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Inflation, Unemployment, and Growth: Testing the Trade-Offs in Emerging Economies

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ABSTRACT

This paper aims at reconsidering three classical macroeconomic relationships (the Phillips curve, Okun's law and the inflation–growth nexus) in a unique empirical setting of emerging economies. The study uses an unbalanced panel of 34 emerging market economies over the period 2000-2023 using the World Bank's World Development Indicators (WDI), and estimates each of the relationships separately and together, with the inclusion of gross capital formation, trade openness, government consumption and level of financial development. The use of panel fixed-effects and two-step system generalised method of moments (GMM) estimators is used to deal with unobserved heterogeneity and dynamic endogeneity issues. The Phillips curve trade-off is statistically significant; but it is relatively small in economic terms: a one-percentage-point increase in the unemployment rate reduces the inflation rate by about 0.28 percentage points. Okun's law is found to be a very strong relationship: a one-percentage-point increase in the unemployment rate is associated with a 0.41 percentage-point decline in real GDP growth. The relationship between inflation and growth is nonlinear and a threshold model identifies the turning point as around 9.4% annual inflation, beyond which increases in inflation have a much greater impact on growth. The results point to a cautious inflation targeting policy in the emerging markets: the estimated Phillips slope implies that disinflation carries real output costs, although the sacrifice ratio itself is not calculated here and no direct comparison of disinflation costs with the advanced economies is claimed.

Keywords: Phillips curve; Okun's law; inflation threshold; emerging economies; panel data; system GMM

INTRODUCTION

Perhaps no macroeconomic relationship has been the source of so much theoretical and empirical debate as that between inflation, unemployment, and output growth. The first systematic evidence of a negative relationship between wage inflation and unemployment in the UK was provided by Phillips (1958) and Samuelson and Solow (1960) translated this correlation into a policy menu for the macro-economic management of the post-war UK. Friedman (1968) and Phelps (1967) challenged the stability of that trade-off just 10 years later by asserting that any trade-off which could be exploited would be eliminated once agents made their expectations adapt. Shortly thereafter, Okun (1962) reported a close empirical relationship between the output gap and the unemployment rate in the short run and this relationship has been studied in many countries and time periods and has proven to be quite stable across some of these periods, such as the U.S., but not so stable across others (Ball et al., 2017).

In the case of emerging economies, the interaction between these three variables is not adequately represented by the models for advanced countries and is not homogenous across the developing world. In many emerging economies, particularly, labour markets are characterised by large informal sectors, incomplete social protection and rigid regulations of the formal sector, which reduce the sensitivity of measured unemployment to output fluctuations (Loayza & Rancière, 2006; Ball, De Roux, & Hofstetter, 2013). This point has a direct methodological consequence for the present study, which is acknowledged at the outset: the unemployment series available on a comparable basis across the sample is the ILO-modelled estimate, and in economies with large informal sectors that measure captures only part of the labour-market adjustment. The empirical strategy therefore returns to this issue in the robustness section, where the unemployment rate is replaced with the employment-to-population ratio as an alternative labour-market indicator. Inflation, however, is more volatile and more sensitive to shifts in the money supply, in exchange rates, and in the fiscal stance than in advanced economies (Fischer, Sahay, & Végh, 2002; Loayza & Rancière, 2006). This implies that the coefficients of the Phillips and Okun equations derived from advanced-country samples may not be very context-sensitive.

The link between growth and inflation is also controversial. Barro (1996) found an adverse impact of inflation on growth in a comprehensive cross-section of countries, but the impact was small and statistically insignificant, while Fischer (1993) suggested that the relationship is nonlinear: low or moderate inflation has no impact or is slightly harmful while high inflation definitely has an impact. This intuition was later made explicit in the work of Sarel (1996) and then Khan and Senhadji (2001) who estimated inflation turning points, which were around 8% for the less developed and 1-3% for industrial countries. By contrast, more recent work with panel threshold techniques continues to find some nonlinear effects, albeit different thresholds depending on the sample composition and methodology (Kremer, Bick and Nautz 2013, Ibarra and Trupkin 2016, and López-Villavicencio and Mignon 2011).

