

INTERNATIONAL MONETARY FUND

# **Breaking Bad: A Disaggregated Analysis of Inflation Inertia**

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WP/22/167

**2022  
SEP**



**WORKING PAPER**

**IMF Working Paper**  
European Department

**Breaking Bad: A Disaggregated Analysis of Inflation Inertia**

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Authorized for distribution by Alfredo Cuevas

September 2022

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**Abstract**

The post-pandemic rise in consumer prices across the world has renewed interest in inflation dynamics after decades of global disinflation. This paper contributes to the literature by providing a granular investigation of inflation persistence at the city level in Lithuania during the period 2000–2021, as well as a comparison of inflation persistence at the country level vis-à-vis the eurozone over the same period. Using disaggregate monthly data collected in five major cities, the empirical analysis finds a mixed and ambiguous picture of inflation persistence. While the headline inflation does not appear to exhibit a high degree of persistence, most consumption categories have significant persistence. As a result, shocks may not remain transitory and instead have persistent effects that could spillover across subcomponents depending on the size of the shock.

ISBN	978-1-51358-###-# (Paper) 978-1-51358-###-# (ePub) 978-1-51358-###-# (PDF)
JEL Classification Numbers:	C22; C23; E31; E32
Keywords:	Inflation persistence; Lithuania; euro area; transition economies
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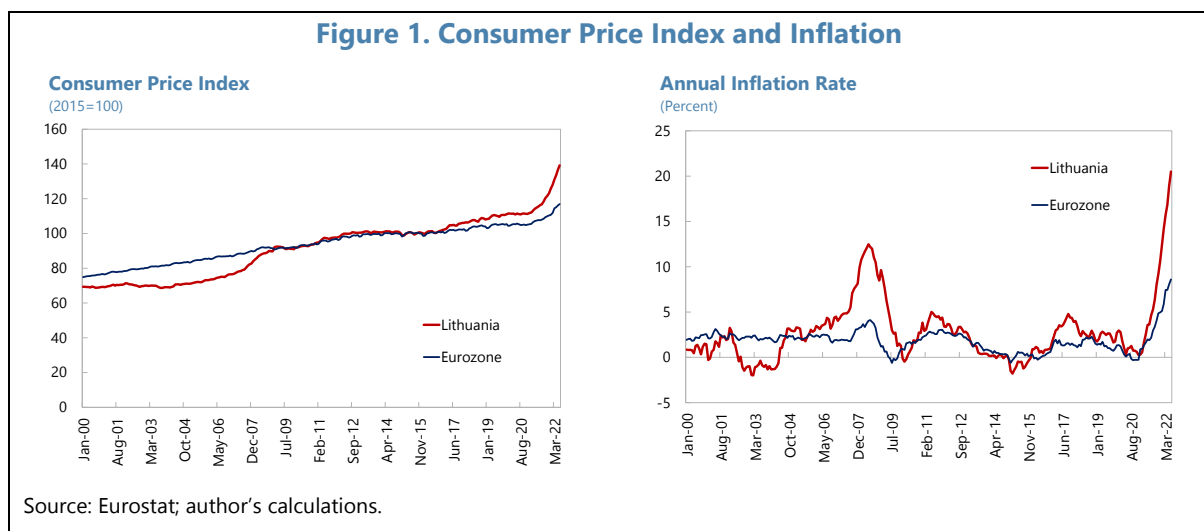
<sup>1</sup> The author would like to thank Alfredo Cuevas, Borja Gracia, Svitlana Maslova, Jan Strasky and the participants of seminars at the Bank of Lithuania and the European Department of the International Monetary Fund (IMF) for their insightful comments and suggestions, and Sadhna Naik for excellent research assistance.

