

THE INFLATION-GROWTH NEXUS: A SYSTEMATIC REVIEW OF INTERNATIONAL EVIDENCE

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Abstract

This paper provides a systematic review of the empirical literature on the relationship between inflation and economic growth. By synthesising findings from 60 studies, we analyse the impact of inflation on growth, the presence of threshold effects, and the direction of causality between the two variables. Our analysis revealed a complex and context-dependent relationship, with diverse outcomes across countries and regions. While some studies indicate a positive impact of moderate inflation on growth, others find negative or insignificant effects of high inflation. Notably, the literature highlights the existence of varying inflation thresholds, beyond which adverse effects on growth become more pronounced. The direction of causality between inflation and growth is also multifaceted, with evidence supporting unidirectional, bidirectional, and insignificant causality. These findings underscore the importance of policymakers adopting nuanced approaches that balance price stability with sustainable economic growth, considering country-specific characteristics and institutional frameworks. The review also points to the need for researchers to focus on refining methodologies, expanding data coverage, and exploring heterogeneity in this relationship to provide more robust and actionable insights for policymakers.

Keywords: price level, macroeconomic variables, economic development, causality, monetary policy

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1. Introduction

Inflation and economic growth have a complex relationship, which has been the subject of much debate and research in the field of macroeconomics. As two of the most crucial macroeconomic variables, the interplay between inflation and growth has far-reaching implications for the overall well-being and development of an economy (Barro, 1995; Dornbusch et al., 1996). Understanding this relationship is of paramount importance for policymakers as it informs the formulation of effective monetary and fiscal policies aimed at fostering price stability and sustainable economic growth.

Historically, the predominant view rooted in the classical and monetary neutrality perspectives has been that inflation is a purely monetary phenomenon with no long-term impact on real economic variables. However, alternative theoretical perspectives challenge this view, proposing several channels through which inflation can potentially affect economic growth. This divergence in theoretical frameworks has led to a rapid expansion of empirical studies on the inflation-growth nexus, yielding a broad spectrum of results-ranging from positive to negative, and even non-linear relationships (Fischer, 1993; Bruno & Easterly, 1995; Khan & Senhadji, 2001). The aftermath of the global financial crisis, periods of low inflation in advanced economies, and ongoing macroeconomic volatility in emerging markets have further intensified the interest in understanding this complex relationship.

In the face of a rising tide of empirical research, systematic reviews have emerged as a critical new means in economics to organise and present evidence from disparate works. Systematic reviews differ from many traditional narrative reviews of the literature by using a consistent methodology for identifying, evaluating, and integrating empirical evidence, leading to conclusions with reduced bias and increased reliability (Petticrew & Roberts, 2006). Increasingly, the use of frameworks such as PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) has also helped researchers consolidate findings more systematically, particularly in a field like the inflation-growth nexus, where results are all too often mixed or conflicting.

This paper adds to this growing literature by using systematic review procedures of the inflation-growth nexus. This review, following a systematic approach, aims to provide an exhaustive synthesis of this

vast empirical literature on the inflation-growth nexus. We also review the methodologies employed in these studies and synthesise the reported empirical findings.

These findings are most important for policymakers. The dynamics between inflation and growth are instrumental in macroeconomic stability; therefore, conceiving these associations is vital to devising policies that support an economy to get on a sustainable economic path while ensuring price stability. In synthesising the key insights from this body of research, we further our understanding of the inflation-growth nexus and flag implications for the future as well as policy-making.

In the subsequent sections, the paper delves into the theoretical underpinnings of the inflation-growth relationship, examines the empirical evidence from various studies, and discusses the implications of our findings for policymakers and researchers.

