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Detecting stagflationary stress in emerging economies

by

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Detecting stagflationary stress in emerging economies

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UPSE Discussion Paper; comments most welcome

Abstract

I compare two ways to date stagflationary stress in 139 emerging market and developing economies over 1980–2023. The capped floor preserves high-inflation contractions and adds positive-growth years with growth below 3 percent and more than two percentage points below trend. The fixed rule requires growth below 2 percent. With inflation above 5 percent, the rules share 661 country-years and 95 multi-year spells with identical dates. The capped floor alone identifies 57 country-years and the fixed rule alone identifies 184. With inflation above 8 percent, the corresponding disagreement counts are 38 and 135. The adjusted employment-growth difference between the two exclusive groups is 0.06 percentage point. The chronology shows how benchmark choice changes episode dates across growth regimes, with limited evidence that either rule detects greater employment distress.

Keywords: stagflation, emerging economies, inflation, growth shortfalls, surveillance, business-cycle dating

JEL codes: E31, E32, F41, O11, O54

*Email: jbpunongbayan@up.edu.ph. The author used GPT-6 to assist in data analysis, and assumes full responsibility for the final output.

1 Introduction

Stagflation remains a recurring concern for policymakers in open economies. When high inflation coincides with weakening activity, policymakers face difficult choices over monetary tightening, exchange-rate management, fiscal support, and measures to expand supply. Yet the operational rule commonly used to recognize stagflation still comes from the advanced-economy experience of the 1970s. Blinder (1979) and a subsequent literature examined a period in which "stagnation" typically meant negative or near-zero real gross domestic product (GDP) growth and "inflation" meant sustained price increases well above levels acceptable to central banks.

This definition is less useful in emerging economies, where trend growth typically runs between 4 and 7 percent and prolonged outright contractions are rare outside balance-of-payments, banking, or political crises. It excludes years in which inflation is high, external conditions are strained, and growth has fallen sharply below its usual rate but remains positive. Philippine experience in 1981 and 1983 illustrates the problem: inflation surged while growth decelerated sharply but remained positive, so the contraction benchmark excludes these years despite the associated economic difficulties.

The choice of definition affects which episodes enter cross-country studies and how policymakers assess economic conditions. In an economy with high trend growth, a substantial slowdown can create a difficult inflation–growth trade-off even when output continues to expand. This suggests measuring the "stag" component relative to the country's usual growth rate.

An August 2026 policy debate in the Philippines illustrates this disagreement. With year-on-year real GDP growth at 2.3 percent in the second quarter and headline inflation at 6.2 percent in July, Monetary Board Member Benjamin Diokno described the economy as experiencing "stagflation lite." Department of Economy, Planning, and Development Secretary Arsenio Balisacan rejected the label as "stretching it too far," while Bangko Sentral ng Pilipinas Governor Eli Remolona argued that stagflation "usually means negative

growth" even as he acknowledged that actual growth was well below an estimated potential rate of 5–6 percent. These remarks raise the central measurement question: must output contract for an economy to experience stagflation, or can growth substantially below potential qualify?[1] The 2026 episode falls outside the annual panel; Section 5.5 examines it separately using quarterly data.

I propose a relative-to-trend rule in which stagflationary stress occurs when inflation exceeds a specified threshold and growth falls substantially below the country's own trend. I apply the rule to 139 emerging market and developing economies over 1980–2023 and compare the resulting dates with those from the contraction benchmark, referred to below as the binary rule. Absolute growth cutoffs of 1, 2, and 3 percent provide additional benchmarks. The appendix reports the complete series of dated episodes, and a Philippine case study illustrates how the rule works.

At a common inflation cutoff of 5 percent, the capped floor and the fixed 2 percent cutoff agree on 661 country-years and 95 multi-year spells with identical endpoints. Of the 241 country-years on which they disagree, 57 are unique to the capped floor and 184 to the fixed rule. The capped-floor-only observations occur in normally faster-growing economies. Disagreement persists at the 8 percent inflation threshold, with 38 capped-floor-only and 135 fixed-only observations.

I use employment growth to assess whether the two rules identify different degrees of labor-market distress. The adjusted difference between their exclusive groups is 0.06 percentage point, with a 95 percent confidence interval spanning -0.77 to 0.89 point. Separate validation against contraction finds weaker consumption in relative-only episodes than in other high-inflation years, with limited financial corroboration. The forward-looking regressions examine the uncapped relative rule. Its discrete flag adds no predictive information once the underlying continuous variables enter the reported specifica-

[1] Manila Bulletin Newsroom, "Is Philippines in 'stagflation lite'? Balisacan, Remolona say not quite," *Manila Bulletin*, August 17, 2026, https://mb.com.ph/2026/08/17/is-philippines-in-stagflation-lite-balisacan-remolona-say-not-quite.

tion.

This paper complements the quarterly U.S. dating exercise of Iqbal and Cervi (2024) and the cross-country long-cycle analysis of Gallegati and Desai (2024). Its contribution is a reproducible annual chronology for 139 emerging market and developing economies and a comparison of relative, absolute, and capped growth rules on the same country-years at common inflation cutoffs. The comparison shows which episodes change across growth regimes and how sensitive the dates are to the trend estimate.

The paper proceeds as follows. Section 2 reviews the related literature; Section 3 develops the conceptual framework; Section 4 describes the data and methodology; Section 5 reports the panel results, validation, surveillance, and persistence exercises, with the Philippines as a short illustration; Section 6 reports robustness checks; and Sections 7–9 discuss limitations, draw policy implications, and conclude. An appendix reports the full dated episode list and supplementary tables.

2 Review of related literature

The classic stagflation literature analyzed the 1970s experience of the United States (Blinder, 1979), the world economy (Bruno and Sachs, 1985), and the United Kingdom (Nelson and Nikolov, 2004), with an emphasis on severe output weakness. A related literature examines whether the 1970s episode reflected oil supply or monetary policy (Barsky and Kilian, 2001; Blanchard and Galí, 2010). More recently, Ha, Kose, and Ohnsorge (2022) assess stagflation risk explicitly for emerging market and developing economies against the 1970s benchmark, with an emphasis on global risk and its transmission. The present paper takes up that operational question because country-year dating rules are often the first step in cross-country surveillance, historical comparison, and policy diagnosis.

Two strands of empirical work inform the choice of inflation and growth thresholds. The threshold-effects literature finds that inflation harms growth mainly at high

rates (Fischer, 1993; Barro, 1995; Bruno and Easterly, 1998), with estimated thresholds near 8 percent (Sarel, 1996), at 1–3 percent for advanced but 11–12 percent for emerging economies (Khan and Senhadji, 2001), with further estimates using smooth-transition and panel methods (Espinoza, Leon, and Prasad, 2010; López-Villavicencio and Mignon, 2011). These findings suggest that what counts as high inflation depends on the country. The literature on supply shocks and emerging-market stress—oil shocks (Hamilton, 1983, 2003; Kilian, 2008, 2009), sudden stops (Calvo, Izquierdo, and Mejía, 2004), crisis histories (Reinhart and Rogoff, 2009), and business cycles driven by trend shocks (Aguiar and Gopinath, 2007; Fernández-Villaverde et al., 2011)—describes sources of economic stress that may be poorly captured by a rule based on advanced-economy experience.

The method builds on the episode-dating approaches of Bry and Boschan (1971) and Harding and Pagan (2002), alongside the Markov-switching alternative of Hamilton (1989) and panel applications such as Claessens, Kose, and Terrones (2012). Work on growth accelerations and slowdowns also measures changes relative to a country's own history (Hausmann, Pritchett, and Rodrik, 2005; Eichengreen, Park, and Shin, 2013). In the closest stagflation applications, Iqbal and Cervi (2024) compare U.S. quarterly growth with its average in the previous expansion and classify episodes by the magnitude and duration of elevated inflation. Gallegati and Desai (2024) distinguish inflationary slowdowns from inflationary recessions using long cycles in inflation and growth. Here I use an annual rolling growth benchmark and a common baseline inflation cutoff to compare competing dating rules across emerging and developing economies. Holding the sample and inflation criterion fixed isolates how the choice of growth rule changes the dates.

3 Conceptual framework

The term *stagflation* was popularized in the 1970s to describe the joint occurrence of high inflation and stagnant output in advanced economies, a configuration the prevailing

Phillips-curve framework had ruled out (Blinder, 1979). Two empirical regularities made a binary definition workable in that context: trend real GDP growth was low (typically 2–3 percent), so negative or near-zero growth represented a clear deviation from normal, and sustained inflation above, say, 5 percent was unusual enough that the threshold could be set in absolute terms. This encouraged definitions that combined severe output weakness with inflation above a fixed threshold.

These features are less typical of emerging economies. Trend growth is structurally higher and more variable: a growth rate of 2 percent against a 6 percent trend is a substantial macroeconomic shortfall—larger than the shortfall implied by zero growth against a 2 percent trend—yet a definition centered on negative or near-zero growth gives greater weight to the latter. Absolute inflation thresholds are similarly ill-suited, since many emerging economies have historically operated with structurally higher inflation, reflecting weaker monetary frameworks, exchange-rate pass-through, and large food and energy weights in the consumer price index. These differences matter for classification: episodes that policymakers, market participants, and households experience as stagflationary are excluded because growth, while sharply lower, remains positive, potentially understating stagflationary stress in cross-country comparisons.

There are reasons to measure growth relative to trend while retaining a common inflation threshold. The welfare costs of inflation operate largely in absolute terms: a given rate of price increase erodes real incomes and can weaken the anchoring of inflation expectations whether trend growth is 2 or 6 percent. The welfare implications of output growth also depend on how far activity falls short of the economy's capacity. The baseline definition reflects this asymmetry, while the robustness analysis examines country-specific inflation thresholds. The baseline 5 percent threshold is intended for surveillance. It should not be interpreted as an estimate of the inflation rate above which growth effects become nonlinear.

3.1 Notation and components

Let $\pi_{i,t}$ denote year-on-year headline consumer price index (CPI) inflation for country i in period t, and let $g_{i,t}$ denote real GDP growth. Let $\overline{g}_{i,t}$ denote a country-specific measure of trend or potential growth, and let $\sigma_{g,i}$ denote the standard deviation of growth around its trend. Let $\pi^*_{i,t}$ denote a high-inflation threshold, which may be fixed across countries or vary by country and time.

3.2 Operational rule

A country i is in a state of stagflationary stress in period t if both

$$\pi_{i,t} \; > \; \pi^*_{i,t}, \tag{1}$$

and

$$g_{i,t} \; < \; \overline{g}_{i,t} - \delta, \tag{2}$$

where $\delta > 0$ is a percentage-point gap that defines how large a growth shortfall is required to qualify. The two conditions must hold jointly. In words, inflation is high relative to the chosen threshold, and growth is meaningfully below the country's own trend. A natural alternative replaces the absolute gap with $\kappa\,\sigma_{g,i}$, where $\sigma_{g,i}$ is the country's growth volatility and $\kappa > 0$; the empirical section shows this variant is too restrictive in countries whose growth variance is itself inflated by past crises.

Implementation requires three choices. *Trend growth* $\overline{g}_{i,t}$ can be estimated using a long-run average (e.g., a 10-year rolling mean), a Hodrick–Prescott or Hamilton filter applied to the country's GDP series, or an output-gap-based measure. *Growth shortfall* can be defined as a fixed percentage-point gap δ below trend (the baseline), or as $\kappa\,\sigma_{g,i}$ standard deviations below trend (an alternative). *Inflation threshold* $\pi^*_{i,t}$ can be set as the country's central-bank target plus a tolerance band, the historical 75th or 80th percentile of country-

specific inflation, or a fixed numerical level applied uniformly across countries when the goal is comparability. Each of these choices involves trade-offs that the empirical section examines.

The rule has no upper bound on observed growth: a boom-inflated trailing average can flag rapid growth during normalization. Section 6.2 quantifies these cases and examines growth ceilings.

The parameter δ governs how restrictive the criterion is. The baseline is $\delta = 2$ percentage points, which corresponds to a meaningful but not extreme growth shortfall: in a country with a 5 percent trend, a year with growth below 3 percent qualifies. The contraction benchmark is recovered as a limiting case when the growth floor $\overline{g}_{i,t} - \delta$ approaches zero and $\pi^*_{i,t}$ approaches a fixed threshold.

3.3 A modification of the aggregate demand–aggregate supply framework

The relative-to-trend definition can be motivated within a textbook aggregate demand–aggregate supply (AD–AS) framework, with one substantive modification: the natural rate of output is treated as a moving target rather than a fixed level. In the standard short-run model, an adverse supply shock shifts the short-run aggregate-supply curve to the left and the new equilibrium combines a higher price level with output below the natural rate, identified by the joint condition

$$\Delta P_t > 0, \quad Y_t < Y^*, \tag{3}$$

where Y^* is the natural rate of output, treated as fixed over the short-run comparison. This configuration motivates the joint concern with prices and activity, but it does not by itself imply high inflation or negative growth: a price-level increase need not exceed the inflation threshold, and output below its natural level can coexist with positive growth.