“Nothing happens until something moves.”  
— Albert Einstein

## I. INTRODUCTION

**Inflation is on the rise across the world, driven by transitory factors outside the control of policymakers as well as discretionary policy choices.** Consumer price inflation in the euro area reached 8.6 percent in June 2022—the highest level in more than thirty years. However, there is still significant heterogeneity among eurozone countries: 6.1 percent in Malta *versus* 20.5 percent in Lithuania. The post-pandemic surge in inflationary pressures after decades of global disinflation is a result of global and domestic developments, the extent and nature of which differ across countries. While supply-chain disruptions and the spike in international commodity prices and transportation costs may be transitory phenomena, tight labor market conditions with significant wage increases may reflect structural factors that could have a long-lasting effect on inflation dynamics and threaten hard-won macroeconomic stability in transition economies like Lithuania. Brining down inflation from the post-Soviet peak of 1,163 percent in 1992 to an average of 1.7 percent after joining the euro area in 2015 was a grueling progress (Grennes, 1996; Ghosh, 1997; Christoffersen and Doyle, 1998; Cihak and Holub, 2001; Flanagan and Hammermann, 2007).

**Are we now witnessing the emergence of post-pandemic inflation inertia in Europe—and across the world?** Persistence in economics is akin to inertia in physics. In the case of market-determined prices, inflation—the rate of change—tends to be persistent over time as long as there are no economic forces to alter the course.<sup>2</sup> That is also why it has long been argued that inflation is all about future expectations, which are in part shaped by current price changes and macroeconomic policy preferences (Phelps, 1967; Friedman, 1968; Lucas, 1972, 1975; Gordon, 1982; Orphanides and Williams, 2005). In response to inflation surprises today, consumers and businesses start extrapolating future price inflation from the current trend. This turns inflation



<sup>2</sup> Fuhrer and Moore (1995) and Fuhrer (2010) provide comprehensive overviews of inflation persistence.

dynamics into a self-fulfilling process, especially if there are labor market rigidities and firms with excessive pricing power. In other words, when policymakers fail in anchoring private inflation expectations to a credible target, inertia sets in and inflation becomes a persistent problem as in the 1970s. Can the latest bout of inflation become a persistent problem? There is an extensive body of literature on inflation inertia. While the lag effect plays an important role in determining inflation, there is also robust evidence that the extent of inflation persistence had declined since the 1990s with global disinflation leading to low and stable inflation expectations, especially owing to greater central bank independence to pursue inflation targeting (Levin and Piger, 2003; Cogley and Sargent, 2005; O'Reilly and Whelan, 2005; Stock and Watson, 2007).

**Escaping recession during the pandemic, Lithuania is now experiencing strong growth and double-digit inflation for the first time since 2008.** Real GDP growth bounced back from nil in 2020 to 4.8 percent in 2021, driven by strong domestic demand and growing exports. At the same time, however, inflation as measured by the Consumer Price Index (CPI) accelerated from an annual rate of 0.2 percent at the end of 2020 to 20.5 percent as of June 2022—the highest reading since the global financial crisis in 2008. While transitory factors such as high energy prices and global supply bottlenecks have certainly contributed to the latest bout of inflation pressures across the world, there are also domestic factors, such as high wage growth, that reflect an economy operating close to, if not above, its potential. This is why it is necessary for policymakers to carefully monitor economy-wide strains on resource utilization and signs of inertia in pricing behavior. Such developments have the potential to turn transitory pressures into a long-lasting inflation shock due to a pronounced tendency to stay near whatever level it has been in the recent past. This has happened many times all around the world, and Lithuania with a history of inflation bursts is no exception. Therefore, it is critical to economic policymaking to fully understand the risk of persistence in post-pandemic inflation dynamics.

**This paper provides a granular analysis of inflation persistence in Lithuania and the euro area as a whole.** This paper contributes to the literature by providing a granular investigation of inflation persistence at the city level in Lithuania during the period 2000–2021, as well as a comparison of inflation persistence at the country level vis-à-vis the eurozone over the same period. Using disaggregate city-level monthly CPI series, the empirical analysis finds a mixed and ambiguous picture of inflation persistence across all consumption categories. While the headline inflation does not appear to exhibit persistence, most subcomponents have significant persistence. As a result, shocks may not remain transitory and have persistent effects that could spillover across subcomponents depending on the size of the shock. This is also consistent with the country-level comparison vis-à-vis the eurozone average, showing that the extent of inflation persistence is significantly higher in Lithuania, but declining over time until the COVID-19 pandemic. Although data constraints do not allow an unequivocal analysis of the past two years, there is preliminary evidence indicating an upward shift in inflation persistence both in Lithuania and the eurozone after the pandemic. Unclear whether reflecting a sustained change or instead transitory factors, the estimated increase in inflation persistence could turn the recent spike in consumer prices an entrenched problem and undermine hard-won gains in policy credibility.