2. Theoretical perspectives

The relationship between inflation and economic growth has been a topic of extensive theoretical and empirical investigation, with numerous scholars proposing various frameworks to explain the potential linkages between these two macroeconomic phenomena. One of the foundational theories in this domain is the Quantity Theory of Money (QTM), which dates back to the work of classical economists such as Irving Fisher and Milton Friedman (Fisher, 1911; Friedman, 1956). The QTM posits a direct relationship between the money supply and the general price level, suggesting that changes in the money supply will lead to proportional changes in the price level, with no long-run effects on real output or employment (Laidler, 1991). This theoretical perspective views inflation as a purely monetary phenomenon, with the central bank's control over the money supply being the primary determinant of the inflation rate.

Building upon the QTM, the classical economic tradition and the principle of monetary neutrality have generally suggested that changes in the money supply or the general price level should have no real effects on the economy's output, employment, or other "real" variables in the long run (Hume, 1752; Fisher, 1911). According to this perspective, the impact of inflation on economic growth is negligible, as market forces eventually restore equilibrium and fully offset any monetary disturbances.

However, this classical view has been challenged by alternative theoretical perspectives that propose various channels through which inflation can potentially impact economic growth. One such framework is the Mundell-Tobin effect, which suggests that moderate levels of inflation can encourage a shift in portfolio allocation, stimulating investment and capital formation (Mundell, 1963; Tobin, 1965). This mechanism is based on the premise that higher inflation can lead to a decline in the real interest rate, which may incentivise individuals to shift their savings from money holdings to more productive assets such as physical capital, thereby promoting economic growth.

Conversely, the Stockman effect posits that inflation can negatively impact economic growth by distorting the optimal allocation of resources and reducing investment (Stockman, 1981). This channel suggests that inflation can create uncertainty, increase transaction costs, and erode the real value of financial assets, thereby discouraging investment and hampering long-term economic development.

Endogenous growth theory, developed by scholars such as Romer (1986) and Lucas (1988), provides another lens through which the inflation-growth relationship can be examined. This framework emphasises the role of technological progress, human capital, and other endogenous factors in driving long-term economic growth. Within this context, inflation can potentially affect growth by influencing the incentives for investment in research and development, the accumulation of human capital, and the efficiency of resource allocation. Empirical studies usually try to take into account all these channels through which inflation might affect growth; however, works testing endogenous growth theory are faced with its complexity. The complexity of the inflation-growth relationship has thus led to various methodological approaches, from panel data analysis to dynamic threshold models, which allow researchers to account for the non-linearities in inflation-to-growth relationships.

Real business cycle (RBC) theory, pioneered by Kydland and Prescott (1982) and Long and Plosser (1983), highlights the importance of intertemporal substitution in shaping the response of economic agents to changes in relative prices, including the general price level (Stadler, 1994). This framework suggests that inflation can impact economic growth by altering the relative attractiveness of leisure versus work as well as incentives for capital investment and consumption decisions. Although being an informative representation

of the inflation-growth nexus, the RBC theory is often hard to apply in practise due to the issue of observing time-dependent decisions. Since the RBC theory is focused on time series data, most studies using these models tend to be complicated econometric techniques such as dynamic general equilibrium modelling that allows researchers to simulate how inflation can dampen growth over time. On the other hand, due to the complex structure of these models, they simply produce ambivalent results, fueling the bitter controversy about whether inflation even has any real effects.

More recently, New Keynesian models have explored the potential linkages between inflation and growth, emphasising the role of nominal rigidities, imperfect competition, and information asymmetries (Mankiw, 1985; Romer, 1986; Clarida et al., 1999). These frameworks suggest that changes in the inflation rate can have real effects on the economy, particularly in the short run, by influencing the allocation of resources, pricing decisions, and the level of economic activity. Empirical analyses based on New Keynesian theory are often econometric, which consider short-run deviations from equilibrium, by use of impulse response functions and error correction models. In general, these studies emphasise the short-run trade-offs between inflation and growth (e.g., Mankiw, 1985), which underscore the significance of credible monetary policy to prevent high levels of inflation from distorting economic performance.

