CBREV 25 (2025) 100199

Contents lists available at ScienceDirect

Central Bank Review

journal homepage: www.journals.elsevier.com/central-bank-review/

Revisiting inflation inertia: A comprehensive analysis of dynamics and connectedness in the Turkish case

Burçhan Sakarya [a], Onur Polat [b,*], Hasan Murat Ertuğrul [c]

[a] Başkent University, Faculty of Commercial Sciences, International Trade and Finance, Ankara, Türkiye
[b] Bilecik Seyh Edebali University, Faculty of Economics and Administrative Sciences, Department of Public Finance, Türkiye
[c] Anadolu University FEAS Department of Economics, Eskisehir, Türkiye

A R T I C L E I N F O

JEL classification:
E1
E31
C32

Keywords:
Inflation
Connectedness
Phillips curve
Quantile-on-quantile regression
Quantile causality

A B S T R A C T

This paper examines the phenomenon of inflation inertia in Türkiye focusing on its persistence and the role of interconnected price-setting behaviors. Utilizing monthly data from 2004 to 2024, the study applies a novel augmented Phillips Curve framework, integrating a Time-Varying Parameter (TVP) approach with a connectedness measure derived from the Antonakakis et al. (2020) methodology. Our aim is to investigate the interplay between consumer price inflation and sub-level pricing dynamics to understand how interconnectedness amplifies inflation persistence. This study uniquely contributes to the literature by analyzing inflation inertia alongside the influence of commodity price interconnectedness, offering a dual perspective on inflation dynamics. The findings reveal a marked increase in inflation inertia in Türkiye since 2018, driven by stronger inflation expectations and intensified price interconnectedness, particularly after 2022. The results underscore the compounded impact of synchronized pricing adjustments and sectoral linkages in perpetuating inflation persistence, which hinders the effectiveness of conventional monetary policy. Robustness checks by employing Markov Switching Regression (MSR) models, the quantile-on-quantile (QQ) regression and causality results confirm these dynamics. Policy recommendations emphasize the need for a coordinated approach, integrating monetary, fiscal, exchange rate, and income policies to reduce system-wide price interconnectedness. Central banks must adopt a clear and credible policy horizon to break inflationary expectations and mitigate inertia. By addressing these systemic challenges, policymakers can enhance the efficacy of inflation-targeting frameworks, supporting sustainable price stability in the face of entrenched inflation dynamics.

1. Introduction

Inflation inertia refers to the persistence of inflation rates in an economy, where prices and wages adjust gradually rather than immediately to changes in economic policy or market conditions. This phenomenon, often related to factors such as adaptive expectations, long-term contracts, and price stickiness, poses significant challenges for policymakers. Conventional monetary and fiscal interventions may take extended periods to influence inflationary trends, complicating efforts to stabilize the economy and achieve price stability. Furthermore, inflation rigidity amplifies uncertainty, affecting long-term investment decisions and altering consumer saving and spending habits.

In Türkiye, persistent inflation is characterized by strong inertia, with exchange rates and food prices often cited as primary drivers (SBB, 2018; CBRT, 2023,2024). Recent global inflation debates further contextualize this study, particularly the "Team Transitory" versus "Team Permanent" perspectives (Bernanke and Blanchard, 2024). The transitory view argues that inflation surges are temporary, driven by supply chain disruptions and commodity price shocks, while the permanent view highlights structural changes, embedded expectations, and prolonged fiscal stimuli as drivers of sustained inflation. This research aligns more closely with the permanent perspective, suggesting that interconnected pricing behaviors and inflation expectations may extend inflation persistence beyond temporary disruptions. By incorporating these dynamics into an augmented Phillips Curve framework, this study underscores the compounded effects of synchronized price adjustments on inflation inertia.

Despite policy interventions, a number of structural and behavioral factors contribute to inflation inertia in Türkiye, perpetuating long-term inflationary tendencies. Backward-looking price-setting behavior, in

* Corresponding author.
E-mail address: onur.polat@bilecik.edu.tr (O. Polat).

https://doi.org/10.1016/j.cbrev.2025.100199
Received 2 January 2025; Received in revised form 16 April 2025; Accepted 18 April 2025
Available online 20 April 2025

which businesses and employees modify prices and compensation in response to historical inflation rather than anticipating future inflation, is a major factor. This is especially true in Türkiye, where protracted inflationary experiences have engendered a habitual reaction to cost increases, making it challenging to interrupt the inflationary cycle. Furthermore, because Türkiye's economy depends heavily on imports for energy, raw materials, and intermediate goods, exchange rate pass-through is essential to maintaining inflation inertia. Higher import costs as a result of currency depreciation are promptly reflected in consumer prices, thereby bolstering the durability of inflation.

Indexation behavior, which further embeds inflationary pressures by adjusting wages, rentals, and contract pricing based on historical inflation, is another important element. Price increases in important businesses (such as food and energy) have a cascading effect on other sectors, increasing inflation inertia. This is made worse by interrelated pricing patterns across sectors. Furthermore, price-setting rigidities can be strengthened by ambiguity or contradictory policy measures since inflation expectations are extremely sensitive to the credibility of fiscal and monetary policy. These elements work together to produce a self-reinforcing cycle that makes it harder to establish sustainable price stability because inflation persistence is strong even after policy measures.

According to empirical data, Türkiye has demonstrated strong inflation inertia throughout a number of economic cycles, with previous inflationary shocks causing prices to rise steadily even after the initial triggers have passed. Inflation persistence is a self-reinforcing phenomenon, according to studies from the CBRT, which highlight the significance of adaptive inflation expectations. In this scenario, economic agents modify contracts, wages, and pricing decisions in response to past inflation trends. Kara and Öğünç (2012) point out that historically, cost-push inflation factors—specifically, changes in currency rates and imported inflation—have played a role in Türkiye's protracted inflation persistence.

Following the 2018 exchange rate shock, when the Turkish lira's dramatic devaluation caused a notable inflation rise that lasted for several quarters despite monetary tightening, is a prime illustration of inflation inertia. Similarly, global supply chain disruptions and rising commodity prices strengthened inflation inertia after the COVID-19 pandemic (2020–2021), preventing inflation from falling even after the initial shocks subsided. The difficulties in lowering inflation inertia were further illustrated by the post-2022 inflation surge, which resulted in persistent price increases across a number of industries due to strong inflation expectations and sectoral price interconnectivity. These empirical examples demonstrate that inflation inertia is still a structural problem in Türkiye and that consistent and reliable policy measures are needed to end the cycle of continuously rising prices.

Türkiye's inflation dynamics reveal the critical role of exchange rate-dependent pricing, as reflected in the distinction between administered and free market prices. Moreover, the diffusion index of inflation partially captures the spread of price changes across sectors, but interconnectedness measures provide a more nuanced understanding. This study evaluates the explanatory power of interconnected pricing variables, marking a novel contribution to the literature by bridging micro-level price-setting behaviours and macroeconomic inflation persistence.

This study examines inflation dynamics in Türkiye, emphasizing the interconnectedness between commodity prices and firm pricing behaviour to understand the rigidity and persistence of inflation. Utilizing monthly data from March 2004 to September 2024, the research employs time-varying parameter (TVP) models, particularly the Kalman filter, to estimate an augmented Phillips Curve. Advanced econometric techniques, including time-varying parameter vector autoregression (TVP-VAR) and the connectedness approach of Antonakakis et al. (2020), are utilized to capture price co-movements and their contribution to inflation persistence. For robustness checks of the main model results, MSR model and QQ regression and causality models employed. This dual focus on inflation inertia and commodity price interconnectedness offers novel insights into Türkiye's inflationary trends within the broader context of a globally interconnected economy.

To deepen the analysis, the study employs rolling quantile analysis to examine the nonlinear dynamics between the Total Connectedness Index (TCI) and inflation inertia across different states of the system. This approach highlights the asymmetric effects and complex interdependencies that shape inflation dynamics, identifying key drivers behind heightened TCI and its amplification of inflation inertia. Additionally, the research evaluates the impact of global commodity price shocks, particularly those triggered by the Russia-Ukraine war, on pricing behaviours in Türkiye's economy. By assessing how these shocks intensify inflation inertia through increased interconnectedness in pricing settings, the study provides a comprehensive understanding of the structural and behavioural factors influencing inflation persistence in both domestic and global contexts.