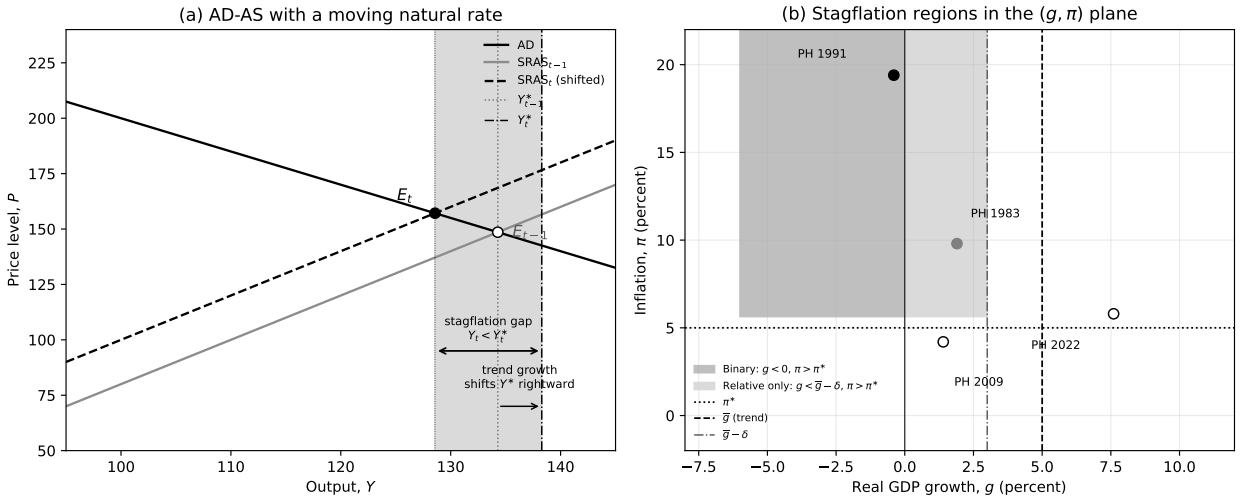
Allowing the natural rate to grow makes the motivation for a relative criterion clearer. If output initially equals its natural level, growth of 2 percent against natural-output growth of 6 percent leaves output below Y_t^* despite positive growth. More generally, with $Y_t^* = (1 + \overline{g}_{i,t}/100)\, Y_{t-1}^*$ (with trend growth $\overline{g}_{i,t}$ in percent), growth below trend reduces the ratio Y_t / Y_t^*; whether that ratio falls below one depends on its initial value. This motivates the operational proxy

$$\pi_{i,t} > \pi_{i,t}^*, \quad g_{i,t} < \overline{g}_{i,t} - \delta, \tag{4}$$

which reproduces the conditions of Section 3. Equation (4) is a surveillance convention motivated by the AD–AS configuration, rather than an algebraic equivalent of equation (3). When the growth floor $\overline{g}_{i,t} - \delta$ equals zero and the inflation threshold is fixed, the operational rule coincides with the contraction benchmark. In general, however, it flags a growth shortfall relative to estimated trend; establishing a negative output gap requires information about initial conditions and accumulated deviations, as well as a credible estimate of potential output.

Figure 1 represents the modification graphically. Panel (a) shows the moving natural rate and the post-shock equilibrium in (Y, P) space; panel (b) shows the operational proxy in the (g, π) plane used in the empirical section, with selected Philippine country-years plotted for illustration. Panel (b) also shows that when the estimated trend has been pulled down by a prolonged crisis, the two rules need not nest each other, a point Sections 5 and 6 return to.

Figure 1: Stagflation in the AD–AS framework with a moving natural rate.



Notes: Panel (a) shows aggregate demand (solid black) and short-run aggregate supply at two dates (solid grey = $t-1$; dashed black = t, after a leftward shift). The natural rate Y^* moves rightward between dates because of trend growth (dotted vs. dash-dotted vertical lines). The shaded interval between Y_t and Y_t^* illustrates a negative output gap. Panel (b) shows the operational growth-inflation criterion, which does not directly measure this level gap: the darker grey region is the binary stagflation region ($g < 0$, $\pi > \pi^*$); the lighter grey region is the additional area flagged by the relative-to-trend rule but missed by the binary rule. Annotated points are illustrative country-years from the Philippine case study (filled = flagged by the binary rule, grey = relative rule only, open = neither).

Condition (4) does not distinguish demand from supply shocks: the configuration (g low, π high) can arise from an adverse supply shock, a demand collapse with cost-push pass-through, or a contraction in import capacity. A shock decomposition would require a structural vector autoregression (VAR) or sign-restriction approach such as that of Kilian (2009). The dating rule alone cannot identify the underlying shock. The modification is also consistent with the threshold-effects literature: a country-specific $\pi^*_{i,t}$ extends the relative logic of Khan and Senhadji (2001) to the growth side.

The results also depend on how trend growth is estimated. Backward-looking trends absorb persistent shocks slowly and can mask further deterioration in countries long in crisis; two-sided filters address this in-sample but introduce end-point problems for recent observations. Aguiar and Gopinath (2007) argue that emerging-economy business cycles are dominated by trend shocks themselves, which would make the distinction between $g_{i,t}$ and $\overline{g}_{i,t}$ less clean than the textbook treatment supposes. The empirical sec-

tion reports robustness across trend specifications; determining when a persistent shock should be treated as a change in trend remains a question for further work.

4 Empirical strategy

4.1 Data

The application uses annual data on real GDP growth and headline CPI inflation for the International Monetary Fund (IMF) World Economic Outlook (WEO) "Emerging Market and Developing Economies" group, which includes low-income developing countries alongside emerging markets. The country group follows the IMF WEO April 2023 classification. Headline CPI inflation is the IMF WEO "PCPIPCH" series from the April 2026 database (International Monetary Fund, 2026), which uses logarithmic differences for high-inflation country-years. Real GDP growth is the year-on-year change in `rgdpna` (real GDP at constant 2021 national prices) from the Penn World Table (PWT) version 11.0 (Feenstra, Inklaar, and Timmer, 2015), covering 1950–2023; growth is taken from PWT rather than WEO so that the output side of both rules rests on a single harmonized national-accounts source, and the panel ends in 2023 with PWT coverage.

Of the 155 economies in the IMF EMDE classification, 139 enter the panel. The 16 excluded economies lack PWT 11.0 national-accounts data: Afghanistan, Eritrea, Kiribati, Kosovo, Libya, the Marshall Islands, Micronesia, Nauru, Palau, Papua New Guinea, Samoa, the Solomon Islands, Timor-Leste, Tonga, Tuvalu, and Vanuatu. Attrition is therefore concentrated in microstates and conflict-affected economies; to the extent the latter are crisis-prone, the panel may understate the incidence of stagflationary stress across all EMDEs. Merging PWT growth and WEO inflation yields 5,533 country-years with both variables observed, all in 1980–2023 because WEO inflation coverage begins in 1980. Trend growth, by contrast, is estimated on the full PWT growth history from the 1950s onward, providing observations for the trailing 10-year window before the analysis sam-

ple begins. Estimating the trend only on the merged panel would discard this history and move the first usable year to 1986, excluding the debt-crisis years of 1980–1985. The empirical sample is the set of country-years where inflation is observed and the trend is computable (at least seven growth observations within the trailing 10-year window): 5,474 country-years over 1980–2023, with the 59 excluded observations concentrated in economies that enter PWT late. The 1970s—the canonical stagflation decade—remain outside the panel because inflation coverage starts in 1980.

The validation dataset merges the annotated panel with PWT measures of real consumption per capita, real GDP per capita, employment, and the exchange rate against the U.S. dollar. The PWT exchange-rate variable is local currency per U.S. dollar, so a positive annual change denotes depreciation. A large currency depreciation is coded as an annual depreciation greater than 25 percent. Banking, currency, and sovereign-debt crisis dates are imported directly from the published supplementary workbook of Laeven and Valencia (2020), whose coverage is 1970–2017. A blank date for a listed country denotes no crisis; countries absent from the workbook and years after 2017 have missing crisis outcomes. The resulting financial-crisis sample contains 4,216 country-years, including 2,591 high-inflation years. Contemporaneous banking distress uses the crisis start year and following year; currency and sovereign crises use the dated start year. Forward-looking banking outcomes use new crisis starts. The Philippine annual illustration uses Philippine Statistics Authority (PSA) national accounts and CPI series accessed in May 2026. The quarterly illustration uses the November 9, 2026 vintage of PSA real GDP from 2001 onward, with archived linked year-on-year growth rates through 2000, and the October 2026 archive update of PSA headline CPI, using observations through September 2026.

4.2 Methodology

The baseline implementation follows the definition in Section 3. Trend growth $\overline{g}_{i,t}$ is the 10-year backward-looking moving average of real GDP growth. The inflation threshold

is set at $\pi^* = 5$ percent uniformly across countries, to keep the cross-country comparison transparent and to capture inflation above a common level of concern for policymakers rather than the level at which growth effects become nonlinear; a country-specific percentile-based threshold is examined as a robustness check. The inflation condition is satisfied in 55.4 percent of eligible country-years, making this a permissive absolute threshold rather than a measure of unusually high inflation relative to domestic history. The uniform 8 percent and country-specific thresholds provide stricter alternatives. The growth shortfall is set at $\delta = 2$ percentage points. As a benchmark, the contraction benchmark requires inflation above 5 percent and real GDP growth below zero. The two rules and absolute growth cutoffs of 1, 2, and 3 percent are applied to the same eligible country-years. Growth ceilings of 3 and 4 percent and a retrospective country-mean ceiling assess sensitivity to unusually high trend growth. The mean ceiling uses every available 1980–2023 growth observation, including years before the rolling trend is computable, and is unsuitable for real-time surveillance.

The choice of comparison group is central to the validation. Every flagged country-year satisfies the inflation condition by construction, so comparing flagged years against all unflagged years—mostly low-inflation years—cannot isolate what the output condition contributes. The primary validation therefore restricts the sample to high-inflation country-years ($\pi_{i,t} > 5$) and asks whether the below-trend-growth condition selects the more distressed subset *within* that sample, using four mutually exclusive categories: a high-inflation base with neither shortfall nor contraction, relative-only, binary-only, and both. Inference uses ordinary least squares (OLS), with a linear probability model for incidence outcomes, and country-clustered standard errors, with and without country and year fixed effects. The appendix also reports the pooled comparison with all unflagged years. Table 7 then compares the two flags in regressions of subsequent outcomes. For

horizon $h \in \{1, 2\}$, the estimating equation is

$$y_{i,t+h} = \alpha_i + \lambda_t + \beta_h R_{i,t} + \gamma_h B_{i,t} + \varepsilon_{i,t+h}, \tag{5}$$

where $R_{i,t}$ is the relative-to-trend flag, $B_{i,t}$ is the binary flag, α_i are country fixed effects, and λ_t are year fixed effects. Standard errors are clustered by country. Additional local-projection specifications replace the two flags with the high-inflation and below-trend-growth components and their interaction, or add the continuous growth gap $g_{i,t} - \overline{g}_{i,t}$ and log inflation directly. These regressions describe outcomes following the dated episodes. Estimating responses to structural shocks would require additional timing and identification assumptions, for example in a VAR or sign-restriction analysis. Such an analysis is left for future work.

To connect the rule more directly to surveillance, I also construct a pseudo-real-time variant whose trend uses only observations through $t - 1$, leaving 5,459 country-years over 1980–2023. The variant is "pseudo" real-time because year-t growth and inflation are treated as observed, whereas in genuine real time they would be nowcasts and PWT data are published with a lag and revised; a fully operational version on WEO vintage data is left for future work. I re-estimate the local projections with the pseudo-real-time flags and examine inflation persistence across four policy states (neither condition, high inflation only, below-trend growth only, and the joint state), measuring persistence as future inflation rates and as the probability that inflation exceeds 5 percent at least once over the next two years; level means exclude country-years with inflation at or above 50 percent, while the binary persistence outcomes use the full sample.

The robustness checks vary each operational choice separately. The growth shortfall is varied from 1 to 3 percentage points and compared with a variance-based formulation; trend growth is recomputed using alternative moving-average, Hodrick–Prescott, and Hamilton filters; the post-2020 trend is recomputed excluding the COVID-19 contraction

from the rolling window; and high-inflation outliers are trimmed at 50 and 100 percent to check whether the results are driven by hyperinflation episodes. For the inflation-threshold checks, each candidate threshold—a uniform 8 percent, country-specific percentiles, and the country median plus 5 points—is applied to *both* rules, so that the comparison varies only the output criterion.

