Journal of the Statistical and Social Inquiry Society of Ireland
Volume

Barrington Lecture 2025/26

International Comovements and Persistence in Irish Inflation: A Nonlinear Approach[1]

Adnan Velic[2]

Technological University Dublin

(read before the Society, 28th May 2026)

Abstract: This paper studies Ireland's idiosyncratic inflation dynamics. We find that Irish inflation is highly susceptible to trends in international inflation. Our results indicate that international inflation's gravitational pull strengthens over time, particularly in the decade leading up to the Global Financial Crisis, after which we see some signs of waning in inflation comovements. The results also suggest that goods are more responsible for higher speeds of convergence towards international inflation than services, which tend to exert more downward pressures. Adjustments in deviations from international inflation are found to be highly nonlinear. While shock persistence for moderate to large inflation gaps is negligible, half-lives are in excess of a year for small deviations from international inflation. We find that factors such as economic size and openness attenuate inflation gaps by enhancing comovements with international inflation. While the impact on idiosyncratic inflation inertia depends on the absolute size of the inflation deviation, it also relies on how covariates influence market frictions and thus the rate of adjustment for a given inflation gap. This implies that, in the case of opposing forces, the net effect hinges on the stronger of the two channels.

Keywords: Irish inflation dynamics, international comovements, inflation gaps, nonlinearities, persistence
JEL codes: E31, E32, F41

1. INTRODUCTION

Ireland's ability to exert direct influence over domestic price dynamics is relatively limited (Galstyan and Lane, 2009; Galstyan and Velic, 2017). This outcome can be attributed to at least two factors. First, production, consumption, and finance in Ireland are highly dependent on international conditions. As a small open economy that is deeply integrated into international markets and supply chains, Ireland is heavily exposed to global macroeconomic shocks, as evinced by the recent energy crises. Second, Ireland is a currency union member, leaving its national policy toolkit void of monetary or exchange rate strategy options. Excessive sluggishness in price dynamics can impede real exchange rate adjustment and therefore reversion in external imbalances to sustainable levels (Galstyan and Velic, 2018; Curran and Velic, 2019; Velic, 2024). In terms of both trade and location of production, such developments are of particular relevance for the international competitiveness of Ireland.

According to some studies, such as that of Ciccarelli and Mojon (2010), global inflation can explain up to 70% of the variance in national inflation. Research of this variety stressing the global nature of domestic inflation has led to the "globalisation of inflation" literature (Monacelli and Sala, 2009; Mumtaz and Surico, 2012; Kamber and Wong, 2020; Peersman, 2022; Carluccio et al., 2023; Ascari and Fosso, 2024; Gerlach and Stuart, 2024). This raises the question of whether idiosyncratic inflation, or the purely local component of domestic inflation, is transitory with national inflation reverting to global trends over time.

[1] This paper was prepared upon receipt of the Barrington Award from the *Statistical and Social Inquiry Society of Ireland* (SSISI). It was read during the 179th session of SSISI. I am grateful to Jennifer Banim, Kevin Timoney, Patrick Paul Walsh and all other participants at the meeting for fruitful discussions. I also thank Albian Krasniqi and Varun Gokul Kumar for proofreading the paper.
[2] Email: adnan.velic@tudublin.ie; ORCID: https://orcid.org/0009-0005-8357-6658.

If so, the degree of idiosyncratic inflation persistence, furthermore, becomes important in discerning the extent to which external forces pin down inflation expectations. At the same time, the idea of convergence forces one to consider state-dependent inflation models and adjustment nonlinearities associated with frictions, shock sizes and stress episodes (Arghyrou et al., 2005; Golosov and Lucas, 2007; Blanco et al., 2024; Gagliardone et al., 2025).

Focusing on Ireland, the contribution of our paper is threefold. *First*, we empirically model nonlinear idiosyncratic inflation dynamics at both aggregate and more granular levels over the period 1996-2025. In particular, we analyse the evolution of idiosyncratic inflation inertia and the underlying nexus between domestic and international inflation for headline, core, goods, and services price measures. This is achieved by modelling deviations in Irish inflation from an international component based on 37 countries in a framework that embeds state dependence in gap corrections. Following Velic (2025a), these nonlinearities are manifested in the form of asymmetric adjustments over the size of the gap between national and international inflation rates.

Second, our setup, in turn, enables us to study the inextricable link between i) Irish-international inflation comovements, ii) deviations from international inflation, and iii) idiosyncratic inflation persistence. By allowing for time-varying parameters in our main inflation gap model, we are also able to assess how the rate of inflation adjustment and the size of the absolute inflation deviation interact over time to form the "effective" rate of adjustment, and thus inertia in idiosyncratic inflation. In general, the frequency and size of price fluctuations, as well as the associated uncertainties, are inseparable from the notion of inflation persistence. Consequently, inflation stickiness is a matter of primary concern amongst macroeconomists and policy-makers (Fuhrer and Moore, 1995; Benati, 2008; Fuhrer, 2010; De Michelis et al., 2024).

Third, building on this foundation, we offer more detailed insights into our findings by examining the potential macroeconomic and institutional determinants of i)-iii) in the case of overall Irish inflation. Additionally, we investigate how the aforementioned covariates influence the two constituent parts of idiosyncratic inflation inertia, namely a) the rate of adjustment, as underpinned by market frictions, for a given inflation gap and b) the size of the absolute inflation gap itself. Fundamentally, such a decomposition provides a deeper understanding of the net impact of drivers on the persistence of deviations from international inflation.

Our results highlight three key points about the role of international inflation as an attractor of domestic inflation. To begin, on average, international inflation continues to exert a relatively strong gravitational force on Irish inflation over the long run despite significant intertemporal fluctuations in cross-country inflation comovements. Next, while the former is typically true across different consumer price indexes, we find that the pull is more than twice as strong for goods compared to services inflation. Lastly, as reflected in the increasing speeds of adjustment, we find that the gravitational pull of international inflation on Irish inflation has been increasing over time in an almost synchronous fashion as the rise in international inflation comovements.

Our analysis reveals that adjustments and volatility in Irish inflation are notably more pronounced for larger departures from international inflation trends. This provides prima facie evidence of the presence of nonlinear dynamics, which is ultimately supported by formal tests. With an asymmetric treatment of adjustment over different sizes of the inflation gap, we find that the distribution of inflation shock half-lives varies in the cases of headline versus core inflation and goods versus services inflation.

For relatively large, moderate, and small inflation gap sizes, half-lives over the adjustment phase are estimated to be < 2 months, 2-2.5 months, and 25 months respectively in the case of headline inflation. By comparison, the estimates for core inflation are < 1 month, < 2 months, and 48 months. The discrepancy is driven primarily by the food component, which displays a relatively low correlation with international trends. On the other hand, the difference is even more marked for goods versus services. For goods, the half-life figures are < 0.5 months, < 1 month, and 12-14 months, compared to 1.5 months, 2-2.5 months, and 28 months for services. This suggests that services inflation adjusts far more slowly towards international levels, in contrast to goods inflation. Our findings on persistence, more generally, support ideas stemming from the "opportunistic approach to disinflation", in the sense that corrections to Irish inflation are more aggressive for larger deviations from the target. Furthermore, we find that idiosyncratic inflation inertia has been declining over time, in line with weakening market frictions.

Although the strength of the comovement has diminished in more recent times following the global financial crisis (GFC), and particularly so for services, our assessment shows that the striking rise in the correlation between Irish and international inflation rates since the mid-1990s has been met with a deterioration in deviations from international inflation. More broadly, we find an inverse link between international inflation comovements and inflation gaps, meaning that, ceteris paribus, stronger inflation comovements should also be associated with higher idiosyncratic inflation persistence. The latter relation can be rationalised by recognising the nonlinear nature of idiosyncratic inflation adjustments over disparate inflation gap sizes. Namely, smaller deviations tend to be more persistent, as they tend to be more costly to arbitrage away in the presence of a fixed set of market frictions.

Turning attention to some of the possible drivers, we find that by increasing comovements with international inflation, a rise in trade openness, relative economic size, share of services, uncertainty, inflation volatility around the ECB target, and national central bank independence attenuate inflation deviations from international trends. Conversely, we obtain evidence suggesting that the accumulation of international reserves and exchange rate flexibility have the opposite impact. Theoretically, the implications of these results for idiosyncratic inflation persistence are not so obvious. This is because the "effective" rate of inflation adjustment, on which inertia is based, can be affected through two channels. One of these is the absolute size of the inflation gap. The other is the rate of adjustment holding the inflation deviation constant, where the speed of adjustment for a given inflation gap covaries negatively with the strength of market frictions.

In terms of the net impact on inertia, we find that the picture is mixed across regressors. For some factors, there is no ambiguity surrounding the expected overall effect on idiosyncratic inflation persistence, as the direction of inertia through both of the aforementioned avenues is the same. For example, in the cases of greater uncertainty, variance of Irish inflation around the ECB target, and central bank independence, we find that persistence increases via i) a decline in the inflation gap which is now more stubborn due to its smaller size and ii) a lower speed of adjustment for a given gap. The latter, ii), could be associated with delayed decision-making in the face of elevated informational frictions (higher uncertainty or inflation volatility) and more robust regulation designed to limit credit expansions or reduce risky behaviour (prudential central bank policies). We indeed find that the anticipated overall impact on inertia in many of these instances is borne out in persistence regressions, which use the "effective" rate of adjustment as the basis for persistence.

In contrast, for other factors, our results indicate that idiosyncratic inflation persistence moves in opposite directions across *gap* and *adjustment* channels. This implies that the net effect on inertia, ex ante, is equivocal, ultimately depending on the more dominant channel in the sample. To illustrate, we find that while trade openness and relative market capitalisation exacerbate persistence via a contraction of inflation gaps, they also alleviate persistence by raising the speed of adjustment for a given gap. The latter can occur due to lower transaction costs and information asymmetries facing a more liberal economy and larger national stock market. Our estimates suggest that the *adjustment channel* dominates the *gap channel* for trade openness and market capitalisation, meaning that the net impact on inertia of both variables is negative.

The remainder of the paper is structured as follows. Section 2 provides a brief overview of the relevant literature, specifically touching on some of the underlying mechanisms through which potential drivers can shape international inflation comovements and corresponding inflation gaps. In section 3, we sequentially outline the elements of our analytical framework. Section 4 describes the data employed. A discussion of our preliminary and core results follows in section 5, before concluding in section 6.

2. BRIEF LITERATURE REVIEW

The three studies that are most closely related to this paper are those by Ciccarelli and Mojon (2010), Gerlach and Stuart (2024), and Velic (2025a). While our work follows the template of Velic (2025a) with attention solely devoted to Ireland, the other two pieces of research fail to capture the nonlinear nature of idiosyncratic inflation adjustments stressed in Velic (2025a). This omission, naturally, has significant implications for inflation forecasting. The neglect of state dependence partly explains why the two aforementioned studies reach opposing conclusions about the durability of international inflation deviations.

There is a suggestion in the literature that both real and financial outcomes tend to move in a synchronised fashion across economies. This trend is highlighted by Forbes et al. (2024) for interest rate cycles, Miranda-Agrippino and Rey (2022) for financial cycles, and Kose et al. (2003a, 2003b, 2008) for business cycles. Di Giovanni et al. (2022, 2023) expound the fundamental rationale in models of trade and monetary policy spillovers, in which transmission occurs through supply chains and risk premia.

Although global inflation has received much attention in recent times (Auer et al., 2025), the dynamics and fundamental drivers of international inflation comovements and idiosyncratic inflation are relatively under-explored. From a macro perspective, the forces defining cross-country correlations can range from similar policies and structural trends (e.g. globalisation) to common shocks (e.g. energy) that are transmitted, and potentially amplified, via real and financial routes. Velic (2025a) offers a thorough discussion of some of the factors and corresponding mechanisms that are important for understanding fluctuations in international inflation comovements. In what follows, we provide an abridged overview of a few of these sources and channels.

Trade and financial openness are prime candidates for explaining the evolution of inflation comovements across countries. Theoretically, their effects are ambiguous. Greater goods and services trade integration may indeed yield a stronger synchronisation of national business cycles, which would fundamentally be reflected in higher core inflation comovements. Such deeper structural integration can arise, for example, via global supply chains and demand side effects (Auer et al., 2017, 2019; Lane, 2020). In contrast to intra-industry trade where home and foreign varieties of products are imperfect substitutes, trade openness may prompt specialisation in quite disparate industries across countries. If inter-industry trade dominates over intra-industry trade, the specialisation patterns may result in different wage dynamics across countries, conditional on labour intensities varying across industries. Significant industry-specific shocks in this case could act to weaken national business cycle and inflation comovements (Kose et al., 2003b; Curran and Velic, 2020).

On the one hand, better integration into international financial capital markets may strengthen a country's comovements with international inflation through, for instance, international portfolio diversification, spillovers during crises that produce more correlated disinflationary pressures, or a deployment of financial resources to sectors in which the source country has a comparative advantage (e.g. Big Tech FDI from U.S. into Ireland). On the other hand, additional foreign capital may accommodate stronger inter-industry specialisation patterns across nations and larger, more persistent current account imbalances with a divergence in inflation paths across deficit and surplus countries (Lane, 2020). Galstyan (2019) finds an inverse relation between inflation and the trade balance for the euro area, suggesting that the low inflation period in the currency union post 2011 may have been partly due to its surplus in the external balance.

The share of services in economic activity is another structural factor that is thought to play a role. An expansion of the services sector relative to others in the economy may lead to a divergence in national inflation outcomes, as aggregate output becomes more nontradable and core inflation, therefore, becomes increasingly determined by local factors. This is the conventional viewpoint. However, the growing importance of intangibles such as software and data, as documented by Velic (2025b), is providing a powerful counterforce. These intangibles are not only themselves very tradable. In conjunction with advances in ICT hardware and connectivity, they are also facilitating greater tradability in services that were previously more subject to a physical "proximity burden", such as consulting. Modern services like cloud computing (e.g. for telecommunications) are used as intermediate inputs in global value chains, meaning shocks to these services propagate through global networks. Intangible-heavy services are thus likely to enhance inflation comovements.