This paper has three contributions to the literature. First, it estimates the Phillips curve, Okun's law and an inflation-augmented growth equation all in one set of data, allowing the coefficients to be compared without worry about sample differences. Second, it is based on recent data up to 2023, which covers the taper tantrum period and the inflation wave that occurred after the COVID-19 pandemic—two periods that had significant impacts on emerging-market macroeconomic dynamics. Third, it empirically examines the impact of a nonlinear relationship between inflation and growth, both in quadratic and panel threshold specifications, compares the estimates, and reports the full set of threshold-test diagnostics, including the bootstrap likelihood-ratio statistic, the confidence interval for the estimated threshold, and confidence intervals for the quadratic turning point.

The remainder of the paper is organised as follows. The data and empirical approach are described in section 2. The results are reported in Section 3, starting with descriptive statistics, and then the estimated Phillips curve, Okun's law, and growth equation, followed by the robustness analysis. The results are presented and discussed in Section 4 and policy implications are drawn. Section 5 concludes.

METHODS

The empirical study is based on the data obtained for the period 2000-2023 for 34 emerging market economies, which are sourced from the World Bank's World Development Indicators (World Bank, 2024). Countries are classified according to the International Monetary Fund (IMF) World Economic Outlook classification for emerging market and middle-income economies, from the April 2024 vintage of that classification, subject to the criterion that countries must have at least 15 years of complete data available for the key variables. The full list of the 34 sample countries, together with the years available for each, is provided in Appendix Table A1, so that readers can assess the sample composition directly, including the balance between commodity exporters and other economies, which the robustness section returns to. The resulting panel is unbalanced with 748 country-year observations.

This includes the dependent variables of annual rate of consumer price inflation (WDI series FP.CPI.TOTL. ZG), total unemployment rate (as a percentage of the labor force) (modelled ILO estimates) (SL.UEM.TOTL. ZS), and annual growth rate of real gross domestic product (NY.GDP.MKTP.KD. ZG). The use of the ILO-modelled unemployment series deserves a word of caution. It is the only unemployment measure available on a consistent basis across all 34 countries and 24 years, which is why it is used in the baseline, but as discussed in the introduction it understates labour-market adjustment where the informal margin is large. The robustness section therefore re-estimates the labour-market equations with the employment-to-population ratio (SL.EMP.TOTL. SP. ZS) in place of the unemployment rate. Control variables are gross fixed capital formation (NE.GDI.FTOT. ZS), the sum of exports and imports (NE.TRD.GNFS. ZS), general government final consumption expenditure (NE.CON. GOVT. ZS) and domestic credit to the private sector (FS.AST.PRVT.GD. ZS), the latter being a proxy for financial depth. To minimize the impact of outlier data, inflation is winsorised at the first and ninety ninth percentiles as was done by Khan and Senhadji (2001) and Kremer et al. (2013); this replaces 15 observations in total, eight in the right tail and seven in the left, and even after winsorisation the maximum inflation of 41.2% leaves a long right tail, so the robustness section also reports estimates that drop all observations with inflation above 20%.

Three baseline specifications are estimated. The first one is a standard price Phillips curve in which inflation πit for country i in year t is regressed on lagged inflation, the unemployment rate and a vector of controls:

$$\pi it = \alpha i + \beta_1\, \pi i,t-1 + \beta_2\, Uit + \gamma' Xit + \lambda t + \varepsilon it \qquad (1)$$

where U represents the unemployment rate, X a vector of macroeconomic controls (openness, government consumption and, in extended specifications, exchange-rate depreciation), α a country fixed effect and λ a common time effect, and ε an idiosyncratic error. The coefficient of interest is β_2 which is likely to be negative in a traditional Phillips relationship. The equation is specified with the unemployment rate itself rather than an unemployment gap or an output gap, because reliable estimates of the natural rate or of potential output are not available on a comparable basis for most of the sample countries over the full window. The country fixed effects absorb time-invariant differences in structural unemployment across countries, so identification comes from within-country variation of unemployment around each country's own mean, which functions as a crude gap measure; as a check, a specification using deviations of unemployment from a country-specific Hodrick-Prescott trend is reported in the robustness section and yields a very similar slope.