The diverse theoretical perspectives outlined above have laid the foundation for extensive empirical research on the inflation-growth nexus, as summarised in Table 1.

Table 1

Summary of theoretical perspectives on the inflation-growth relationship

Theoretical Perspective	Key Propositions	Implications for Inflation-Growth Relationship
Quantity Theory of Money (QTM)	Changes in the money supply lead to proportional changes in the price level. Inflation is a purely monetary phenomenon.	Inflation has no long-run impact on real output or employment; long-run neutrality of money.
Classical and Monetary Neutrality	Changes in money supply or price level have no real effects on the economy in the long run. Inflation is neutral and does not affect real variables.	Inflation has a negligible impact on economic growth.
Mundell-Tobin Effect	Moderate inflation can lead to a decline in the real interest rate. This incentivises a shift from money holdings to productive assets, stimulating investment and capital formation.	Moderate inflation can have a positive impact on economic growth.
Stockman Effect	Inflation creates uncertainty, increases transaction costs, and erodes the real value of financial assets. This discourages investment and hampers long-term economic development.	Inflation has a negative impact on economic growth.
Endogenous Growth Theory	Technological progress, human capital, and other endogenous factors drive long-term growth. Inflation can affect growth by influencing incentives for investment in R&D and human capital accumulation.	The impact of inflation on growth can be positive or negative, depending on the specific channels.
Intertemporal Substitution and RBC Theory	Inflation can impact the relative attractiveness of leisure versus work, as well as the incentives for capital investment and consumption decisions.	The effect of inflation on growth can be mediated by the intertemporal substitution decisions of economic agents.
New Keynesian Perspectives	Nominal rigidities, imperfect competition, and information asymmetries can lead to real effects of inflation, particularly in the short run.	Changes in the inflation rate can affect resource allocation, pricing decisions, and the level of economic activity.

Source: Authors' compilation based on Fisher (1911), Mundell (1963), Tobin (1965), Stockman (1981), Romer (1986), Lucas (1988), Kydland and Prescott (1982), Mankiw (1985), Clarida et al. (1999), and Snowdon and Vane (2005)

By synthesising the key propositions and implications of these theoretical frameworks, the authors aim to provide a solid foundation for the subsequent discussion and analysis of the empirical literature on the inflation-growth relationship.

3. Methodology

This study employs a systematic review methodology to synthesise the empirical literature on the inflation-growth nexus. We followed established guidelines for conducting and reporting systematic reviews, drawing upon best practices from the PRISMA framework where applicable, to enhance the transparency and reproducibility of our research.

3.1 Search strategy and selection criteria

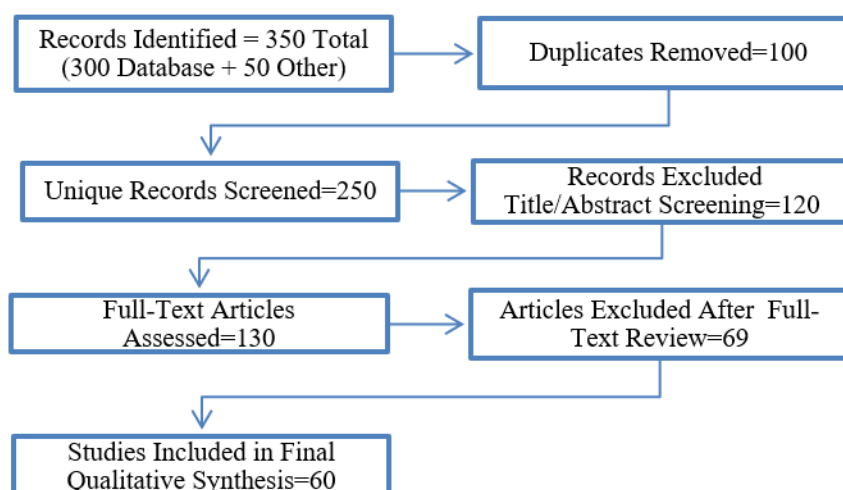
The search process involved querying multiple electronic databases, including EconLit, Web of Science, and Google Scholar, using keywords such as “inflation,” “economic growth,” “GDP,” and related terms. The initial search yielded a large number of potentially relevant studies, which were further screened based on a set of predefined eligibility criteria. To be included in the review, studies had to meet the following requirements: (1) published in peer-reviewed journals or as reputable working papers, research reports, and policy publications, (2) directly examined the relationship between inflation and economic growth, and (3) employ quantitative methodologies to examine the nature and direction of the relationship. Studies that were purely theoretical, qualitative, or did not directly address the inflation-growth nexus were excluded from the analysis.