The remainder of this paper is structured as follows: Section 2 reviews the relevant literature on inflation inertia and its underlying factors, focusing on sectoral and firm-level contributions to inflation persistence. Section 3 outlines the data and methodology, describing the dataset, empirical models, and analytical approaches used to examine inflation dynamics in Türkiye. Section 4 presents empirical results, highlighting the role of inflation inertia, commodity price shocks, and interconnectedness in shaping inflationary trends. Finally, Section 5 concludes with a summary of the findings, discusses policy implications, and provides recommendations for future research.

2. Literature review

The literature on sectoral and firm-level contributions to inflation persistence and their role in driving inflation inertia remains relatively underexplored. This gap can be attributed primarily to the limited availability of diverse methodologies and comprehensive data, which have only recently enabled more robust research in this field. A precursor study, Taylor (1980), examined the persistence of inflation—and even rising inflation rates—through the graded contract approach he developed. The author suggested that wage and price contracts between workers and employers are usually staggered for a certain period of time. These staggered contracts reduce the flexibility of the labor market, leading to supply and demand imbalances and causing unemployment and inflation. This aggregated perspective is applied to sub-sectors with a high concentration of staggered contracts and sectoral persistence is analyzed. Saita et al. (2006) examined the time dimension of the link between firms' pricing behavior and cost changes in Japan and investigated the gradual pass-through of cost increases to the final price. The study reported that a gradual transition process towards the permanence of cost led to a rise in Japan that helps to keep inflation relatively low. Nakamura and Steinsson (2013) discussed the macroeconomic implications of price adjustment behavior by reviewing recent microeconomic evidence on price adjustment. The study examined heterogeneity in the frequency of price changes, headline inflation and monetary policy effectiveness. They argued that slow price adjustment causes demand shocks to have more persistent effects on inflation and unemployment, while at the same time reducing the effectiveness of monetary policy. Heterogeneity in price adjustment behaviour contributes to variations in inflation across sectors. From the perspective of consumer behaviour, Rotemberg (2005) analyzed the extent to which consumer dissatisfaction with price increases influences the frequency of price adjustments by firms. The study found that greater consumer outrage over price increases leads firms to raise prices less frequently, resulting in lower inflation. This finding provides valuable policy insights for central banks. To mitigate inflation, central banks might consider the role of consumer perceptions of price changes. For instance, policies could be designed to minimize consumer awareness of price increases, such as encouraging smaller, incremental price adjustments or less frequent changes. These measures could indirectly reduce inflationary pressures by influencing firm pricing behaviour.

Regarding the analysis of price shock transmission across subsectors, Bilgin and Yilmaz (2018) conducted a study on post-WWII producer price inflation across U.S. manufacturing industries, highlighting the heightened system-wide inflation connectedness, especially during major supply-side shocks such as global oil and metal price surges. Their analysis also finds that tariffs introduced during the Trump administration increased inflation connectedness. This study offers a significant contribution by examining inflation dynamics from a production perspective. Since inflation became a global concern following COVID-19, international institutions have intensified their focus on identifying its core causes to provide a comprehensive understanding of the recent surge. In this context, the study by Kose, Ohnsorge, and Yilmazkuday (2024) determined that fluctuations in global inflation over the past half-century have been primarily driven by oil price and global demand shocks, with their impact growing over time. In contrast, global supply shocks have become less significant, particularly in influencing variations in core CPI inflation. Furthermore, in examining the post-2020 period, the authors highlighted that during the pandemic, the initial decline in global inflation was driven by global demand shocks. This was followed by a sharp rebound between May 2020 and October 2022, primarily due to renewed demand, with oil prices and global supply shocks further exacerbating inflation—particularly after Russia's invasion of Ukraine. Kose, Ohnsorge, and Yilmazkuday (2024) underlined the role of renewed demand coupled with supply shocks in shaping inflation dynamics in the post-2020 period. Shapiro (2024) further explored the interplay between supply and demand shocks and their impact on inflation over time. The study offered new insights by quantifying the monthly contributions of these shocks to inflation, revealing that demand-driven inflation typically declines during recessions, while supply-driven inflation closely mirrors fluctuations in food and energy prices.

Di Giovanni et al. (2023) emphasized how the drivers of inflation evolved during the pandemic and post-pandemic period, initially driven by supply chain disruptions and later transitioning to demand-side pressures as economies reopened. This shift highlights the need for targeted policy responses, as monetary policy tools are more effective in mitigating demand-driven inflation than supply-side constraints. Eickmeier and Hoffmann (2022) adopted a global perspective, analyzing how inflation persistence varies across economies based on the relative influence of supply and demand factors. Their study emphasized the interplay between monetary policy, inflation expectations, and structural economic factors, identifying labor market dynamics and energy prices as key drivers. The authors suggested that policy frameworks must be adaptable to address both short-term inflationary pressures and long-term structural trends effectively.

Shapiro (2024) developed a framework to decompose US inflation into supply- and demand-driven components, showcasing that demand-driven inflation tends to decline during recessions, while supply-driven inflation follows fluctuations in food and energy prices; it also finds that monetary policy tightening reduces demand-driven inflation, whereas oil supply shocks increase the supply-driven component but lower the demand-driven one. However, Shapiro (2024) did not dwell into expectations and inertia in particular. He provides a new data set that identifies between demand and supply shocks derived from changes in equilibrium quantity. Nevertheless, the study offered how supply side (be it shocks or price setting behavior due to inertia, worsening expectations etc.) components or factors have been dominant considering the last US inflation episode.

Studies examining inflation dynamics in Türkiye reveal notable findings. Karadaş et al. (2008), employing data from a CBRT survey, identified the widespread practice of variable profit margins, where firms adjust prices based on competitors' behaviour. Relying on this, Özmen and Sevinc (2015) and Özmen and Yücel (2017) highlighted significant sectoral differences in inflation rigidity, as well as the magnitude and dispersion of price changes. Additionally, substantial research has been conducted on indexation and exchange rate pass-through, key factors influencing inflation. The study by Kara et al. (2017) is particularly significant in understanding core inflation, as it investigates how shifts in core inflation dynamics guide monetary policy decisions. Kara and Sarıkaya (2021) expanded on their earlier work, analysing the role of exchange rate pass-through in shaping core inflation, offering deeper insights into inflationary pressures and policy implications.

Duvan (2024) determined that in Türkiye, unit profits have been the primary driver of domestic inflation from 1998 to 2023, with their influence intensifying in the post-COVID-19 period. The study identifies a strong bidirectional relationship between unit profit growth and inflation, suggesting the potential existence of a "profit-price spiral." Similarly, Arce et al. (2022) focused on inflation dynamics in Europe, observing that early pandemic inflation was driven by supply chain disruptions, which were later supplanted by energy price shocks and wage pressures. Their study highlights the importance of distinguishing between transient supply-side inflation and more persistent demand-driven pressures when formulating policy interventions, emphasizing the need for tailored strategies to address evolving inflation drivers.

3. Data and methodology

3.1. Data

The aim of this study is to examine inflation inertia, one of the main drivers of macroeconomic instability in Türkiye, and to determine the relationship between time-varying relationship in commodity prices and inflation.

While the Consumer Price Index and commodity prices are the primary focus, the goal of this study is to provide a novel explanation for inflation dynamics in Türkiye and to assist policymakers in developing alternative strategies to combat inflation.

In the empirical model, we extend the framework proposed by Kara et al. (2017) by incorporating a total connectedness index, derived from exchange rates, sub-CPI indicators, and the import unit value index. Within this framework, we estimate an augmented Phillips equation, which includes key determinants of inflation such as inflation inertia (lagged inflation), exchange rates, import prices, the output gap, and total connectedness.

The sample period covers 2004/03–2024/09 periods and variables obtained from TURKSTAT, CBRT the Electronic Data Delivery System (EVDS) and Bloomberg. The Fig. 1 below displays a broad look at the variables.