**The remainder of this paper is structured as follows.** Section II provides an overview of the data used in the empirical analysis. Section III describes the econometric methodology. Section IV discusses the findings. Finally, Section IV summarizes and provides concluding remarks.

## II. DATA OVERVIEW

**The empirical analysis is based on a balanced panel dataset of monthly observations of the city-level and country-level CPI series for Lithuania and the euro area.** Disaggregate city-level CPI data covering 5 major cities in Lithuania during the period 2000–2021 are obtained from Statistics Lithuania and include the overall index and its 12 subcomponents.<sup>3</sup> Country-level series on the Harmonized Indices of Consumer Prices (HICP) over the period 2000–2021, providing a comparable measure of inflation for Lithuania and the eurozone as a whole, are drawn from Eurostat. Inflation rates are computed on a monthly basis as the year-on-year percentage change in the CPI for each city as follows:

$$\pi_{c,t} = \left( \frac{CPI_{c,t}}{CPI_{c,t-12}} \right) * 100$$

where  $\pi_{c,t}$  is the year-on-year rate of inflation in city  $c$  at month  $t$  based on the headline CPI and its subcomponents, including (1) food and non-alcoholic beverages, (2) alcoholic beverages and tobacco, (3) clothing and footwear, (4) housing, water, electricity, gas and other fuels, (5) furnishings, household equipment and routine house maintenance, (6) healthcare, (7) transportation, (8) communication, (9) recreation and culture, (10) education, (11) restaurants and hotels, and (12) miscellaneous goods and services. The comparison of Lithuania vis-à-vis the euro area is based on harmonized data at the country-level with the headline HICP and its subcomponents.

**Table 1. Summary Statistics for City-Level Inflation**

Variable	Obs	Mean	Std. Dev.	Min	Max
Headline CPI	1,205	2.4	3.0	-4.2	13.5
Food	1,205	3.1	4.9	-8.1	19.6
Alcohol & tobacco	1,205	4.7	5.0	-2.5	22.6
Clothing & footwear	1,205	-3.3	5.1	-25.2	13.2
Housing & energy	1,205	3.9	7.4	-12.3	34.9
Furnishings	1,205	0.4	2.7	-7.6	10.3
Healthcare	1,205	4.8	4.4	-2.4	22.7
Transportation	1,205	-0.4	10.7	-23.8	29.8
Communication	1,205	-1.9	5.0	-15.1	22.5
Recreation & culture	1,205	0.7	2.7	-5.6	10.1
Education	1,205	3.2	5.1	-7.7	26.6
Restaurants & hotels	1,205	4.6	4.1	-3.3	23.0
Miscellaneous	1,205	2.9	3.4	-5.4	14.7

Source: Statistics Lithuania; author's calculations.

<sup>3</sup> The cities in the sample are Kaunas, Klaipeda, Panevezys, Siauliai, and Vilnius.

**Inflation dynamics have evolved significantly in Lithuania since its independence and converged towards the euro area.** The collapse of centralized economy in 1991 led to a historical realignment of prices and consequently an unprecedented surge in inflation across all transition economies. After experiencing an annualized monthly inflation rate of over 1,400 percent in 1992, Lithuania managed to lower the pace of inflation to less than 1 percent by 1999. While consumer price inflation surged over 10 percent before the global financial crisis in 2008, it declined steadily since then to around 2 percent. Headline inflation rates at the city level moved broadly in synch since 2000, with some variation across cities and over time.<sup>4</sup> Table 1 and Table 2 presents the summary statistics for city-level inflation series in Lithuania and the summary