5 Results

5.1 Agreement between the capped floor and fixed 2 percent cutoff

Table 1 compares the two rules at common inflation thresholds. The capped floor requires growth below $\max(0, \min(\overline{g}_{i,t} - 2, 3))$. With inflation above 5 percent, the capped floor identifies 718 country-years (13.1 percent) and the fixed cutoff identifies 845 (15.4 percent). Their 661 shared dates account for 73.3 percent of the 902 country-years flagged by either rule. The 57 years unique to the capped floor have growth between 2 and 3 percent and a median trend of 5.66 percent. The fixed cutoff alone identifies 184 years.

Table 1: Agreement between the capped floor and fixed 2 percent cutoff.

Measure	Inflation > 5	Inflation > 8
Inflation above threshold	3,035	2,110
Capped floor	718	537
Fixed cutoff	845	634
Both rules	661	499
Capped floor only	57	38
Fixed cutoff only	184	135
Spells under capped floor	460	343
Spells under fixed cutoff	486	356
Spells with identical dates	323	241
Multi-year spells under capped floor	150	112
Multi-year spells under fixed cutoff	184	140
Multi-year spells with identical dates	95	70

Notes: Counts use the same 5,474 country-years. The first six rows count country-years. A spell is a maximal run of consecutive flagged years within a country. Exact matches share the country and both endpoints. Multi-year spells last at least two years. Source: PWT 11.0, IMF WEO; author calculations.

At the 5 percent cutoff, 323 spells have the same country and start and end years under both rules. Of these, 95 last at least two years, compared with 150 multi-year spells under the capped floor and 184 under the fixed rule. Changing a single flagged year can move a spell boundary or split a spell. Raising the inflation cutoff to 8 percent reduces the share of country-years satisfying the inflation condition from 55.4 to 38.5 percent. The rules still disagree on 173 country-years and share 70 multi-year spells with identical endpoints.

5.2 Panel results

Table 2 summarizes the panel-wide results. The binary rule flags 487 country-years, or 8.9 percent of the sample, across 115 countries. The relative-to-trend rule flags 799, or 14.6 percent—about 64 percent more episodes—across 135 countries. Of the 139 countries in the panel, 24 are never flagged by the binary rule; 20 of those 24 are nevertheless flagged at least once by the relative rule. The additional episodes include high-inflation slowdowns excluded by the contraction criterion: China in 1989, when inflation of 18 percent coincided with growth of about 4 percent against a trend near 10 percent; Egypt through much of the 1980s and again in 2011–2013; and Bangladesh, Saudi Arabia, Oman, and several transition economies. Only four countries—Brunei Darussalam, Cameroon, Kuwait, and Panama—are never flagged by either criterion. The full country-by-year episode list appears in Table A1 in the appendix.

Table 2: Stagflationary-stress episodes across EMDEs, 1980–2023: binary versus relative-to-trend.

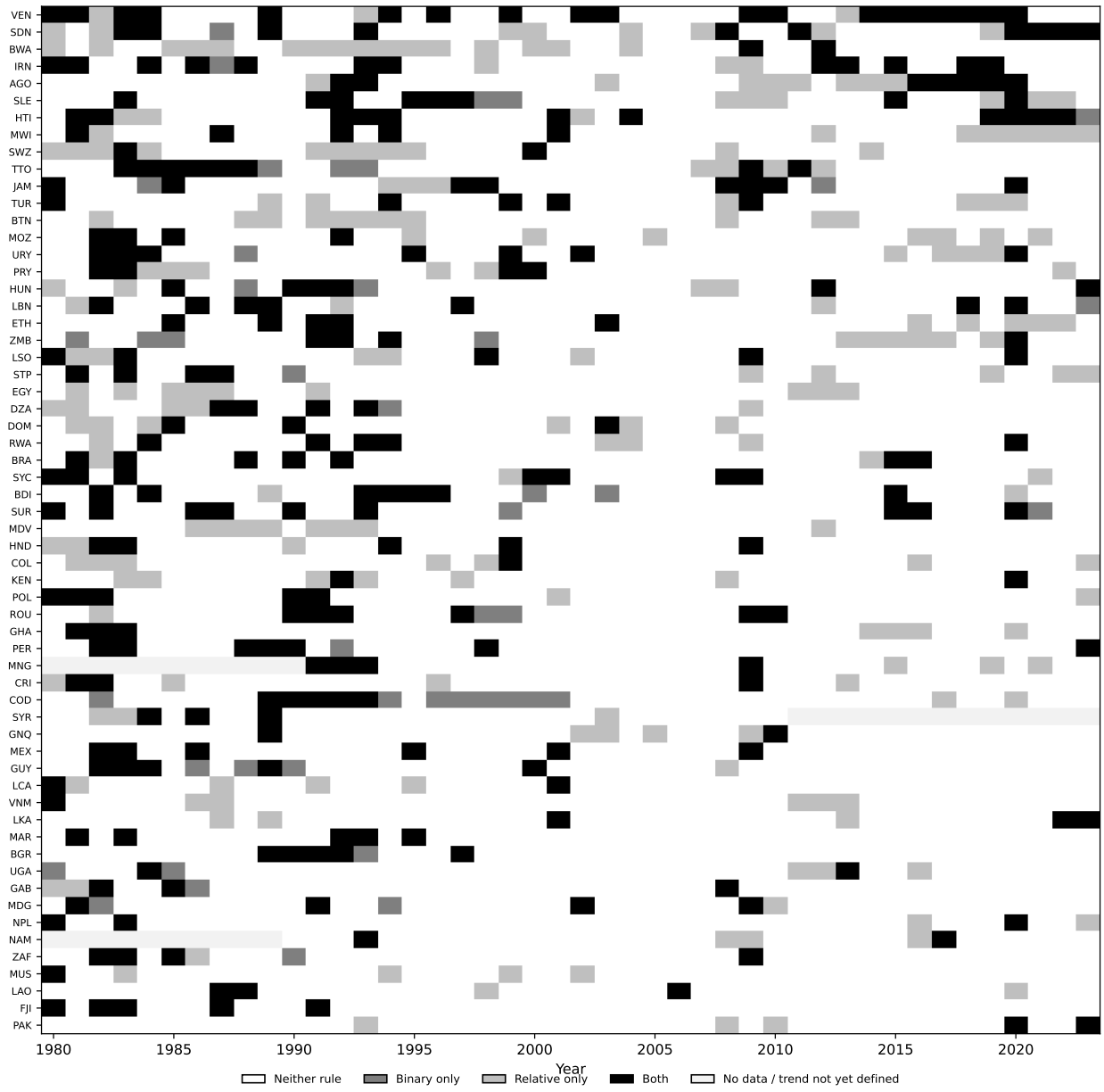
Criterion	N flagged	Share (%)	Countries flagged
Binary (inf > 5, $g < 0$)	487	8.9	115
Relative rule	799	14.6	135
Both rules agree on flag	415	7.6	—
Binary only	72	1.3	—
Relative only	384	7.0	—

Notes: Sample of 139 EMDEs (IMF WEO April 2023 classification), 5,474 country-years, 1980–2023, restricted to country-years where inflation is observed and the 10-year backward-looking growth trend (estimated on the full PWT growth history) is computable. The relative rule is inflation > 5 percent and $g <$ trend -2 pp. Real GDP growth is from PWT 11.0; CPI inflation is from IMF WEO PCPIPCH. Of the 139 countries, 24 are never flagged by the binary rule, of which 20 are flagged at least once by the relative rule.

Requiring both conditions substantially narrows the set of identified years. The high-

inflation condition alone flags 55.4 percent of country-years and the below-trend-growth condition alone flags 27.0 percent—the latter including ordinary disinflationary recessions and low-inflation slowdowns—while the joint rule identifies years in which both conditions hold (Table A2 in the appendix reports the full comparison).

Figure 2: Stagflation flags across EMDEs, 1980–2023.



Notes: Each row is a country (ISO3 code), each column a year. Cells are shaded by which rule flags the country-year as stagflationary stress: black = both rules, dark grey = binary only, light grey = relative only, white = neither; the palest grey marks years with no data or where the 10-year trend is not yet computable. Countries are sorted by total relative-rule flag count; the top 60 are displayed. The complete 139-country heatmap appears in the online appendix, Section B (Figures B1–B3); the full episode list is in Table A1. Source: PWT 11.0, IMF WEO; author's calculations.

5.3 Regional, temporal, and episode-level patterns

The differences between the two rules vary across regions and decades and affect the number and duration of dated episodes.

First, the relative-to-trend rule's added flags are concentrated in regions with high trend growth and rare contractions. In emerging Asia, the relative rule identifies three times as many country-years as the binary rule. The ratio is 1.86 in the Middle East / Central Asia region and 1.77 in Sub-Saharan Africa, compared with about 1.2 in Latin America and the Caribbean and in emerging Europe: the latter regions experienced outright contractions during the 1980s debt crisis and the post-Soviet transition, so the binary rule already identifies many episodes. The contraction criterion thus captures more of the stress in regions with frequent recessions and less where growth has generally remained positive during periods of high inflation.

Second, the relative difference in episode frequency is larger after 2000. In the 1980s and 1990s the difference between the two rules was proportionately smaller (18.2 versus 25.1 percent of country-years in the 1980s, 11.4 versus 14.7 in the 1990s), reflecting the high frequency of outright contractions during the debt and transition crises. In the 2000s and 2010s the binary rule fell to 4.0–4.3 percent of country-years while the relative rule remained at 9.4–11.8 percent, so the ratio between the two rules rose from about 1.3–1.4 in the crisis decades to 2.3–2.7; in the 2020s, pandemic-era contractions and the post-2021 inflation surge increased the frequency under both rules (8.7 versus 13.8 percent). The proposed definition records more high-inflation growth shortfalls in the two decades before the pandemic. Some have high absolute growth after booms; Section 6.2 shows that the frequency difference survives growth ceilings, although it becomes smaller. The measured frequency of stagflation therefore depends on how the output criterion is defined.

Third, the relative rule also identifies longer episodes on average. Collapsing consecutive flagged years into episodes, the binary rule dates 326 episodes with a mean duration of 1.5 years, of which 30 percent last more than one year; the relative rule dates 484

episodes with a mean duration of 1.7 years, of which 35 percent are multi-year, with a maximum spell of ten years (Liberia, 2013–2022). The number of episode starts follows a similar pattern: binary-rule episodes fall from 129 starts in the 1980s to 37 in the 2010s, while relative-rule episodes decline much less steeply, from 159 to 76. These differences can affect studies of episode frequency, duration, or outcomes around episode starts, particularly after 2000.

5.4 Additional growth benchmarks

Table 3: Relative and capped rules versus the absolute 2 percent rule.

Growth rule	Flags	Share (%)	Countries	Both	Rule only	$g < 2$ only
Absolute ($g < 2$)	845	15.4	129	845	0	0
Relative	799	14.6	135	589	210	256
Relative, cap 3	646	11.8	132	589	57	256
Relative, cap 4	690	12.6	133	589	101	256
Capped floor, cap 3	718	13.1	132	661	57	184

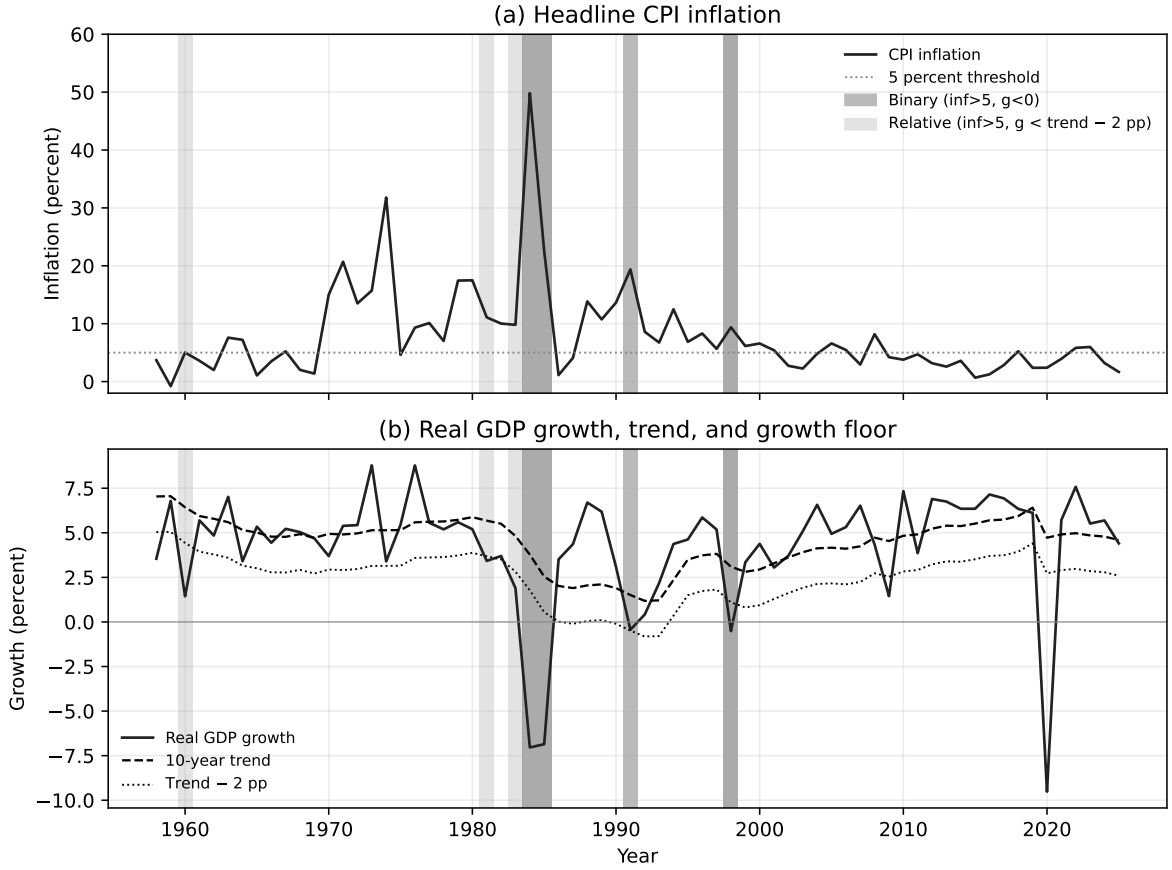
Notes: All rules require inflation above 5 percent and use the same 5,474 country-years. The last three columns compare each row with the absolute 2 percent rule. Caps require growth below 3 or 4 percent in addition to the relative condition. The capped floor also flags all high-inflation contractions. Source: PWT 11.0, IMF WEO; author's calculations.