The second, a difference version of Okun's law, is a regression of the change in the unemployment rate on real GDP growth:

$$\Delta Uit = \delta i + \varphi\, git + \eta it \qquad (2)$$

where g is real GDP's growth rate per year. A statistically significant negative φ is in line with Okun's law. For the sake of easier comparison to the growth equation, an inverse specification, regressing growth on the change in unemployment, is also estimated. It should be stated explicitly that the coefficients from the two directions are not simple reciprocals of one another: measurement error in each variable attenuates the coefficient of whichever regression it sits on the right-hand side of, and omitted variables load differently on the two specifications, so the direct and reverse estimates carry different biases and are reported side by side rather than converted into one another.

The third specification is a growth equation with an inflation augment that contains both linear and quadratic terms in inflation:

$$git = \mu i + \theta_1\, \pi it + \theta_2\, \pi^2 it + \theta_3\, Uit + \rho' Zit + vit \qquad (3)$$

where Z is a vector that includes gross capital formation, trade openness, government consumption and domestic credit to private sector. A negative, significant value of θ_2 indicates that inflation will eventually have a growth reducing effect. The turning point that can be associated with it is $-\theta_1 / 2\theta_2$, and because a point estimate of a turning point is of limited use without a measure of its precision, a delta-method standard error and confidence interval for the turning point are reported alongside it.

A panel threshold specification similar to Hansen (1999) and Kremer et al. (2013) is also estimated, to directly identify the inflation threshold.

$$git = \mu i + \theta L\, \pi it\, I(\pi it \le \tau) + \theta H\, \pi it\, I(\pi it > \tau) + \rho' Zit + vit \qquad (4)$$

where I(·) is the indicator function and τ is the inflation threshold which is to be estimated using grid search over the interior of the inflation distribution, trimming the top and bottom 5% of candidate values. The significance of the threshold effect is tested with the bootstrap likelihood-ratio procedure of Hansen (1999) using 500 replications, and the 95% confidence interval for τ is constructed by inverting the likelihood-ratio statistic, as in Hansen (1999); both the LR statistic and the interval are reported with the results.

All three specifications make use of country and time fixed-effects. Since inflation, unemployment and growth are determined simultaneously, and there are lagged dependent variables in the equations, the fixed-effects estimator might be prone to the Nickell (1981) bias in the relatively short time span of panels. To cope with the above, the two-step system GMM estimator, which is developed by Blundell and Bond (1998), with the small-sample corrected standard errors by Windmeijer (2005), is also employed to estimate equations (1) and (3). Instruments are lagged versions of the endogenous regressors, where there is no instrument proliferation using the collapse option as in Roodman (2009). For each GMM specification, standard diagnostics (Arellano–Bond AR(2) test and Hansen J test) are given.

RESULTS

Descriptive statistics

Descriptive statistics of the main variables are presented in table 1. On average, real GDP growth has been 3.9% annually over the sample, with a standard deviation of 3.7 percentage points, which is due to the large decline in real GDP during 2009 and 2020 and the subsequent recoveries. The average inflation rate is 6.2%, but these figures vary widely, with some countries having average inflation rates under 3% and others having double-digit average rates for long periods of time. The average rate of unemployment is 7.8% with significant variation across countries, ranging from less than 3% to more than 25% in East Asian economies and South Africa, respectively.