**Table 2. Summary Statistics for Country-Level Inflation**

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>Lithuania</b>					
Headline HICP	253	2.6	3.0	-1.9	12.7
Food	253	3.3	4.8	-7.3	18.6
Alcohol & tobacco	253	4.5	-2.3	-2.3	21.9
Clothing & footwear	253	-1.7	3.0	-9.9	5.3
Housing & energy	253	4.2	6.8	-6.2	33.8
Furnishings	253	0.5	2.4	-3.6	8.9
Healthcare	253	4.4	4.4	-2.8	21.5
Transportation	253	2.6	6.1	-10.9	19.8
Communication	253	-1.3	5.9	-14.7	23.5
Recreation & culture	253	0.7	1.9	-3.4	7.1
Education	253	3.4	4.1	-5.3	16.6
Restaurants & hotels	253	3.9	3.7	-3.9	16.1
Miscellaneous	253	2.7	2.6	-2.6	9.1
<b>Euro Area</b>					
Headline HICP	253	1.7	1.1	-0.6	5.1
Food	253	1.9	1.6	-1.6	6.9
Alcohol & tobacco	253	3.6	1.4	1.4	8.6
Clothing & footwear	253	0.6	1.0	-3.3	6.3
Housing & energy	253	2.4	2.2	-1.7	11.9
Furnishings	253	1.0	0.7	-0.1	2.8
Healthcare	253	1.6	1.6	-0.6	8.5
Transportation	253	2.1	3.1	-5.5	12.2
Communication	253	-1.8	1.3	-8.4	1.0
Recreation & culture	253	0.6	0.9	-1.4	4.0
Education	253	2.0	2.3	-3.6	9.5
Restaurants & hotels	253	2.3	0.9	0.2	4.8
Miscellaneous	253	1.9	0.7	0.5	3.4

Source: Eurostat; author's calculations.

<sup>4</sup> Cevik (2022) provides an empirical analysis of city-level inflation synchronization in Lithuania.

statistics for country-level harmonized inflation series for Lithuania and the euro area as a whole, respectively. Both disaggregate and aggregate inflation figures show significant differences over time and in subcomponents across five cities in Lithuania and as well as between Lithuania and the eurozone. Table 3 presents the breakdown of basic statistics at the country level by decades for Lithuania and the euro area, displaying the evolution of inflation dynamics during the period 2000–2021. The mean of consumer price inflation in Lithuania declined from 3.3 percent in the 2000s to 1.8 percent in the 2010s, pointing to a clear convergence towards the eurozone average, which stood at 1.4 percent in the 2010s. After the pandemic, however, there is already preliminary evidence for significant divergence, with an average inflation of 5.6 percent in Lithuania compared to 2.6 percent in the euro area. Even though inflation is on the rise everywhere, more recent figures show even greater divergence in inflation dynamic between Lithuania (20.5 percent) and the eurozone (8.6 percent) as of June 2022.

**Table 3. Basic Country-Level Statistics by Decades**

	2000s	2010s	2020s
<b>Lithuania</b>			
Mean	3.3	1.8	3.2
Standard deviation	3.7	1.6	3.5
Minimum	-1.9	-1.5	-0.1
Maximum	12.7	5.0	12.3
<b>Euro Area</b>			
Mean	2.1	1.4	1.6
Standard deviation	0.8	0.9	1.7
Minimum	-0.6	-0.6	-0.3
Maximum	4.1	3.0	5.1

Source: Eurostat: author's calculations.

### III. EMPIRICAL STRATEGY AND RESULTS

**There is no standard measure of inflation persistence in the literature.** Studies have used a variety of measures to capture the idea that consumer price inflation responds gradually to shocks, or remains close to its recent history, assuming that inflation is positively correlated with its own lags (Marques, 2004; O'Reilly and Whelan, 2005; Batini, 2006; Fuhrer, 2010; Cogley, Primiceri, and Sargent, 2010). This is why most measures of inflation persistence are based on the autocorrelation function for inflation. A time series like the rate of change of the CPI is considered to exhibit inertia if its correlations with its own past decay at a slow pace. In other words, the more correlated inflation is with its distant past, the more shocks that perturb inflation in the distant past will be reflected in the current rate of inflation. Accordingly, this paper examines inflation persistence with high-frequency data and two alternative methods that are most frequently used in the literature: (1) unit root tests and (2) reduced-form autoregressive

(AR) models. These measures of persistence provide alternative approaches to quantify the rate at which inflation's autocorrelations fade over time.