3.2 Screening process

After the first search, titles and abstracts of studies retrieved were reviewed for selection. The full text was searched, and the studies were selected after validation in terms of fulfilling the inclusion/exclusion criteria. Sixty (60) studies were deemed eligible and included in the final review. An indication of this process is shown in Figure 1, which describes how studies are considered from identification to eventual inclusion.

Figure 1

PRISMA flow chart for study selection process



Source: Authors'

3.3 Data extraction and analysis

The selected studies were carefully reviewed, and relevant data were extracted and compiled into a comprehensive database. This included information on the country or region examined, the period covered, the methodological approach utilised, and key findings regarding the direction and magnitude of the inflation-growth relationship. To facilitate the synthesis and analysis of the literature, we organised the extracted data into a series of summary tables, as discussed in Section 4. This structured presentation allowed for the identification of patterns, commonalities, and divergences across various studies, laying the groundwork for in-depth discussion and analysis in the subsequent sections.

3.4 Bias minimisation

To reduce the risk of bias in the systematic review process, we used several approaches:

- The breadth of databases: We searched across a large number of different databases to ensure that we undertook an exhaustive scoping exercise.

- We also sought to reduce publication bias by including unpublished material research in addition to peer-reviewed journal articles, such as working papers and conference proceedings.
- Rigorous Scrutiny: A fine-toothed-comb scrutiny was done by 2 independent reviewers to reduce the selection bias, and discrepancies were resolved through discussion.
- Robust inclusion criteria: Inclusion/exclusion criteria were clearly described before the search stage that would ensure only pertinent and high-quality studies are included in the review.

3.5 Classification and summary of studies

We then classified the selected studies by geographic region, time, and methodological approach. This was classified to look for some patterns and trends in the literature that are observed based on differences in findings, regional disparities and methodological heterogeneity. The reason to categorise papers in this way is that it helps to understand how these types of context-specific factors (e.g., country characteristics, inflation thresholds) can precondition the relationship between inflation and growth.

In addition to comprehensive data collection and synthesis, the authors compared the methodological approaches, data coverage, and empirical findings of the included studies. Factors such as the study design, data sources, and analytical techniques were evaluated to ensure the validity and reliability of the reported findings.

However, it is important to note that the existing literature on the inflation-growth nexus is subject to certain limitations. These include the heterogeneity of methodological approaches, the potential for publication bias, and inherent challenges in establishing causal relationships between the two macroeconomic variables.

4. Findings

This section presents the empirical findings from the literature review on the inflation-growth nexus. The study's results are grouped into two parts: empirical findings on the inflation-growth nexus and empirical findings on the causal relationship between inflation and economic growth.

4.1 Empirical findings on the inflation-growth nexus

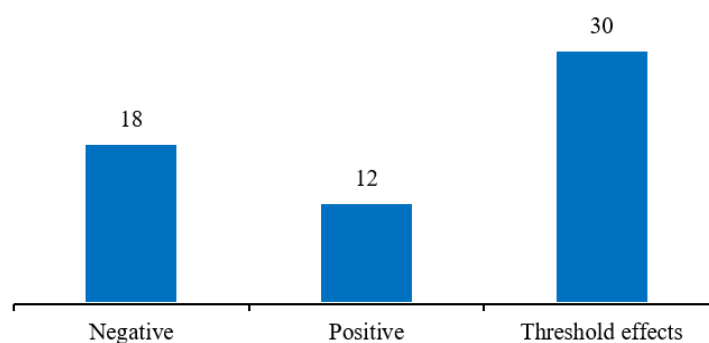
A comprehensive review of the existing literature on the relationship between inflation and economic growth reveals a complex and multifaceted landscape, with a diverse array of findings across different regions and contexts.

