such as changes in the tax structure as well as incentives in several occasions, in the form of subsidies or rebates, which directly impacted those prices.\textsuperscript{9} Inflation in the Communication subcategory remained largely stable except for a few hikes and drops in certain months. Nevertheless, core inflation remained in single digits in both subsamples and was noticeably less volatile when compared to that of most other subcategories.

\textsuperscript{9} Collection of prices of certain categories/services such as health, education and communication is performed at less frequent intervals.
Table 1
Descriptive Statistics - Inflation

<table>
<thead>
<tr>
<th>CPI Category</th>
<th>Weight</th>
<th>Mean</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>28.2%</td>
<td>14.7</td>
<td>6.0</td>
</tr>
<tr>
<td>Alcohol</td>
<td>1.0%</td>
<td>NA</td>
<td>14.4</td>
</tr>
<tr>
<td>Clothing</td>
<td>2.3%</td>
<td>7.3</td>
<td>7.1</td>
</tr>
<tr>
<td>Housing</td>
<td>32.0%</td>
<td>14.0</td>
<td>3.3</td>
</tr>
<tr>
<td>Furniture</td>
<td>2.5%</td>
<td>7.0</td>
<td>5.1</td>
</tr>
<tr>
<td>Health</td>
<td>4.4%</td>
<td>8.7</td>
<td>10.2</td>
</tr>
<tr>
<td>Transport</td>
<td>10.6%</td>
<td>15.7</td>
<td>3.6</td>
</tr>
<tr>
<td>Communication</td>
<td>3.3%</td>
<td>-1.4</td>
<td>2.8</td>
</tr>
<tr>
<td>Recreation</td>
<td>1.3%</td>
<td>4.4</td>
<td>3.9</td>
</tr>
<tr>
<td>Education</td>
<td>5.9%</td>
<td>5.4</td>
<td>5.7</td>
</tr>
<tr>
<td>Restaurants</td>
<td>5.1%</td>
<td>NA</td>
<td>5.7</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>3.3%</td>
<td>6.9</td>
<td>5.7</td>
</tr>
<tr>
<td>Aggregate</td>
<td>100.0%</td>
<td>12.7</td>
<td>5.0</td>
</tr>
<tr>
<td>Core</td>
<td></td>
<td>9.5</td>
<td>5.2</td>
</tr>
</tbody>
</table>

Source: Department of Census and Statistics; Authors’ calculations.

Notes: The data are taken from the Department of Census and Statistics. The exact subcategories are: Food and Non-alcoholic beverages (food), Alcoholic beverages, Tobacco and Narcotics (alcohol), Clothing and Footwear (clothing), Housing, Water, Electricity and Fuel (housing), Furnishing, Household Equipment & Routine Household Maintenance (furniture), Health (health), Transport (transport), Communication (communication), Recreation and Culture (recreation), Education (education), Restaurant and Hotels (restaurants), Miscellaneous goods and services (miscellaneous). In CPI (Base: 2006/07=100), Alcoholic beverages, Tobacco and Narcotics division was not included and Restaurants and Hotels division was included under the food group.; Aggregate refers to overall headline inflation.
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Figure 1
Inflation Rate Across CPI Subcategories

Source: Department of Census and Statistics; Authors’ calculations.
4. Results

As the focus of this study is to analyse the presence of persistence in inflation and its magnitude, and the heterogeneity of inflation persistence across CPI subcategories, understanding the data temporal properties would be appropriate before conducting the autoregressive analysis. We perform the Augmented Dickey Fuller (ADF) test to identify the nature of stationarity of the data.

Table 2, which presents the results of the unit root tests, indicates that the subcategories of Housing, Furniture, Education and Miscellaneous goods and services are non-stationary at levels, therefore integrated of order 1 (or I(1)), while the rest of the subcategories of CPI inflation were stationary at levels or I(0) in the full sample (Column 3). Unit root tests were also performed on the pre-2008 and post-2009 periods as this study focuses on analysing the dynamics of inflation persistence across these two subsamples. Results of the unit root tests revealed that all subcategories of CPI inflation were non-stationary at levels (i.e. I(1)) in the pre-2008 period (Column 1), while most subcategories, excluding Clothing, Education and Miscellaneous goods and services, were stationary at levels (i.e. I(0)) in the post-2009 period (Column 2). This indicates that inflation during the pre-2008 era followed an explosive process thereby suggesting that inflation was highly persistent during this period. However, a majority of the subcategories of CPI inflation being stationary at levels during the post-2009 period suggest that the time series is well-behaved, implying that the magnitude of persistence is lower when compared to the pre-2008 era.