The fixed and uncapped relative rules share 589 flags. The 3 percent cap removes 153 of the 210 uncapped relative-only years. The 256 years unique to the fixed cutoff relative to the uncapped rule have a median trend of 0.89 percent. In the 2000s and 2010s, the capped relative rule flags 7.3 and 8.1 percent of years, compared with 8.4 and 8.7 percent under the fixed rule and 4.0 and 4.3 percent under the contraction benchmark (Table 9). Appendix Tables A5 and A4 report outcome comparisons for the uncapped rule and results for additional cutoffs.

5.5 Illustration: the Philippines

The Philippine case illustrates how the rule classifies individual years. The case-study series use Philippine Statistics Authority national accounts in 2018 prices—a linked series extending back to 1946, so the 10-year trailing trend is computable throughout the period shown—paired with the PSA headline CPI series, whose annual inflation rates begin in 1958; the figure accordingly displays 1958 onward. Applying the same thresholds as in the panel, the binary rule flags four years (1984–1985, 1991, and 1998), while the relative rule flags six (1960, 1981, 1983–1985, and 1998).

Figure 3: Real GDP growth, inflation, and stagflation flags for the Philippines, 1958–2025.



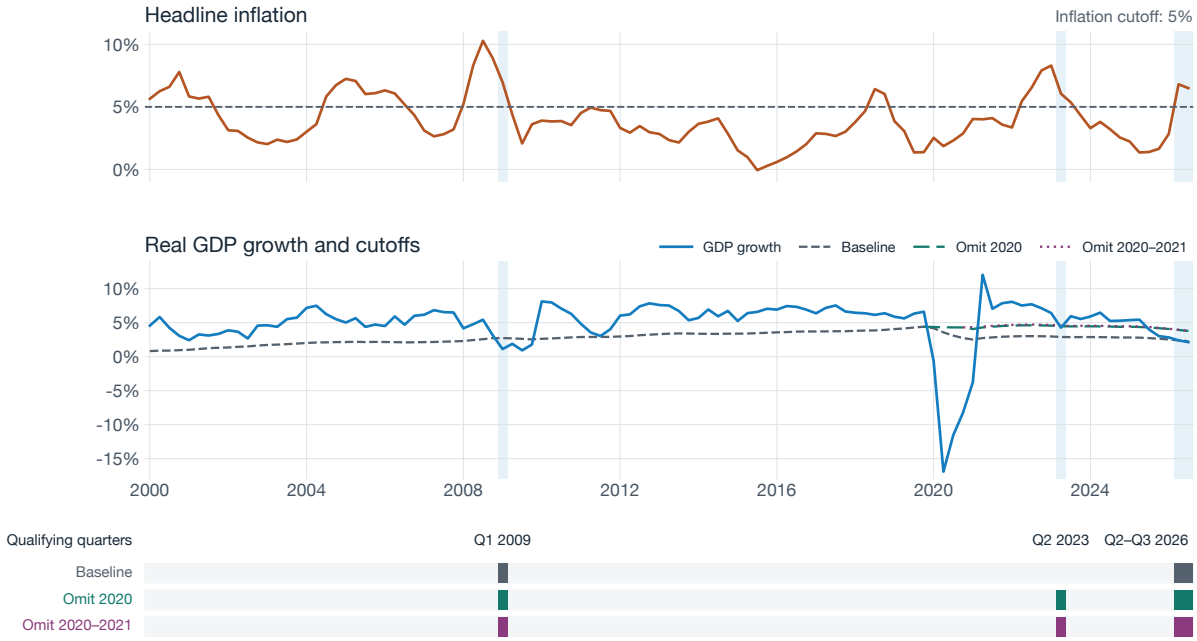
Notes: Top panel shows year-on-year headline CPI inflation; the dotted line marks the 5 percent threshold. Bottom panel shows real GDP growth (solid), the 10-year backward-looking trend (dashed), and the trend $-$ 2 pp growth floor (dotted). Shaded years indicate stagflation flags: dark grey for the binary rule (inflation $>$ 5, growth $<$ 0) and light grey for the relative-to-trend rule (inflation $>$ 5, growth $<$ trend $-$ 2 pp). Source: PSA national accounts and CPI series; author's calculations.

The figure shows where the two rules agree and where they differ. First, the two rules agree on the contractions during the 1984–1985 debt and political crisis and the 1998 Asian Financial Crisis. Second, the relative rule captures positive-growth stress years such as 1981 and 1983, when inflation was high and growth fell below trends of 5.7 percent in 1981 and 4.8 percent in 1983. The 1981 flag is marginal: growth of 3.42 percent is only 0.26 percentage point below the 3.68 percent cutoff. An absolute 2 percent rule captures 1983 but excludes 1981. Third, 1991 is a binary-only year: output contracted with inflation near 20 percent, but the trailing trend had been dragged down by the 1984–1985 collapse, so the growth cutoff was below the observed growth rate. This motivates the floor variant recommended in Section 6. Fourth, the relative rule does not flag 2022–2023, when inflation was high but growth was at or above trend. The annual rule misses the overlap around the global financial crisis: annual inflation crossed the cutoff in 2008, and the annual growth shortfall appeared in 2009.

Figure 4 applies the rule to quarters from 2000 through the third quarter of 2026. I average the three monthly year-on-year headline inflation rates and compare them with real GDP growth from the same quarter a year earlier. The growth cutoff is the trailing 40-quarter average of year-on-year growth, including the current quarter, minus 2 percentage points. I also recalculate the trend omitting observations dated in 2020, and then omitting both 2020 and 2021, to check the influence of the pandemic contraction and the rebound from a low base. The exclusions change the trend window's average; actual growth and inflation remain as observed.[2]

[2]Philippine Statistics Authority, quarterly national accounts and linked GDP series, https://psa.gov.ph/statistics/national-accounts/data-series; third-quarter GDP release, November 9, 2026, https://psa.gov.ph/content/gdp-grows-21-percent-third-quarter-2026; headline consumer price index, https://psa.gov.ph/price-indices/cpi-ir.

Figure 4: Philippine quarterly inflation and growth under three trend estimates, 2000–2026.



Notes: Inflation must exceed 5 percent and real GDP growth must be below the cutoff for the same quarter. The shaded bands mark quarters flagged under at least one trend estimate; the bottom rows show agreement by rule. The three cutoffs coincide before 2020. Omitted observations are not replaced with older quarters. The sample ends in the third quarter of 2026. Source: Philippine Statistics Authority national accounts and headline CPI; archived linked GDP growth through 2000; author's calculations.

The first quarter of 2009 qualifies under all three trend estimates: inflation was 6.98 percent and growth was 1.12 percent, against a growth cutoff of 2.73 percent. The absolute 2 percent rule flags this quarter too, so its inclusion illustrates the gain from using quarterly data. In the second quarter of 2023, growth of 4.26 percent passes the relative test only when the pandemic contraction is omitted; it fails both the absolute 2 percent rule and the 3 percent capped rule. By contrast, the second and third quarters of 2026 qualify under all three trend estimates and still qualify with a 3 percent growth cap, while the absolute 2 percent rule misses both. The unadjusted trend places growth only 0.01 and 0.13 percentage point below the respective cutoffs. These dates are sensitive to revisions and to the inflation threshold: neither quarter clears an 8 percent inflation cutoff. The quarterly flags provide no classification of 2026 as a whole.

5.6 External validation using employment growth

Employment growth is the sole outcome in this comparison. It is external to the dating rule and is observed for 889 of the 902 country-years flagged by either rule at the 5 percent inflation threshold. I compare the capped-floor-only, fixed-cutoff-only, and jointly flagged groups. The regression includes country and year fixed effects, with standard errors clustered by country. The estimates describe differences among flagged observations.

Table 4: Employment growth in country-years flagged by either benchmark.

Group	Eligible	Observed	Mean (%)
Capped floor only	57	56	1.98
Fixed cutoff only	184	183	2.01
Both rules	661	650	1.42
Adjusted contrasts (percentage points)			
Contrast		Estimate	95% CI
Capped floor only vs. Both rules		0.39	[−0.39, 1.17]
Fixed cutoff only vs. Both rules		0.33	[−0.16, 0.82]
Capped floor only vs. Fixed cutoff only		0.06	[−0.77, 0.89]

Notes: Group rows show unadjusted means in percent. Contrast rows show the adjusted difference in the third column and its confidence interval in the fourth. Regressions include country and year fixed effects. Intervals use country-clustered standard errors with a t reference distribution (133 countries). All groups satisfy inflation above 5 percent. Source: PWT 11.0; author calculations.

Average employment growth is 1.98 percent in the capped-floor-only group, 2.01 percent in the fixed-only group, and 1.42 percent in the overlap. The adjusted difference between the exclusive groups is 0.06 percentage point. Table 4 reports the 95 percent confidence interval. The intervals for both contrasts with the overlap also include zero. The results leave considerable uncertainty about relative employment distress, especially for the 56 observed capped-floor-only years. Aggregate employment growth also has limited

ability to capture changes in hours or job quality.

5.7 Validation strategy

Greater coverage alone does not establish that the relative rule is useful. The additional episodes should also show evidence of economic distress. The validation therefore examines whether they differ from other high-inflation years.

Every country-year flagged by the relative rule satisfies the inflation condition. A comparison of relative-only episodes with *all* unflagged years would therefore mix the effects of the two conditions: the unflagged pool is dominated by low-inflation years, and high inflation is itself strongly associated with financial stress (Table 6 below shows that high-inflation years without any slowdown have higher banking-crisis and large-depreciation incidence than tranquil years). The relevant comparison is therefore conditional: *among high-inflation country-years*, does the below-trend-growth condition select the more distressed subset? The primary validation restricts the sample to the 3,035 country-years with inflation above 5 percent. Within this sample, the base category is a high-inflation year with growth neither below the floor nor negative (2,164 country-years); the comparison categories are relative-only years (384), binary-only years (72), and years flagged by both rules (415).

I examine seven outcomes to assess the economic conditions in the dated episodes: the growth rate of real consumption per capita, the growth rate of real GDP per capita, the growth rate of employment, the incidence of a large currency depreciation, the incidence of a systemic banking crisis, and currency- and sovereign-debt-crisis starts. Consumption, GDP, employment, and exchange rates are from the Penn World Table; the exchange-rate variable is local currency per U.S. dollar, so positive changes denote depreciation. Banking, currency, and sovereign-debt crises are dated by Laeven and Valencia (2020), using the source coverage described in Section 4. GDP per capita growth is mechanically close to the output-growth component of the rule, so it should be read as

a severity check rather than as an independent validation outcome. Consumption per capita is a more direct welfare proxy but still co-moves strongly with output in these data. Banking crises and large depreciations provide evidence of financial stress beyond the output and inflation variables used to define the rule.