4.1.1 General trends of the inflation-growth relationship

As outlined in Section 3, data from 60 peer-reviewed studies were compiled into summary tables to simplify the analysis and synthesis of the available empirical evidence. The following is an overview of the general trend in the inflation-growth relationship reported in these studies, as presented in Figure 2.

Figure 2

The general trend in the inflation-growth relationship reported in selected studies



Source: Authors' compilation from the reviewed literature

- **Negative relationship**

As illustrated in Figure 2, a significant proportion of the reviewed studies (n=18) find a negative and statistically significant relationship between inflation and economic growth. This suggests that higher inflation rates tend to be detrimental to long-term economic development, potentially through channels such as resource allocation distortions, reduced investment, and eroded productivity gains, as outlined in the Stockman effect (Stockman, 1981).

- **Positive relationship**

By contrast, a comparable number of studies (n=12) identified a positive and significant impact of inflation on growth. This finding is consistent with the Mundell-Tobin effect (Mundell, 1963; Tobin, 1965),

which posits that moderate inflation levels can encourage a shift in portfolio allocation, stimulating investment and capital formation.

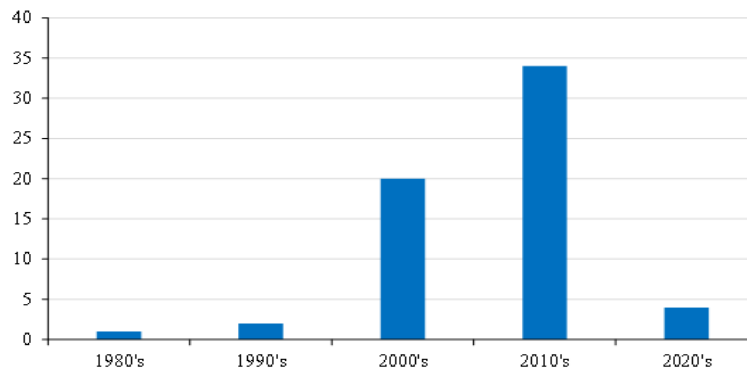
- **Threshold effects**

A majority group of studies (n=30) reported non-linear, threshold-based relationships, in which the impact of inflation on growth changes at certain critical levels. These results suggest that the inflation-growth nexus may be more complex than a simple linear relationship, with the directionality and magnitude of the effects potentially dependent on the specific economic context.

Figure 3 illustrates the distribution of publication years for the studies included in this review.

Figure 3

Histogram of publication years



Source: Authors' compilation from the reviewed literature

Figure 3 shows that publications on the inflation-growth nexus included in the analysis grew substantially in number over time, especially in the 2010s. This probably reflects increased interest in the topic because of several things, such as:

- **The Global Financial Crisis:** Following the global financial crisis and the long period of stagnation that came after, macroeconomic policies were once again put under a microscope.
- **Low inflation:** The prolonged periods of low inflation experienced by many advanced economies in the years following the crisis made the spectre of deflation and its potential growth impacts a reality.

- Macroeconomic instability in emerging market economies: Several macroeconomic instabilities in Emerging Markets, like currency movements and inflationary pressures, are additional factors, therefore fuelling inflation-growth interaction research.

This continued increase in publications serves to reiterate the ongoing significance and related relevance of studying the dynamic backdrop within which inflation or deflation affects economic growth.