Table 2
Results of the Augmented Dickey-Fuller (Unit Root) Tests

<table>
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<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>p-value</td>
<td>Order of Integration</td>
<td>p-value</td>
</tr>
<tr>
<td>Food</td>
<td>0.0050*</td>
<td>I(1)</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Clothing</td>
<td>0.0000*</td>
<td>I(1)</td>
<td>0.0000*</td>
</tr>
<tr>
<td>Housing</td>
<td>0.0000*</td>
<td>I(1)</td>
<td>0.0641**</td>
</tr>
<tr>
<td>Furniture</td>
<td>0.0000*</td>
<td>I(1)</td>
<td>0.0671**</td>
</tr>
<tr>
<td>Health</td>
<td>0.0005*</td>
<td>I(1)</td>
<td>0.0070*</td>
</tr>
<tr>
<td>Transport</td>
<td>0.0000*</td>
<td>I(1)</td>
<td>0.0431*</td>
</tr>
<tr>
<td>Communication</td>
<td>0.0000*</td>
<td>I(1)</td>
<td>0.0002*</td>
</tr>
<tr>
<td>Recreation</td>
<td>0.0000*</td>
<td>I(1)</td>
<td>0.0118*</td>
</tr>
<tr>
<td>Education</td>
<td>0.0000*</td>
<td>I(1)</td>
<td>0.0000*</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>0.0000*</td>
<td>I(1)</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Core</td>
<td>0.0262*</td>
<td>I(1)</td>
<td>0.0250*</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.
Note: MacKinnon (1996) one-sided p-values.
*,** suggest that the null hypothesis is rejected at 5% and 10%, respectively.
Although the ADF test results provide some insight into the drop in persistence during the post-2009 period, it fails to measure the exact magnitude of persistence during the two subsamples. To serve this purpose, we adopt the methodology followed by Gerlach & Tillmann (2012) and others which involves an autoregressive analysis, where persistence is measured as the sum of autoregressive coefficients in a univariate process of inflation and use Hansen (1999) mean unbiased estimates.

Table 3 presents the findings following the forming of univariate autoregressive models for overall headline inflation, core inflation, inflation of CPI subcategories as well as mean weighted inflation. The estimates of $\rho$ in Column 3, which is based on the entire sample period, indicate the presence of very high persistence across all measures of inflation, including the subcategories. Persistence in overall headline inflation is estimated to be 0.97, while core inflation persistence also remains at a high of 0.96. The Housing subcategory, which accounts for the highest weight in the CPI basket, exhibits the case of a unit root, while Food inflation also appears to be highly persistent with a $\rho$ estimate of 0.95. All other subcategories of CPI display high levels of inflation persistence as well. Meanwhile, the mean weighted inflation persistence also remains high at 0.96 although remaining marginally lower than the persistence of overall headline inflation.

Limiting the analysis to the full sample is bound to mask the true underlying forces of persistence considering the change in inflation dynamics over time. Therefore, the analysis is extended by measuring persistence under the two subsamples – pre-2008 and post-2009, findings of which are presented in Columns 1 and 2, respectively, in Table 3.

Overall headline inflation recorded a persistence estimate of 0.94,\(^\text{10}\) while core inflation also remains at a high of 0.92. The subcategories of Housing, Furniture, Health, Recreation and Miscellaneous goods and services are unit root processes portraying characteristics of an explosive process, while the subcategories of Food, Transport, Communication and Clothing remain near unit root processes. Most strikingly, mean weighted inflation persistence in the pre-2008 subsample remains elevated at 0.97.

\(^{10}\) The difference in the estimates of overall inflation persistence between this study and Harishchandra (2010) could be due to the differences in the sample period of the studies as well as the frequency of data.
Table 3  
Inflation Persistence Across CPI Categories

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Lag order</td>
<td>Sum of AR coefficients</td>
<td>Confidence Band</td>
</tr>
<tr>
<td>Food</td>
<td>2</td>
<td>0.98 (0.92, 1.02)</td>
<td></td>
</tr>
<tr>
<td>Clothing</td>
<td>3</td>
<td>0.90 (0.76, 1.05)</td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>1</td>
<td>1.01 (0.85, 1.07)</td>
<td></td>
</tr>
<tr>
<td>Furniture</td>
<td>1</td>
<td>1.02 (0.88, 1.07)</td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>2</td>
<td>1.02 (0.99, 1.05)</td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>1</td>
<td>0.97 (0.85, 1.06)</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>1</td>
<td>0.93 (0.85, 1.04)</td>
<td></td>
</tr>
<tr>
<td>Recreation</td>
<td>1</td>
<td>1.02 (0.86, 1.08)</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>5</td>
<td>0.60 (0.38, 0.83)</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2</td>
<td>1.07 (1.02, 1.12)</td>
<td></td>
</tr>
<tr>
<td>Mean (weighted)</td>
<td></td>
<td>0.97</td>
<td>0.86</td>
</tr>
</tbody>
</table>

Total  4  0.94 (0.89, 1.00)  3  0.85 (0.79, 0.92)  4  0.97 (0.94, 1.00)
Core  3  0.92 (0.84, 1.02)  1  0.90 (0.83, 0.97)  3  0.96 (0.93, 1.01)