5.8 Validation results

Table 5 reports the conditional comparison. The growth condition identifies years with weaker output and consumption: relative to other high-inflation years, relative-only episodes have real GDP per capita growth 3.2 percentage points lower and real consumption per capita growth 2.0 points lower. Both estimates have $p < 0.001$ using country-clustered standard errors and are similar with country and year fixed effects. The GDP result is partly mechanical—output growth is the sorting variable—but consumption is a welfare-relevant outcome the rule does not use directly, and years flagged by the binary rule have still weaker outcomes, as expected for periods of contraction.

The additional financial-stress evidence is weak and specification-dependent. Banking-crisis incidence in relative-only years is 6.2 percent against 4.7 percent in the high-inflation base: the excess is not significant without fixed effects ($p = 0.396$) and is only marginal with country and year effects ($p = 0.051$). Currency-crisis incidence is 6.5 versus 4.8 percent ($p = 0.234$ without effects and $p = 0.093$ with effects); sovereign-debt-crisis incidence is 2.6 versus 0.8 percent ($p = 0.058$ and $p = 0.051$). These crisis comparisons use the smaller source-covered sample through 2017. Large-depreciation incidence is lower in relative-only years (13.0 versus 16.8 percent; the difference disappears with fixed effects), and employment growth is indistinguishable. The rule chiefly selects weaker output and consumption within high-inflation years; financial evidence offers limited corroboration.

Table 5: Conditional validation: outcomes within high-inflation country-years.

	Category means				Relative-only coefficient	
	Base	Rel. only	Bin. only	Both	No FE	FE
	(N = 2,164)	(384)	(72)	(415)		
GDP pc growth (%)	4.09	0.84	−3.14	−7.08	−3.25***	−3.87***
					(0.22)	(0.19)
Consumption pc growth (%)	3.70	1.70	−3.50	−5.38	−2.00***	−2.19***
					(0.47)	(0.52)
Employment growth (%)	2.58	2.59	1.34	0.99	0.00	−0.15
					(0.23)	(0.24)
Banking crisis (%)	4.70	6.17	14.06	12.36	1.47	3.47*
					(1.73)	(1.78)
Large depreciation (%)	16.82	13.02	58.33	38.55	−3.80**	−0.15
					(1.88)	(1.75)
Currency crisis (%)	4.76	6.49	17.19	14.08	1.74	2.69*
					(1.46)	(1.60)
Sovereign crisis (%)	0.80	2.60	6.25	6.32	1.80*	1.86*
					(0.95)	(0.95)

Notes: Sample restricted to country-years with inflation above 5 percent (N = 3,035; employment: 3,000). Banking, currency, and sovereign crisis rows use 2,591 source-covered country-years through 2017: base 1,871, relative only 308, binary only 64, and both 348. The base category is a high-inflation year with growth neither below trend − 2 pp nor negative. The final two columns report the relative-only coefficient from OLS (linear probability for incidence outcomes, in percentage points) of each outcome on the three non-base category indicators, without and with country and year fixed effects; standard errors clustered by country in parentheses. Crisis outcomes are missing outside source coverage. Banking crises use the start and following year; currency and sovereign crises use start years. *10, **5, ***1 percent. Source: PWT 11.0, IMF WEO, Laeven and Valencia (2020); author's calculations.

The pooled comparison with all unflagged country-years in Table A3 shows weaker output and consumption and higher financial-stress incidence in relative-only years. Banking-crisis incidence is 6.2 versus 3.5 percent, but the difference is not significant under country-clustered inference without fixed effects (p = 0.103). The large-depreciation

difference remains significant in the pooled comparison. These results depend on the inflation composition of the comparison group and should be read alongside the conditional results. PWT employment may adjust weakly over the cycle in economies with large informal sectors and may contain substantial measurement error.

5.9 The role of each condition

Table 6 groups country-years by whether they satisfy neither condition, one condition, or both. High-inflation-only years have output and consumption growth similar to tranquil years but higher financial-stress incidence. Below-trend years with low inflation have weaker activity. The joint category combines weaker activity and greater financial stress than tranquil years. Crisis means use only source-covered countries through 2017, whereas other outcomes use the full sample. As the conditional results show, adding the growth condition within high-inflation years chiefly selects weaker output and consumption; the additional crisis evidence is weak.

Table 6: Outcomes by inflation and growth condition, EMDEs 1980–2023.

Category	N	Cons. pc (%)	GDP pc (%)	Banking crisis (%)	Large dep. (%)
Neither condition	1,760	3.58	3.90	1.49	0.97
High inflation only	2,236	3.47	3.85	5.01	18.16
Below-trend growth only	679	−0.59	−2.58	3.86	0.88
Joint condition	799	−1.97	−3.28	9.45	26.28

Notes: Categories are mutually exclusive. High inflation is inflation $>$ 5 percent; below-trend growth is $g <$ trend -2 pp. The joint category is the relative-to-trend rule. A large depreciation is an annual depreciation of more than 25 percent against the U.S. dollar. Source: PWT 11.0, IMF WEO, Laeven and Valencia (2020); author's calculations. Banking-crisis means use source-covered countries through 2017; column N reports the full category sizes.

The inflation condition distinguishes stagflationary stress from an ordinary slowdown. The association with subsequent economic weakness, examined next, comes

mainly from the growth shortfall.

5.10 Forward-looking checks and limits

The validation exercises above ask whether the dated episodes look economically different from ordinary country-years. As a supplementary check, Table 7 asks whether the flags are followed by weaker future outcomes. This provides evidence on whether the weakness associated with the dated episodes persists. The table reports panel local projections of one- and two-year-ahead outcomes on the flags at t, with country and year fixed effects and standard errors clustered by country.

First, the relative flag is followed by lower output and consumption growth one year ahead even when the binary flag is included in the same regression: a relative flag is associated with output per capita growth about 1.0 percentage point lower at $t+1$ ($p < 0.001$) and consumption growth 1.4 points lower ($p = 0.005$), conditional on the binary flag. Second, the relative flag's association with future output is longer-lived. At the two-year horizon the relative flag remains significantly associated with lower output growth (-0.61 percentage point, $p = 0.012$), whereas the binary flag's coefficient is no longer significant ($p = 0.62$). Neither flag is significantly associated with consumption growth at the two-year horizon. The retrospective relative flag is associated with a 2.5 percentage-point increase in banking-crisis starts at $t+2$ ($p = 0.023$), but not at $t+1$; the two-year association is not significant after continuous growth-gap and inflation controls ($p = 0.116$). These estimates suggest that weakness following a relative-rule episode may persist for longer, although the associations differ by outcome and horizon.

Table 7: Forward-looking check: outcomes after relative and binary flags.

	GDP pc growth		Cons. pc growth		Banking-crisis starts	
	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$
Relative flag$_t$	-1.01^{***}	-0.61^{**}	-1.37^{***}	0.24	0.006	0.025^{**}
	(0.27)	(0.24)	(0.48)	(0.50)	(0.011)	(0.011)
Binary flag$_t$	-1.35^{***}	0.20	-0.35	-0.20	0.002	-0.015
	(0.40)	(0.39)	(0.94)	(0.63)	(0.014)	(0.014)
Country FE, year FE	Yes					

Notes: Each column is a separate OLS regression of the future outcome on both flags at t, with country and year fixed effects; standard errors clustered by country in parentheses. The banking-crisis regressions are linear probability models of new starts, observed only for source-covered countries through 2017. Growth outcomes use $N = 5{,}334$ ($t+1$) and 5,194 ($t+2$); crisis starts use 4,090 and 3,965. *10, **5, ***1 percent. The table reports all outcomes at both horizons: Neither flag is significantly associated with consumption growth at $t+2$. The relative flag is associated with crisis starts at $t+2$ before continuous controls. The relative flag remains significantly associated with output growth at the two-year horizon when the binary flag does not, consistent with slower-unwinding stress.

The results require two qualifications. First, when the relative rule is decomposed into its two components—high inflation and below-trend growth—and these are entered separately along with their interaction, the association with future outcomes is largely accounted for by below-trend growth; the high-inflation $\times$ below-trend interaction is not separately significant. Second, when the continuous variables underlying the rule—the growth gap $g_{i,t} - \overline{g}_{i,t}$ and (log) inflation—are entered directly, the discrete flags lose their forecasting content: for output growth at $t+1$, the relative-flag coefficient falls from -1.01 to 0.05 ($p = 0.86$) while the continuous gap enters at $p < 0.001$. The discrete flag therefore adds no forecasting power for output growth at this horizon once the underlying continuous variables are included; the two-year banking-crisis association also loses significance with these controls. Its contribution is to provide a common set of dates for studying high-inflation slowdowns relative to each country's trend. This use is comparable to that of the business-cycle dating methods of Bry and Boschan (1971) and Harding and Pagan

(2002), which provide chronologies for counting and comparing recessions. High inflation defines the type of slowdown being studied; the predictive association comes mainly from the growth shortfall.

5.11 Pseudo-real-time surveillance and inflation persistence

The baseline rule is useful for historical dating, but surveillance requires a version that does not use current-year output growth to estimate the trend. I therefore recompute trend growth as the 10-year moving average through $t-1$ and apply the same thresholds in year t; as Section 4 emphasizes, this pseudo-real-time exercise lags the trend but treats year-t growth and inflation as observed. It covers 5,459 country-years over 1980–2023: the binary rule flags 485 country-years (8.9 percent), the pseudo-real-time relative rule 852 (15.6 percent), with a time pattern similar to the retrospective baseline.

Table 8 reports the associations between the pseudo-real-time flag and subsequent outcomes. The flag is followed by GDP per capita growth about 1.0 percentage point lower at $t+1$ ($p < 0.001$) and 0.42 point lower at $t+2$ ($p = 0.095$), controlling for the binary flag, country fixed effects, and year fixed effects, and by consumption growth 1.2 points lower at $t+1$ ($p = 0.01$) but not at $t+2$; neither flag is significantly associated with new banking-crisis starts at either horizon. The binary flag is comparable at the one-year output horizon, as expected for a rule that identifies contractions, but loses its association at two years. For surveillance, these results suggest that the relative rule can identify high-inflation slowdowns while growth is still positive, some of which are followed by further weakness.

Table 8: Pseudo-real-time surveillance regressions.

	GDP pc growth		Cons. pc growth		Banking-crisis starts	
	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$
Pseudo-real-time relative flag$_t$	-1.02^{***}	-0.42^{*}	-1.19^{***}	0.49	0.013	0.015
	(0.26)	(0.25)	(0.46)	(0.50)	(0.011)	(0.011)
Pseudo-real-time binary flag$_t$	-1.34^{***}	0.04	-0.51	-0.42	-0.005	-0.008
	(0.40)	(0.40)	(0.91)	(0.63)	(0.014)	(0.014)
Country FE, year FE			Yes			
N	5,319	5,179	5,319	5,179	4,075	3,950

Notes: The pseudo-real-time relative rule estimates trend growth using only observations through $t-1$; year-t growth and inflation are treated as observed. Each column is a separate OLS regression of the future outcome on the pseudo-real-time relative and binary flags at t, with country and year fixed effects; standard errors clustered by country in parentheses. The banking-crisis regressions are linear probability models of new starts, observed only for source-covered countries through 2017. The table reports all outcomes at both horizons: Neither flag is significantly associated with consumption growth at $t+2$ or with new banking-crisis starts at either horizon. *10, **5, ***1 percent. Source: PWT 11.0, IMF WEO, Laeven and Valencia (2020); author's calculations.

Inflation remains persistent across both high-inflation states. Classifying country-years into four pseudo-real-time policy states—neither condition, high inflation only, below-trend growth only, and the joint state—shows that high inflation is persistent whether or not growth is below trend: 86.9 percent of high-inflation-only years and 86.6 percent of joint stagflationary-stress years are followed by at least one more above-threshold inflation year over the next two years (excluding hyperinflation country-years to keep levels interpretable; the full tabulation is in Table A7). Subsequent output growth differs more clearly: next-year GDP per capita growth averages 2.8 percent after high-inflation-only years but only 0.7 percent after joint years. The joint state thus combines persistent inflation with weaker subsequent activity, without showing greater inflation persistence than high-inflation-only years.

6 Robustness checks

6.1 The growth-shortfall and variance-based formulations

The growth shortfall δ is varied between 1 and 3 percentage points: the relative-rule flag count rises to 1,055 (19.3 percent of country-years) at $\delta = 1$ percentage point and falls to 610 (11.1 percent) at $\delta = 3$ percentage points. The excess of relative over binary flags is preserved across this range. The variance-based formulation $g_{i,t} < \overline{g}_{i,t} - \kappa\sigma_{g,i}$ with $\kappa = 1$ flags fewer country-years than either (400, or 7.3 percent), because in countries dominated by a few extreme contractions the full-sample standard deviation is itself inflated. The Philippine series illustrates this sensitivity: $\sigma_{g,i} = 3.2$ percentage points for the Philippines over the 1958–2025 estimation sample, against 1.9 points once the 1984–1985 collapse and the 2020 pandemic contraction are removed, so the joint variance-based rule with $\kappa = 1$ flags four years (1960, 1984–1985, and 1998) against six under the 2 percentage-point gap. The years it drops are 1981 and 1983—the positive-growth slowdowns discussed earlier—because a threshold scaled to a variance inflated by two crises is too wide to register them. For panel work and for single-country settings with skewed growth distributions, a fixed percentage-point gap is better suited to identifying such slowdowns.