The chosen sample period, which spans 2004 to 2024, is intended to capture significant structural changes in the inflation environment in Türkiye, taking into account significant policy changes and economic shocks that have impacted inflation dynamics. While the 2018 exchange rate shock caused a significant depreciation of the currency, which exacerbated inflationary pressures and highlighted the significance of exchange rate pass-through, the 2008 global financial crisis caused demand-driven inflation swings and reversals of capital flow.

Following the COVID-19 pandemic (2020–2021), which disrupted global supply chains and altered inflation expectations, the Russia–Ukraine war (2022–2023) exacerbated commodity price volatility, especially in the food and oil sectors. The 2004–2024 period is a pertinent timeframe for examining the persistence of inflation and the part structural changes play in influencing inflation dynamics because of these occurrences, which highlight the changing nature of inflation inertia and related pricing practices in Türkiye.

The data reveal a significant shift beginning in 2018, marking a turning point for inflation in Türkiye. Since then, both external and domestic factors have exerted negative pressure on inflation. Additionally, as previously noted, a global shift in the inflationary outlook has introduced further uncertainties, particularly concerning domestic price developments and pricing behavior. The model specification employed

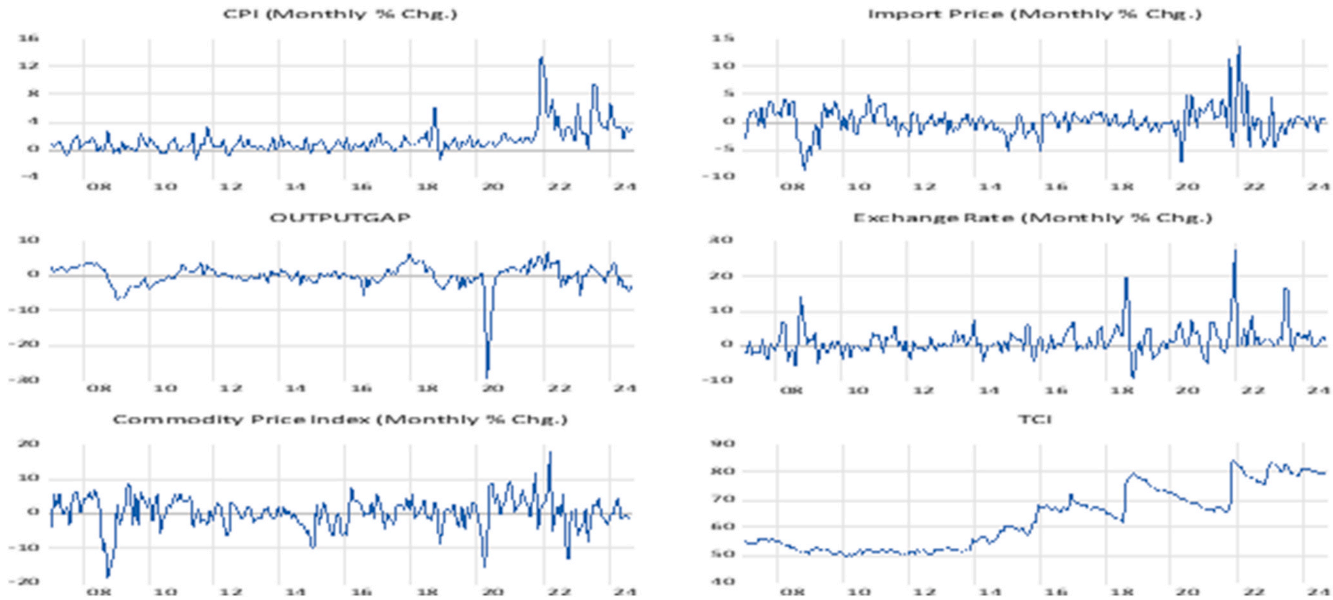

Fig. 1. Trends in Data
Source: CBRT-EVDS, Bloomberg and authors calculations.

in the empirical analysis is presented in equation (1).

$$\pi_{t}=a_0+a_1\pi_{t-1}+a_2e_t+a_3\pi_t^m+a_4y_t+a_5commodity_t+a_6TCI_t+u_t \quad (1)$$

In equation (1), π_t , π_{t-1}, e_t, π_t^m, y_t, $commodity_t$ *and* TCI_t denote the inflation rate, the inflation inertia, the monthly exchange rate change, the monthly import price change, the monthly output gap obtained via the difference between the industrial production index and its HP-filtering, the monthly change rate of the commodity price index and the total connectedness index between employing exchange rates, sub-CPI indicators, and the import unit value index respectively. The details for TCI and its methodology are presented in Appendix 1.

The total connectedness index (TCI) included in Equation (1) is a system-wide connectedness measure derived from the variance decomposition matrix of a TVP-VAR model (Antonakakis et al., 2020). TCI ($connectedness_t$) is employed to capture sub-sectoral inflation driven by price changes in other sectors. This measure indicates the extent to which price shocks are transmitted across sectors, offering valuable insights into inflationary dynamics. The estimation of the $connectedness_t$ variable, based on the Diebold and Yılmaz (2014) connectedness approach, is detailed in Appendix 1.

The study estimates the Phillips curve presented in Eq (1) using the TVP approach via the Kalman filter model[1] so that both inflation inertia and the impact of commodity price linkages on inflation can be analyzed. The contribution of commodity prices to inflation and inflation inertia in Türkiye will be assessed mainly through the exchange rate channel. The unique contribution of this paper lies in its consideration of this channel, incorporating pricing behavior processes and intra-sectoral linkages, and implementing a rolling quantile analysis that captures the dynamics of their interaction across varying levels of the distribution,

[1] This work estimates the enhanced Phillips Curve using the Time-Varying Parameter (TVP) model with Kalman Filter, which enables a more dynamic and adaptable examination of inflation inertia and price-setting practices in Türkiye. Conventional Vector Autoregression (VAR) models with fixed parameters make the assumption that the correlations between exchange rates, inflation, and other macroeconomic variables don't change over time. However, big economic shocks like the global financial crisis of 2008, the currency rate shock of 2018, the COVID-19 pandemic, and the global commodity price increase of 2022 have caused significant structural changes in Türkiye's inflation patterns. Because it permits coefficients to alter over time to reflect shifts in inflation persistence, the efficacy of monetary policy, and sectoral price interconnectivity, the TVP model is especially well-suited for capturing these changing dynamics. This strategy is crucial in economies where pricing patterns and inflation expectations change in response to changes in macroeconomic conditions and policy.Furthermore, by iteratively updating parameters depending on incoming data, the Kalman Filter is essential to the estimation of the TVP model and keeps our analysis flexible enough to respond to current economic changes. This characteristic is especially helpful in an inflationary context when interrelated pricing habits, exchange rate pass-through, and the efficacy of monetary policy all fluctuate over time. In contrast to fixed-parameter models, which could produce skewed estimates in the presence of structural changes, the TVP model offers a more accurate depiction of inflation dynamics by permitting dynamic coefficient adjustments. Thus, using the TVP model with Kalman Filter improves the reliability of our results and enables a more accurate evaluation of inflation inertia in the changing economic environment of Türkiye.

offering inference across the distribution inflation.

A dynamic TVP approach by employing the Kalman filter, which relies on recursive estimation, is applied to identify statistically significant relationships between inflation, inflation inertia and commodity prices. This approach builds upon the foundational work of Harvey (1989), who introduced the Kalman filter methodology. The Kalman filter framework employs a state-space representation, where the linear dynamics of an equation can be expressed within this state-space model.

The measurement equation and the state equation are the two fundamental equations that make up the TVP model's state-space representation. Inflation is expressed as a function of commodity prices, exchange rate fluctuations, inflation inertia, and the TCI in the measurement equation. We may estimate how these factors affect inflation over time by using this equation, which connects observed inflation to its determinants.