4.1.2. Regional variations in the inflation-growth nexus

When examining the literature through a geographical lens, some notable regional differences emerge, which underscore the importance of considering the broader economic and institutional environment in understanding the inflation-growth relationship. This section presents a detailed review of the empirical literature on the relationship between inflation and economic growth organised by geographical region. The key findings for each region are summarised in a tabular format, followed by an analysis of the patterns, commonalities, and divergences observed in the literature.

- **Europe**

Table 2 summarises the key findings of 11 selected studies on the inflation-growth relationship in European countries.

Table 2

Summary of studies on the impact of inflation on economic growth in Europe

Author(s)	Country(ies)	Period of Analysis	Methodology	Key Findings
Karaca (2003)	Turkey	1987–2002	Regression analysis	Negative relationship
Lupu (2009)	Romania	1990-2000 2001-2009	Correlation	Positive relationship
Aydm et al. (2016)	Turkey	2002:Q1 to 2015:Q1	Dynamic panel threshold model	Nonlinear, threshold at 8.0 %
Kryeziu and Durguti (2019)	17 Eurozone countries	1997-2017	OLS regression	Positive relationship
Misiri and Fetai (2022)	Western Balkans	2000-2020	OLS, fixed effects, random effects, Hausman-Taylor IV*	Nonlinear with threshold at 3.9 %

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Author(s)	Country(ies)	Period of Analysis	Methodology	Key Findings
Khan and Senhadji (2001)	140 countries, including several European countries	1960-1998	Threshold regression analysis	Nonlinear with a threshold at 2-3 % for European countries
Özdemir (2010)	UK	1957Q2 to 2006Q4	The vector auto-regressive fractionally integrated moving average (VARFIMA)	Negative relationship
Tsionas and Christopoulos, (2003)	Euro		Threshold and smooth transition regression models	Nonlinear, threshold at 4.3 %
Kryeziu (2016)	Kosovo	2005-2014	Linear Regression Model	Positive relationship
Andoni and Osmani (2017)	Albania	1993-2015	ARDL	Negative relationship
Obradović, Šapić, Furtula and Lojanica (2017)	Serbia	Q1 2007 to Q3 2014	ARDL model	Positive relationship

Notes: OLS = Ordinary Least Squares, Hausman-Taylor IV = Hausman-Taylor Instrumental Variable approach

Source: Synthesis based on the studies listed in Table 2

Studies of European countries reveal no clear consensus on the inflation-growth relationship; however, nonlinear threshold effects appear more frequently than either purely positive or purely negative relationships.

- **Positive Relationship:** Lupu (2009), Kryeziu (2016), Obradović, Šapić, Furtula and Lojanica (2017) and a cross-sectional study by Kryeziu and Durguti (2019) find a positive impact of inflation on growth, particularly in countries with higher trade exposure and transitional economic structures, such as Romania and the transitional economies of Eastern Europe.
- **Negative Relationship:** Karaca (2003), Özdemir (2010) and Andoni and Osmani (2017) identify a negative relationship, especially in larger, more developed economies, such as Turkey and the UK.
- **Nonlinear Relationship:** Notably, four of the eleven studies reviewed, such as Khan and Senhadji (2001), Tsionas and

Christopoulos (2003), Aydın et al. (2016) and Misiri and Fetai (2022) identify nonlinear threshold effects, suggesting that the impact of inflation on growth changes beyond certain levels (4.3 percent for the Euro, 8.0 percent for Turkey and 3.9 percent for the Western Balkans).

Overall, the European evidence suggests that the inflation-growth relationship is highly context-specific, although threshold effects emerge as the most consistent finding across studies. The positive relationship observed in some studies may be attributable to the stimulative effects of moderate inflation on investment and consumption in developing economies. By contrast, the negative relationship found in other studies may be due to the distortionary effects of high inflation on resource allocation and price stability in developed economies.

- **Asia**

Table 3 summarises the key findings from 20 studies on the inflation-growth relationship in Asian countries.