### A. Unit Root Tests

**A unit root test is a simple approach to assess persistency by determining whether a variable, such as inflation, is stationary.** Variables with a unit root exhibit a high degree of persistency. In other words, a positive shock would cause a persistent increase in inflation instead of dissipating over time. To ensure the robustness of the results, this paper implements two alternative panel data unit root tests on city-level disaggregate and aggregate inflation series to check the presence of a unit root in Lithuania: (1) the Levin-Lin-Chu (2002) test and (2) the Im-Pesaran-Shin (2003) test. Taking into account the cross-section and time-series properties of the data, panel unit root tests are more powerful and provide more robust results than standard time-series unit root tests. Similarities among cities could distort the stationarity test results due to cross-sectional dependence in the disaggregate and aggregate inflation series. Hence, cross-sectional averages are removed from the data to help control for this correlation, and panel unit root tests are applied to demeaned inflation series. These tests are conducted for two specifications including (1) intercept only and (2) both intercept and trend, with the optimal number of lags determined according to the Akaike Information Criterion (AIC).<sup>5</sup>

**Unit root tests yield an ambiguous rendering of inflation persistence in Lithuania over the period 2000–2021.** Two panel unit root tests are applied to disaggregate inflation series at the city-level in Lithuania. The results, presented in Table 4, demonstrate a mixed and ambiguous picture of inflation persistence across all consumption categories during the period 2000–2021. Although both panel unit root tests reject the presence of a unit root at the headline level, most inflation series appear to contain a unit root. Only 2 (or 4) out of 13 city-level inflation series in the sample (depending on the test) show no significant sign of persistence. With the specification including both intercept and trend, 1 (or 2) more inflation series (depending on the test) are found to contain no unit root. The extent of persistence varies considerably among subcomponents of the CPI. For example, according to the Im-Pesaran-Shin (2003) test with the specification including both intercept and trend, the estimated  $p$ -value ranges from 0.0000 for alcohol and tobacco, clothing and footwear, and housing and energy to 0.0096 for food and nonalcoholic beverages and as much as 0.4447 for healthcare. Overall, panel unit root test results suggest that although the headline inflation does not exhibit significant persistence, it is not possible to reject the null hypothesis of unit roots in the case of some subcomponents of the CPI. As a result, shocks may not be transitory and have long-lasting effects that could spillover across subcomponents depending on the size of the shock.

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<sup>5</sup> This paper does not execute a detailed set of structural break tests, as its objective is not to provide a definitive guidance on the precise timing of changes in inflation persistence. However, as shown in Figure 1, there is some evidence of shifts in inflation dynamics before the global financial crisis in 2008 and after Lithuania joining the eurozone in 2015, which could be considered as a breakpoint in the time-series properties of inflation. Accordingly, this paper conducts tests on split-samples for the inflation series as a robustness check.



**Table 4. Unit Root Tests for City-Level Inflation in Lithuania***(p-values, null = series has a unit root)*

	<b>Levin-Lin-Chu</b>		<b>Im-Pesaran-Shin</b>	
	Intercept only	Intercept and trend	Intercept only	Intercept and trend
Headline CPI	0.0001	0.0000	0.0000	0.0000
Food	0.0812	0.0106	0.2911	0.0096
Alcohol & tobacco	0.0068	0.0000	0.0004	0.0000
Clothing & footwear	0.0747	0.0000	0.7126	0.0000
Housing & energy	0.0000	0.0000	0.0000	0.0000
Furnishings	0.0061	0.0284	0.0838	0.0312
Healthcare	0.0202	0.1134	0.1807	0.4447
Transportation	0.0812	0.0106	0.2911	0.0096
Communication	0.9359	0.0072	0.8835	0.0311
Recreation & culture	0.0031	0.0010	0.0003	0.0004
Education	0.0871	0.0306	0.0363	0.0109
Restaurants & hotels	0.0099	0.0031	0.0009	0.0133
Miscellaneous	0.1606	0.0015	0.0228	0.0105

Source: Author's estimations.