We can estimate how these factors affect inflation over time by using this equation, which connects observed inflation to its determinants. Contrarily, the state equation dynamically represents how these interactions evolve, allowing coefficients to alter in response to changes in the economy. Here, the Kalman Filter is essential because it ensures that our model adjusts to structural changes in inflation dynamics by recursively updating parameter estimates based on fresh data. Because it takes into consideration changing economic conditions and policy effects rather than supposing static correlations, this method is especially useful for examining Türkiye's inflation persistence.

$$y_t = c_t + Z_t\alpha_t + \varepsilon_t \tag{2}$$

$$\alpha_{t+1} = d_t + T_t\alpha_t + v_t \tag{3}$$

where in our case α_t is unobserved state variables, where, c_t, Z_t, d_t and T_t are flexible vectors and matrices, and where ε_t and v_t are vectors of Gaussian disturbances with a mean of zero. As outlined in equation (3), the unobserved state vector α_t is modeled to evolve over time following a first-order vector auto-regression process. The Kalman filter updates parameter estimates recursively, refining them with each new observation. The Kalman filter specification employed in the empirical modeling is presented in equations (4) and (5) below.

$$\pi_{t=}a_0 + a_{1,t}\pi_{t-1} + a_{2,t}e_t + a_{3,t}\pi_t^m + a_{4,t}y_t + a_{5,t}commodity_t + a_{6,t}TCI_t + u_t \tag{4}$$

$$a_{i,t} = a_{i,t-1} + v_{i,t} \tag{5}$$

Finally for the first robustness check, we estimated MSR model to check Kalman Filter model coefficients. As second robustness check, we employed the quantile-on-quantile regression (QQR) and a non-parametric Quantile causality.

4. Results

We estimated Equation (4) by employing the Kalman Filter model. The estimation results of the Kalman Filter model are presented in Table 1.

Table 1 reveals that the effects of commodity prices and output gap on inflation found statistically insignificant. Other coefficients including inertia, exchange rate growth, import growth and TCI indicate positive and statistically significant effect on inflation. These results are parallel with expectations. Further analyzing the estimations results we observe that the positive and highly significant coefficient for lagged inflation underscores the persistence of inflation in Türkiye. This implies that past inflation strongly influences current inflation, a characteristic often observed in inflationary dynamics. Moreover, this overall significance of lagged inflation is augmented by the significant coefficient on the TCI variable. TCI variable captures the transmission of consumer price inflation shocks across subsectors of the Turkish CPI. Inflation inertia can be significantly amplified when pricing behavior becomes increasingly interconnected across sub-sectors and sub-prices of goods and services. This phenomenon arises from heightened interdependencies in price-setting mechanisms, where firms actively respond to pricing signals from their peers or adjust prices in reaction to perceived or actual shocks in adjacent markets. Such behavior fosters a self-reinforcing cycle, where price changes in one domain propagate through others, embedding inflationary expectations more deeply across the economy.

In order to check Kalman Filter model results, we also estimated the MSR model for the first robustness check. MSR model results are presented in Annex 2 and the MSR model shows similar results[2] with the Kalman Filter model.

The $a_{1,t}$ parameter estimations from the Kalman Filter model which indicate dynamic inflation inertia are presented in Fig. 2. The step-wise movement in this parameter is an indicator of how inflation inertia has strengthened since 2018.

The evolution of inflation inertia, as depicted in Fig. 2, aligns with major economic and financial developments in Türkiye. During August and September 2018, the Turkish lira depreciated sharply—21 % in August and 11 % in September—due to the Pastor Brunson crisis, leading to an increase in inflation inertia. However, by October 2018, with the resolution of the crisis, the exchange rate appreciated by 7 %, partially easing immediate inflationary pressures.

In terms of the COVID-19 pandemic's effects, the figure does not show a significant rise in inertia right after it started in early 2020. Rather, at this time, inertia stayed largely constant. In contrast, a notable increase in inertia is noted in late 2021, which is consistent with exchange rate shocks produced domestically as opposed to disruptions brought on by the epidemic. This implies that changes in monetary policy and exchange rate volatility had a greater impact on inflation persistence than did direct pandemic effects.

Additionally, Fig. 2 demonstrates a distinct change in inflation inertia from June to July 2023, which corresponds with the exchange rate changes following the general elections. These changes caused the Turkish lira to depreciate significantly, which resulting in inflation pass-through effects that increased inflation inertia in the months that followed.

These results highlight how exchange rate dynamics play a critical role in determining inflation inertia in Türkiye and emphasize the significance of both external shocks and internal policy responses in promoting inflation persistence.

The onset of the COVID-19 pandemic in 2020 marked a turning point, with inflation inertia increasing sharply from 0.25 to 0.55. This surge in inertia reflects the global economic disruptions caused by the pandemic, including supply chain breakdowns, shifts in demand patterns, and government fiscal responses. As the immediate effects of the pandemic began to subside, inflation inertia started to decrease, reaching 0.4. However, this decline was short-lived, as the Ukraine-Russia war in 2022 triggered another rise in the inertia coefficient to 0.5, driven by the sharp increases in energy and food prices, alongside global supply

Table 1
Kalman filter estimation results.

Variable	Coefficient	Std. Error	Prob. Value
Constant	−1.618	0.314	0.000
Inertia	0.511	0.038	0.000
Exc	0.172	0.016	0.000
Import	0.113	0.033	0.001
Commodity	−0.003	0.017	0.838
TCI	0.032	0.001	0.000
Output gap	0.010	0.021	0.635

[2] As shown in Appendix 2, the effects of inertia, exchange rates, and TCI on inflation are more pronounced during high-volatility regimes. Additionally, the import variable is found to be significant only in high-volatility regimes, based on the results of the MSR model.

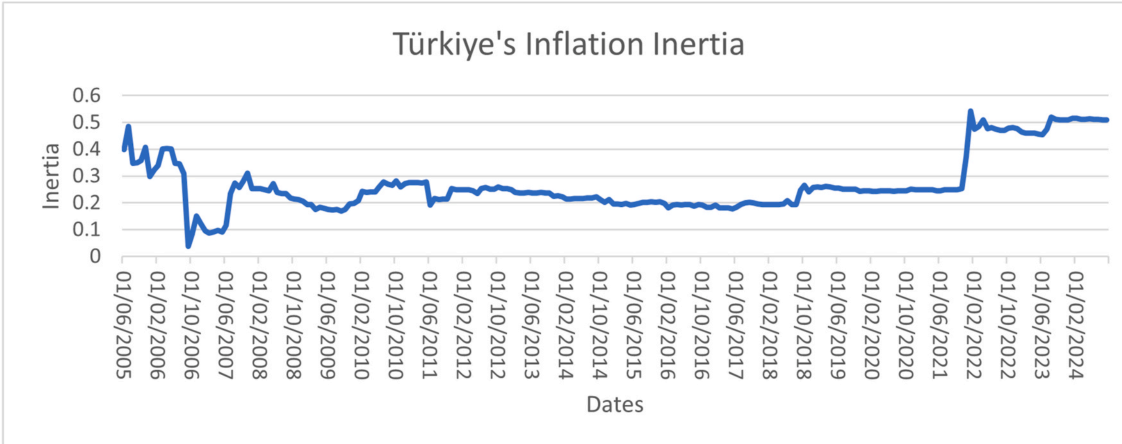

Fig. 2. Dynamic inertia coefficients from Kalman filter model.

chain challenges.

Moreover, the interplay between these external shocks and domestic factors, such as monetary policy responses and market expectations, has played a crucial role in shaping the persistence of inflation. The persistence observed during these periods underscores the complexity of inflation dynamics in an interconnected global economy, where both supply-side shocks and domestic structural factors contribute to the overall inflationary environment. The ongoing shifts in the inertia coefficient highlight the importance of adaptive policy frameworks that can respond effectively to both global and domestic inflation drivers.

To further deepen our analysis as second robustness check, we utilize the quantile-on-quantile regression (QQR) and a non-parametric causality in quantiles (Balcilar et al., 2016)[3] analyses. First, we focus on the QQ regression between the conditional quantiles of TCI regressed on the quantiles of inertia and presented in Fig. 3.