Source: Authors’ calculations
Note: This table presents the mean unbiased estimator of the sum of autoregressive coefficients and the bootstrapped 90% confidence band based on 101 grid points and 999 replications. The lag order is chosen according to the Akaike Information Criteria (AIC)

However, comparing the findings of the pre-2008 subsample with those of post-2009 produces some interesting results. Except for the subcategories of Clothing and Education, persistence across all other measures and subcategories of inflation appear to have eased somewhat. We observe a decline in the persistence of overall headline inflation to 0.85 in the post-2009 subsample when compared to 0.94 in the pre-2008 period, although it remains much higher than most other economies in the region (see Gerlach and Tillmann, 2012). However, core inflation persistence dropped measly in the post-2009 period to 0.90 as opposed to 0.92 in the pre-2008 period. Although one could interpret this to be a poor development, one should be aware that the period of the post-2009 subsample is quite large, and therefore one could obtain better insights as to how persistence has evolved over by observing rolling regression coefficients, which are discussed later in this paper.

11. The sample period (1985-2010) for which Gerlach and Tillmann (2012) conducted the persistence analysis is different to the sample in this study, hence not directly comparable.
Another notable finding is that the degree of inflation persistence in the Food subcategory of CPI has dropped to 0.69 in the post-2009 period implying that there is faster return in food prices towards equilibrium following an idiosyncratic shock.\(^12\) From a policymaker’s perspective, this is a favourable development as agents appear to believe that any shocks to food inflation are comparatively transitory, which eases the policymaker’s task in monetary policy formulation as expectations of inflation appear to be relatively anchored, particularly when compared to the estimate of food inflation persistence in the pre-2008 period.

Similarly, we also observe that inflation persistence in the Housing, Furniture, Health, Recreation and Miscellaneous goods and services subcategories of CPI have declined in the post-2009 period and no longer follow a unit root process. However, the near unit root estimates of \(\rho\) indicate that there is still a very high level of persistence in inflation in those subcategories.

Since we do not observe a substantial difference between overall inflation persistence and mean weighted inflation persistence of subcategories in any sample, we find no evidence for aggregation or reverse aggregation effects in the sample period considered.

Figure 2
Inflation Persistence Across CPI Categories

![Inflation Persistence Across CPI Categories](image)

Source: Authors’ calculations.

Figure 2 shows the heterogeneity in inflation persistence across subcategories in both samples. This has implications on monetary policy. Heterogeneity in price stickiness across subcategories implies a sluggish response of aggregate prices to a monetary policy shock compared to a case where price stickiness is alike across subcategories (see Altissimo et al. (2009) and references therein).

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12. It was examined whether the drop in domestic food inflation over time was driven by the world food inflation. For this purpose, to compute world food inflation persistence, monthly data on the FAO food price index was used. However, as evidenced in domestic food inflation, no evidence of a notable drop in persistence of world food inflation was observed in the post-2009 subsample when compared to pre-2008.
Next, we estimate 5-year rolling-window regressions to examine the behaviour of inflation over time in major components of CPI, results of which are shown in Figure 3.\textsuperscript{13}

**Figure 3**
Rolling Regression (Inflation Persistence - 5 Year Rolling Window)

![Rolling Regression Graphs](source: Authors’ calculations.)

\textsuperscript{13} Rolling window regressions are estimated using least square estimates.
Both CPI and core inflation exhibit declining trends in inflation persistence over time, as observed in the inflation persistence in two samples. However, notably, although a significant decline in core inflation was not observed in the post-2009 period when compared to pre-2008 in the previous analysis, the rolling regression uncovers a declining trend in core inflation persistence since mid of the post-2009 sample.

5. Conclusion

In this study, we examine 15-years of monthly data on inflation and its subcomponents in Sri Lanka to assess the degree of persistence in inflation using an autoregressive process. We do not find significant evidence to establish an aggregation or reverse aggregation effect as observed in some other countries. We consider two subsamples; pre-2008 (January 2004 – December 2008) and post-2009 (January 2009 – September 2018) for the analysis. We observe that inflation persistence is lower in the post-2009 period compared to pre-2008, primarily driven by food inflation. Further, inflation persistence is lower in most subcategories in the post-2009 period compared to pre-2008. Persistence in core inflation follows a declining trend in the latter part of the post-2009 sample. Substantial cross-sectional heterogeneity is also observed in both subsamples.

These findings have implications on monetary policymaking in Sri Lanka. The decline in persistence in overall inflation as well as inflation persistence in subcategories including core inflation imply that the policymakers have been able to anchor inflation expectations relatively well in recent times. However, inflation persistence in Sri Lanka appears to be still high compared to peers. With the introduction of flexible inflation targeting in Sri Lanka, as experienced in some other countries, it is expected to observe a further decline in inflation persistence in time to come.
References