**Table 5. Unit Root Tests for Inflation in Lithuania and Eurozone***(p-values, null = series has a unit root)*

	<b>Augmented Dickey-Fuller</b>		<b>Phillips-Peron</b>	
	Intercept only	Intercept and trend	Intercept only	Intercept and trend
<b>Lithuania</b>				
Headline HICP	0.0634	0.2214	0.2789	0.5984
Food	0.0039	0.0251	0.0462	0.1701
Alcohol & tobacco	0.0353	0.1298	0.0638	0.2204
Clothing & footwear	0.1121	0.0675	0.0268	0.0106
Housing & energy	0.3007	0.7601	0.4829	0.8882
Furnishings	0.4277	0.1123	0.7508	0.6050
Healthcare	0.0102	0.026	0.0600	0.1733
Transportation	0.0005	0.0024	0.0142	0.0672
Communication	0.0000	0.0000	0.0001	0.0009
Recreation & culture	0.1164	0.0014	0.2516	0.0882
Education	0.0195	0.0384	0.0142	0.0267
Restaurants & hotels	0.0007	0.0014	0.0909	0.2309
Miscellaneous	0.0278	0.0571	0.0595	0.1336
<b>Euro Area</b>				
Headline HICP	0.0097	0.0304	0.1491	0.5708
Food	0.0001	0.0009	0.0179	0.0763
Alcohol & tobacco	0.0468	0.0076	0.0285	0.0093
Clothing & footwear	0.0000	0.0002	0.0000	0.0000
Housing & energy	0.1167	0.4780	0.2518	0.7963
Furnishings	0.0580	0.5054	0.4986	0.9678
Healthcare	0.0085	0.0001	0.0230	0.0146
Transportation	0.0004	0.0017	0.0203	0.1004
Communication	0.0070	0.0293	0.0000	0.0001
Recreation & culture	0.0002	0.0002	0.0000	0.0000
Education	0.0147	0.0000	0.0891	0.0139
Restaurants & hotels	0.0120	0.0215	0.1592	0.3883
Miscellaneous	0.0517	0.2502	0.4124	0.6483

Source: Author's estimations.

**Inflation persistence is further probed by applying time-series unit root tests to country-level HICP series for Lithuania and the eurozone.** For the country-level analysis, the presence of unit roots in inflation series in Lithuania and the euro area as a whole is analyzed with two alternative unit root tests for time series: (1) the Augmented Dickey-Fuller (1979) test and (2) the Phillips-Perron (1988) test. These country-level results, presented in Table 5, confirm mixed and ambiguous findings obtained with city-level inflation series in Lithuania. First, the estimated  $p$ -value for headline inflation varies with the time-series unit root test and the specification, but it is higher than the estimate based on panel unit root tests. As a result, it is not possible to uniformly reject the presence of unit roots in aggregate inflation series for Lithuania and the eurozone. Second, the extent of inflation persistence as indicated by the estimated  $p$ -value is significantly higher in Lithuania compared to the euro area, but this difference depends on the test employed and the specification used to analyze unit roots. Third, there is significant heterogeneity across consumption categories, but the estimated  $p$ -value for disaggregate series tends to be notably higher in Lithuania than the eurozone average.

**Inflation persistence is not constant over time in Lithuania and the euro area, showing considerable change after the global financial crisis and the pandemic so far.** Unit roots tests on headline inflation series are also conducted on period subsamples to identify whether inflation persistence remains constant or changes over time. These results, presented in Table 6, show an interesting pattern with diverging and converging trends in Lithuania and the eurozone average. First, there is high persistence in Lithuania during the 2000s compared to no sign of inflation persistence in the euro area as whole. Second, while the extent of persistence declined in Lithuania over the course of the 2010s, it appears to have increased in the eurozone.<sup>6</sup> This may reflect greater credibility gains in anchoring inflation expectations in Lithuania after joining to euro area in 2015. After the COVID-19 pandemic, however, unit roots tests indicate an upward shift in inflation persistence both in Lithuania and the eurozone. This is of course a relatively short period of time and consequently data constraints do not allow to determine unequivocally whether the estimated shift in inflation persistence reflects a sustained change or instead transitory factors.