The QQ regression slope estimates reveal a dynamic and nonlinear relationship between inflation, inertia and the TCI across various economic conditions. The results highlight that the sensitivity of inflation inertia to TCI is not uniform, with stronger effects observed at higher quantiles of both variables. Specifically, during periods of high inflation inertia and heightened connectedness (upper quantiles), the slopes are steeper and predominantly positive. This indicates that the interconnectedness of commodity prices and inflation plays a critical role in amplifying inflation persistence under volatile economic conditions. Conversely, in low-inflation and low-connectedness regimes (lower quantiles), the slopes are relatively flat or even slightly negative, suggesting a weaker or inverse relationship during periods of economic stability.

These findings have significant policy implications, emphasizing the need for targeted interventions to address the amplification effects of sectoral interconnectedness on inflation inertia, particularly in high-volatility scenarios. The asymmetric nature of the relationship suggests that traditional policy tools may be less effective in mitigating inflation persistence during extreme states, requiring more nuanced approaches to manage the interconnected pricing dynamics. Additionally, the strong positive relationship at higher quantiles underscores the importance of monitoring and managing external shocks, such as exchange rate volatility and global commodity price fluctuations, as these factors are likely to reinforce inflation inertia during periods of economic instability. By addressing the interconnected nature of pricing behavior, policymakers can enhance their ability to stabilize inflation expectations and reduce the persistence of inflationary pressures.

The findings of the QQ regression offer important new information about how the TCI and inflation inertia relate to one another at various inflation persistence levels. Our analysis's main conclusion is that interrelated pricing behavior' effects on inflation inertia vary depending on the economic environment. In particular, we demonstrate that the influence of TCI is much larger when inflation inertia is already high (upper quantiles). This suggests that networked pricing behavior enhances inflation persistence more aggressively in high-inflation contexts. This implies that firms and consumers respond more forcefully to sectoral pricing links when inflation is high, which strengthens ongoing inflationary pressures.

On the other hand, TCI has a much smaller or even insignificant impact at lower quantiles of inflation inertia, or when inflation is comparatively moderate and constant. This suggests that linked pricing practices are less important in maintaining price increases during times of low inflation. Given that the reinforcing effects are particularly noticeable during high-inflation periods, this unbalanced relationship emphasizes the necessity for policy interventions intended to reduce inflation inertia to concentrate more on disrupting interrelated pricing processes during these times. We may gain a better understanding of how pricing interconnectivity interacts with inflation inertia in various economic situations by reading the results of QQ regressions through this lens. This will provide policymakers with important insights to help them fight persistent inflation.

Next, we estimate the 12-month rolling-window causality-in quantiles to determine the causal relationships from the TCI to the inertia and depict them in Fig. 4.

The 12-month rolling QC analysis demonstrates that the relationship between the TCI and inflation inertia varies significantly over time and across quantiles, reflecting the dynamic and heterogeneous nature of their interaction. Peaks in the causality strength are observed during periods of economic shocks or heightened volatility, such as global financial crises, major commodity price fluctuations, or domestic currency devaluations. These temporal variations suggest that the influence of TCI on inflation inertia intensifies during periods of economic instability, emphasizing the importance of considering time-varying dynamics when analysing inflationary pressures. Such fluctuations highlight the role of interconnected pricing mechanisms in exacerbating inflation inertia during periods of stress.

The heterogeneity across quantiles further underscores the asymmetric nature of the relationship. Higher quantiles, which correspond to extreme levels of TCI or inflation inertia, exhibit stronger causality, indicating that interconnectedness among price-setting agents significantly amplifies inflation inertia under volatile conditions. In contrast, lower quantiles reveal a weaker or negligible relationship, suggesting that TCI plays a limited role in more stable economic environments. These findings emphasize the need for tailored policy interventions that

[3] The QQR methodology is presented in Appendix 3.

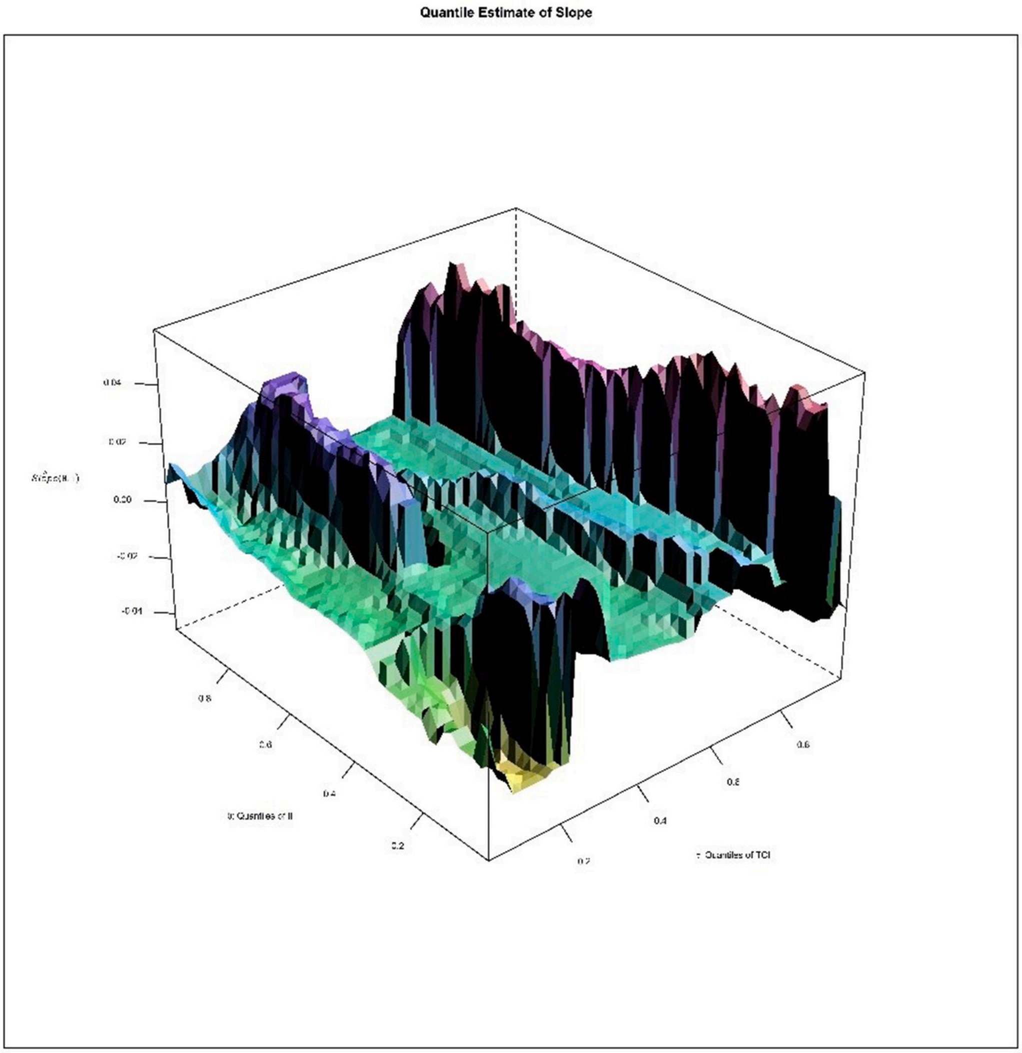

Fig. 3. Quantile-on-Quantile (QQ) regressions-based estimated impact of TCI on Inertia.

address the amplification effects of TCI during high-volatility regimes while recognizing its reduced significance under stable conditions. By focusing on the asymmetric and dynamic nature of this relationship, policymakers can develop more effective strategies to manage inflationary pressures and mitigate the persistence of inflation inertia.

5. Conclusion

This study examined the inflation inertia in Türkiye, examining the interconnectedness between consumer price inflation across sub-sectors and its implications for monetary policy. Utilizing monthly data from March 2004 to September 2024, we incorporated advanced methodologies, including the connectedness approach of Antonakakis et al. (2020), Kalman Filter estimations, Markov Switching regression models, and rolling quantile analyses. By embedding these approaches into an augmented Phillips Curve framework, the study highlights the evolving dynamics of inflation inertia and the role of interconnected pricing behavior in Türkiye's inflationary landscape.