Gravity-style models in the literature suggest that countries of larger economic size should exhibit stronger international comovements due to their tighter trade linkages. However, larger economic size may also result in a larger public sector, and hence more spending on nontradables that act as a buffer against international inflation synchronisation. Foreign exchange reserves can shield domestic markets from destabilising global shocks (Obstfeld et al., 2010), resulting in weaker cross-country correlations. But, equally, reserve accumulation may stimulate greater risk-taking in the private sector, translating to greater volatility at home. If confined to local markets, this volatility may erode comovements with international trends. If associated with cross-border spillover effects, it may enhance them.

Nominal exchange rate flexibility can attenuate the international propagation of inflation shocks, with exchange rate adjustments offsetting cross-country inflation differentials. For Ireland, this is particularly relevant vis-à-vis the U.S. dollar and British pound as the U.S. and U.K. are two of Ireland's main non-euro trading partners. On the other hand, according to the contagion explanation of asset price movements (King and Wadhwani, 1990), international comovements may rise in the presence of more volatile currency markets. Ahir et al. (2022) indicate that synchronised uncertainty spikes, reflecting both economic and political affairs, are more probable when shocks emanate from systemically important countries or when trade ties between countries are stronger. By inducing stock market volatility and disagreements in forecasts, higher uncertainty can prolong cross-country price and inflation differentials as consumption and investment decisions are postponed.

Finally, when considering the quality of national institutions, central bank independence and powers emerge as important dimensions in theory (Malovaná et al., 2023). Research suggests that macroprudential policy is more likely to be adopted and effectively implemented under a more autonomous central bank, with greater independence providing the capacity to act swiftly to achieve financial stability. For example, macroprudential policy rules pertaining to borrowing and lending may produce smoother business cycles that are more in line with those of stable developed economies. Lower autonomy in contrast may lead to fiscal mismanagement and a deviation from macroeconomic patterns in the developed world, unless there are spillovers that extend beyond national borders.

3. METHODOLOGY

To model the nonlinear adjustment dynamics of idiosyncratic inflation for consumer price index $i \in$ {*headline, core, goods, services*}, the following exponential smooth transition autoregressive (ESTAR) model is adopted

$$\Delta y_t^i = \alpha_0^i + \sum_{j=1}^{m} \alpha_j^i D_{M(j)} + \phi^i y_{t-1}^i + \sum_{k=1}^{q^i} \beta_k^i \Delta y_{t-k}^i + \\ + \left(\alpha_0^{i*} + \sum_{j=1}^{m} \alpha_j^{i*} D_{M(j)} + \phi^{i*} y_{t-1}^i + \sum_{k=1}^{q^i} \beta_k^{i*} \Delta y_{t-k}^i \right) \tilde{F}\left(y_{t-d}^i; \tilde{\gamma}^i, \mu^i\right) + \varepsilon_t^i. \quad (1)$$

The difference between Ireland's inflation π and international inflation π^* gives the inflation gap $y \equiv \pi - \pi^*$, or idiosyncratic inflation. Month dummy $D_{M(j)}$ equals 1 for month j and 0 otherwise, while q is the model's lag length as determined by information criteria.

The continuous transition function $\tilde{F}(y_{t-d}; \tilde{\gamma}, \mu) = \left[1 - \exp\left(-e^{\tilde{\gamma}} \frac{(y_{t-d}-\mu)^2}{\sigma_y^2}\right)\right] \in [0,1]$ governs the nonlinear behaviour of the inflation gap y around the equilibrium gap μ.[3] $\mu = 0$ suggests that π^* is a long-run attractor. As we obtain $\hat{\mu} \approx 0$ across all cases, $\tilde{F}(.)$ can be interpreted as a function that enables larger deviations from international inflation to adjust at speeds that are different to those of smaller deviations. Reflecting price stickiness, the timing of the response to inflation gaps is dictated by delay parameter d. For a fixed value of $\tilde{\gamma}$, $\tilde{F}(.) \in [0,1]$ represents a continuum of inflation gap regimes corresponding to the absolute size of the transition variable, $|y_{t-d}|$. $\tilde{\gamma}$ mediates the paths between inflation gap regimes. A higher $\tilde{\gamma}$ implies a steeper transition function and thus easier transition across regimes. The effective rate of gap adjustment at each point in time can be gauged by $\phi + \phi^* \tilde{F}(.)$, where lower (higher) values of $\tilde{F}(.)$ capture smaller (larger) inflation gaps. The model is estimated by nonlinear least squares, which is

[3] The variance σ_y^2 is a scaling factor that hastens convergence in model parameters.

equivalent to maximum likelihood estimation under the additional assumption that the errors are normally distributed.

We use this model to examine the relation between international inflation comovements, inflation gaps, and idiosyncratic inflation persistence. The first of these is given by the correlation between Irish and international inflation for the given price index i, denoted by $\rho_t^{\pi^i,\pi^{i*}}$. The second is given by the transition function $\tilde{F}_t^i(.)$ which is a standardised measure of the absolute deviation from international inflation $|\pi_t^i - \pi_t^{i*}| \approx |(\pi_t^i - \pi_t^{i*}) - \mu^i|$. The third is given by $|1 + \phi_t^i + \phi_t^{i*}\tilde{F}_t^i(.)|$, where higher (lower) values of the measure signal higher (lower) persistence or, equivalently, slower (faster) reversion in y_t^i towards the long-run mean μ^i. The latter, in turn, suggests slower (faster) reversion in π^i towards π^{i*}.[4] To obtain time-varying slope parameters ϕ_t^i and ϕ_t^{i*}, we estimate equation (1) over moving time intervals with varying restrictions on $\tilde{\gamma}$, μ, and d.

Although we do not impose this empirically as we wish to let the data speak freely, theory suggests that smaller deviations from international inflation are more difficult to eliminate compared to larger ones because market frictions are more binding at this level. For sufficiently small inflation gaps, our model allows for these more persistent dynamics, including the possibility of non-convergence. Therefore, for y_t^i to be globally stationary around μ^i in the case of $\phi^i \geq 0$, $-2 < \phi^i + \phi^{i*} < 0$ must hold. A more intuitive measure of inertia that follows directly from our model is the half-life

$$\widehat{hl}_{t|y_{t-d}}^i = \frac{\ln(0.5)}{\ln(|1 + \hat{\phi}_t^i + \hat{\phi}_t^{i*}\tilde{F}(y_{t-d}^i; \hat{\tilde{\gamma}}^i, \hat{\mu}^i)|)}. \tag{2}$$

We define it as the number of months required for the effects of a unit shock to disappear by 50%, without re-emerging, once adjustment kicks in. The half-life is calculated for the 99th percentile, median/mean, and 10th percentile of $\tilde{F}^i(.)$, corresponding to relatively large, moderate, and small inflation gaps. To further understand the evolution of idiosyncratic inflation persistence, we examine its components, which include adjustment coefficients $\{\phi^i, \phi^{i*}\}$ and the standardised inflation gap $\tilde{F}^i(.)$.

Focusing on the headline (overall) price index, a common set of covariates across international inflation comovements, inflation gaps, adjustment coefficients, and idiosyncratic inflation persistence is analysed in time series regressions of the form

$$\omega_t = \chi + \sum_{j=1}^{r} \nu_j D_{Q(j)} + \boldsymbol{\delta}'\mathbf{X}_{t-l} + \epsilon_t. \tag{3}$$

The regressands are defined as $\omega_t \in \{\ln(\rho_t^{\pi,\pi^*}), \ln(\tilde{F}_t(.)), \ln(|1 + \phi_t + \phi_t^*|), \ln(|1 + \phi_t + \phi_t^*\tilde{F}_t(.)|)\}$. $D_{Q(j)}$ is a quarterly time dummy that equals 1 for quarter j and 0 otherwise. Equation (3) is also estimated without quarterly dummies. The vector of non-deterministic regressors **X** includes trade openness, financial openness, relative GDP, relative market capitalisation, services share, international reserves, nominal exchange rate flexibility, uncertainty, volatility of inflation around the ECB target, and national central bank independence. All variables in **X** enter the equation in logarithmic form. Estimation is conducted using ordinary least squares (OLS) with Newey-West standard errors. As the extreme inner and outer inflation gap regimes, corresponding to the lower and upper bounds of $\tilde{F}(.) \in [0, 1]$, are visited over time, we additionally employ the logit model for inflation gaps. In these logit regressions, we define the dependent variable as $\omega_t = 1(0)$ if $\tilde{F}_t > (\leq) 0.5$. A penalised likelihood estimator is employed for the logit specification in order to avoid small sample or rare event biases in estimation.[5]

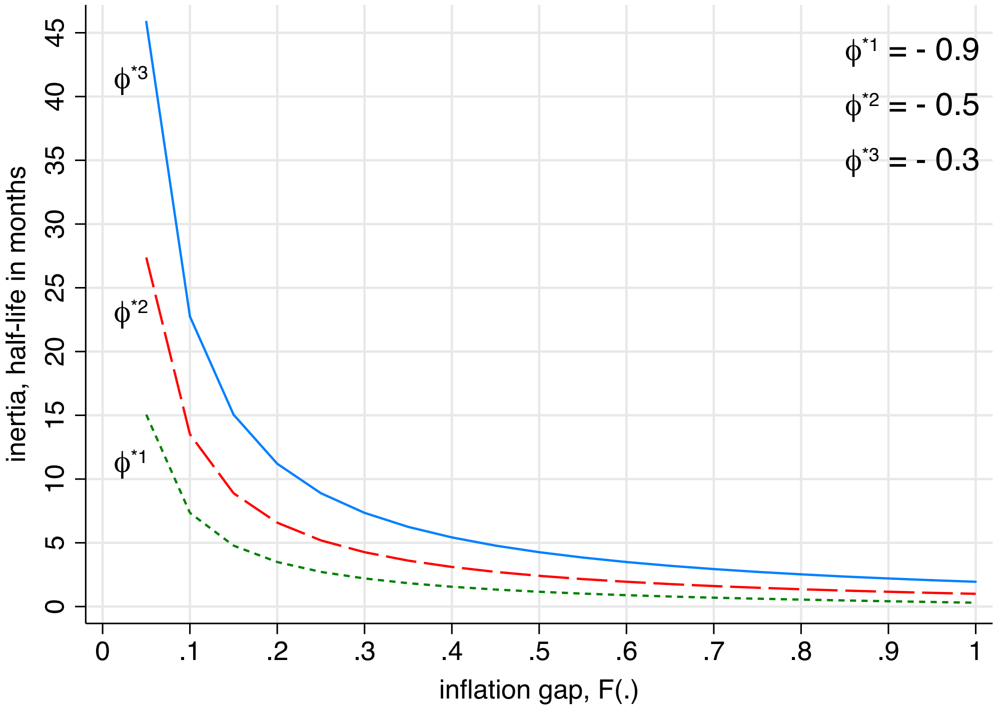
To fully appreciate how a regressor's effects on adjustment coefficients $\{\phi_t, \phi_t^*\}$ and inflation gap $\tilde{F}_t(.)$ can lead to ambiguous implications for idiosyncratic inflation persistence prior to an observation of estimates, we turn to Figure 1. To simplify the illustration while preserving the core message, Figure 1 assumes that inflation deviations are best characterised by unit root dynamics whenever y_t is in the

[4] Assuming that Ireland is an overall price-taker that does not affect world prices.

[5] We use lower frequency data for the analysis of covariates, leaving us with a smaller sample.

vicinity of μ (i.e. extreme inner regimes). This means that $\phi \approx 0$. Larger departures from μ, meanwhile, are permitted to diminish over time at a rate consistent with $\phi^* \in (-1, 0)$.[6] Thus, Figure 1 shows how idiosyncratic inflation inertia, as measured by the half-life in equation (2), changes with a) the size of the inflation deviation $\tilde{F}(.)$ under a fixed adjustment coefficient $\bar{\phi}^*$ and b) adjustment coefficient ϕ^* for a given inflation gap $\bar{\tilde{F}}(.)$.

Figure 1: Idiosyncratic Inflation Persistence Simulations



Note: Transition function $F(.) \equiv \tilde{F}(.)$ provides a standardised measure of the absolute inflation gap $|\pi^i - \pi^{i*}| \approx |(\pi^i - \pi^{i*}) - \mu^i|$. $\phi^* \tilde{F}(.)$ is the effective inflation adjustment coefficient used in the calculation of the half-life.

Take for example the economic openness of Ireland. A more open Irish economy within a particular regulatory paradigm may observe increased comovements with international macroeconomic trends. If this stronger synchronisation implies a decline in deviations from international inflation, Figure 1 points to elevated levels of gap persistence as the country moves up along a given curve. The higher half-life in the graph, which is tied to a higher trade volume, however, is the outcome for a given set of market frictions as reflected in the absolute size of ϕ^*. By attenuating transaction costs, information asymmetries, and other elements that constrain profitable cross-border trade, higher openness may also be associated with a higher rate of adjustment for a given inflation gap. If so, $|\phi^*|$ rises and the curve in Figure 1 shifts downward. The presence of competing forces across *gap* and *adjustment channels* of persistence changes implies that the net impact on the half-life is equivocal, ultimately hinging on the channel that dominates in the sample. Put differently, the sign and magnitude of the change in idiosyncratic inflation inertia depend on whether the *movement along the curve* or the *shift in the curve* is more pronounced, and by how much.

4. DATA

Our study uses Eurostat's harmonised indexes of consumer prices (HICP). We obtain monthly data for 38 countries over the period 1996:01-2025:12.[7] Currently, for the various aggregate indexes, special

[6] Given an adjustment rate of $-\phi^* \tilde{F}(.)$, the expected duration of a unit shock in these outer inflation gap regimes would be $\frac{1}{-\phi^* \tilde{F}(.)}$.