Table 1

Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
GDP growth (%)	748	3.90	3.72	−13.20	14.50
Inflation (%)	748	6.21	6.05	−1.10	41.20
Unemployment (%)	748	7.81	4.98	0.60	28.30
Gross capital formation (% GDP)	748	23.94	6.11	11.20	46.80
Trade openness (% GDP)	748	68.42	32.15	17.30	178.50
Govt. consumption (% GDP)	748	14.02	4.16	5.10	26.40
Private credit (% GDP)	748	48.17	30.42	6.30	62.10

Note: Authors' calculations using World Development Indicators (World Bank, 2024). Sample: 34 emerging economies, 2000–2023 (see Appendix Table A1 for the country list). Inflation is winsorised at the 1st and 99th percentiles, which affects 15 observations in total (eight in the right tail, seven in the left).

The phillips curve

Estimates of equation (1) are shown in table 2. The results are reported in column (1) pooled OLS, (2) fixed-effects without time dummies and (3) fixed-effects with time dummies and (4) two-step system GMM. The unemployment coefficient is negative and statistically significant for all of the specifications. A one percentage-point increase in the unemployment rate is correlated with a 0.28 percentage-point decrease in inflation in the preferred fixed-effects specification that includes the time dummies, which is of the same order of magnitude as the −0.31 observed by Blanchard, Cerutti, and Summers (2015) for a mixed sample of advanced and emerging economies. The GMM point estimate is somewhat larger at −0.34, but is not significantly different from the fixed-effects estimate. There is no evidence of second order auto-correlation from the AR(2) test ($p = 0.42$) or of any instrument validity issues from the Hansen J test ($p = 0.31$).

Two features of these estimates deserve comment. First, the preferred specification includes year fixed effects, which absorb common global shocks in an unrestricted way; a natural question is whether the unemployment coefficient is doing its work through those dummies. As a check, reported in the robustness section, the year dummies were replaced with observable global factors, namely oil-price growth and the U.S. policy rate, and the unemployment coefficient is essentially unchanged, so the slope is not an artifact of the way common shocks are handled. Second, the GMM estimate of the lagged dependent variable, 0.487, implies that roughly half of an inflation shock persists into the following year, which corresponds to a half-life of about one year. That is faster mean reversion than the near-unit-root persistence typical of high-inflation episodes in the 1980s and 1990s, but it is plausible for the present sample: most of the 34 countries adopted inflation targeting or some form of nominal anchor during the 2000s, and inflation persistence is known to fall under such regimes (Roger, 2010). The fixed-effects estimates of the same coefficient are somewhat higher at 0.52–0.55, and since the Nickell bias pushes the fixed-effects estimate of a lagged dependent variable downward while weak instruments would push the GMM estimate toward the OLS value, the true persistence most likely lies in this general neighbourhood.

Table 2
Phillips curve estimates (dependent variable: inflation)

	(1) Pooled OLS	(2) FE	(3) FE + year FE	(4) System GMM
Lagged inflation	0.612***	0.548***	0.521***	0.487***
	(0.041)	(0.045)	(0.047)	(0.062)
Unemployment rate	−0.194**	−0.309***	−0.281***	−0.342***
	(0.078)	(0.091)	(0.088)	(0.104)
Trade openness	−0.008	−0.021*	−0.019*	−0.025*
	(0.009)	(0.011)	(0.010)	(0.013)
Govt. consumption	0.089	0.134*	0.118	0.152*
	(0.062)	(0.071)	(0.075)	(0.088)
Country FE	No	Yes	Yes	Yes
Year FE	No	No	Yes	Yes
Observations	714	714	714	714
R² / AR(2) p	0.412	0.487	0.531	0.42
Hansen J (p-value)	—	—	—	0.31

Note: Robust standard errors clustered at the country level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. GMM estimates are two-step with Windmeijer (2005) corrected standard errors; instruments collapsed following Roodman (2009).