Our findings reveal that inflation inertia has undergone significant changes since 2018, primarily driven by external shocks and domestic structural factors. Notably, the persistence of inflation has been exacerbated by rising TCI levels, particularly during the post-2022 period. The TCI captures the transmission of price shocks across sectors, underscoring the amplifying effect of interconnected pricing on inflation inertia. This phenomenon creates a self-reinforcing cycle, where price adjustments in one sector influence others, embedding inflationary expectations more deeply across the economy.

Our research on interrelated pricing patterns and inflation inertia is extremely pertinent to the recent inflationary trends in Türkiye, especially those that have occurred since 2021. Beginning in late 2021 and continuing through 2022, Türkiye had a dramatic increase in inflation, mostly due to supply chain interruptions, depreciating currency, and rising commodity prices worldwide. This is consistent with our Quantile-on-Quantile (QQ) regression and causality-in-quantiles findings, which show that inflation inertia is strongest at higher inflation levels. This means that the interconnected pricing behavior makes it harder to control inflation once it reaches high levels.

Further supporting inflation inertia, as indicated by our TVP model results, were high inflation expectations and price-setting rigidities over the 2022–2023 inflation era. The challenge of overcoming inflation inertia in highly interconnected pricing settings was highlighted by the high rate of inflation persistence despite attempts to tighten monetary policy in mid-2023. Our results on the significance of exchange rate pass-through in magnifying inflation inertia were further supported by the fact that the exchange rate adjustments following Türkiye's general elections in 2023 sparked a fresh inflationary wave as import prices swiftly translated into larger increases in consumer prices. In order to create more successful inflation-targeting strategies in Türkiye, it is

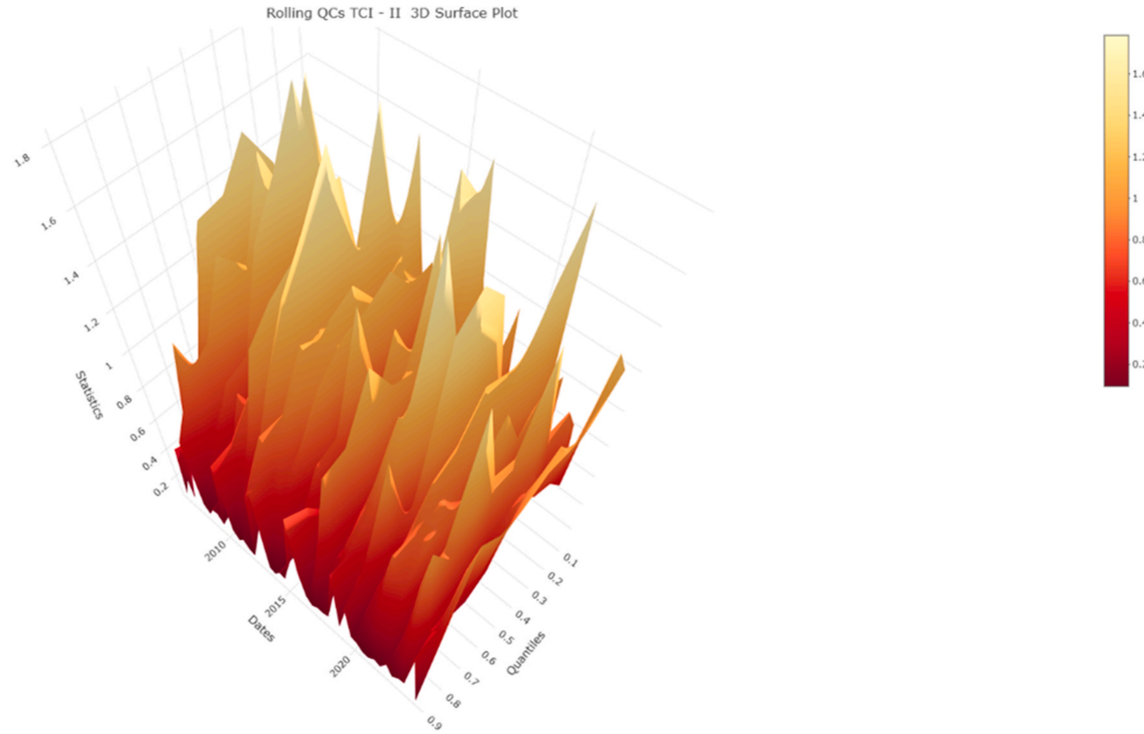

Fig. 4. Causality-in Quantiles-based estimated impact of TCI on Inertia.

crucial to address interrelated pricing patterns, as these real-world trends demonstrate.

The dynamic and nonlinear nature of the relationship between inflation inertia and TCI was further explored using quantile-on-quantile regression and rolling causality analyses. These methodologies revealed that the sensitivity of inflation inertia to TCI is asymmetric, with stronger effects observed during periods of heightened volatility and economic instability. Peaks in causality strength aligned with significant economic shocks, such as currency devaluations and global commodity price surges, highlighting the amplified role of interconnected pricing settings during turbulent times. Conversely, in stable economic conditions, the relationship was weaker or negligible, indicating the reduced impact of TCI in low-inertia regimes.

From a policy perspective, these findings emphasize the critical need for targeted interventions to address sectoral interconnectedness and pricing rigidities, particularly during high-volatility regimes. Traditional monetary policy tools, such as interest rate adjustments, may be insufficient to counter inflation inertia in such environments. Coordinated efforts across monetary, fiscal, and structural policies are necessary to stabilize inflation expectations and mitigate the persistence of inflationary pressures. Addressing the asymmetric relationship between TCI and inflation inertia also requires monitoring and managing external shocks, such as exchange rate volatility and global commodity price fluctuations.

The implications extend beyond Türkiye, offering insights into inflationary dynamics in interconnected economies. The persistence of inflation inertia, driven by synchronized price-setting behavior and adaptive expectations, poses challenges for policymakers worldwide. Recognizing the structural and behavioral factors that amplify inflation inertia, particularly in response to global shocks, is essential for designing effective policy frameworks that balance short-term stabilization goals with long-term economic resilience.

In summary, this study underscores the complexity of inflation dynamics in Türkiye, shaped by evolving external and domestic forces. The findings highlight the importance of managing interconnected pricing mechanisms and adopting nuanced, multi-pronged policy approaches to address inflation inertia. By tackling these challenges, policymakers can enhance their ability to stabilize inflation expectations, foster economic stability, and reduce the costly ramifications of prolonged inflation persistence.

Future studies could delve into the role of consumer and firm expectations in shaping inflation inertia, particularly the behavioral factors influencing pricing dynamics. A sectoral decomposition of connectedness could help identify industries that disproportionately drive inertia, while cross-country comparisons could provide insights into global spillovers and differing responses to inflationary pressures. Research could also explore the impact of climate risks, such as energy price shocks and green transition policies, on inflation dynamics. Additionally, applying machine learning techniques may uncover complex, non-linear relationships, and structural shifts more effectively.

Acknowledgement

This study was supported by Scientific and Technological Research Council of Türkiye (TUBITAK) under the Grant Number 224K511 and Anadolu University Scientific Research Project under the Grant Number YTS-2023-1899 The authors thank to TUBITAK and Anadolu University for their supports).

APPENDIX 1

To obtain total connectedness index, this study utilizes 14 monthly data series, covering exchange rates (EUR/TRY and USD/TRY), CPI indicators, and the import unit value index, spanning from February 2004 to February 2024. The specific names and codes for the data are as follows: USD/TRY (TP.DK.USD.A.YTL), EUR/TRY (TP.DK.EUR.A.YTL), CPI for Food and Non-Alcoholic Beverages (TP.FG.J0), CPI Food Level (TP.FG.J011), CPI excluding Unprocessed Food, Energy, Alcoholic Beverages, Tobacco, and Gold (TP.FE.OKTG02), CPI Indicators for Specified Coverages (TP.FE.OKTG03), CPI excluding Energy, Food and Non-Alcoholic Beverages, Alcoholic Beverages, Tobacco, and Gold (TP.FE.OKTG04), CPI excluding Unprocessed Food, Alcoholic Beverages, and Tobacco (TP.FE.OKTG05), CPI excluding Alcoholic Beverages and Tobacco (TP.FE.OKTG27), CPI excluding Administered and Directed Prices (TP.FE.OKTG28), 12-Month Ahead Annual CPI Expectation (TP.BEK.S01.E.U), and Import Unit Value Index (TP.DT.IT.FIY.D01.2010). The headline inflation data for Türkiye is sourced from the TURKSTAT database, and EVDS CBTR, while other macroeconomic and financial indicators are gathered from Bloomberg.