[7] The sample of countries includes Albania (AL), Austria (AT), Belgium (BE), Bulgaria (BG), Croatia (HR), Cyprus (CY), Czechia (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (EL), Hungary (HU), Iceland (IS),

aggregates, and sub-components listed in Table 1, there is no material difference in available figures and discernible patterns across the ECOICOP version 1 and ECOICOP version 2 HICP data in Eurostat.[8] The first version, however, provides significantly better coverage over time across countries. As a result, ECOICOP version 1 data are employed. The only exception in Table 1 is for "Insurance and Financial Services" which employs version 2 data, as this special aggregate is unavailable in the version 1 repository.

To circumvent the issue of temporal aggregation bias (Paya et al., 2007; Savat, 2022), which tends to raise persistence, month-on-month inflation rates are used. As our measure of international inflation, we consider i) the cross-country median inflation rate (π^*_{med}), ii) the cross-country average inflation rate (π^*_{avg}) , iii) the cross-country GDP-weighted inflation rate (π^*_{wavg}), iv) the first principal component of national inflation rates (π^*_{fpc}), v) a common single factor from a factor model (π^*_{sfm}) and vi) a Eurostat regional index that comprises EU countries (π^*_{ndx}). Although it does not affect our analysis empirically or in theory given the small open economy status of Ireland, we follow Gerlach and Stuart (2024) for comparability by excluding Ireland from the international inflation measure.[9]

The examination of potential determinants and transmission mechanisms in equation (3) employs quarterly data in line with data availability on the right-hand side of the regression. In relation to vector **X**, the data sources primarily include Eurostat, LSEG Datastream, World Bank's World Development Indicators, External Wealth of Nations, and CSO. Trade openness for Ireland is defined as the total of exports and imports of goods and services divided by GDP. Financial openness meanwhile is given by the de facto volume-based measure of international financial integration adopted from Lane and Milesi-Ferretti (2007, 2018). It is defined as the sum of total external assets and liabilities relative to GDP.

Economic size variables include Irish GDP and market capitalisation relative to corresponding rest-of-sample figures. The size of the Irish services sector is defined as the value added of services divided by GDP. International reserves are expressed as a share of GDP. Nominal exchange rate flexibility in each quarter is the standard deviation of the monthly change in the logarithm of the trade-weighted multilateral nominal exchange rate. Retrieved from Ahir et al. (2022), national uncertainty data pertain to economic and political developments over short- and long-run horizons. The role of the ECB's inflation target is captured by the variance of monthly year-on-year inflation around the 2% rate. Finally, a de jure measure of Irish central bank independence is obtained from Romelli (2025).

5. EMPIRICAL FINDINGS

5.1 Some Empirical Foundations

Figure 2 shows the evolution of Irish headline, core, goods (total, industrial, non-energy industrial), and services inflation rates for month-on-month and year-on-year cases.[10] The year-on-year plots indicate that all categories of inflation generally follow similar patterns, with two major spikes evident over the last two decades. The first of these episodes is associated with the Great Recession while the second relates to i) COVID after the initial disinflationary phase and ii) the energy crisis originating in the Ukraine-Russia war. On the matter of volatility and magnitude, we observe some divergence. For example, the difference between headline and core inflation at the onset of the Ukraine-Russia conflict highlights the direct role of global commodities. Pass-through from the energy sector to other parts of the economy, however, is still possible. Comparing goods to services inflation, the latter normally exhibit a lower variance and higher inertia. Services are thought to be more labour-intensive and nontradable. Relying more heavily on sticky wages or relatively more stable local conditions implies smoother trends in corresponding inflation.

Ireland (IE), Italy (IT), Kosovo (XK), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Montenegro (ME), Netherlands (NL), North Macedonia (MK), Norway (NO), Poland (PL), Portugal (PT), Romania (RO), Serbia (RS), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE), Switzerland (CH), Turkey (TR), United Kingdom (UK), United States (US).

[8] ECOICOP version 2 is the new European Classification of Individual Consumption According to Purpose and is aligned with the updated UN COICOP 2018 classification. This new scheme is in the process of replacing ECOICOP version 1 (implemented in 2015) which is based on the UN COICOP 1999 classification. Differences between these two versions of HICP data are most evident at higher levels of disaggregation with changes in certain classes and subclasses of goods and services.

[9] Gerlach and Stuart (2024) contend that including country c's domestic inflation rate in the international measure may lead to a spurious relation between international inflation and the national inflation of country c.

[10] Core inflation excludes energy, food, alcohol and tobacco.

Table 1: Irish-International Inflation Correlations, 1996-2025

HICP Index	(1) $\rho^{\pi,\pi^*_{med}}$	(2) $\rho^{\pi,\pi^*_{avg}}$	(3) $\rho^{\pi,\pi^*_{wavg}}$	(4) $\rho^{\pi,\pi^*_{fpc}}$	(5) $\rho^{\pi,\pi^*_{sfm}}$	(6) $\rho^{\pi,\pi^*_{ndx}}$	(7) $\sqrt{R^2_{\pi,\pi^j}}$
Total - All Items	0.65	0.60	0.60	0.71	0.71	0.70	0.87
Total - All Items, 2000-2025	0.67	0.65	0.66	0.70	0.70	0.70	0.87
Overall ex. A&T	0.69	0.66	0.69	0.74	0.74	0.70	0.89
Overall ex. Energy	0.63	0.60	0.61	0.64	0.64	0.62	0.86
Overall ex. Energy, Food, A&T	0.70	0.67	0.65	0.69	0.69	0.67	0.89
Overall ex. Energy, Unpr. Food	0.66	0.63	0.63	0.66	0.65	0.64	0.87
Overall ex. Energy, Seasl. Food	0.65	0.63	0.64	0.66	0.66	0.64	0.87
Overall ex. Adm. Prices, CTRs	0.72	0.72	0.73	0.74	0.73	0.73	0.96
Goods	0.73	0.71	0.71	0.74	0.74	0.69	0.91
Industrial Goods	0.77	0.75	0.74	0.80	0.80	0.72	0.94
Non-Energy Ind. Goods	0.72	0.72	0.70	0.73	0.73	0.67	0.96
Non-Energy Ind. Goods, Durables	0.50	0.50	0.54	0.62	0.63	0.50	0.75
Non-Energy Ind. Goods, Semi-Dur.	0.68	0.69	0.67	0.70	0.70	0.64	0.97
Non-Energy Ind. Goods, Non-Dur.	0.30	0.35	0.30	0.30	0.30	0.30	0.45
Food, inc. A&T	0.47	0.48	0.43	0.52	0.52	0.48	0.64
Processed Food inc. A&T	0.46	0.50	0.44	0.53	0.53	0.48	0.66
Processed Food ex. A&T	0.53	0.49	0.53	0.55	0.55	0.56	0.71
Unprocessed Food	0.30	0.27	0.26	0.30	0.29	0.28	0.54
Seasonal Food	0.22	0.18	0.19	0.24	0.23	0.22	0.40
Energy	0.77	0.70	0.74	0.77	0.78	0.77	0.92
Electricity, Gas, Solid Fuels, Heat	0.28	0.22	0.34	0.31	0.31	0.40	0.63
Liquid Fuels, Fuels, Lubric. - PTE	0.85	0.84	0.82	0.92	0.92	0.85	0.97
Energy & Unprocessed Food	0.70	0.66	0.70	0.74	0.74	0.75	0.88
Energy & Seasonal Food	0.69	0.64	0.69	0.73	0.73	0.74	0.88
Services	0.65	0.60	0.58	0.66	0.66	0.64	0.82
Services related to Communication	0.13	**0.05**	0.07	0.11	0.10	0.13	0.41
Services related to Housing	**0.01**	0.10	**0.03**	**0.05**	**0.04**	**0.02**	0.55
Services related to Recreation	0.62	0.64	0.50	0.67	0.67	0.56	0.79
Services related to Transport	0.63	0.62	0.60	0.66	0.66	0.65	0.79
Education, Health, Social Prot.	0.21	0.30	0.25	0.29	0.29	0.26	0.71
Housing Rental Payments	**-0.04**	0.13	**-0.01**	**0.03**	**0.02**	**-0.01**	0.56
Insurance & Financial Services	**0.01**	**0.02**	**0.01**	**0.04**	**0.04**	**0.04**	0.34

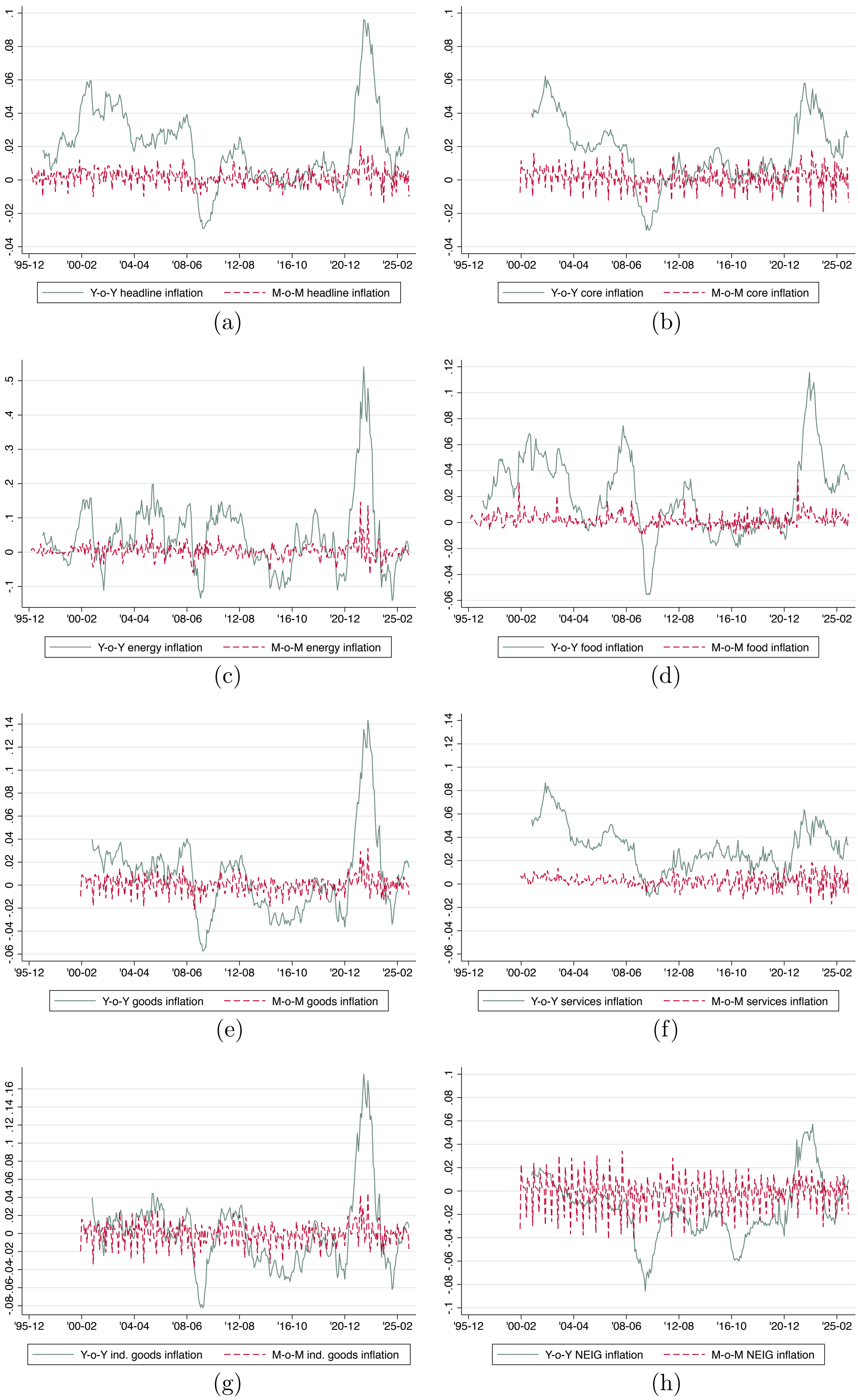
Note: Month-on-month inflation data employed (monthly year-on-year inflation rates, by construction, increase the correlation between domestic and international inflation). Correlation coefficients not in bold are statistically significant at conventional levels (almost all at 1% level). Correlation coefficients in bold are statistically insignificant. The Eurostat regional index (ndx) proxy for international patterns comprises EU countries. Apart from the ndx measure, all international inflation measures exclude Ireland.

Another salient point that emerges from the graphs is that developments in month-on-month inflation take time to embed themselves in year-on-year inflation statistics due to base effects. In the short-term (if the focus is on the latter), this can lead to misleading conclusions about persistence and de-anchor inflation expectations through entrenched mindsets amongst consumers and producers.[11] Year-on-year inflation, moreover, can exaggerate cross-country comovements in inflation.

As denoted by ρ^{π,π^*_s} for a given consumption basket, the full sample period correlation between Irish inflation and our measure of international inflation is reported in Table 1. Squaring the correlations in columns 1-6 returns R-squareds from simple linear regressions of Irish inflation on international inflation, which provide a basic measure of the proportion of national inflation that is explained by international patterns. Column 7 on the other hand shows, for comparison, the square root of the coefficient of determi-

[11] In times of crisis, month-on-month inflation can offer a better gauge of current movements in the economy.

Figure 2: Inflation in Ireland



Note: NEIG is non-energy industrial (ind.) goods.

nation from a multiple regression of Irish inflation on remaining foreign country inflation rates.[12] The single factor model measure of international inflation focuses on the shared variation in foreign inflation rates. Comparing ρ^2 from column 5 to R^2 in column 7 indicates that the single factor model usually captures a sizeable share of the explanatory power of foreign inflation rates. While the correlation coefficients across columns are generally quite strong, it is important to note that they can mask significant fluctuations in comovements over time, as we will observe later. Moreover, the table shows notable heterogeneity across aggregates of consumption items.