Okun's law

The Okun's law estimates are given in Table 3. The change in the unemployment rate is highly sensitive and negatively related to real GDP growth: a 1 percentage point increase in real GDP growth leads to a 0.24 percentage point decrease in the unemployment rate in the fixed effects specification. Regressing output growth on the change in unemployment, as in the corresponding growth-form specification, results in a coefficient of −0.41. As set out in Section 2, the two directions are not reciprocals of one another, since measurement error and omitted variables bias them differently, and column (1) should not be inverted to recover columns (2)–(4) or vice versa. Because the baseline Okun regressions in columns (1)–(3) include only country fixed effects, column (4) adds year fixed effects and the same control vector used in the growth equation to check that the relationship is not driven by common global shocks or omitted country-level covariates; the coefficient moves only slightly, from −0.41 to −0.39, and remains significant at the one percent level. Both estimates are in line with those of Ball et al. (2013) for emerging economies and are below −0.5 to −0.7, which constitute typical estimates in advanced economies (Ball, Leigh, & Loungani, 2017). This lower sensitivity reflects that in the countries with the bigger informal sectors, the labor shock is absorbed by these sectors without affecting the measured unemployment rate (Loayza & Rancière, 2006).

Table 3
Okun's law estimates

	(1) ΔU on growth	(2) Growth on ΔU	(3) Growth on ΔU (GMM)	(4) Growth on ΔU, year FE + controls
Real GDP growth	−0.238***	—	—	—
	(0.032)	—	—	—
Change in unemployment (ΔU)	—	−0.407***	−0.432***	−0.386***
	—	(0.058)	(0.071)	(0.061)
Constant	0.912***	3.842***	3.751***	—
	(0.148)	(0.312)	(0.398)	—
Controls (as in eq. 3)	No	No	No	Yes
Country FE	Yes	Yes	Yes	Yes
Year FE	No	No	No	Yes
Observations	714	714	714	714
R² / AR(2) p	0.362	0.418	0.38	0.447

Note: Robust standard errors clustered at the country level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Column (4) adds year fixed effects and the control vector from equation (3) (gross capital formation, trade openness, government consumption, private credit) to the growth-form specification.

The inflation–growth relationship

The growth equation is given in table 4. In column (1) inflation is entered linearly, with a negative, small and marginally significant coefficient. When a quadratic term is added in column (2), the linear term is positive and significant at the one-percent level, the quadratic term is negative and significant at the one-percent level. The implied turning point (the ratio of the linear and twice the quadratic coefficient) is about 9.4%

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annual inflation; the delta-method standard error of the turning point is 0.94 percentage points, giving a 95% confidence interval of roughly 7.6% to 11.3%, so the location of the turning point is estimated with useful, though not pinpoint, precision. The panel threshold estimates, shown in column (3), find the threshold to be at 8.7%, with different coefficients on the low and high sides of the threshold: inflation below the threshold is not statistically significantly associated with growth; but inflation above the threshold is associated with a decrease in growth by approximately 0.19 percentage points for a one percentage point increase in inflation. The bootstrap likelihood-ratio test of Hansen (1999), based on 500 replications, gives an LR statistic of 18.4 with a bootstrap p-value of 0.02, rejecting the linear specification in favor of the threshold specification, and the 95% confidence interval for the threshold τ, obtained by inverting the likelihood-ratio statistic, runs from 6.9% to 10.4%. The quadratic turning point of 9.4% sits inside that interval, so the two nonlinear approaches locate the change in regime in the same territory.

The gross capital formation and financial depth have the expected positive signs and are highly significant among the control variables. Higher trade openness is positively correlated with growth, but is only marginally significant in the GMM specification. The coefficient of unemployment is negative and significant as was discussed in the previous subsection (the Okun-type relationship).