A separate issue is that the relative rule does not nest the binary rule: 72 country-years are flagged by the binary rule alone, because the backward-looking trend had already been dragged down by earlier crises (the Philippine 1991 case in Section 5.5). These excluded episodes have a large-depreciation incidence of 58.3 percent, the highest of any flag category. A surveillance rule should continue to identify high-inflation contractions even when past crises have lowered estimated trend growth. The floor variant addresses this omission: inflation $> \pi^*$ and $g < \max(0, \overline{g}_{i,t} - \delta)$, which is exactly the union of the two rules: it flags 871 country-years (15.9 percent), reaches 135 countries, and preserves the coverage result (20 of the 24 countries never flagged by the binary rule). The pure relative rule remains the analytical baseline so that the additional positive-growth episodes

can be assessed separately from contractions.

6.2 High growth and post-boom normalization

The uncapped rule can flag rapid growth when a preceding boom raises the rolling average. Among the 384 relative-only country-years, median growth is 2.25 percent; 153 (39.8 percent) have growth of at least 3 percent, and 72 (18.8 percent) have growth of at least 5 percent. Equatorial Guinea in 2002 has growth of 20.2 percent against a 30.2 percent trend; Liberia in 2006 has 15.1 percent against 18.6 percent. These are large relative slowdowns, but high aggregate growth alone provides insufficient grounds to describe activity as weak. Against the country mean estimated from all available 1980–2023 growth observations, 109 relative-only years are at or above the mean, including 64 of the 180 relative-only years in 2000–2019.

The capped variants require $g < \min(\overline{g}_{i,t} - \delta, c)$, with $c = 3$ or 4 percent. They flag 646 and 690 country-years (11.8 and 12.6 percent), reach 132 and 133 countries, and cover 17 and 18 of the 24 countries never flagged by the contraction benchmark. A country-mean ceiling flags 688 years (12.6 percent) and reaches 134 countries, but uses future information and serves only as a retrospective check. None of these ceilings is estimated as an optimal threshold.

Table 9: Episode frequency by decade under alternative growth criteria.

Decade	$g < 0$	$g < 2$	Relative	Cap 3	Cap 4
1980s	18.2	28.7	25.1	22.0	23.1
1990s	11.4	19.1	14.7	12.1	13.0
2000s	4.0	8.4	9.4	7.3	7.9
2010s	4.3	8.7	11.8	8.1	8.9
2020s	8.7	16.1	13.8	11.8	12.3

Notes: Entries are percentages of eligible country-years within each decade. Every rule requires inflation above 5 percent; the 2020s cover 2020–2023. Caps additionally require growth below 3 or 4 percent. Source: PWT 11.0, IMF WEO; author's calculations.

The post-2000 frequency difference becomes smaller but survives. With a 3 percent ceiling, the relative share is 7.3 percent in the 2000s and 8.1 percent in the 2010s, against contraction-based shares of 4.0 and 4.3 percent. With a 4 percent ceiling it is 7.9 and 8.9 percent. This supports a limited historical conclusion: high-inflation years with both a relative shortfall and low absolute growth were more common than contractions alone suggest. It does not establish that all uncapped flags represent economic distress. With fixed effects, relative-only consumption shortfalls remain under both ceilings (-2.95 and -2.82 percentage points, both $p < 0.001$), while employment differences remain insignificant and banking-crisis evidence remains marginal (Table A6).

The uncapped floor variant includes every high-inflation contraction but does not remove rapid-growth flags. A capped floor variant, $g < \max(0, \min(\overline{g}_{i,t} - \delta, c))$, preserves contractions while imposing the chosen ceiling on positive-growth flags. Panel B of Table 10 compares the capped floor with the absolute 2 percent rule under common inflation cutoffs. Raising the inflation cutoff from 5 to 8 percent reduces the number of flags unique to the capped floor from 57 to 38 and the number unique to the absolute rule from 184 to 135. The floor adds no flags unique to the capped floor because the absolute rule already

includes contractions. The cap is a sensitivity choice that limits flags during high absolute growth.

6.3 Alternative trend estimators

The estimate of trend growth $\overline{g}_{i,t}$ is a central choice, and the backward-looking moving average offers a simple starting point. Table 10 recomputes the flags under five trend estimators, evaluated on the same 5,474 country-years as the baseline panel: the baseline 10-year backward moving average; a 7-year backward moving average; one-sided and two-sided Hodrick–Prescott filters ($\lambda = 100$, applied to log GDP); and the Hamilton (2018) regression filter. The relative rule identifies more country-years than the binary rule under every estimator (the ratio ranges from 1.2 under the one-sided HP filter to 2.0 under the Hamilton filter), and 18–20 of the 24 countries that the binary rule never flags are flagged at least once by the relative rule. The *magnitude* of the excess depends on the filter—the two-sided and one-sided HP filters are the most conservative, the Hamilton filter the most permissive—but the direction and the country-coverage conclusion do not. I report the moving average as the baseline because it is transparent, uses current and past data but no future data (avoiding the end-point revisions that affect two-sided filters precisely in the most recent and policy-relevant years), and is easy to reproduce. The aggregate ordering survives, but the individual dates vary. The seven-year average retains 85.0 percent of the 799 baseline flags; the one-sided and two-sided HP filters retain 61.0 and 69.1 percent, respectively, and the Hamilton filter retains 67.7 percent. An aggregate frequency result therefore does not imply that the same country-years qualify.

The post-pandemic years illustrate one limitation of the backward-looking trend: the 2020 COVID-19 contraction sits inside the trend window for 2021 onward, pulling estimated trend growth down (from 4.0 to 3.1 percent on average over 2021–2023) and thereby lowering the growth floor precisely in the years of the post-pandemic inflation surge. Recomputing the trend with 2020 excluded from the window raises the 2021–2023

flag count from 42 to 52 country-years (10.1 to 12.6 percent of those years). The baseline rule is therefore mildly conservative for the most recent and most policy-relevant episode; users applying the rule in real time after a large transitory collapse may prefer to exclude the collapse year from the trend window.

Table 10: Robustness of flag counts and individual dates.

Panel A. Trend estimators, inflation above 5 percent

Trend estimator	Flags	Share (%)	R/B	Shared	Retained (%)	Added
10-year average (baseline)	799	14.6	1.64	799	100.0	20
7-year average	761	13.9	1.56	679	85.0	20
One-sided HP	604	11.0	1.24	487	61.0	18
Two-sided HP	634	11.6	1.30	552	69.1	18
Hamilton filter	987	18.0	2.03	541	67.7	19

Panel B. Capped rules versus the absolute cutoff

Inflation cutoff	Absolute	Capped	Cap only	Capped floor	Floor only	Abs. only
5 percent	845	646	57	718	57	184
8 percent	634	474	38	537	38	135

Notes: Both panels use the same 5,474 country-years. In panel A, R/B is the ratio to the 487 contraction flags; shared and retained report the number and percentage of the 799 baseline relative flags reproduced. Added counts economies flagged among the 24 never flagged by the contraction rule. HP filters use annual log GDP and $\lambda = 100$; the Hamilton regression uses annual log GDP with $h = 2$ and $p = 4$ and is estimated on the full country history. In panel B, all rules require inflation above the row cutoff. The absolute rule requires $g < 2$; the two capped rules use the baseline trend and a 3 percent cap. Cap only and floor only count flags missed by the absolute rule; abs. only counts absolute flags missed by the capped floor. Source: PWT 11.0, IMF WEO; author's calculations.

At the 5 percent inflation cutoff, the four alternative estimators retain between 596 and 673 of the 718 baseline capped-floor flags, and 551 country-years qualify under all five estimators. For the uncapped relative rule, 352 of the 799 baseline flags qualify under all five. At the 8 percent inflation cutoff, 422 of the 537 baseline capped-floor flags qualify under all five. These comparisons include contractions, which the floor retains regardless

of the trend estimate. The replication files list the country-year flags by estimator and inflation cutoff.

6.4 Country-specific inflation thresholds

The baseline 5 percent inflation threshold provides a common benchmark for surveillance and is exceeded in 55.4 percent of the sample. A uniform 8 percent threshold reduces the relative share to 10.5 percent and the contraction share to 6.9 percent; these stricter dates offer a useful companion to the permissive baseline. It is not an estimate of the rate above which inflation harms growth. Since what counts as high inflation may vary across countries (Khan and Senhadji, 2001), I also examine country-specific thresholds. Each candidate threshold is applied to *both* rules so that the comparison continues to isolate the effect of changing the output criterion. The country-specific thresholds use the full sample and are retrospective checks. Table 11 reports the symmetric comparison for thresholds set at the country-specific 75th and 80th percentiles of own inflation history, the country median plus 5 points, and a uniform 8 percent, alongside the uniform 5 percent baseline. Both rules identify fewer country-years under these alternative thresholds, but the relative rule identifies 1.25 to 1.64 times as many as the binary rule in each case, and between 20 and 27 countries that the binary rule never flags at a given threshold are flagged by the relative rule at that same threshold. Measuring growth relative to trend therefore expands both episode counts and country coverage under all the inflation thresholds examined.

6.5 Hyperinflation outliers

The panel contains 293 country-years with inflation at or above 50 percent, and extreme observations of this kind can dominate crisis and depreciation statistics. Excluding them strengthens rather than weakens the comparison with the binary rule: the binary share falls to 7.2 percent while the relative share falls only to 13.5 percent, raising the ratio to 1.9,

because hyperinflation episodes disproportionately coincide with outright contractions that both rules already flag. The coverage result also improves slightly (24 of 28 countries never flagged by the binary rule in the trimmed sample). In the validation results, the pooled differences for relative-only years in output growth, consumption growth, crisis incidence, and large-depreciation incidence have p-values below 0.001, 0.020, 0.067, and 0.006, respectively, after the exclusion (country-clustered), and the conditional pattern of Table 5 is unchanged: the output and consumption differences remain significant, while financial differences remain sensitive to the outcome and specification. Excluding inflation at or above 100 percent instead gives essentially identical results (binary 7.8 percent, relative 13.9 percent). The paper's conclusions are therefore not driven by hyperinflation outliers.

Table 11: Robustness to alternative inflation thresholds applied to both rules.

Inflation threshold π^*	Binary (%)	Relative (%)	R/B	Binary-never countries	Flagged by relative
5% uniform (baseline)	8.9	14.6	1.64	24	20
8% uniform	6.9	10.5	1.51	39	21
Country 75th percentile	5.5	7.5	1.37	34	27
Country 80th percentile	4.6	6.3	1.37	37	26
Country median + 5 pp	5.2	6.5	1.25	46	22

Notes: Each row applies the same inflation threshold to *both* rules—binary: inflation $> \pi^*$ and $g < 0$; relative: inflation $> \pi^*$ and $g <$ trend -2 pp with the 10-year moving-average trend—so that only the output criterion differs within a row. "Binary-never countries" counts countries never flagged by the binary rule at that threshold; the final column counts how many of those are flagged at least once by the relative rule at the same threshold. Source: PWT 11.0, IMF WEO; author's calculations.

7 Discussion

The relative-to-trend rule provides a common method for dating high-inflation growth shortfalls across countries. It identifies slowdowns that a contraction threshold excludes, but does not explain their causes. The capped floor and fixed 2 percent cutoff often disagree on when a spell begins or ends.

Several limitations affect how the dates should be interpreted. Estimates of trend growth depend on the filter, the treatment of recent observations, and structural breaks. Because the growth criterion is relative to each country's own history, the dates also do not establish whether an episode has greater welfare costs in one country than another. The inflation threshold involves a separate choice: a common cutoff is easy to compare across countries but may fit some inflation regimes poorly, while country-specific percentiles make absolute inflation rates less comparable.

The validation supports a limited interpretation of distress. Consumption is weaker in additional relative-rule episodes than in other high-inflation years, but GDP weakness is partly built into the selection rule and consumption co-moves with output. Corrected banking, currency, and sovereign-debt dates provide only weak additional evidence, and their coverage ends in 2017. The comparison with an absolute 2 percent cutoff does not establish superior external validation for the relative dates. Both approaches make classification choices that users should report explicitly.

Boom-inflated trends create a separate interpretation problem. Resource expansion, reconstruction, and subsequent normalization can generate large relative shortfalls despite rapid observed growth. Growth ceilings reduce these cases and preserve the broad decade-frequency difference, but introduce another discretionary threshold. Robustness of aggregate counts across filters does not establish that individual episodes are correctly classified, and lengthy spells warrant country-specific scrutiny.