Reflecting household usage, Irish electricity, gas, solid fuels and heating show a low correlation with the international counterpart. Some explanations for this divergence include the dispersion of Ireland's population, the level of diversification in the energy portfolio (reliance on gas), the effects of data centres, and the long-run hedging strategies of energy suppliers. Irish energy inflation overall, including that in liquid fuels for personal transport equipment (PTE), is clearly highly correlated with global trends, as expected. Some of this naturally feeds into the high correlation observed for aggregates and sub-components like industrial goods. Nevertheless, removing energy from headline inflation over time reveals that Irish inflation is still strongly correlated with international dynamics ($\rho > 0.6$ persists). Additionally excluding other components that are thought to be more volatile due to their dependence on global markets, namely food items, does not change this finding. The strong correlations for core inflation measures may suggest that international inflation comovements are not just because of exposure to global commodity markets, but also due to deeper structural integration of national markets that is reflected in more synchronised national business cycles. In other words, comovements are not only rooted in the supply-side dynamics of global commodities, but also underlying national aggregate demands.

Although correlations for processed food are stronger than those for unprocessed food, due to the higher energy-intensity of the former, food inflation more generally in Ireland shows a relatively weaker link with international trends. A number of factors contribute to this divergence. Firstly, Ireland's geographic location means that the country faces higher logistics costs. Shipping and distribution costs are more influenced by maritime constraints than the land-based supply networks prevalent in continental Europe. Second, due to its trade intensity vis-à-vis the UK and the presence of UK-based retailers in the Republic, Ireland's food prices have been more sensitive to UK-specific trends than trends in mainland Europe. Third, a relatively higher degree of concentration in the groceries market over time may have also contributed to differing price dynamics.[13] Fourth, labour is a significant input in food processing, and so food price dynamics are heavily influenced by domestic wage growth. The correlation for overall goods therefore appears to be weighed down by food. This is indeed reflected in the higher correlations for industrial goods (which excludes food).

With structural transformation shifting the Irish economy towards services, one could argue that international inflation comovements should be weaker. Total services inflation for Ireland, however, demonstrates a relatively high correlation with corresponding international patterns. Column 7 suggests that close to 70 percent of the variation in Irish services inflation can be explained by the services inflation trajectories across foreign countries. Columns 1-6 meanwhile imply that the international inflation measure can account for over 40 percent of the domestic fluctuations, which is still a significant proportion. In relation to sub-components, services related to recreation and transport appear to be most important.[14] By contrast, inflation patterns in housing rental payments and insurance & financial services display almost no correlation with corresponding industry trends abroad. Domestic legislation and structural market issues partly drive this result. Furthermore, housing rents refer to actual payments and not imputed ones for owner-occupiers. The relatively high home ownership rate in Ireland, compared to countries like Germany that have a stronger tenant culture, implies a weaker rental weight in Ireland's HICP aggregates. Although "services related to housing" inflation remains relatively uncorrelated, this

[12] Conceptually, this offers bounds on the communality and uniqueness in Irish inflation.

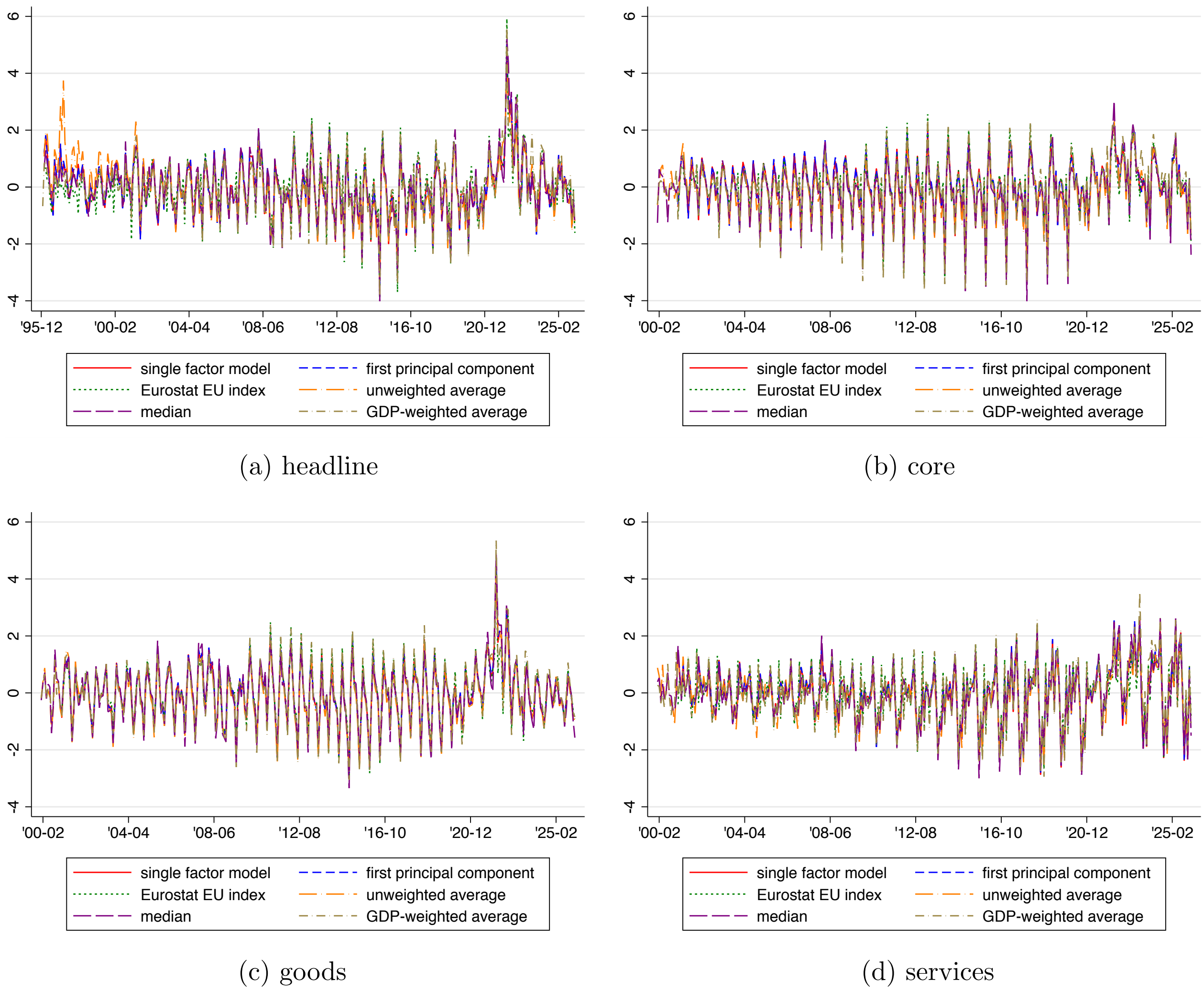
[13] Tesco acquired Crazy Prices in the late 1990s and by 2010 had over 30% of the market. At present, around 90% of the market is controlled by five players (Dunnes Stores, Tesco, SuperValu, Lidl, and Aldi). The 1987 Grocery Order, which prohibited the setting of prices below cost or invoice price, was also abolished in 2006. This, in turn, generated some volatility in the market with undercutting amongst competitors via loss leader strategies, while price increases were imposed on unaffected brands in order to maintain profit margins.

[14] These services have seen a rise in their reliance on digital infrastructures. Energy also feeds naturally into transport services.

may act to improve international inflation comovements in services given Ireland's notably higher average rents. Conversely, severe structural imbalances in the Irish residential property market (localised supply-demand mismatch) over the past decade have rapidly accelerated open-market housing rents. Such domestic capacity constraints can act to decouple trends in services inflation across countries.

For each of the price indexes of interest, Figure 3 plots our six statistical measures of international inflation, representing the common component of national inflation rates. The graphs illustrate that these measures move in a highly synchronous fashion over time with a high degree of overlap. For comparability, the series are standardised so that they have a mean of zero and variance of one. From the graphs, it is evident that there was a relatively recent shock to global inflation, which is particularly pronounced in headline and goods measures.[15] The correlation matrices of international inflation measures are presented in Table 2. The strong correlation coefficients, primarily in excess of 0.9, indeed corroborate the graphical evidence from Figure 3. This kind of analysis is important, as there is no obvious reason why the international measures should be almost perfectly congruent. Given that these results cannot tilt our preferences towards a particular measure, we proceed with the cross-country median for international inflation since it is robust to outliers in the distribution and an easy non-parametric statistic to compute.

Figure 3: International Inflation Measures



(a) headline

(b) core

(c) goods

(d) services

[15] This stemmed from i) COVID-related supply chain disturbances, production bottlenecks, pent-up demand, and ii) geopolitical tensions. COVID shifted demand away from services to goods, while simultaneously crippling the supply of the latter. Meanwhile, goods inflation, which includes food and energy, was more sensitive to the Ukraine-Russia war compared to services inflation, which experienced lagged pass-through and second round effects. This explains the difference in inflation spikes across the two components.

Table 2: Correlation Matrix of International Inflation Measures

HICP Index	(1) median	(2) unweighted average	(3) GDP-weighted average	(4) first principal component	(5) single factor model	(6) Eurostat EU index
***Headline:* Total - All Items**						
median	1.00					
unweighted average	0.90	1.00				
GDP-weighted average	0.91	0.87	1.00			
first principal component	0.96	0.94	0.94	1.00		
single factor model	0.96	0.93	0.94	1.00	1.00	
Eurostat EU index	0.90	0.80	0.96	0.92	0.92	1.00
***Core:* Ex. Energy, Food, A&T**						
median	1.00					
unweighted average	0.96	1.00				
GDP-weighted average	0.94	0.94	1.00			
first principal component	0.97	0.98	0.96	1.00		
single factor model	0.97	0.97	0.96	1.00	1.00	
Eurostat EU index	0.93	0.92	0.99	0.95	0.96	1.00
***Core:* Ex. Energy, Unpr. Food**						
median	1.00					
unweighted average	0.95	1.00				
GDP-weighted average	0.93	0.93	1.00			
first principal component	0.97	0.97	0.95	1.00		
single factor model	0.97	0.97	0.95	1.00	1.00	
Eurostat EU index	0.92	0.91	0.98	0.95	0.95	1.00
Goods						
median	1.00					
unweighted average	0.97	1.00				
GDP-weighted average	0.94	0.97	1.00			
first principal component	0.98	0.99	0.97	1.00		
single factor model	0.98	0.99	0.98	1.00	1.00	
Eurostat EU index	0.94	0.96	0.99	0.97	0.98	1.00
Services						
median	1.00					
unweighted average	0.94	1.00				
GDP-weighted average	0.87	0.86	1.00			
first principal component	0.97	0.98	0.90	1.00		
single factor model	0.97	0.97	0.90	1.00	1.00	
Eurostat EU index	0.86	0.83	0.98	0.90	0.90	1.00

Note: All of the reported Pearson correlation coefficients are statistically significant at the 1% level. Apart from the Eurostat regional index measure capturing EU countries, all international inflation measures exclude Ireland.

Table 3 offers some tentative evidence of nonlinearities in idiosyncratic headline, core, goods, and services inflation for Ireland. In particular, the table stresses the presence of asymmetric adjustment and volatility in inflation deviations across regimes of high and low inflation gaps. The upper (lower) regime for HICP i captures absolute inflation gaps at time $t-1$, $|\pi_{t-1}^{i}-\pi_{t-1}^{i*}|$, that are greater than (less than or equal to) the average absolute gap, $\tau^{i}=\overline{|\pi^{i}-\pi^{i*}|}$. Under each of the regimes for a given index i, we calculate the average absolute monthly change in Irish inflation, $\overline{|\Delta\pi_{t}^{i}|}$, and the standard deviation of these domestic inflation changes, $\sigma^{\Delta\pi_{t}^{i}}$. Firstly, we find greater adjustment and volatility in Irish inflation across all indexes whenever the lagged inflation gap lies above average. This may hint at subsequent corrections. The discrepancy is also notable. The figures of the upper regime are at least 50% larger than those of the lower regime. This could suggest that international inflation exerts a stronger pull on Irish inflation whenever the absolute inflation gap is relatively large.

Table 3: Inflation Adjustments and Volatility across Regimes

$t-1$:	$\lvert\pi^i - \pi^{i*}\rvert > \tau^i$	$\lvert\pi^i - \pi^{i*}\rvert \leqslant \tau^i$	$t-1$:	$\lvert\pi^i - \pi^{i*}\rvert > \tau^i$	$\lvert\pi^i - \pi^{i*}\rvert \leqslant \tau^i$
HICP	$\overline{\lvert\Delta\pi_t^i\rvert}$	$\overline{\lvert\Delta\pi_t^i\rvert}$	**HICP**	$\sigma^{\Delta\pi_t^i}$	$\sigma^{\Delta\pi_t^i}$
headline	0.006	0.004	headline	0.008	0.005
core	0.008	0.005	core	0.011	0.006
goods	0.009	0.006	goods	0.012	0.007
neig	0.013	0.007	neig	0.018	0.010
services	0.007	0.004	services	0.010	0.005

Note: i is the HICP. neig is non-energy industrial goods. $\overline{\lvert\Delta\pi_t^i\rvert}$ is the average absolute change in Irish inflation. Median absolute changes are similar. $\sigma^{\Delta\pi_t^i}$ is the standard deviation of Irish inflation changes. $\lvert\pi^i - \pi^{i*}\rvert$ is the absolute value of the gap between Irish inflation, π^i, and international inflation, π^{i*}. International inflation is gauged by the cross-country median inflation rate at each point in time. Threshold τ^i is the average/median value of $\lvert\pi^i - \pi^{i*}\rvert$.

Interestingly, we find that adjustment and volatility across regimes are stronger for core inflation than headline inflation. This difference might be due to the core measure's exclusion of food inflation, which can be relatively sticky for Ireland because of local factors. These include structural cost challenges such as high legal, insurance and logistics fees that generate steeper baseline costs and downward price rigidities.[16] Earlier, we found that food exhibits a lower correlation with international trends. For energy, which is also excluded from the core measure, we see the opposite. However, given food's higher weight in overall inflation, it may be driving the positive net effect on core inflation figures in Table 3. Finally, the dynamics across regimes for services are weaker than those for goods. Services inflation could be stickier for reasons outlined earlier (higher labour intensity, non-tradability), implying slower rates of adjustment. Compared to goods, overall services inflation for Ireland shows somewhat weaker international comovements based on the full-sample correlation coefficients in Table 1.