Table 4

Inflation-augmented growth equation (dependent variable: real GDP growth)

	(1) FE linear	(2)FE quadratic	(3) Threshold	(4) System GMM
Inflation	−0.041*	0.098***	—	0.112***
	(0.022)	(0.031)	—	(0.038)
Inflation squared	—	−0.0052 ***	—	−0.0061***
	—	(0.0014)	—	(0.0018)
Inflation ($\pi \le \tau$)	—	—	0.048	—
	—	—	(0.041)	—
Inflation ($\pi > \tau$)	—	—	−0.187***	—
	—	—	(0.052)	—
Unemployment	−0.212***	−0.198***	−0.201***	−0.221***
	(0.048)	(0.045)	(0.046)	(0.058)
Gross capital formation	0.184***	0.179***	0.181***	0.192***
	(0.028)	(0.027)	(0.028)	(0.034)
Trade openness	0.014*	0.012	0.013*	0.017*
	(0.008)	(0.008)	(0.007)	(0.010)
Govt. consumption	−0.072	−0.081*	−0.078	−0.094*
	(0.048)	(0.047)	(0.049)	(0.055)
Private credit	0.031***	0.028***	0.029***	0.034***
	(0.009)	(0.010)	(0.009)	(0.011)
Turning point / threshold	—	9.42% [7.6, 11.3]	8.7% [6.9, 10.4]	9.18%
Threshold LR statistic (bootstrap p)	—	—	18.4 (0.02)	—
Observations	748	748	748	714
R^2 / AR(2) p	0.398	0.421	0.432	0.36
Hansen J (p-value)	—	—	—	0.28

Note. Robust standard errors clustered by country in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Column (3) reports threshold estimates following the panel threshold procedure of Hansen (1999); the grid search trims the top and bottom 5% of candidate threshold values, and the significance of the threshold effect is tested with 500 bootstrap replications. Figures in square brackets are 95% confidence intervals: for the turning point in column (2), from the delta method applied to $-\theta_1/2\theta_2$; for the threshold in column (3), from inversion of the Hansen likelihood-ratio statistic. Turning point in column (2) is calculated as $-\theta_1/2\theta_2$ using the fitted coefficients on inflation and inflation squared.

Robustness

The results are verified by a number of robustness checks, and because the main claims of the paper rest on the stability of the Phillips slope, the Okun coefficient, and the inflation threshold, the key results are reported in the main text in Table 5 rather than being left available upon request. First, excluding the pandemic years 2020 and 2021 shrinks the Okun coefficient by about 15%, to −0.35 in the growth form, but does not affect the qualitative results. Second, separating the sample between commodity exporters and other economies, and estimating the threshold model separately on each sub-sample rather than merely interacting terms, gives a lower threshold of around 7.5% for commodity exporters against roughly 9.8% for the non-commodity group, a gap consistent with the higher terms-of-trade volatility that commodity exporters face; the confidence intervals for the two thresholds overlap, so the difference is suggestive rather than sharply established, and it is discussed further in Section 4. Third, the threshold is similar, at 8.9%, when consumer price inflation is replaced by the GDP deflator. Fourth, employing pooled mean group estimation as in Pesaran, Shin and Smith (1999) leads to a negative long-run impact of inflation above the threshold, albeit with a slightly reduced point estimate. Fifth, in response to the long right tail that survives winsorisation, dropping all observations with inflation above 20% leaves the quadratic turning point at 9.1% and the coefficients on the low and high inflation regimes essentially unchanged, so the nonlinearity is not driven by the handful of very high inflation episodes. Sixth, replacing the ILO-modelled unemployment rate with the employment-to-population ratio reverses the expected signs, as it should, and delivers the same qualitative story: the growth form of Okun's law gives a significant positive coefficient on the change in the employment ratio, and the Phillips slope on the employment ratio is positive and significant, so the labour-market relationships are not an artifact of the modelled unemployment series. Seventh, replacing the year fixed effects in the Phillips equation with observable global factors, oil-price growth and the U.S. policy rate, leaves the unemployment coefficient at −0.27, effectively unchanged from the −0.28 baseline, and the HP-gap version of unemployment discussed in Section 2 gives a slope of −0.30.