Table 3

Summary of studies on the impact of inflation on economic growth in Asia

Author(s)	Country(ies)	Period of Analysis	Methodology	Key Findings
Ahmed and Mortaza (2005)	Bangladesh	1980-2005	Co-integration, error correction	Negative relationship, Nonlinear with a threshold at 6.0 %
Alkhatani and Elhendy (2014)	Saudi Arabia	1970-2012	Threshold model	Nonlinear, threshold at 4.0 %
Behera and Mishra (2016)	China, South Africa	1970-2013	ARDL Bound Testing	Positive relationship
Bhusal and Silpakar (2011)	Nepal	1975-2010	OLS	Nonlinear, threshold at 6.0 %
Fountas et al. (2002)	Japan	1970-1999	Bivariate GARCH	Negative relationship
He and Zou (2016)	China	1952-2013	OLS, IV regression	Positive relationship
Hossain (2015)	Bangladesh, Iran, Indonesia, Malaysia, Pakistan	1980-2013	Co-integration, error correction, Granger causality	Negative relationship
Hussain and Malik (2011)	Pakistan	1961-2010	Two-stage least squares	Positive relationship

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Author(s)	Country(ies)	Period of Analysis	Methodology	Key Findings
Khan and Khan (2018)	Bangladesh, Iran, Indonesia, Malaysia, Pakistan	1980-2016	Least Squares, traditional panel estimation	Negative relationship
Lee and Wong (2005)	Taiwan, Japan	1961-2001	Threshold autoregressive (TAR) approach	Nonlinear, threshold at 7.2 % (Taiwan), 9.7 % (Japan)
Madurapperuma (2016)	Sri Lanka	1978-2013	Engle-Granger co-integration, ECM	Negative relationship
Mallik and Chowdhury (2001)	South Asia (Bangladesh, India, Pakistan, Sri Lanka)	1965-1996	Error-correction, co-integration	Positive relationship
Mohseni and Jouzaryan (2016)	Iran	1988-2013	ARDL	Negative relationship
Mubarik (2005)	Pakistan	1973-2000	Threshold autoregressive (TAR) approach	Nonlinear, threshold at 9.0 %
Munir, Mansur and Furuoka (2009)	Malaysia	1970-2005	Endogenous threshold autoregressive models	Nonlinear, threshold at 3.9 %
Sweidan (2004)	Jordan	1970-2000	ARCH model, growth model	Nonlinear, threshold at 2.0 %
Thanh (2015)	ASEAN-5 (Indonesia, Malaysia, Philippines, Singapore, Thailand)	1980-2011	Panel Smooth Transition Regression (PSTR)	Nonlinear, threshold at 7.8 %
Tien (2021)	Vietnam	1986-2019	Threshold regression	Nonlinear, threshold at 6.0 %
Tung and Thanh (2015)	Vietnam	1990-2013	Threshold autoregressive (TAR) approach	Nonlinear, threshold at 7.0 %
Van Dinh (2020)	Vietnam	1986-2018	OLS regression	Positive relationship

Notes: ARDL = autoregressive distributed lag, ARCH = autoregressive conditional heteroskedasticity ECM = error correction model, IV = instrumental variable, OLS = ordinary least squares, PSTR = panel smooth transition regression, TAR = threshold autoregression.

Source: Synthesis based on the studies listed in Table 3

Studies on Asian countries present a mixed picture; however, nonlinear threshold effects emerge as the dominant finding, accounting for nearly half of the studies reviewed.