5.2 Core Results

5.2.1 ESTAR

In the case of each price index, parameter estimates for the ESTAR model given in equation (1) are presented in Table 4. Before implementing the ESTAR framework, inflation gap series $\{y_t^i\}$ are exposed to tests of i) linearity versus nonlinearities of the smooth transition variety and ii) non-stationarity versus stationarity.[17] In relation to i), tests in the spirit of Teräsvirta (1994) strongly point to STAR-type nonlinearities. Along with ESTAR model convergence considerations, they also provide guidance on the choice of d^i. The results of this first background check are consistent with the distribution of $\tilde{\gamma}$ estimates in column 4 of Table 4, as $\tilde{\gamma} \rightarrow -\infty$ (highly negative value in practice) implies a linear model. In relation to ii), all conventional linear and nonlinear unit root tests unequivocally support the view that the idiosyncratic inflation series are globally stationary.

Based on extensive assessments in the data, we find across all indexes that the extreme inner regime of the ESTAR specification is best described by unit root dynamics as captured by $\phi^i = 0$. Our persistence measures thus imply that any convergence towards equilibrium will be entirely reflected in $\phi^{i*}\tilde{F}^i(.)$. Columns 2 and 3 of Table 4 indeed show that the global stationarity condition of $-2 < \phi^* < 0$ is met in all cases. Point estimates in column 2 indicate $\phi^{i*} \in (-1, 0)$, with the rate of adjustment towards equilibrium μ^i rising for lower values of $\phi^{i*} \in (-1, 0)$. Figure 4 presents the evolution of idiosyncratic inflation series over time. In particular, based on the mean or median as the measure of central tendency, graphs on the right suggest that zero is a good candidate for the long-run equilibrium of inflation gap series. The direct estimates of μ^i in column 5 provide formal evidence that zero is the ultimate target of

[16] Ireland's small market size and geographic remoteness are other factors driving the structural floor and keeping prices elevated.
[17] Results available upon request.

Table 4: ESTAR Estimates and Idiosyncratic Inflation Persistence

	Parameter Estimates					**Half Lives (months)**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
HICP	ϕ	ϕ^*	$\phi+\phi^*$	$\tilde{\gamma}$	μ	$\tilde{F}(.)^{99p}$	$\tilde{F}(.)^{50p}$	$\tilde{F}(.)^{10p}$	$\overline{\tilde{F}(.)}$
headline	—	−0.320**	−0.320**	2.072***	−0.000***	1.814	1.934	25.941	2.611
		(0.180)	(0.180)	(0.373)	(0.000)				
core	—	−0.550**	−0.550**	1.167***	0.000	0.868	1.481	48.801	1.850
		(0.290)	(0.290)	(0.323)	(0.000)				
goods	—	−0.815***	−0.815***	1.388***	−0.000	0.411	0.683	14.874	0.913
		(0.298)	(0.298)	(0.434)	(0.000)				
neig	—	−0.905***	−0.905***	1.800***	−0.000	0.295	0.531	12.542	0.771
		(0.266)	(0.266)	(0.455)	(0.000)				
services	—	−0.365*	−0.365*	1.587***	0.000*	1.527	2.047	27.639	2.651
		(0.230)	(0.230)	(0.401)	(0.000)				

Note: neig is non-energy industrial goods. Columns (1)-(5) present parameter estimates for the model in equation (1). Columns (6)-(8) present rates of persistence at p^{th} percentiles of transition function $\tilde{F}(.)$, while column (9) does so at the mean of $\tilde{F}(.)$.

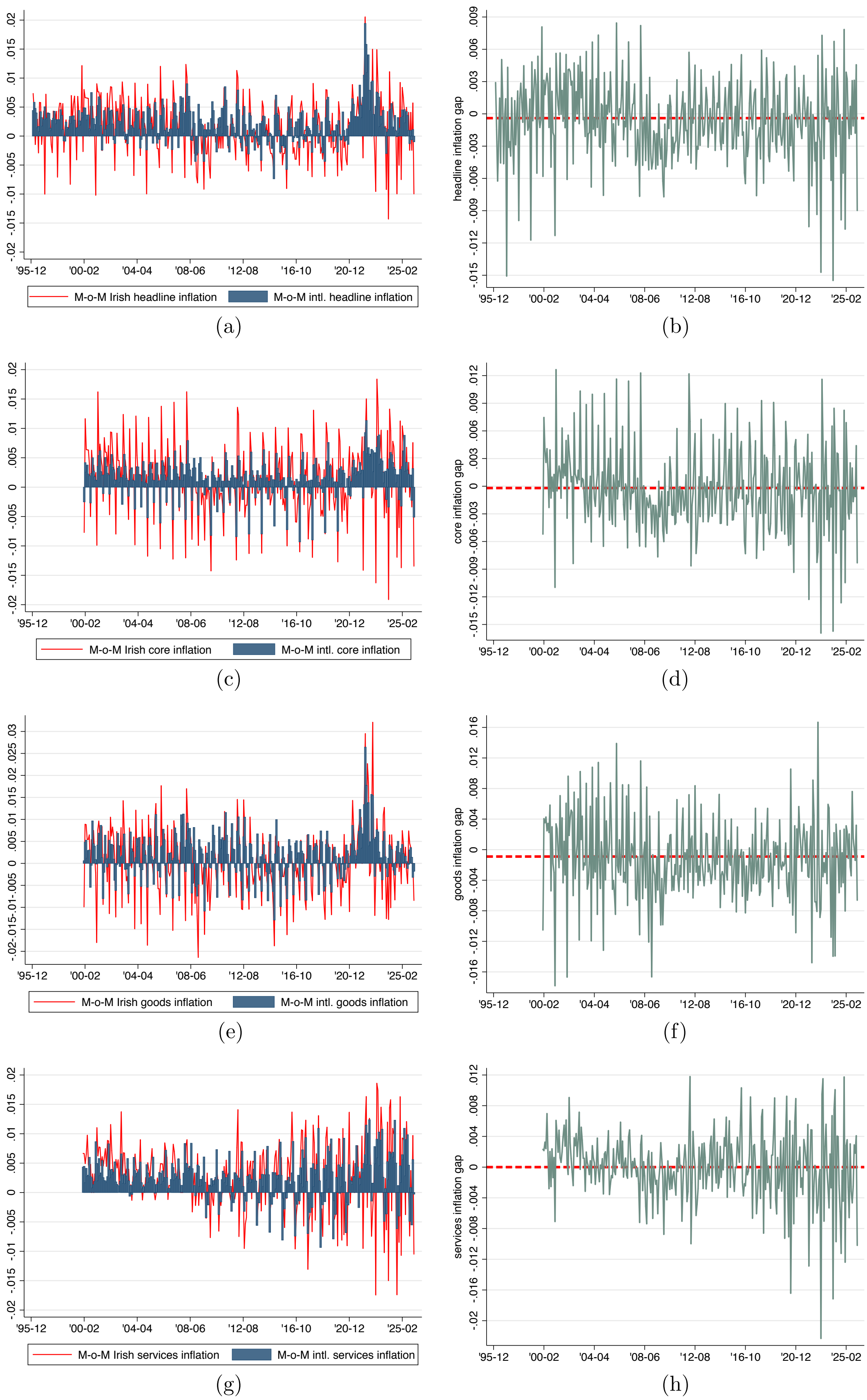
inflation gap convergence.

The estimate of $\tilde{\gamma}^i$ in column 4 pins down the gradient of the symmetric transition function $\tilde{F}^i(.)$. Plots of the transition functions are provided down the middle in Figure 5. Those functions with a higher $\tilde{\gamma}^i$ observe easier movement between regimes, as the transition function is steeper. $\tilde{\gamma}^i$ effectively determines the paths between inflation gap regimes. To compensate for a flatter transition function in terms of speed of adjustment, a higher $|\phi^{i*}|$ would be required. Figure 5 indicates that all of the transition functions are relatively steep, suggesting relatively easier transitions between regimes for a given rate of adjustment.

Combined with the graphical evidence from Figure 4, our estimates of ϕ^{i*} and μ^i overall suggest that international inflation is continuously exerting a strong gravitational pull on Irish inflation. However, without violating this umbrella statement, non-negligible differences in results can be found across price indexes. In line with the initial suggestive evidence of Table 3, Table 4 supports the notion that goods place more upward pressure on the speed of adjustment in aggregate inflation gaps when compared to services, which are more responsible for downward pressures. Optimal d values also indicate that goods react to changing inflation gap sizes markedly faster than services, with the response time being around a quarter for goods and a year for services.

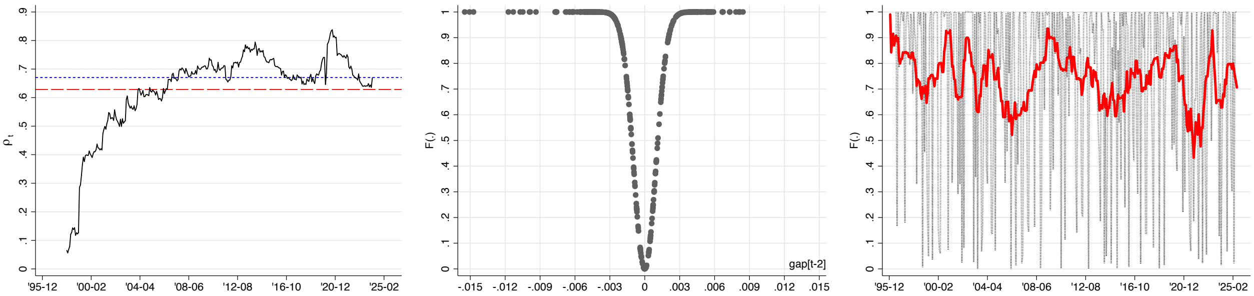
Columns 6-9 in Table 4 compute the corresponding levels of idiosyncratic inflation inertia for different gap sizes holding constant the rate of adjustment at its estimated average level. The half-lives imply that the speed of correction in inflation gaps increases with the absolute size of the deviation. Across the board, gaps of a moderate (columns 7 and 9) to large (column 6) size are characterised by relatively swift adjustments once they commence, with half-lives falling well short of 3 months. Conversely, very small gaps (column 8) persist much longer. These dynamics in persistence bear resemblance to ideas ascribed to the "opportunistic approach to disinflation", in the sense that corrections to inflation are more aggressive for larger departures from the target. In our context, as market frictions tend to be more binding for smaller inflation gaps, they slow down the adjustment of such gaps. On the other hand, the larger profits associated with larger deviations suppress these constraints, thereby leading to faster adjustment. As idiosyncratic inflation persistence is very much state dependent, contentions about it need to be more nuanced.

Figure 4: Idiosyncratic Inflation

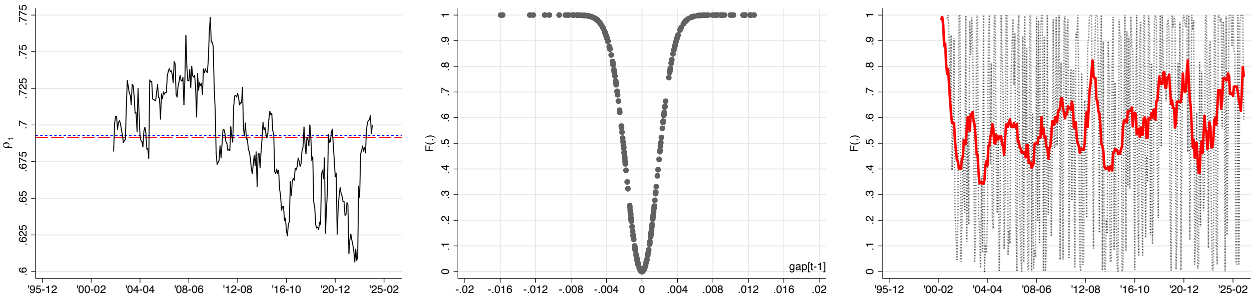


Note: Red dashed reference line gives the mean or median inflation gap.