	<b>2000s</b>	<b>2010s</b>	<b>2020s</b>
	Headline HICP		
<b>Lithuania</b>			
City-level	0.0273	0.0000	0.1792
Country-level	0.3312	0.0602	0.0483
<b>Euro Area</b>	0.0000	0.1870	0.4669

Source: Author's calculations.

<sup>6</sup> This result is consistent with the findings of Abdih, Lin, and Paret (2018), showing a high degree of inflation persistence in the euro area than in the U.S.

## B. Autoregressive Models

**An economic variable, such as inflation, is considered to exhibit inertia if the absolute value of its autocorrelations is high.** There are multivariate models of persistence, but this paper follows Nelson and Plosser (1982) and Pivetta and Reis (2007) and chooses a univariate model since persistence is a univariate concept. Furthermore, the objective is to estimate the degree of persistence in inflation, not to develop a forecast model with greater predictive power. Under the univariate approach, a reduced-form measure of inflation persistence is therefore derived from a simple AR( $q$ ) model for inflation:

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

where  $\pi_t$  is the measure of inflation;  $\alpha$  is an intercept term;  $\sum_{k=1}^q \beta_k$  denotes the sum of AR coefficients, which is equal to  $\rho$ ; and  $\varepsilon_t$  is a serially uncorrelated error term. Inflation persistence is therefore closely linked to the impulse response function of a stationary AR process of order  $q$  (Andrews and Chen, 1994). The AR model is estimated by using the ordinary least squares (OLS) method with the number of lags determined according to the AIC. In this framework, the persistence of inflation is considered to be high if the value of  $\rho$  is close to 1, which also implies that inflation has a unit root. On the other hand, if  $\rho$  is close to 0, the speed of adjustment in inflation towards its long-run trend is high. Accordingly, if the value of  $\rho$  is equal or less than 0.5, inflation is considered to exhibit relatively low persistence (Dossche and Everaert, 2005). In other words, the higher the sum of AR coefficients in the univariate model of inflation, the longer it takes for consumer price inflation to return back to its mean, or the more persistent is the inflation process.

**Autoregressive models confirm that the extent of inflation persistence in Lithuania vis-à-vis the eurozone.** The results, presented in Table 7, show that consumer price inflation both in Lithuania and in the euro area as a whole exhibits a high level of inertia during the full sample period of 2000–2021, but the sum of AR coefficients is significantly higher in Lithuania compared to the eurozone. The persistence parameter,  $\rho$ , is estimated to be 0.99 in Lithuania and 0.93 in the euro area, which are higher than the average of persistence parameters estimated for the HICP sub-components. This reflects the so-called aggregation effect that tends to occur when more persistent categories, such as food and non-alcoholic beverages, have a relatively larger weight in the headline index. The parameter of persistence varies considerably among subcomponents of the HICP, but the disaggregate analysis confirm that inflation tends to exhibit stronger inertia in Lithuania than the eurozone average.

**Estimating split-sample AR models deals with potential breakpoints in the inflation series and better highlight the evolution of inertia over time.** As described in the previous section, there is some evidence of shifts in inflation dynamics before the global financial crisis in 2008. In the case of Lithuania, the degree of inflation persistence declined marginally from 1.00 during 2000–2007 to 0.98 during 2008–2021. For the eurozone as a whole, however, inflation appears to have become slightly more persistent, with the estimated parameter increasing from 0.96 during

2000–2007 to 0.98 after the global financial crisis. This pattern is also prevalent, with some exceptions, at the disaggregate level when the AR model is estimated for sub-components of the HICP. Most consumption categories exhibit an improvement in inflation persistence after the global financial crisis, while some register no change. Finally, although number of monthly observations after the COVID-19 pandemic so far is still low to provide robust estimates of AR coefficients, but there is preliminary evidence for a post-pandemic increase in inflation persistence.