TVP-VAR Connectedness

Antonakakis et al. (2020) introduced the TVP-VAR interconnectedness approach, building on the earlier method developed by Diebold and Yilmaz (2014). This approach allows the variance-covariance matrix to change over time using Kalman filter estimation, which applies "forgetting factors" to give more weight to recent data. This idea was inspired by the work of Koop and Korobilis (2013).

$TVP-VAR(p)$ model is defined as follows:

$$y_t = A_t x_{t-1} + \varepsilon_t \quad \varepsilon_t | \Omega_{t-1} \sim N(0, \Sigma_t) \tag{A.1}$$

$$vec(A_t) = vec(A_{t-1}) + \varrho_t \quad \varrho_t | \Omega_{t-1} \sim N(0, \Xi_t) \tag{A.2}$$

with

$$x_{t-1} = \begin{pmatrix} y_{t-1} \\ y_{t-2} \\ \vdots \\ y_{t-p} \end{pmatrix} \quad A_t^{'} = \begin{pmatrix} A_{1t} \\ A_{2t} \\ \vdots \\ A_{pt} \end{pmatrix} \tag{A.3}$$

wherein Ω_{t-1} denotes all available information until $t-1$; y_t and x_{t-1} denote $n \times 1$ and $np \times 1$ vectors, respectively. A_t and A_{it} are $n\times np$ and $n\times n$ matrices, respectively. ε_t and ϱ_t are $n \times 1$ and $n^2p \times 1$ dimensional vectors, respectively. Σ_t and Ξ_t are $n \times n$ and $n^2p \times n^2p$ dimensional matrices, respectively. $vec(B_t)$ is the vectorization of B_t and is an $n^2p \times 1$ dimensional vector.

TVP-VAR is transformed to its vector moving average (VMA) structure relied on the Wold representation theorem, hence the Generalized IRF (GIRF) and generalized forecast error variance decompositions (GFEVD) are estimated. Therefore, the VMA representation of y_t is introduced as $\sum_{j=0}^{\infty} B_{jt}\varepsilon_{t-j}$, where B_{jt} is the $n \times n$ matrix.

The $GIRF(\Psi_{ij,t}(H))$ represents the responses of all variables j, following a shock in i computed with an *H-step* ahead of forecast. $GIRF(\Psi_{ij,t}(H))$ is given as follows:

$$GIRF_t(H, \rho_{j,t}, \Omega_{t-1}) = E(y_t + H | e_j = \rho_{j,t}, \Omega_{t-1}) - E\left(y_{t+j} \middle| \Omega_{t-1}\right) \tag{A.4}$$

$$\Psi_{j,t}(H) = \frac{B_{H,t}\Sigma_t e_j}{\sqrt{\Sigma_{jj,t}}} \frac{\rho_{j,t}}{\sqrt{\Sigma_{jj,t}}} \quad \rho_{j,t} = \sqrt{\Sigma_{jj,t}} \tag{A.5}$$

$$\Psi_{j,t}(H) = \Sigma_{jj,t}{}^{-1/2} B_{H,t}\Sigma_t e_j \tag{A.6}$$

where e_j is an $n \times 1$ vector which is 1 with the selection of the *jth* element, and 0 o.w. Therefore, the $GFEVD(\widetilde{\Phi}_{ij,t}(H))$ is estimated based on $\widetilde{\Phi}_{ij,t}(H)$ as follows:

$$\widetilde{\Phi}_{ij,t}(H) = \frac{\sum_{t=1}^{H-1} \Psi_{ij,t}^2}{\sum_{j=1}^{n}\sum_{t=1}^{H-1} \Psi_{ij,t}^2} \tag{A.7}$$

with $\sum_{j=1}^{n} \widetilde{\Phi}_{ij,t}(H) = 1$, and $\sum_{i,j=1}^{n} \widetilde{\Phi}_{ij,t}(H) = n$.

TCI:

$$C_t(H) = \frac{\sum_{i,j=1, i\neq j}^{n} \widetilde{\Phi}_{ij,t}(H)}{\sum_{i,j=1}^{n} \widetilde{\Phi}_{ij,t}(H)} *100 = \frac{\sum_{i,j=1, i\neq j}^{n} \widetilde{\Phi}_{ij,t}(H)}{n} *100 \tag{A.8}$$

TO connectedness:

$$C_{i\rightarrow j,t}(H) = \frac{\sum_{j=1, i\neq j}^{n} \widetilde{\Phi}_{ji,t}(H)}{\sum_{j=1}^{n} \widetilde{\Phi}_{ji,t}(H)} *100 \tag{A.9}$$

FROM connectedness:

$$C_{i\leftarrow j,t}(H)=\frac{\sum_{j=1,i\neq j}^{n}\widetilde{\Phi}_{ij,t}(H)}{\sum_{j=1}^{n}\widetilde{\Phi}_{ij,t}(H)}*100 \quad (A.10)$$

NET:

$$C_{i,t}(H)=C_{i\rightarrow j,t}(H)-C_{i\leftarrow j,t}(H) \quad (A.11)$$

APPENDIX II. MSR Model Results

Variable/Model	Markov Model
Regime 1: Low Volatility	
Inertia	0.201*
Exc	0.068*
Import	−0.000
Commodity	0.027
TCI	0.026**
Outputgap	0.018
C	−1.291
Regime 2: High Volatility	
Inertia	0.472*
Exc	0.342*
Import	0.326*
Commodity	−0.040
TCI	0.080**
Outputgap	−0.077
C	−5.448
Observations	218

APPENDIX III. QQR and QC Methodologies

QQR Approach

Sim and Zhou (2015) introduced the QQ regression framework, building upon the foundational quantile regression model developed by Koenker and Bassett (1978). This method explores the relationship between specific quantiles of an independent variable and the corresponding conditional quantiles of a dependent variable. By leveraging a blend of nonparametric estimation techniques and quantile regression, the QQ regression approach provides a nuanced analysis of variable interactions.

Let θ superscript shows the quantile of the y and x under consideration. We posit a model for the θ-quantile of y as a function of the x, so we have:

$$y_t=\beta^{\theta}x_t+\varepsilon_t^{\theta}, \quad (A.12)$$

where ε_t^{θ} is an error term that has a zero θ -quantile.

Due to the lack prior knowledge about the relationship between the changes in y and x, we allow the relationship function $\beta^{\theta}(x_t)$ to be unknown. To examine this relationship between the θ-quantile of y and τ-quantile of x, denoted by x^{τ}, we linearize the function $\beta^{\theta}(x_t)$ by taking a first-order Taylor expansion of β^{θ} (.) around x^{τ}, which indicates the following:

$$\beta^{\theta}(x_t)\approx\beta^{\theta}(x^{\tau})+\beta^{\theta'}(x^{\tau})(x_t-x^{\tau}) \quad (A.13)$$

Following Sim and Zhou (2015), we redefine $\beta^{\theta}(x^{\tau})$ and $\beta^{\theta'}(x^{\tau})$, respectively, as $\beta_0(\theta,\tau)$ and $\beta_1(\theta,\tau)$. Then, equation (A.14) can be re-formatted as follows:

$$\beta^{\theta}(x_t)\approx\beta_0(\theta,\tau)+\beta_1(\theta,\tau)(x_t-x^{\tau}) \quad (A.14)$$

Subsequently, we substitute equation (A.14) into equation (A.12) to obtain the following:

$$y_t=\beta_0(\theta,\tau)+\beta_1(\theta,\tau)(x_t-x^{\tau})+\varepsilon_t^{\theta} \quad (A.15)$$

The expression: $\beta_0(\theta,\tau)+\beta_1(\theta,\tau)(x_t-x^{\tau})$ captures the relationship between the θ-quantile of the y and τ-quantile of x, given that β_0 and β_1 are doubly indexed in θ and τ.