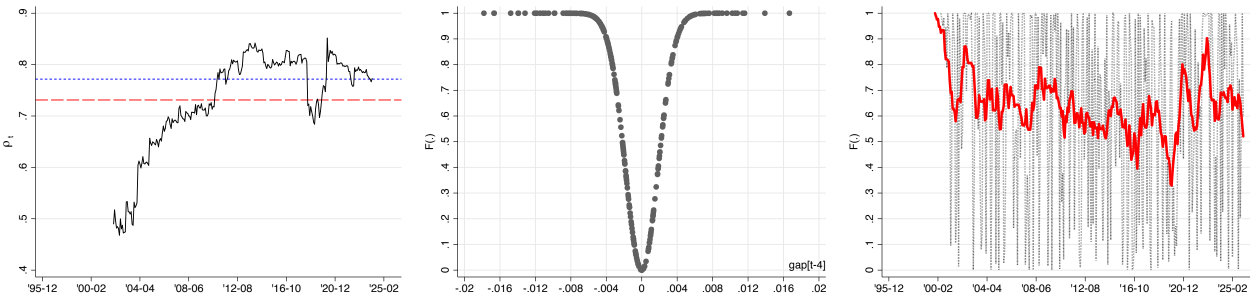
Figure 5: International Inflation Comovements (left), Transition Function vs. Transition Variable (middle), Transition Function vs. Time (right)



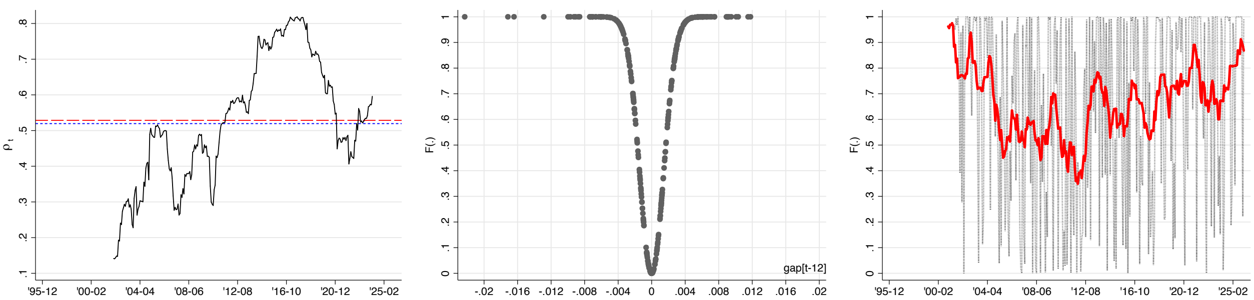
(a) Headline, $\eta = -0.30$***



(b) Core, $\eta = -0.47$***



(c) Goods, $\eta = -0.45$***



(d) Services, $\eta = -0.14$**

*Note: ρ_t is the monthly-rolling 4-year gross correlation between Irish and international inflation. Each of the aforementioned correlations is reported at the mid-point of the respective 4-year period. International inflation is measured as the cross-country median inflation rate at each point in time. Red long-dash reference line marks the average 4-year correlation over the period. Blue short-dash reference line marks the median 4-year correlation over the period. F(.) $\equiv \tilde{F}$(.) is the transition function. gap[t-d] is the idiosyncratic inflation gap at time t-d. Red series plotted in graphs on right is the 12-month moving average of $\tilde{F}$(.), with each observation reported at the mid-point of the respective 12-month period. η is the gross correlation between the series in the left graph (ρ_t) and the red series in the right graph (12-month moving average of $\tilde{F}$(.)). ***, **, * denote 1%, 5%, and 10% significance levels respectively.*

Captured by the 99th percentile of $\tilde{F}^i(.)$ and 50th percentile or mean of $\tilde{F}^i(.)$ respectively, large and moderate inflation gaps for services display half-lives that are 3 to 5 times the size of that for overall and non-energy industrial goods. Goods measures show shock dissipation of well over 50% after half a month in the case of large gaps, and after 1 month in the case of moderate gaps. For small gaps, as reflected in the 10th percentile of the transition function, inertia in idiosyncratic services inflation based on the half-life is roughly twice as strong as observed for goods. In absolute terms, this difference is much more notable, with the small gap half-life for goods standing below 15 months.

Table 4 shows that most of the half-lives for core inflation gaps are lower than those for headline inflation gaps. This is likely related to the exclusion of food, which tends to experience more sluggish adjustment, from core inflation. Small inflation gaps are the exception, and display the opposite pattern in half-lives (column 8). The exclusion of food from core inflation means that the core aggregate measure should show greater comovement with international inflation. As we will see in the next section, this implies smaller deviations from international trends on average. These are generally more persistent, as we have found. Along this gap dimension, the increase in persistence for core inflation is particularly pronounced at the 10th percentile or lower of the transition function. Unlike at the higher ends of $\tilde{F}^i(.)$, this offers a stronger counterforce to the increase in the rate of adjustment associated with the exclusion of food. The net effect is a reversal in the pattern of inertia across headline and core inflation in column 8 compared to patterns in columns 6, 7 and 9. Driven also by the omission of food, non-energy industrial goods see lower persistence relative to total goods across all of the examined gaps (columns 6-9).

5.2.2 Evolution of Inflation Comovements, Gaps, Adjustments, and Inertia

Graphs on the left-hand side of Figure 5 depict the evolution of comovements between Irish and international inflation, as measured by the monthly-rolling 4-year correlation coefficient $\rho_t^{\pi^i,\pi^{i*}}$. Average (median) 4-year correlations are marked by the red long-dash (blue short-dash) reference line. The graphs on the right-hand side of Figure 5 meanwhile track corresponding developments in standardised inflation gaps $\tilde{F}^i(.)$. The thick red series, in particular, plot the 12-month moving average of the transition function, thereby giving a sense of the general trajectory of inflation gaps. This makes it easier to identify key turning points. Lastly, in Figure 5, η^i provides the correlation between the international inflation comovements ($\rho_t^{\pi^i,\pi^{i*}}$) shown on the left and the absolute inflation gaps ($\tilde{F}^i(.)$) shown on the right.

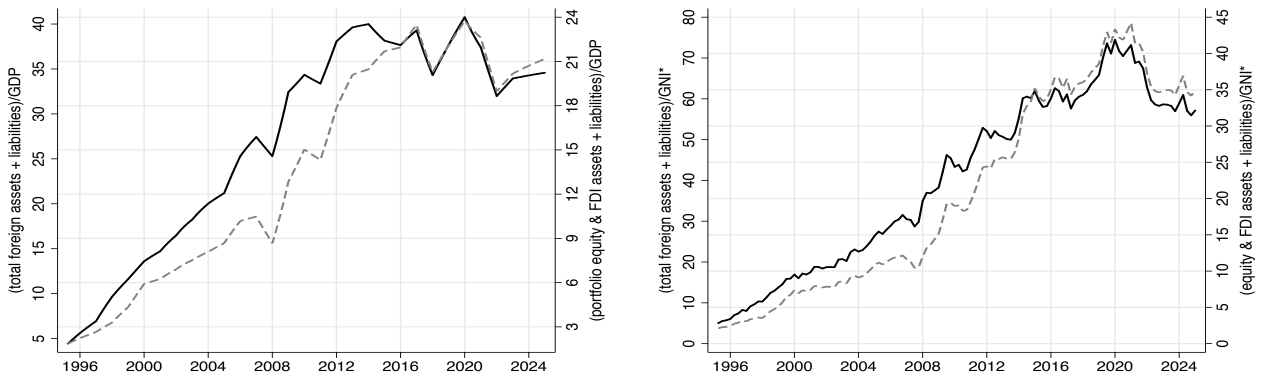
International inflation comovements display significant heterogeneity over time. These trends are concealed by the average or median inflation correlations shown, which are quite similar to those reported in Table 1. The inflation comovement series unveil a striking rise in the synchronisation of Irish and international inflation dynamics in the lead up to the GFC and Great Recession, with signs of the link weakening thereafter, especially in more recent times. In tandem with these changes over the same timeframe, Figure 5 indicates that inflation deviations tend to initially contract in size, before showing some reversal post GFC. These concurrent general trends in inflation comovements and gaps for Ireland suggest an inverse long-run relation between the two variables. This cursory observation is indeed corroborated more formally by η estimates, which show a statistically significant negative link between comovements and gaps over our long-run horizon.

In line with previous discussions, we find that the inverse link is more pronounced for core compared to headline inflation, and goods compared to services inflation. As evident from the graphs, core (goods) inflation features stronger comovements and smaller gaps more regularly relative to headline (services) inflation.[18] From Figure 5, in the case of each price aggregate, it is clear that Ireland visits both the extreme inner and outer regimes of inflation gaps at $\tilde{F}(.) = 0$ and $\tilde{F}(.) = 1$ over time. These extreme points correspond to zero or negligible inflation gaps and very large inflation gaps respectively. More generally, across indexes, we find that Ireland spends a considerable amount of time in each of the low and high inflation gap regimes corresponding to $\tilde{F}(.) \leq 0.5$ and $\tilde{F}(.) > 0.5$. However, it is Irish core and goods inflation that visit the extreme inner regime ($\tilde{F}(.) \approx 0$) more frequently, and spend more time in the lower regime of inflation gaps ($\tilde{F}(.) \leq 0.5$), compared to headline and services inflation.

[18] Comovements are stronger, and corresponding deviations weaker, for core compared to headline inflation particularly in the period prior to the Great Recession.

Inflation comovements and gaps in the lead up to the GFC evolved in an environment of hyper-globalisation. This period was characterised by technology improvements supporting international production relying on global labour supplies, relatively high risk appetites, low global interest rates, deregulated financial markets, and an expansion of global capital flows, including the credit boom that fueled Ireland's construction sector. From GFC onwards, signs of a reversal in comovement and gap trends coincided with the external adjustments of the Great Recession, which included a trade collapse, and capital market fragmentation effects of the European sovereign debt crisis. The sudden stop in private capital flows left an indelible mark. Failing to fully recuperate, the ratio of global capital flows to world GDP has remained lodged well below its pre-crisis zenith. This can partly be attributed to government bailouts, inertia in higher levels of risk aversion, and macroprudential policy. The introduction of regulatory frameworks, such as Basel III, after the GFC produced a financial environment defined by greater oversight. In more recent times, factors such as Brexit, Trump 1.0 & 2.0, COVID, and geopolitical tensions have adversely affected international markets and integration (Velic, 2025a). Overall, although it is inaccurate to describe the post-GFC period as a phase of deglobalisation, evidence of stagnation in globalisation can be argued. To illustrate, while Ireland's ratio of total foreign assets and liabilities to GDP went from 5.6 in 1996 to 27.4 in 2007, seeing a fivefold rise, this ratio increased from 32.4 in 2009 to only 34.6 by the end of 2025 as shown in Figure 6(a). Similar slowdowns can be observed for the equity-based measure of international financial integration and ratios using modified GNI, GNI* (Figure 6(b)).

Figure 6: Volume-Based (solid line, left axis) and Equity-Based (dashed line, right axis) International Financial Integration, Ireland

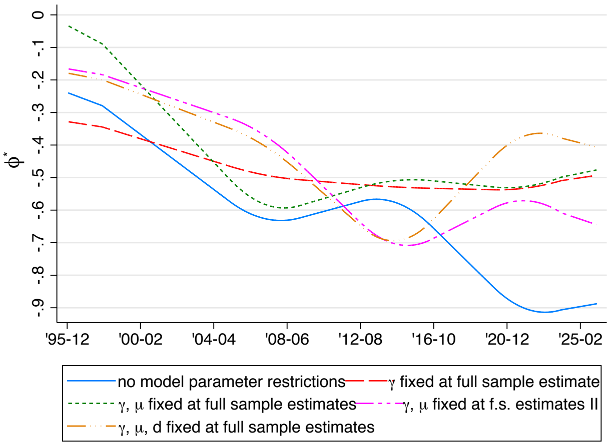


(a) (b)

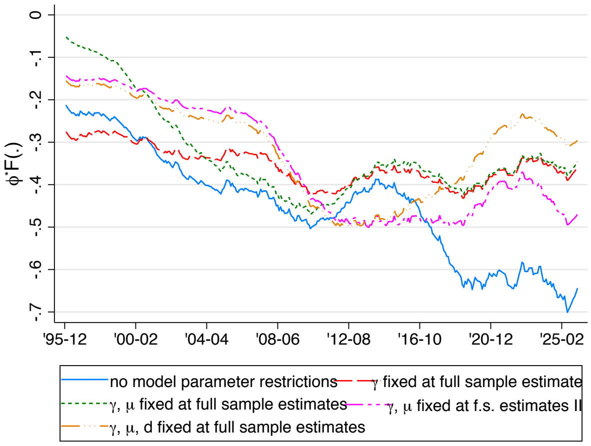
What do the observed developments in inflation comovements and gaps imply about the evolution of idiosyncratic inflation persistence? For a given adjustment coefficient ϕ^*, gap inertia increases over time before beginning to show signs of abating post GFC. This trajectory points to a positive relation between international inflation comovements and idiosyncratic inflation persistence. The link can be rationalised by noting i) the inverse relation between inflation comovements and gaps and ii) the nonlinear nature of idiosyncratic inflation adjustments established in section 5.2.1. At the start of the sample, as inflation comovements are weak and gaps are relatively wide, the persistence of inflation deviations is relatively low, ceteris paribus. By the end of the sample, although there is some reversal in comovements and gaps, inflation comovements are stronger and deviations are weaker than they were initially, in 1996. As a result, gap inertia is more pronounced in 2025 than it is at the start of the sample.

However, this reasoning assumes that ϕ^*, which mediates a given gap's rate of adjustment, does not change over the sample period. It means that the effective rate of adjustment, $\phi^*\tilde{F}(.)$, is driven intertemporally only by the inflation gap. To also allow ϕ^* to vary over time, we re-estimate equation (1) over moving 7.5-year windows in our sample under various model assumptions. To focus the analysis, we just examine headline inflation. Using 4-year moving averages, Figure 7(a) plots the evolution of our ϕ^* estimates in the case of i) no model parameter restrictions and ii) varying restrictions on γ, μ, and d. For the latter, we fix the aforementioned parameters at their full sample estimates in different ways, as highlighted in the graph, in order to enable comparability in ϕ^* over time. The plots suggest that the speed of adjustment for a given inflation gap has increased significantly over the sample period, although some tapering off and reversal is found post GFC. As ϕ^* reflects market frictions, the latter might be associated with the emergence of tighter financial controls after the GFC, including heightened banking supervision and prudential regulation. Brexit, the protectionist policies of the Trump administration, COVID, and geopolitical upheaval may furthermore have contributed to a slowdown in rates of adjustment in the past decade.