Annual averages can miss an overlap when high inflation and weak growth peak in different calendar years. The Philippine illustration in Section 5.5 dates such an overlap

in the first quarter of 2009. Its more recent flags also show why a quarterly application should report the distance from the cutoff and sensitivity to alternative trends.

8 Policy implications

The dated series provides researchers with a broader set of emerging-economy slowdowns to study, especially from the 2000s onward, when high inflation often coincided with weak but positive growth. The appendix lists the episodes for use in subsequent empirical work. For surveillance, the floor is useful when the screen should retain every high-inflation contraction. I would use the capped floor when it is also important to rule out rapid positive growth, particularly after a boom has raised the estimated trend. The 3 percent cap is an illustrative guardrail; the absolute 2 percent rule provides a simple cross-check (Table 3). For a prospective application, the trend should use only information available before the period being assessed. A growth shortfall in either floor variant need not imply a negative output-level gap. The persistence results reinforce this distinction: high inflation often remains above threshold whether or not growth is weak, but the joint state identifies years in which that persistence coincides with weaker output and consumption.

The rule can also help central banks, finance ministries, and international institutions explain why high inflation accompanied by a slowdown warrants a different assessment from high inflation during strong growth. It does not determine the policy response, but it clarifies the relevant trade-off: in an inflationary slowdown, aggressive tightening can deepen the output shortfall while passive accommodation can risk unanchoring expectations. Supply-side measures, targeted fiscal support, and exchange-rate management may therefore be relevant alongside monetary policy. The appropriate mix depends on the sources and persistence of inflation, available fiscal space, and the exchange-rate regime.

9 Conclusion

This paper develops a reproducible chronology of stagflationary stress for 139 emerging market and developing economies over 1980–2023. It asks how the choice of growth benchmark changes which high-inflation slowdowns qualify and whether the rules identify periods with different degrees of economic distress.

The capped floor and fixed 2 percent cutoff select different high-inflation slowdowns across growth regimes. They agree on 661 country-years and 95 multi-year spells with identical dates at the 5 percent inflation threshold. Disagreement persists at the 8 percent threshold. The employment-growth contrasts are imprecise, leaving the relative merits of the two rules for identifying employment distress unresolved. The contribution is a reproducible chronology that allows researchers to inspect and compare the dates implied by each benchmark.

The dates do not identify structural shocks, establish negative output gaps, or provide incremental forecasting power beyond the underlying continuous variables in the reported specification. Consumption weakness provides supporting evidence within high-inflation years, while financial validation is weak and depends on specification and source coverage. Quarterly applications, genuine data vintages, and updated financial-crisis sources would improve timing and validation; structural and household evidence would help assess mechanisms and welfare consequences.

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A Dated episodes

Table A1 reports the complete dated series: every episode of stagflationary stress identified by the relative-to-trend rule (inflation > 5 percent, $g <$ 10-year trend -2 pp) and by the binary rule (inflation > 5 percent, $g < 0$) for each of the 135 countries with at least one episode, 1980–2023. Consecutive flagged years are collapsed into spells. The four countries with no episode under either rule are Brunei Darussalam, Cameroon, Kuwait, and Panama. A machine-readable version of the series is included in the replication materials.

Table A1: Dated stagflationary-stress episodes by country, 1980–2023.

Country	ISO3	Relative-rule episodes	Binary-rule episodes
Albania	ALB	1991–1992, 1997, 2002	1991–1992, 1997
Algeria	DZA	1980–1981, 1985–1988, 1991, 1993, 2009	1987–1988, 1991, 1993–1994
Angola	AGO	1991–1993, 2003, 2009–2011, 2013–2020	1992–1993, 2016–2020
Antigua and Barbuda	ATG	1990	—
Argentina	ARG	2002, 2009, 2012–2013, 2018–2020	2002, 2009, 2012, 2018–2020, 2023
Armenia	ARM	2008, 2010–2011, 2013	—
Aruba	ABW	1990–1991, 1993, 2008	2008
Azerbaijan	AZE	2008, 2010–2011, 2016–2017	2016
Bahamas	BHS	1981, 1986–1987, 1991–1992	1981, 1991–1992
Bahrain	BHR	1981–1982	1981–1982
Bangladesh	BGD	1982, 2020	—
Barbados	BRB	1981–1982, 1991–1992, 2011	1981–1982, 1991–1992, 2011
Belarus	BLR	2009, 2012–2016, 2022	2015–2016, 2020, 2022
Belize	BLZ	1981–1982, 1996, 2008	1982
Benin	BEN	2005	—
Bhutan	BTN	1982, 1988–1989, 1991–1995, 2008, 2012–2013	—

Table A1 continued

Country	ISO3	Relative-rule episodes	Binary-rule episodes
Bolivia	BOL	1980–1983	1980, 1982–1986
Bosnia and Herzegovina	BIH	2006	—
Botswana	BWA	1980, 1982, 1985–1987, 1990–1996, 1998, 2000–2001, 2004, 2009, 2012	2009, 2012
Brazil	BRA	1981–1983, 1988, 1990, 1992, 2014–2016	1981, 1983, 1988, 1990, 1992, 2015–2016
Bulgaria	BGR	1989–1992, 1997	1989–1993, 1997
Burkina Faso	BFA	1980, 1983, 1994, 2022	1983
Burundi	BDI	1982, 1984, 1989, 1993–1996, 2015, 2020	1982, 1984, 1993–1996, 2000, 2003, 2015
Côte d'Ivoire	CIV	1980, 1982–1983, 2022	1980, 1983, 1987
Cabo Verde	CPV	1986, 1990–1991	—
Cambodia	KHM	1989–1990, 1993, 1996, 2008	1989
Central African Republic	CAF	1980, 1983	1980, 1983
Chad	TCD	1980–1981, 2006, 2008	1980–1981
Chile	CHL	1982–1983, 1998	1982–1983
China	CHN	1989	—
Colombia	COL	1981–1983, 1996, 1998–1999, 2016, 2023	1999
Comoros	COM	1985, 1994	1994
Congo	COG	1997	1994, 1997
Costa Rica	CRI	1980–1982, 1985, 1996, 2009, 2013	1981–1982, 2009
D.R. of the Congo	COD	1989–1993, 2017, 2020	1982, 1989–1994, 1996–2001
Djibouti	DJI	1994, 2022	1994
Dominica	DMA	1989, 1991	1989
Dominican Republic	DOM	1981–1982, 1984–1985, 1990, 2001, 2003–2004, 2008	1985, 1990, 2003
Ecuador	ECU	1980, 1982–1983, 1999, 2009	1999
Egypt	EGY	1981, 1983, 1985–1987, 1991, 2011–2013	—

Table A1 continued

Country	ISO3	Relative-rule episodes	Binary-rule episodes
El Salvador	SLV	1980–1982, 1996	1980–1982
Equatorial Guinea	GNQ	1989, 2002–2003, 2005, 2009–2010	1989, 2010
Eswatini	SWZ	1980–1984, 1991–1995, 2000, 2008, 2014	1983, 2000
Ethiopia	ETH	1985, 1989, 1991–1992, 2003, 2016, 2018, 2020–2022	1985, 1989, 1991–1992, 2003
Fiji	FJI	1980, 1982–1983, 1987, 1991	1980, 1982–1983, 1987, 1991
Gabon	GAB	1980–1982, 1985, 2008	1982, 1985–1986, 2008
Gambia	GMB	1983, 2002, 2014	1983, 2014
Georgia	GEO	2008, 2020	2020
Ghana	GHA	1981–1983, 2014–2016, 2020	1981–1983
Grenada	GRD	1980–1981, 2008	1980
Guatemala	GTM	1981, 1983, 1985	1983, 1985
Guinea	GIN	2003, 2006	2006
Guinea-Bissau	GNB	1980–1981, 1983, 1998, 2000	1980–1981, 1983, 1986, 1998, 2000
Guyana	GUY	1982–1984, 1989, 2000, 2008	1982–1984, 1986, 1988–1990, 2000
Haiti	HTI	1981–1984, 1992–1994, 2001–2002, 2004, 2019–2022	1981–1982, 1992–1994, 2001, 2004, 2019–2023
Honduras	HND	1980–1983, 1990, 1994, 1999, 2009	1982–1983, 1994, 1999, 2009
Hungary	HUN	1980, 1983, 1985, 1990–1992, 2007–2008, 2012, 2023	1985, 1988, 1990–1993, 2012, 2023
India	IND	1991, 2008, 2020	2020
Indonesia	IDN	1982, 1997–1999	1998
Iran	IRN	1980–1981, 1984, 1986, 1988, 1993–1994, 1998, 2008–2009, 2012–2013, 2015, 2018–2019	1980–1981, 1984, 1986–1988, 1993–1994, 2012–2013, 2015, 2018–2019
Iraq	IRQ	2005–2007, 2021	—

Table A1 continued

Country	ISO3	Relative-rule episodes	Binary-rule episodes
Jamaica	JAM	1980, 1985, 1994–1998, 2008–2010, 2020	1980, 1984–1985, 1997–1998, 2008–2010, 2012, 2020
Jordan	JOR	1988–1990	1989–1990
Kazakhstan	KAZ	2008–2009, 2012, 2014–2016, 2020	1998, 2020
Kenya	KEN	1983–1984, 1991–1993, 1997, 2008, 2020	1992, 2020
Kyrgyzstan	KGZ	2010, 2020	2010, 2020
Lao People's DR	LAO	1987–1988, 1998, 2006, 2020	1987–1988, 2006
Lebanon	LBN	1981–1982, 1986, 1988–1989, 1992, 1997, 2012, 2018, 2020	1982, 1986, 1988–1989, 1997, 2018, 2020, 2023
Lesotho	LSO	1980–1983, 1993–1994, 1998, 2002, 2009, 2020	1980, 1983, 1998, 2009, 2020
Liberia	LBR	2001–2003, 2005–2006, 2013–2022	2003, 2019–2020
Madagascar	MDG	1981, 1991, 2002, 2009–2010	1981–1982, 1991, 1994, 2002, 2009
Malawi	MWI	1981–1982, 1987, 1992, 1994, 2001, 2012, 2018–2023	1981, 1987, 1992, 1994, 2001
Malaysia	MYS	1980, 1998	1998
Maldives	MDV	1986–1989, 1991–1993, 2012	—
Mali	MLI	1980, 1983–1984, 1988	1980, 1983
Mauritania	MRT	1995, 2007–2008	1995, 2007–2008
Mauritius	MUS	1980, 1983, 1994, 1999, 2002	1980
Mexico	MEX	1982–1983, 1986, 1995, 2001, 2009	1982–1983, 1986, 1995, 2001, 2009
Moldova	MDA	2015, 2022	1998–1999, 2015, 2022
Mongolia	MNG	1991–1993, 2009, 2015, 2019, 2021	1991–1993, 2009
Montenegro	MNE	2003	—
Morocco	MAR	1981, 1983, 1992–1993, 1995	1981, 1983, 1992–1993, 1995

Table A1 continued

Country	ISO3	Relative-rule episodes	Binary-rule episodes
Mozambique	MOZ	1982–1983, 1985, 1992, 1995, 2000, 2005, 2016–2017, 2019, 2021	1982–1983, 1985, 1992
Myanmar	MMR	2008, 2011, 2013, 2015–2016, 2018, 2021, 2023	—
Namibia	NAM	1993, 2008–2009, 2016–2017	1993, 2017
Nepal	NPL	1980, 1983, 2016, 2020, 2023	1980, 1983, 2020
Nicaragua	NIC	1985, 1988, 2019	1982, 1984–1991, 1993, 2019
Niger	NER	1980, 1984	1980, 1984
Nigeria	NGA	2011–2012, 2015–2018, 2020	2016, 2020
North Macedonia	MKD	2001	2001
Oman	OMN	1980, 1986	—
Pakistan	PAK	1993, 2008, 2010, 2020, 2023	2020, 2023
Paraguay	PRY	1982–1986, 1996, 1998–2000, 2022	1982–1983, 1999–2000
Peru	PER	1982–1983, 1988–1990, 1998, 2023	1982–1983, 1988–1990, 1992, 1998, 2023
Philippines	PHL	1981, 1983–1985, 1998	1984–1985, 1991, 1998
Poland	POL	1980–1982, 1990–1991, 2001, 2023	1980–1982, 1990–1991
Qatar	QAT	1980–1982, 2005	1980, 1982
Romania	ROU	1982, 1990–1992, 1997, 2009–2010	1990–1992, 1997–1999, 2009–2010
Russia	RUS	2009, 2013–2015, 2022	1998, 2009, 2015, 2022
Rwanda	RWA	1982, 1984, 1991, 1993–1994, 2003–2004, 2009, 2020	1984, 1991, 1993–1994, 2020
Sao Tome and Principe	STP	1981, 1983, 1986–1987, 2009, 2012, 2019, 2022–2023	1981, 1983, 1986–1987, 1990
Saudi Arabia	SAU	1995	—
Senegal	SEN	1980–1981, 1984	1980–1981, 1984
Serbia	SRB	1999, 2009–2012	1999, 2009, 2012
Seychelles	SYC	1980–1981, 1983, 1999–2001, 2008–2009, 2021	1980–1981, 1983, 2000–2001, 2008–2009