**Table 7. Autoregressive Models of Inflation**

	2000-2021	Pre-Crisis	Post-Crisis
<b>Lithuania</b>			
Headline HICP	0.99	1.00	0.98
Food	0.96	0.99	0.96
Alcohol & tobacco	0.96	0.97	0.95
Clothing & footwear	0.92	0.89	0.90
Housing & energy	0.99	1.00	0.99
Furnishings	0.99	1.00	0.99
Healthcare	0.93	0.96	0.93
Transportation	0.85	0.88	0.92
Communication	0.83	0.80	0.92
Recreation & culture	0.96	0.96	0.93
Education	0.92	0.92	0.93
Restaurants & hotels	0.94	1.00	0.98
Miscellaneous	0.93	0.93	0.97
<b>Euro Area</b>			
Headline HICP	0.94	0.96	0.98
Food	0.95	0.96	0.96
Alcohol & tobacco	0.80	0.95	0.95
Clothing & footwear	0.85	0.90	0.90
Housing & energy	0.95	1.00	1.00
Furnishings	0.97	0.99	1.00
Healthcare	0.93	0.93	0.96
Transportation	0.92	0.92	0.92
Communication	0.92	0.93	0.93
Recreation & culture	0.88	0.96	0.96
Education	0.92	0.89	0.93
Restaurants & hotels	0.93	0.98	0.98
Miscellaneous	0.97	0.97	0.97

Source: Author's estimations.

#### IV. CONCLUSION

**Post-pandemic developments and geopolitical shocks have made inflation a key variable of interest once again for policymakers and market participants.** The annualized increase in

consumer prices reached 8.6 percent in June 2022 in the euro area—the highest level since the introduction of the common currency at the beginning of 1999. In new members of the eurozone like Lithuania, however, the surge in inflation is even more dramatic with the annual rate running at 20.5 percent. Could this become a persistent problem? There is an extensive body of literature on inflation inertia. Although the lag effect is an important factor in shaping inflation dynamics, there is also evidence that the persistence in inflation had declined low and stable inflation since the 1990s. The question, of course, whether these the current policy stance is enough to anchor inflation expectations.

**This paper estimates a panel of city-level monthly observations for inflation persistence in Lithuania during the period 2000–2021.** Different estimation methods and different measures lead to the same conclusion: there is a mixed and ambiguous picture of inflation persistence across the CPI subcomponents in Lithuania. While the headline inflation does not appear to exhibit persistence, most consumption categories have significant persistence. As a result, shocks may not remain transitory and have long-lasting effects that could spillover across subcomponents depending on the size of the shock. This is consistent with the country-level comparison vis-à-vis the eurozone average, which indicates that the extent of inflation persistence is significantly higher in Lithuania, but declining over time until the pandemic. Even though data constraints prevent an unequivocal analysis of the past two years, there is preliminary evidence showing an upward shift in inflation persistence both in Lithuania and the eurozone after the COVID-19 pandemic. Unclear whether reflecting a sustained change or instead transitory factors, the estimated increase in inflation persistence could turn the recent spike in consumer prices an entrenched problem and undermine hard-won gains in policy credibility.

**Even without independent monetary policy, Lithuania can still use an arsenal of measures to contain inflation becoming a persistent problem.** The European Central Bank (ECB) conducts monetary policy for the eurozone as a whole, in which some member countries may experience significant deviations from the average. This is exactly the case for Lithuania where consumer price inflation is running at an annual rate of 20.5 percent compared to the average of 8.6 percent in the euro area as of June 2022. Although the Bank of Lithuania (BoL) cannot alter the monetary policy stance according to economic and financial developments in Lithuania, this does not mean policymakers have no control over inflation dynamics. The BoL, for example, can still use regulatory measures to influence the pace of credit growth, which affects aggregate demand in general and housing prices in particular. Of course, with a common monetary policy implemented by the ECB, fiscal policy has the leading role in aggregate demand management by adjusting the fiscal policy stance. In particular, labor market policies, including public-sector contracts, are critical to manage wage growth to avoid inflation spiraling out of control and becoming entrenched in long-term expectations. Policymakers can also use regulatory measures to address some supply chain bottlenecks—causing high shipping costs and delivery lags—that have contributed to the spike in consumer prices.

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