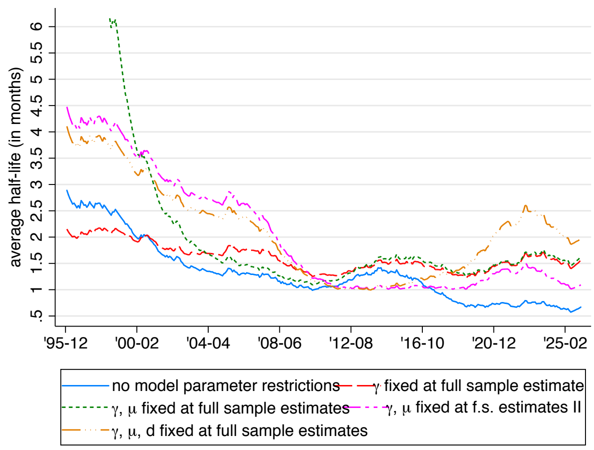
Figure 7: Evolution of Adjustment Coefficient ϕ^*, Effective Adjustment Coefficient $\phi^* F(.)$, and Half-Life



(a)



(b)



(c)

Note: Estimates are for the headline inflation gap. $\phi^* F(.)$ *gives the effective inflation adjustment coefficient used in the measurement of idiosyncratic inflation persistence, including the half-life, where transition function* $F(.) \equiv \tilde{F}(.)$ *provides a standardised measure of the absolute inflation gap* $|\pi - \pi^*| \approx |(\pi - \pi^*) - \mu|$. *Adjustment coefficient* ϕ_t^* *is estimated using windows of 7.5 years.* $F(.) \equiv \tilde{F}(.)$ *is the full sample period transition function, with the full sample estimates of* $\tilde{\gamma}$ *and* μ *approximately equalling the corresponding average estimates over sub-intervals. 4-year moving average* ϕ^* *and* $\phi^* F(.)$ *are plotted.*

The general downward trend in ϕ^* from 1996 to 2025 presents a counterforce to the higher idiosyncratic inflation persistence originating in smaller inflation gaps. To obtain an idea of how the net effect on inertia has evolved over time, Figure 7(b) plots the 4-year moving average of the effective adjustment coefficient, $\phi^* \tilde{F}(.)$. The salient feature of the graph is the long-term downward trend in the effective coefficient series, with pre and post GFC patterns that are predominantly consistent with those of ϕ_t^*. The evidence indicates that ϕ^* has largely been the more dominant component of the effective rate of adjustment. This is particularly clear in the period leading up to the GFC, during which the rising rate of adjustment ϕ^* is typically more than offsetting the declining inflation gap $\tilde{F}(.)$ to produce lower levels of idiosyncratic inflation persistence. Figure 7(c) shows that the most substantial reduction in half-lives was observed in the period preceding the Great Recession. The half-life hits a low of just under 1 month by the time of the crisis. Thereafter, half-lives display mixed patterns, hovering around those relatively low values.

5.2.3 Multivariate Regression Results

Focusing on headline figures, Table 5 delves deeper into our findings for Ireland by examining some of the potential drivers of i) inflation comovements, ii) inflation gaps, iii) adjustment rates, and iv) idiosyncratic inflation persistence. As reported in the table, all unit root tests point to stationarity of corresponding regression residual series. Regression R-squareds, moreover, suggest that our set of covariates does a good job of capturing variation in the dependent variables. From columns 5-6 and 7-8, we see that regressors explain around 50% of the variation in adjustment coefficients and overall idiosyncratic inflation inertia, respectively. This figure is around 40% for inflation gaps (columns 3-4) and 80% for inflation comovements (columns 1-2).

We find in columns 1-2 that trade openness, economic size, share of services, uncertainty, volatility of inflation deviations from the ECB target, and extent of national central bank independence all covary positively with the degree of comovement between Irish inflation and international inflation. Conversely, higher international reserves attenuate these comovements. This inverse relation primarily stems from the higher holdings in the period before Euro Area entry, which coincided with the lower comovements observed during that time. It is interesting to note how the variance of Irish inflation around the ECB target reflects push and pull forces. Lower volatility around the inflation target implies lower comovements with international inflation as the ECB pulls in the direction of its 2% medium-run goal. Higher volatility may indicate that global inflation is exerting the more dominant force, resulting in Irish inflation following international trends more closely. This suggests that international inflation in our sample deviates considerably from 2%, otherwise lower volatility for Ireland would be associated with higher inflation comovements. In times of low Irish inflation volatility around the ECB target, the result also suggests that Ireland does a relatively better job of complying with the ECB's price stability mandate, as it diverges from other countries.

Given the inverse link between inflation comovements and gaps, our covariates are expected to carry the opposite sign in inflation gap regressions. Columns 3-4 of Table 5 indeed confirm this to be the case. We find this to also materialise in logit regressions as shown in Table 6, where the level odds ratios in square brackets are computed for +5% changes in covariates. The regressors that reduce deviations of Irish inflation from international inflation do so by strengthening comovements with international inflation.

Columns 5-6 in Table 5 report the effects on the rate of adjustment for a given inflation gap. Higher levels of trade and financial openness for Ireland are associated with higher $|\phi^*| \in (0, 1)$, implying a higher speed of adjustment. The same is true for relative market capitalisation, but not for the other economic size variable, relative GDP. A larger stock market may mean better access to information thereby reducing information asymmetries. A relatively larger economic size may on the other hand be accompanied by an outsized public sector. This could make overall national output less tradable and more labour intensive. A larger government can result in more layers of bureaucracy, red tape, or excessive legislation that bolsters market frictions and hinders market operations. Services represent over half of the Irish economy. As the sector has grown, Irish services inflation has become more closely aligned with its international counterpart (Figure 5), perhaps owing to the roles of intangibles and energy in transport, for example. This has led to a greater synchronisation of inflation at the headline level. However, we find that a higher share of services generally slows down overall inflation gap adjustments, as local labour costs and legislation start playing a more influential role.

By absorbing pressures, higher multilateral exchange rate flexibility places a wedge between Irish and international inflation, thereby inducing a slower rate of adjustment for a given inflation gap. Higher uncertainty meanwhile attenuates adjustment according to results. This can occur through informational frictions that delay decision-making. Qualitatively, we see a similar pattern for higher Irish inflation volat-

Table 5: Drivers of Inflation Comovements, Gaps, Adjustments and Inertia

Dependent Variable:	*Comov.* $\ln(\rho^{\pi,\pi^*})$		*Inf. Gap* $\ln(\tilde{F}(.))$		*Adj. Coeff.* $\ln(\|1+\phi^*\|)$		*Idio. Inertia* $\ln(\|1+\phi^*\tilde{F}(.)\|)$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trade Openness	0.721*	0.704*	−0.920*	−0.812*	−0.457***	−0.470***	−0.760***	−0.712***
	(0.424)	(0.423)	(0.570)	(0.500)	(0.152)	(0.143)	(0.272)	(0.247)
Financial Openness	−0.016	−0.016	1.736***	1.625***	−0.778***	−0.807***	−0.374**	−0.330*
	(0.011)	(0.011)	(0.485)	(0.515)	(0.114)	(0.106)	(0.169)	(0.206)
Relative GDP	0.443***	0.458***	−1.330**	−1.294**	1.058***	1.158***	0.776**	0.645*
	(0.121)	(0.128)	(0.663)	(0.679)	(0.139)	(0.137)	(0.325)	(0.390)
Relative Market Cap.	0.074***	0.076***	−0.259***	−0.256***	−0.091***	−0.078***	−0.076**	−0.094**
	(0.022)	(0.024)	(0.077)	(0.080)	(0.025)	(0.023)	(0.036)	(0.040)
Services Share	1.025***	1.063***	−3.138*	−2.993*	0.667*	0.873**	1.198*	0.900
	(0.258)	(0.268)	(1.689)	(1.792)	(0.404)	(0.387)	(0.689)	(0.845)
Reserves	−0.129***	−0.126***	0.347***	0.321***	0.036*	0.045**	0.093*	0.085**
	(0.047)	(0.047)	(0.118)	(0.113)	(0.019)	(0.020)	(0.051)	(0.043)
Exch. Rate Flexibility	−0.012	−0.012	0.106	0.113	0.023**	0.023**	0.074*	0.069*
	(0.017)	(0.018)	(0.082)	(0.083)	(0.011)	(0.010)	(0.043)	(0.041)
Uncertainty	0.007**	0.008**	−0.040***	−0.032***	0.003*	0.002	0.014**	0.012*
	(0.003)	(0.004)	(0.012)	(0.012)	(0.001)	(0.002)	(0.006)	(0.007)
Inflation Target	0.014**	0.014**	−0.032*	−0.036*	0.003	0.005	−0.011	−0.014
	(0.007)	(0.007)	(0.018)	(0.020)	(0.004)	(0.004)	(0.016)	(0.016)
CB Independence	3.503***	3.521***	−1.441***	−1.417***	0.627***	0.621***	0.510***	0.472***
	(0.297)	(0.297)	(0.333)	(0.391)	(0.109)	(0.103)	(0.080)	(0.107)
Quarter dummies	no	yes	no	yes	no	yes	no	yes
No. of observations	120	120	120	120	120	120	120	120
R-squared	0.80	0.80	0.38	0.45	0.42	0.53	0.43	0.47
DFGLS_u	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ADF_u	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PP_u	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KPSS_u	0.08	0.08	0.05	0.05	0.09	0.09	0.02	0.02

*Note: * significant at 10%; ** significant at 5%; *** significant at 1%. Newey-West heteroskedasticity and autocorrelation robust standard errors in parentheses. The aforementioned standard errors are used as a precaution, even though Breusch-Godfrey, Durbin-Watson, and Gauss-Newton serial correlation tests on regression residuals in many cases show no signs of autoregressive errors. Prais-Winsten regressions that correct for first-order serially correlated residuals using a GLS estimator produce very similar results to standard OLS. With the exception of quarter dummies, all regressors are in logarithmic form. ρ^{π,π^*} is the correlation between Irish (domestic) inflation π and international inflation π^*. Transition function $\tilde{F}(.)$ is a standardised measure of the absolute deviation from international inflation, $|\pi-\pi^*| \approx |(\pi-\pi^*)-\mu|$. ϕ^* mediates the rate of idiosyncratic inflation adjustment for a given inflation gap $\tilde{F}(.)$. $\phi^*\tilde{F}(.)$ is the effective rate of adjustment, which is used in the measure of idiosyncratic inflation persistence (Idio. Inertia). P-values are reported in modified Dickey-Fuller (DFGLS), augmented Dickey-Fuller (ADF), and Phillips-Perron (PP) tests for which the null hypothesis is that of a unit root in regression residuals u. Test statistic is reported in Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test, with asterisks indicating significance, for which the null hypothesis is that of stationary regression residuals u. KPSS critical test statistic values at 10%, 5% and 1% significance levels are 0.35, 0.46 and 0.74 respectively.*

ility around the ECB target. Finally, greater central bank independence is linked to more protracted inflation gap adjustments. A possible explanation is more pervasive, effective supervision and financial regulation in such an environment.

The net effects of covariates on idiosyncratic inflation inertia in columns 7-8 of Table 5 can be viewed through the lens of i) the *gap channel* and ii) the *adjustment channel*. The former is reflected in the results of columns 3-4, while the latter in those of columns 5-6. For some factors, the expected net impact on inertia is unambiguous based on findings from columns 3-6. These expectations are ultimately borne out in the results of columns 7-8. Namely, persistence travels in the same direction across the two channels for financial openness, relative GDP, share of services, uncertainty, and central bank independence.

Table 6: Drivers of Domestic-International Inflation Gap: Logit Regressions

Dependent Variable: ω = 1[0] if $\tilde{F}(.)>$ [≤]0.5	*Odds Ratios I* (1)	*Marginal Effects I* (2)	*Odds Ratios II* (3)	*Marginal Effects II* (4)
Trade Openness	-14.602^{*}	-1.778^{*}	-14.324^{*}	-1.765^{*}
	(9.000)	(1.086)	(9.209)	(1.090)
	[0.491]		[0.497]	
Financial Openness	8.970^{**}	1.092^{***}	8.796^{***}	1.084^{***}
	(3.832)	(0.403)	(3.652)	(0.406)
	[1.549]		[1.536]	
Relative GDP	-10.924^{**}	-1.330^{**}	-10.718^{**}	-1.321^{**}
	(5.044)	(0.577)	(4.751)	(0.581)
	[0.587]		[0.593]	
Relative Market Cap.	-4.723^{*}	-0.575^{**}	-4.641^{**}	-0.572^{**}
	(2.564)	(0.261)	(2.474)	(0.262)
	[0.794]		[0.797]	
Services Share	-15.797^{*}	-1.923^{*}	-15.501^{*}	-1.911^{*}
	(9.429)	(1.155)	(8.996)	(1.167)
	[0.463]		[0.470]	
Reserves	1.474^{*}	0.180^{*}	1.448^{*}	0.179^{*}
	(0.890)	(0.103)	(0.876)	(0.104)
	[1.075]		[1.073]	
Exch. Rate Flexibility	0.895^{**}	0.109^{**}	0.888^{**}	0.110^{**}
	(0.480)	(0.056)	(0.477)	(0.057)
	[1.045]		[1.044]	
Uncertainty	-0.281^{**}	-0.035^{***}	-0.277^{**}	-0.034^{**}
	(0.136)	(0.014)	(0.136)	(0.015)
	[0.986]		[0.987]	
Inflation Target	0.133	0.016	0.133	0.016
	(0.196)	(0.024)	(0.196)	(0.024)
	[1.007]		[1.007]	
CB Independence	−0.883	−0.108	−0.858	−0.106
	(5.506)	(0.651)	(5.466)	(0.651)
	[0.958]		[0.959]	
Quarter dummies	no	no	yes	yes
Efron's Pseudo R^2	0.29		0.29	
Tjur's D Pseudo R^2	0.28		0.28	

*Note: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors in parentheses. Penalised likelihood estimator employed. Model shows no signs of state (path) dependency (lagged dependent variable as a regressor is statistically insignificant). With the exception of quarter dummies, all regressors are in logarithmic form. Estimates of effects on log odds are shown while figures in square brackets show corresponding odds ratios in levels for +5% changes in regressors. Average marginal effects are reported. The marginal effect is computed as the average of evaluations across individual observations i.e. average of* $\frac{\partial p}{\partial x_j}|_{\mathbf{x}=\mathbf{x}_t}$ *over observations* $t = 1, 2 \ldots T$ *with conditional probability* $p = P(\omega = 1|\mathbf{x}) = e^{\mathbf{x}'\boldsymbol{\delta}}\left(1 + e^{\mathbf{x}'\boldsymbol{\delta}}\right)^{-1}$.