Table A1 continued

Country	ISO3	Relative-rule episodes	Binary-rule episodes
Sierra Leone	SLE	1983, 1991–1992, 1995–1997, 2008–2010, 2015, 2019–2022	1983, 1991–1992, 1995–1999, 2015, 2020
Somalia	SOM	2022–2023	—
South Africa	ZAF	1982–1983, 1985–1986, 2009	1982–1983, 1985, 1990, 2009
South Sudan	SSD	2016–2017, 2020–2021	2016–2017, 2020–2021
Sri Lanka	LKA	1987, 1989, 2001, 2013, 2022–2023	2001, 2022–2023
St. Vincent and the Grenadines	VCT	1991, 2008	—
St. Kitts and Nevis	KNA	1981–1982	—
St. Lucia	LCA	1980–1981, 1987, 1991, 1995, 2001	1980, 2001
Sudan	SDN	1980, 1982–1984, 1989, 1993, 1999–2000, 2004, 2007–2008, 2011–2012, 2019–2023	1983–1984, 1987, 1989, 1993, 2008, 2011, 2020–2023
Suriname	SUR	1980, 1982, 1986–1987, 1990, 1993, 2015–2016, 2020	1980, 1982, 1986–1987, 1990, 1993, 1999, 2015–2016, 2020–2021
Syria	SYR	1982–1984, 1986, 1989, 2003	1984, 1986, 1989
Türkiye	TUR	1980, 1989, 1991, 1994, 1999, 2001, 2008–2009, 2018–2020	1980, 1994, 1999, 2001, 2009
Tajikistan	TJK	2009, 2011	—
Thailand	THA	1980, 1996–1998, 2008	1997–1998
Togo	TGO	1980–1983	1980–1983
Trinidad and Tobago	TTO	1983–1988, 2007–2012	1983–1989, 1992–1993, 2009, 2011
Tunisia	TUN	1982, 1986, 1988, 2020	1982, 1986, 2020
Turkmenistan	TKM	1997, 2012–2015	1997, 2013
U.R. of Tanzania: Mainland	TZA	1981, 1983	1981, 1983
Uganda	UGA	1984, 2011–2013, 2016	1980, 1984–1985, 2013
Ukraine	UKR	2008–2010, 2014–2015, 2022	1997–1999, 2009, 2014–2015, 2022
United Arab Emirates	ARE	1981–1982, 1986, 2007	1982, 1986

Table A1 continued

Country	ISO3	Relative-rule episodes	Binary-rule episodes
Uruguay	URY	1982–1984, 1995, 1999, 2002, 2015, 2017–2020	1982–1984, 1988, 1995, 1999, 2002, 2020
Uzbekistan	UZB	2016–2017, 2020	—
Venezuela	VEN	1980–1984, 1989, 1993–1994, 1996, 1999, 2002–2003, 2009–2010, 2013–2020	1980–1981, 1983–1984, 1989, 1994, 1996, 1999, 2002–2003, 2009–2010, 2014–2020
Vietnam	VNM	1980, 1986–1987, 2011–2013	1980
West Bank and Gaza	PSE	1999, 2002, 2023	2002, 2023
Yemen	YEM	2015–2017	2015–2018, 2021, 2023
Zambia	ZMB	1991–1992, 1994, 2013–2017, 2019–2020	1981, 1984–1985, 1991–1992, 1994, 1998, 2020
Zimbabwe	ZWE	2018–2020	2019–2020

B Comparison of candidate rules

Table A2: Comparison of candidate stagflation rules, EMDEs 1980–2023.

Criterion	N flagged	Share (%)	Countries flagged
High inflation condition alone	3,035	55.4	138
Below-trend growth condition alone	1,478	27.0	139
Binary rule	487	8.9	115
Relative-to-trend joint rule	799	14.6	135
High inflation or below-trend growth	3,714	67.8	139

Notes: The high-inflation condition is inflation $>$ 5 percent. The below-trend growth condition is $g <$ trend -2 pp, using the 10-year backward-looking trend estimated on the full PWT growth history. The relative-to-trend joint rule requires both conditions. Source: PWT 11.0, IMF WEO; author's calculations.

C Pooled validation

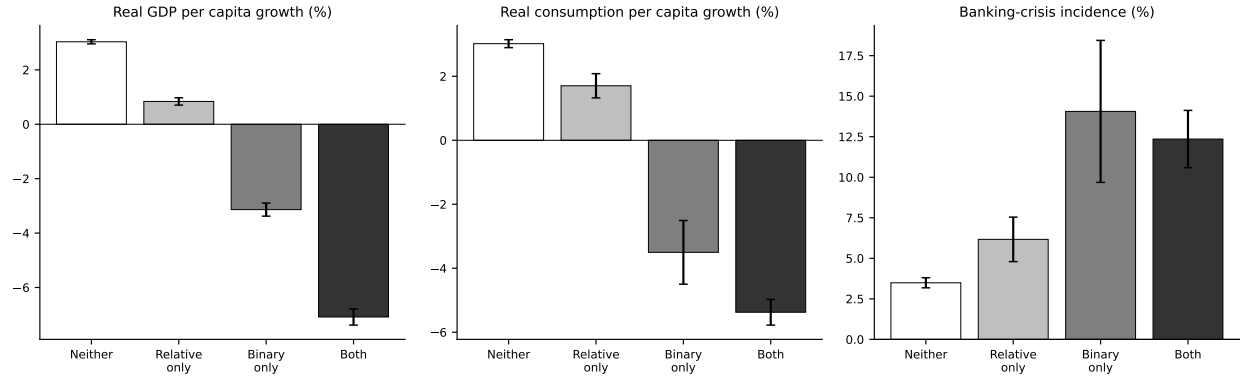
Table A3 reports the pooled four-category comparison of distress outcomes against all unflagged country-years, and Figure A1 displays the central outcomes. Distress increases from neither to relative-only to binary-flagged years: output and consumption growth fall, while banking-crisis and large-depreciation incidence rise. As the conditional validation in Section 5.7 shows, however, the pooled financial differences should be interpreted alongside the high-inflation conditional comparison; the pooled comparison is reported here for completeness.

Table A3: Pooled distress outcomes by stagflation-flag category, EMDEs 1980–2023.

	Neither (N = 4,603)	Relative only (N = 384)	Binary only (N = 72)	Both (N = 415)
Real GDP per capita growth (%)	3.03	0.84^{***}	-3.14^{***}	-7.08^{***}
Real consumption per capita growth (%)	3.02	1.70^{***}	-3.50^{***}	-5.38^{***}
Employment growth (%)	2.42	2.59	1.34^{**}	0.99^{***}
Banking-crisis incidence (%)	3.49	6.17	14.06^{**}	12.36^{***}
Large depreciation incidence (%)	8.41	13.02^{***}	58.33^{***}	38.55^{***}

Notes: Cell entries are category means. Consumption, GDP, employment, and exchange rates are from PWT 11.0; banking-crisis dates (start year and the following year) are from Laeven and Valencia (2020). The exchange-rate variable is local currency per U.S. dollar, so positive changes denote depreciation. A large depreciation is an annual depreciation of more than 25 percent against the U.S. dollar. Asterisks denote a difference from the "neither" category significant at $^{*}10$, $^{**}5$, $^{***}1$ percent, based on OLS (continuous outcomes) or linear probability (incidence outcomes) regressions of each outcome on the three category indicators, with standard errors clustered by country. With country and year fixed effects the relative-only differentials are -2.89 pp for GDP growth ($p < 0.001$), -2.09 pp for consumption growth ($p = 0.001$), $+3.2$ pp for crisis incidence ($p = 0.047$), and the depreciation excess is absorbed ($p = 0.43$). Source: PWT 11.0, IMF WEO; author's calculations. Banking-crisis means use 4,216 source-covered years through 2017 (neither 3,496; relative only 308; binary only 64; both 348).

Figure A1: Pooled distress outcomes by stagflation-flag category.



Notes: Bars are category means; whiskers are ±1 standard error. "Relative only" denotes country-years flagged by the relative-to-trend rule but not the binary rule. Source: PWT 11.0, Laeven and Valencia (2020); author's calculations.

D Absolute benchmarks and growth ceilings

Table A4: Absolute growth benchmarks and capped relative rules.

Growth criterion	Flags	Share (%)	Countries	Added countries
Contraction ($g < 0$)	487	8.9	115	0
$g < 1$	645	11.8	121	6
$g < 2$	845	15.4	129	14
$g < 3$	1,102	20.1	134	19
Relative rule	799	14.6	135	20
Relative, $g < 3$	646	11.8	132	17
Relative, $g < 4$	690	12.6	133	18
Relative, $g <$ country mean	688	12.6	134	19

Notes: All rules require inflation above 5 percent and use the same 5,474 country-years. Added countries are among the 24 never flagged by the contraction benchmark. Caps require both the relative condition and growth below the stated ceiling. The country mean uses all available 1980–2023 growth observations and is a retrospective sensitivity check. Source: PWT 11.0, IMF WEO; author's calculations.

Table A5: Outcomes in overlapping and disjoint flag sets.

Outcome	Both	Relative only	$g < 2$ only	FE difference	p
GDP pc growth	−5.25	2.27	−1.20	2.34	< 0.001
Consumption pc growth	−3.68	2.81	−1.12	1.45	0.492
Employment growth	1.43	2.70	1.82	0.26	0.582
Banking crisis	11.70	2.96	9.09	−5.59	0.299
Large depreciation	31.58	11.43	36.72	−5.52	0.497
Currency crisis	12.94	3.55	11.82	2.73	0.716
Sovereign crisis	5.75	1.18	1.82	−0.37	0.934

Notes: Both denotes agreement between the relative rule and the absolute 2 percent rule (589 years); relative only and absolute only contain 210 and 256 years. Continuous outcomes are growth rates in percent; incidence outcomes are percentages. The FE difference compares the disjoint relative set with the disjoint absolute set, controlling for country and year effects, with country-clustered standard errors. Crisis outcomes use only listed countries through 2017; other outcomes cover 1980–2023. Banking crises use the start year and following year; currency and sovereign crises use start years. Source: PWT 11.0, IMF WEO, Laeven and Valencia (2020); author's calculations.

Table A6: Conditional validation under growth ceilings.

Rule	Consumption	p	Employment	p	Banking crisis	p
Relative	−2.19	< 0.001	−0.15	0.527	3.47	0.051
Cap 3	−2.95	< 0.001	−0.30	0.358	4.40	0.061
Cap 4	−2.82	< 0.001	−0.18	0.521	4.16	0.053
Mean ceiling	−2.93	< 0.001	−0.26	0.364	4.10	0.047

Notes: Coefficients compare each rule's relative-only years with its own high-inflation base (neither contraction nor that rule's shortfall). Regressions include country and year effects and country-clustered standard errors. All coefficients are percentage points. Banking crises are observed only for countries listed in Laeven and Valencia (2020), through 2017. The mean ceiling uses all available 1980–2023 growth observations. Source: PWT 11.0, IMF WEO, Laeven and Valencia (2020); author's calculations.

E Inflation persistence by policy state

Table A7: Inflation persistence and pseudo-real-time policy states.

Pseudo-real-time state	N	π_t (%)	π_{t+1} (%)	High inf. next 2y (%)	GDP pc g_{t+1} (%)
Neither condition	1,703	2.1	3.4	32.5	2.4
High inflation only	1,987	13.5	13.1	86.9	2.8
Below-trend growth only	734	1.7	3.4	33.8	1.3
Joint stagflationary state	747	13.9	14.8	86.6	0.7

Notes: States are defined using the pseudo-real-time trend, which uses growth observations through $t-1$. High inflation is inflation >5 percent; below-trend growth is $g <$ trend -2 pp. The table excludes country-years with inflation at or above 50 percent at t to keep inflation-level means interpretable. "High inf. next 2y" is the share of country-years with available follow-up that are followed by inflation above 5 percent in either $t+1$ or $t+2$; unavailable future observations are treated as missing. Full-sample inflation-level regressions are dominated by hyperinflation and are not reported here; the table presents trimmed descriptive means. Source: PWT 11.0, IMF WEO; author's calculations. The banking-crisis panel uses source-covered countries through 2017; the growth panels use the full sample.