Table 5

Summary of robustness checks

Check	Specification change	Key estimate	Baseline
Pandemic years excluded	Drop 2020–2021	Okun (growth form): −0.35***	−0.41***
Commodity exporters	Split-sample threshold estimation	Threshold: 7.5%	8.7%
Non-commodity economies	Split-sample threshold estimation	Threshold: 9.8%	8.7%
Alternative price index	GDP deflator replaces CPI	Threshold: 8.9%	8.7%
Long-run estimator	Pooled mean group (PMG)	High-inflation effect: negative, smaller	−0.187***
High-inflation episodes dropped	Exclude inflation > 20%	Turning point: 9.1%	9.42%
Alternative labour indicator	Employment-to-population ratio	Signs reverse as expected; significant	—
Global factors vs year FE	Oil-price growth + U.S. policy rate	Phillips slope: −0.27***	−0.28***
Unemployment gap	Deviation from country HP trend	Phillips slope: −0.30***	−0.28***

Note: Each row re-estimates the relevant baseline specification with the single change described. Full tables for each check are provided in the online appendix submitted with the manuscript. *** $p < 0.01$.

DISCUSSION

The analysis provides three main findings. First, there is a short-run Phillips curve tradeoff, but of modest economic magnitude, in emerging economies. In the short run, other things constant, the estimated slope of −0.28 to −0.34 suggests that a one-percentage-point decrease in the unemployment rate would increase the inflation rate by about 0.3 percentage point. Table 6 puts this slope beside recent estimates for advanced economies rather than resting the comparison on a single citation. The comparison must be read with

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care, since specifications, activity measures and samples differ across studies, but the broad pattern is consistent: the emerging-market slope estimated here is somewhat steeper than the flattened post-1990s slopes reported for advanced economies (Blanchard et al., 2015; Del Negro et al., 2020; IMF, 2013), while remaining far below the steep trade-offs of the 1970s and 1980s in high-inflation Latin American economies. On the sacrifice ratio, the paper is deliberately careful: the sacrifice ratio itself is not calculated here, and the slope comparison alone cannot establish whether disinflation is more or less costly than in advanced economies, since the sacrifice ratio also depends on inflation persistence and expectations formation. What the estimates do establish is that the trade-off exists and is not negligible, so disinflation in emerging economies carries real output costs.

Table 6

Phillips-slope estimates: this study in context

Study	Sample	Activity measure	Slope (approx.)
This study, FE + year FE	34 emerging economies, 2000–2023	Unemployment rate	−0.28
This study, system GMM	34 emerging economies, 2000–2023	Unemployment rate	−0.34
Blanchard, Cerutti & Summers (2015)	Mixed advanced/emerging, long panel	Unemployment gap	−0.31, declining over time
IMF (2013)	Advanced economies, 1960s–2000s	Unemployment gap	Steep in 1970s, flattening toward −0.2 or below by the 2000s
Del Negro et al. (2020)	United States, post-1990	Unemployment/ slack	Close to zero

Note: Slopes are approximate and drawn from the cited studies; specifications, activity measures, price indices and estimation methods differ across rows, so magnitudes are indicative rather than strictly comparable.

Second, Okun's law is not only valid, but also has a lower coefficient than in advanced economies. The point estimate of approximately −0.41 for the growth form specification is within the bounds of −0.3 to −0.5 found by Ball et al. (2013) for emerging economies, and it is robust to adding year fixed effects and the full control vector, as column (4) of Table 3 shows. This lower sensitivity may be interpreted as an adjustment of the labour market in emerging economies primarily along the informal margin of the labour market: in times of demand contraction, workers can move from formal to informal jobs or even leave the labour market (Loayza & Rancière, 2006; Fields, 2011). The robustness check with the employment-to-population ratio supports this reading directly, since the qualitative relationships survive the change of indicator. On the policy side, this means that measured unemployment is not as informative as a measure of the state of the business cycle as it might be, and that other indicators of the labour market, such as the employment-to-population ratio, should be relied upon more.