For example, higher financial openness widens the inflation gap, which, ceteris paribus, reduces inertia as larger deviations experience more prompt adjustment. The wider inflation gaps can emerge if easier access to international financial markets enables an expansion of external surpluses and deficits and, therefore, a divergence in home and foreign inflation trajectories. At the same time, greater financial openness improves a given inflation gap's speed of adjustment, by possibly alleviating market frictions. Both the gap and adjustment channels therefore indicate an inverse relation between financial openness and idiosyncratic inflation inertia, implying an overall negative net impact of financial openness on inertia. This net effect ultimately materialises in columns 7-8, where we find that a 5% increase in financial openness is associated with approximately a 2% decline in inflation gap persistence. From the viewpoint of Figure 1, we find a movement down the curve alongside a downward shift in the curve producing the net effect.

With much of it related to external factors, higher uncertainty, on the other hand, reduces inflation gaps by boosting inflation comovements. Smaller gaps exhibit greater persistence in the context of our nonlinear model. Simultaneously, increases in uncertainty slow down inflation gap adjustments by obscuring information sets and delaying decision-making. As both of these channels increase idiosyncratic inflation persistence, the estimated positive net impact in columns 7-8 of Table 5 is to be expected. In terms of Figure 1, we find a movement up the curve and an upward shift of the curve. These two changes reinforce each other to yield the overall positive effect. The same patterns are found for relative GDP, share of services, and central bank independence.

For other covariates, including trade openness, relative market capitalisation, reserves, and exchange rate flexibility, the expected net impact on idiosyncratic inflation persistence is ambiguous based on results in columns 3-6 of Table 5. An increase of 5% in trade openness raises the international inflation correlation by around 3.6% and, in turn, reduces the inflation gap by about 4.3%. Relying on the logit model, Table 6 reports that the odds of a relatively large inflation gap in this case fall by half while marginal effects suggest a drop of around 8.8 percentage points in the conditional probability of such a deviation. The gap channel therefore implies an increase in persistence, which is reflected in a movement to the left along the curve in Figure 1. Along the adjustment channel, we find an increase in $|\phi^*|$ that implies a 2.5% decrease in inertia. The corresponding interpretation in Figure 1 is a downward shift in the curve. Examining net effects in columns 7-8, we find that the *adjustment channel* dominates the *gap channel* to generate an overall decline in idiosyncratic inflation inertia of around 3.7%. The same qualitative patterns across channels and net effect are found for relative market capitalisation. For reserves and exchange rate flexibility, the gap channel implies a decline in inertia while the adjustment channel indicates the opposite, with the latter more than offsetting the former to produce a net increase in idiosyncratic inflation persistence.

6. CONCLUSIONS

As a small island nation that is deeply integrated into global markets, Ireland faces a significant risk of overvaluing the weight of domestic policies by overlooking international developments. Moving forward, however, rising geopolitical tensions threaten to create long-term structural fissures in the global economic landscape. A more fragmented world economy and continued stagnation of globalisation may mean that domestic policy becomes more important for Ireland as the nation, for example, shifts towards greater energy independence and away from an overreliance on foreign multinationals. While global comovements may decline in such an environment, the emergence of new geopolitical blocs divided by sanctions and protectionist measures could enhance Ireland's comovements with regional or strategic partners.

Our findings suggest that international inflation, acting as an anchor, exerts a strong pull on overall Irish inflation. In tandem with Ireland's increasing relative economic size and openness, we find that this gravitational force strengthens over time, with the rate of adjustment in inflation deviations displaying a long-run upward trend. Our results reveal this to be particularly true in the 10 to 15 years preceding the Great Recession. The results also indicate that goods are more responsible for higher speeds of convergence in aggregate inflation gaps when compared to services, which tend to place more downward pressures. In contrast to services, goods inflation reacts considerably faster to the changing size of deviations from its international counterpart.

We find that the idiosyncratic inflation dynamics of Ireland are strongly nonlinear. For moderate to large inflation deviations, shocks are mostly corrected (over 50%) within 3 months. Very small inflation gaps exhibit much higher shock persistence, with the half-life being around 12-14 months for goods, 28 months for services, and about two years for the aggregate (headline) consumption basket. In general, inertia across inflation gap sizes tends to be lower for core compared to headline inflation owing to the food component, and goods compared to services inflation. Our results emphasise the state-dependent nature of idiosyncratic inflation inertia. They suggest that conclusions about idiosyncratic inflation persistence in the literature should be more nuanced, ultimately depending on the size of the inflation gap.

Ireland's comovements with international inflation are found to be inversely related to the size of corresponding inflation deviations. In the context of our nonlinear framework, this implies a positive link between inflation comovements and inflation gap inertia, ceteris paribus. We find that Ireland experiences a striking increase in international inflation comovements, accompanied by smaller inflation deviations, particularly in the lead up to the GFC, after which this trend peters out and we see some reversals.

Higher trade openness, relative economic size, share of services, uncertainty, inflation volatility around the ECB target, and national central bank independence attenuate inflation gaps by enhancing comovements with international inflation. However, the expected impact of these covariates on idiosyncratic inflation persistence is not so clear-cut. This is because the effective rate of adjustment relies on two underlying channels. The first is the gap channel, which captures the impact of the inflation gap's absolute size. The second is the adjustment channel, which captures the rate of adjustment, as mediated by market frictions, for a given inflation gap.

For factors like uncertainty and share of services, we find that the adjustment channel reinforces the gap channel to produce a positive overall effect on idiosyncratic inflation inertia, as confirmed in regressions. As information asymmetries worsen under higher uncertainty, and nontradability potentially rises in the case of a greater role for services, we observe a decline in a given inflation gap's speed of convergence. Conversely, by weakening market frictions, higher trade openness and relative market capitalisation induce a rise in a given inflation gap's speed of adjustment according to our estimates. This offers a counterforce to the rise in inertia along the gap channel. In these cases, we find that the adjustment channel dominates the gap channel over the sample to yield an overall fall in inertia. Therefore, in order to fully understand how covariates influence idiosyncratic inflation persistence, we must study its decomposition.

References

Ahir, H., Bloom, N. and Furceri, D. (2022). The World Uncertainty Index. NBER Working Paper No. 29763.

Arghyrou, M., Martin, C. and Milas, C. (2005). Non-Linear Inflationary Dynamics: Evidence From the UK. *Oxford Economic Papers*, 57 (1), 51–69.

Ascari, G. and Fosso, L. (2024). The International Dimension of Trend Inflation. *Journal of International Economics*, 148 (March), 103896.

Auer, R. A., Borio, C. E. and Filardo, A. J. (2017). The Globalisation of Inflation: The Growing Importance of Global Value Chains. CEPR Discussion Paper No. 11905.

—, Levchenko, A. A. and Sauré, P. (2019). International Inflation Spillovers Through Input Linkages. *Review of Economics and Statistics*, 101 (3), 507–521.

—, Pedemonte, M. and Schoenle, R. (2025). Sixty Years of Global Inflation: A Post-GFC Update. In G. Ascari and R. Trezzi (eds.), *Research Handbook on Inflation*, *18*, Edward Elgar Publishing, pp. 390–419.

Benati, L. (2008). Investigating Inflation Persistence Across Monetary Regimes. *Quarterly Journal of Economics*, 123 (3), 1005–1060.

Blanco, A., Boar, C., Jones, C. J. and Midrigan, V. (2024). Nonlinear Inflation Dynamics in Menu Cost Economies. NBER Working Paper No. 32094.

Carluccio, J., Gautier, E. and Guilloux-Nefussi, S. (2023). Dissecting the Impact of Imports from Low-Wage Countries on Inflation. *European Economic Review*, 160 (November), 104613.

Ciccarelli, M. and Mojon, B. (2010). Global Inflation. *Review of Economics and Statistics*, 92 (3), 524–535.

Curran, M. and Velic, A. (2019). Real Exchange Rate Persistence and Country Characteristics: A Global Analysis. *Journal of International Money and Finance*, 97 (C), 35–56.

— and — (2020). The CAPM, National Stock Market Betas, and Macroeconomic Covariates: A Global Analysis. *Open Economies Review*, 31 (4), 787–820.

De Michelis, A., Lofstrom, G., McHenry, M., Orak, M., Queralto, A. and Scaramucci, M. (2024). Has the Inflation Process Become More Persistent? Evidence from the Major Advanced Economies. FEDS Notes. Washington: Board of Governors of the Federal Reserve System, July 19.

Di Giovanni, J., Kalemli-Özcan, S., Silva, A. and Yildirim, M. A. (2023). Pandemic-Era Inflation Drivers and Global Spillovers. NBER Working Paper No. 31887.

—, Kalemli-Özcan, S., Ulu, M. F. and Baskaya, Y. S. (2022). International Spillovers and Local Credit Cycles. *Review of Economic Studies*, 89 (2), 733–773.

Forbes, K., Ha, J. and Kose, M. A. (2024). Rate Cycles. CEPR Discussion Paper No. 19272.

Fuhrer, J. and Moore, G. (1995). Inflation Persistence. *Quarterly Journal of Economics*, 110 (1), 127–159.

Fuhrer, J. C. (2010). Inflation Persistence. In B. M. Friedman and M. Woodford (eds.), *Handbook of Monetary Economics*, vol. 3, 1st edn., Elsevier, pp. 423–486.

Gagliardone, L., Gertler, M., Lenzu, S. and Tielens, J. (2025). Micro and Macro Cost-Price Dynamics in Normal Times and During Inflation Surges. NBER Working Paper No. 33478.

Galstyan, V. (2019). Inflation and the Current Account in the Euro Area. *Central Bank of Ireland Economic Letter*, 2019 (4).

— and Lane, P. R. (2009). Fiscal Policy and International Competitiveness: Evidence from Ireland. *Economic and Social Review*, 40 (3), 299–315.

— and Velic, A. (2017). Taxation, Debt and Relative Prices in the Long Run: The Irish Experience. *Economic and Social Review*, 48 (3), 231–251.

— and — (2018). Public Debt and Relative Prices in a Cross-Section of Countries. *Review of World Economics*, 154 (2), 229–245.

Gerlach, S. and Stuart, R. (2024). International Co-movements of Inflation, 1851–1913. *Oxford Economic Papers*, 76 (4), 997–1013.

Golosov, M. and Lucas, R. E. (2007). Menu Costs and Phillips Curves. *Journal of Political Economy*, 115 (2), 171–199.

Kamber, G. and Wong, B. (2020). Global Factors and Trend Inflation. *Journal of International Economics*, 122 (January), 103265.

King, M. A. and Wadhwani, S. (1990). Transmission of Volatility Between Stock Markets. *Review of Financial Studies*, 3 (1), 5–33.

Kose, M. A., Otrok, C. and Whiteman, C. H. (2003a). International Business Cycles: World, Region, and Country-Specific Factors. *American Economic Review*, 93 (4), 1216–1239.

—, — and — (2008). Understanding the Evolution of World Business Cycles. *Journal of International Economics*, 75 (1), 110–130.

—, Prasad, E. S. and Terrones, M. E. (2003b). How Does Globalization Affect the Synchronization of Business Cycles? *American Economic Review*, 93 (2), 57–62.

Lane, P. (2020). International Inflation Co-Movements. Speech at the Inflation: Drivers and Dynamics 2020 Online Conference, Federal Reserve Bank of Cleveland / ECB, May.

Lane, P. R. and Milesi-Ferretti, G. M. (2007). The External Wealth of Nations Mark II: Revised and Extended Estimates of Foreign Assets and Liabilities, 1970–2004. *Journal of International Economics*, 73 (2), 223–250.

— and — (2018). The External Wealth of Nations Revisited: International Financial Integration in the Aftermath of the Global Financial Crisis. *IMF Economic Review*, 66 (1), 189–222.

Malovaná, S., Hodula, M., Gric, Z. and Bajzík, J. (2023). Macroprudential Policy in Central Banks: Integrated or Separate? Survey Among Academics and Central Bankers. *Journal of Financial Stability*, 65 (C), 101107.

Miranda-Agrippino, S. and Rey, H. (2022). The Global Financial Cycle. In G. Gopinath, E. Helpman and K. Rogoff (eds.), *Handbook of International Economics: International Macroeconomics*, vol. 6, *1*, Amsterdam: Elsevier, pp. 1–43.

Monacelli, T. and Sala, L. (2009). The International Dimension of Inflation: Evidence From Disaggregated Consumer Price Data. *Journal of Money, Credit and Banking*, 41 (s1), 101–120.

Mumtaz, H. and Surico, P. (2012). Evolving International Inflation Dynamics: World and Country-Specific Factors. *Journal of the European Economic Association*, 10 (4), 716–734.

Obstfeld, M., Shambaugh, J. C. and Taylor, A. M. (2010). Financial Stability, the Trilemma, and International Reserves. *American Economic Journal: Macroeconomics*, 2 (2), 57–94.

Paya, I., Duarte, A. and Holden, K. (2007). On the Relationship Between Inflation Persistence and Temporal Aggregation. *Journal of Money, Credit and Banking*, 39 (6), 1521–1531.

Peersman, G. (2022). International Food Commodity Prices and Missing (Dis) Inflation in the Euro Area. *Review of Economics and Statistics*, 104 (1), 85–100.

Romelli, D. (2025). Trends in Central Bank Independence: A De Jure Perspective. In E. Farvaque and P. Stanek (eds.), *Are Central Banks Still Conservative?*, Edward Elgar Publishing, pp. 59–94.

Savat, S. (2022). WashU Expert: Comparing Annual Inflation Changes Each Month Can Distort Reality. *States News Service*.

Teräsvirta, T. (1994). Specification, Estimation, and Evaluation of Smooth Transition Autoregressive Models. *Journal of the American Statistical Association*, 89 (425), 208–218.

Velic, A. (2024). Current Account Imbalances, Real Exchange Rates, and Nominal Exchange Rate Variability. *Open Economies Review*, 35 (3), 497–545.

— (2025a). On Inflation Dynamics: International Comovements, Nonlinearities, and Persistence. TEP Working Paper No. 1825.

— (2025b). Relative Finance Wages and Inequality: A Role for Intangibles? *Journal of International Financial Markets, Institutions and Money*, 103 (C), 102192.