To estimate (A.15), we solve for:

$$\min_{\beta_0\beta_1}\sum_{i=1}^{n}\rho_{\theta}[y_t-\beta_0-\beta_1(x_t-x\hat{\tau})]K\left(\frac{F_n(x_t)-\tau}{h}\right) \quad (A.16)$$

and derive the estimates $\widehat{\beta}_0(\theta,\tau)$ and $\widehat{\beta}_1(\theta,\tau)$, where the function ρ_θ is the tilted absolute value function that provides the θ-conditional quantile of y_t as the solution. To analyze the effect exerted locally by the τ-quantile of x, we utilize a Gaussian kernel $K(.)$ to weigh the observations in the neighborhood of x^τ, relied on bandwidth h (=0.02). The weights are inversely related to the distance of x_t from x^τ, i.e., the distance of the empirical distribution function as:

$$F_n(x_t) = \frac{1}{n}\sum_{k=1}^{n} I(x_k < x_t) \tag{A.17}$$

from τ, where τ is the value of the distribution function that related to x^τ.

QC Approach

Quantile Causality Methodology

The quantile causality approach extends traditional causality analysis by allowing for the investigation of causal relationships across different quantiles of the conditional distribution of a dependent variable. This methodology, introduced to capture nonlinear and asymmetric relationships, is particularly useful in examining how the effects of an independent variable vary across the entire distribution of the dependent variable.

In this approach, causality is tested for each quantile using a quantile regression framework. The quantile regression model estimates the conditional quantiles of the dependent variable as functions of the independent variable. The causality test then evaluates whether the independent variable contributes to the explanation of the dependent variable at specific quantiles.

The model can be specified as follows:

$$\theta_Y(\tau|X) = \alpha(t) + \beta(t)X + \varepsilon(t) \tag{A.18}$$

where $\theta_Y(\tau|X)$ represents the τ-th conditional quantile of the dependent variable Y given the independent variable X, $\alpha(t)+$ is the intercept term, $\beta(t)$ captures the effect of X on the τ-th quantile of y, and $\varepsilon(t)$ is the error term.

The hypothesis tested is:H0: $\beta(t) = 0$ (no causality at quantile τ) versus H1: $\beta(t) \neq 0$ (causality exists at quantile τ).

By estimating $\beta(t)$ across different quantiles, the methodology provides a detailed understanding of the relationship between variables, revealing whether the causal effect is stronger or weaker at particular parts of the distribution. This approach is particularly valuable in exploring heterogeneous effects, such as in cases of financial time series or economic shocks, where the impact of variables may differ under extreme conditions compared to normal states.

References

Antonakakis, N., Chatziantoniou, I., ve Gabauer, D., 2020. Refined measures of dynamic connectedness based on time-varying parameter vector autoregressions. J. Risk Financ. Manag. 13 (4), 84. https://doi.org/10.3390/jrfm13040084.

Arce, O., Koester, G., Pierluigi, B., 2022. Challenges for global monetary policy in an environment of high inflation: the case of the euro area. ICE, Revista de Economía 929.

Balcilar, M., Gupta, R., Pierdzioch, C., 2016. Does uncertainty move the gold price? New evidence from a nonparametric causality-in-quantiles test. Resour. Policy 49, 74–80.

Bernanke, B., Blanchard, O., 2024. An Analysis of Pandemic-Era Inflation in 11 Economies. Peterson Institute for International Economics Working Paper, 24-11.

Bilgin, N.M., Yilmaz, K., 2018. Producer price inflation connectedness and Input-Output networks. SSRN Electron. J. https://doi.org/10.2139/ssrn.3244645.

CBRT Central Bank of the Republic of Türkiye, 2023. Inflation report 2023 - IV. Retrieved from. https://www.tcmb.gov.tr.

CBRT Central Bank of the Republic of Türkiye, 2024. Inflation report 2024 - II. Retrieved from. https://www.tcmb.gov.tr.

Di Giovanni, J., Kalemli-Özcan, Ş., Silva, A., Yildirim, M.A., 2023. *Pandemic-era inflation drivers and global spillovers* (No. w31887). National Bureau of Economic Research.

Diebold, F.X., ve Yılmaz, K., 2014. On the network topology of variance decompositions: measuring the connectedness of financial firms. J. Econom. 182 (1), 119–134.

Duvan, O.B., 2024. Türkiye'de şirket kârları ve enflasyon: Adam Smith haklı mı? Uluslararası İktisadi ve İdari İncelemeler. Dergisi 45, 167–182.

Eickmeier, S., Hofmann, B.. What drives inflation? Disentangling demand and supply factors (BIS Working Paper No. 1047). Bank for International Settlements. https://www.bis.org/publ/work1047.pdf.

Ha, J., Kose, M.A., Ohnsorge, F., Yilmazkuday, H., 2024. What explains global inflation. IMF Econ. Rev. 1–34.

Kara, H., Sarıkaya, Ç., 2021. Enflasyon Dinamiklerindeki Değişim: Döviz Kuru Geçişkenliği Güçleniyor Mu? Koç University-TÜSIAD Economic Research Forum (ERF), Istanbul. Working Paper, No. 2121.

Karadaş, M., Şahinöz, S., Saraçoğlu, B., 2008. Price setting behavior in Turkish industries: Evidence from survey data (CBRT Working Paper No. 08/04). Central Bank of the Republic of Turkey.

Harvey, A.C., 1989. Forecasting, structural time series models and the Kalman filter. Cambridge University Press.

Kara, H., Ogunc, F., 2012. Döviz kuru ve ithalat fiyatlarının yurt içi fiyatlara etkisi. *Iktisat Isletme ve*. Finans 27 (317), 09–28.

Kara, A.H., Ogunc, F., ve Sarikaya, C., 2017. Inflation dynamics in Türkiye : a historical accounting. CBT Research Notes in Economics 1703, Research and Monetary Policy Department, Central Bank of the Republic of Türkiye.

Koenker, R., Bassett, Jr G., 1978. Regression quantiles. Econometrica: J. Econom. Soc. 33–50.

Koop, G., Korobilis, D., 2013. Large time-varying parameter VARs. J. Econom. 177 (2), 185–198.

Nakamura, E., ve Steinsson, J., 2013. Price rigidity: microeconomic evidence and macroeconomic implications. Annual Rev. Econ. 5 (1), 133–163.

Özmen, M.U., Sevinç, O., 2015. Price rigidity in Turkey: Evidence from micro data (LSE Research Online Documents on Economics No. 66507). London School of Economics and Political Science.

Ozmen, M.U., Yucel, C.Y., 2017. *Turkiye'de Yakin Donemde Kira Enflasyonunu Etkileyen Faktorler* (No. 1707). Research and Monetary Policy Department, Central Bank of the Republic of Turkey.

Rotemberg, J.J., 2005. Customer anger at price increases, changes in the frequency of price adjustment and monetary policy. J. Monetary Econ. 52 (4), 829–852.

Saita, Y., Takagawa, I., Nishizaki, K., ve Higo, M., 2006. Kouribukkatoukeichousa wo mochiita kakakunenchakusei no keisoku. Price setting in Japan: evidence from individual retail price data). Bank Japan Work. Paper Series (06-J) 2.

SBB, 2018. On Birinci Kalkınma Planı (2019-2023) Enflasyonla Mücadele Özel İhtisas Komisyonu Raporu, TC Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı, Ankara. https://www.sbb.gov.tr/wp-content/uploads/2020/04/EnflasyonlaMucadeleOzelIhtisasKomisyonuRaporu.pdf.

Shapiro, Adam Hale, 2024. Decomposing Supply and Demand Driven Inflation. Federal Reserve Bank of San Francisco Working. https://doi.org/10.24148/wp2022-18. Paper 2022-18.

Sim, N., Zhou, H., 2015. Oil prices, US stock return, and the dependence between their quantiles. J. Bank. Finance 55, 1–8.

Taylor, J.B., 1980. Aggregate dynamics and staggered contracts. J. Polit. Econ. 88 (1), 1–23.