Third, and most importantly, the analysis shows that the inflation–growth nonlinearity is indeed strong in emerging economies. The estimated threshold, 8.7% with a 95% confidence interval of 6.9% to 10.4%, is similar to the threshold of 8% reported by Sarel (1996) and 11-12% reported by Khan and Senhadji (2001) for developing countries and is consistent with the more recent estimates of Kremer et al. (2013) and Ibarra and Trupkin (2016). Below this level, there is no measurable statistically significant effect of inflation on growth; above it, inflation is a major damper on growth. The split-sample estimation adds texture: the threshold appears lower for commodity exporters, around 7.5%, than for other economies, around 9.8%, though the overlapping confidence intervals mean the difference should be treated as suggestive. This finding is consistent with inflation targeting regimes with mid-single-digit targets, of the kind most emerging-market central banks have adopted since the early 2000s (Roger, 2010), and cautions against overly-aggressive disinflation when inflation is already at the low-to-moderate range. That said, the policy inference should be drawn with the limits of the analysis in view. The paper estimates where the growth cost of inflation begins to bind; it does not estimate the welfare costs of inflation below the threshold, which may still be material through channels other than growth, and it does not examine how the threshold interacts with the exchange-rate regime or the degree of dollarisation, both of which plausibly shift the level of inflation at which damage sets in. The threshold estimate is therefore an input into target selection, not a sufficient statistic for it.

The results have a number of policy implications. The Phillips curve should be viewed by central banks in emerging economies as a true but limited constraint on policy, and disinflation should be seen as having real costs to output, not just rule-of-thumb costs. But the Okun relationship is relatively weak, and so output measures of the business cycle should be used in conjunction with labour market measures when setting monetary policy. Lastly, if there is an inflation threshold, then lower inflation (not exceeding the threshold) should not be a policy concern for growth-oriented policymakers, but credible institutional arrangements to keep inflation from exceeding the threshold should be, subject to the caveats about welfare costs and regime interactions just noted. This is especially true in recent times, when a large number of emerging economies have been suffering from continuous inflation which is higher than their inflation targets since 2022.

The study has some limitations. The panel considers the emerging economies as a homogeneous group in the baseline, but the structural characteristics—such as commodity dependence, exchange-rate regime and level of dollarisation—are known to affect macroeconomic dynamics. The split-sample threshold estimation reported in Section 3.5 is a first step toward relaxing the homogeneous-threshold assumption, and it does point to a lower threshold for commodity exporters, but a fuller treatment, with formal tests of threshold equality across groups and thresholds allowed to vary with regime characteristics, remains for future work. The ILO-modelled unemployment series, while the only comparable measure available, remains an imperfect gauge of labour-market slack in informal-sector-heavy economies, and although the employment-to-population robustness check is reassuring, a purpose-built informality-adjusted slack measure would be better still. Lastly, expectations formation is not modelled explicitly, but rather the direct relationships between the three variables are analysed. There are many ways to modify these assumptions in future work, such as by using a mixed-frequency Bayesian panel approach or by using survey measures of inflation expectations.

CONCLUSION

In this paper, WDI data on 34 emerging economies has been used to examine the inflation-unemployment-growth trade-offs in this group of countries for the period 2000–2023. The short-run Phillips curve relation is modest but exists, Okun's law is quite robust but the coefficient is less than in the advanced economies, and the inflation–growth relation is nonlinear with a threshold around 9%. These results together suggest a fairly activist monetary policy orientation which would aim to keep inflation in the low-to-moderate range, recognizing that there are real output consequences to disinflation, and that the measured unemployment rate has limitations as a diagnostic tool. Put precisely, emerging-market policymakers face three estimated constraints at once: a Phillips slope of roughly −0.3, which means disinflation is not free; an Okun coefficient of roughly −0.4, which means measured unemployment understates the output consequences of labour-market slack; and an inflation threshold in the region of 9%, above which inflation begins to damage growth. An inflation-targeting regime with mid-single-digit targets is broadly consistent with all three constraints, subject to the caveats on welfare costs and regime heterogeneity set out in the discussion, and managing them jointly, rather than any one in isolation, is the practical task these estimates define for policy.

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