- **Positive Relationship:** Mallik and Chowdhury (2001), Hussain and Malik (2011), Behera and Mishra (2016), He and Zou (2016), and Van Dinh (2020) find a positive impact of inflation on growth, particularly in rapidly growing economies such as Pakistan, China, and Vietnam.
- **A negative Relationship:** Fountas et al. (2002), Hossain (2015), Khan and Khan (2018), Madurapperuma (2016), and Mohseni and Jouzaryan (2016) identify negative effects of inflation on growth across a diverse group of Asian economies, including Japan, Bangladesh, India, and Sri Lanka.
- **Nonlinear Relationship:** Ten of the twenty studies reviewed identify nonlinear threshold effects. Ahmed and Mortaza (2005), Thanh (2015), Lee and Wong (2005), Mubarik (2005), Munir, Mansur and Furuoka (2009), Bhusal and Silpakar (2011), Tien (2021), Tung and Thanh (2015), Alkhatani and Elhendy (2014), and Sweidan (2004) find nonlinear relationships with varying threshold levels, suggesting that the optimal inflation rate for growth may vary depending on the country's specific context.

Overall, the Asian evidence suggests that inflation-growth dynamics are predominantly nonlinear, with most studies indicating the existence of inflation thresholds beyond which the effects on growth become less favourable. The positive relationship found in some studies may be attributed to the role of moderate inflation in stimulating investment and consumption in developing economies. The negative relationships found in other studies may be due to the adverse effects of high inflation on price stability and resource allocation in developed economies. The nonlinear findings, with threshold levels ranging from 2 percent to 9.7 percent, suggest that the optimal inflation rate for growth may vary depending on a country's level of economic development, institutional frameworks, and macroeconomic policies. Nevertheless, most estimated thresholds are concentrated within the 4 to 8 percent range, suggesting a degree of convergence despite differences across countries. For example, studies on Vietnam and China, which have experienced rapid economic growth and increasing trade integration, find higher inflation thresholds than more developed economies such as Japan and Taiwan.

• **Africa**

Table 4 summarises the key findings from studies on the inflation-growth relationship in African countries.

Table 4

Summary of studies on the impact of inflation on economic growth in Africa

Author(s)	Country(ies)	Period of analysis	Methodology	Key findings
Umaru and Zubairu (2012)	Nigeria	1970-2010	Augmented Dickey-Fuller, Granger causality	Positive relationship
Chude and Chude (2015)	Nigeria	1986-2012	OLS	Positive relationship
Hodge (2006)	South Africa	1965-2002	OLS	Negative relationship
Inyama (2013)	Nigeria	1970-2012	Granger causality, co-integration	Negative relationship
Mkhatshwa et al. (2015)	Swaziland	1980-2013	ARDL	Negative relationship
Opeyemi (2020)	5 African countries (excluding Egypt)	1980-2017	Regression analysis	Negative relationship
Shitundu and Luvanda (2000)	Tanzania	1967-1996	Least Trimmed Squares (LTS)	Negative relationship
Iyke and Odhiambo (2017)	Ghana, Nigeria	1980-2013	Threshold autoregressive (TAR) approach	Nonlinear, threshold at 10.7-29.8 % (Ghana), 10.1-19.3 % (Nigeria)
Rao and Abate (2015)	Ethiopia	1970-2013	Threshold autoregressive (TAR) approach	Nonlinear, threshold at 9-10 %
Yabu and Kessy (2015)	Kenya, Tanzania, Uganda	1970-2013	Non-linear quadratic model	Nonlinear, threshold at 6.8 % (Kenya), 8.4 % (Uganda), 8.8 % (Tanzania)
Rutayisire (2015)	Rwanda	1970-2010	Threshold autoregressive (TAR) approach	Nonlinear, threshold at 5.4 %
Fabayo and Ajilore (2006), Salami and Kelikume (2010), Bawa and Abdullahi (2012)	Nigeria	-	Non-linear least squares, TAR approach	Nonlinear, thresholds at 6 %, 8 %, and 13 %
Frimpong and Oteng-Abayie (2010)	Ghana	-	Threshold autoregressive (TAR) approach	Nonlinear, thresholds at 11 % and 6-10 %
Phiri (2010)	South Africa	1980-2008	Threshold autoregressive (TAR) approach	Nonlinear, threshold at 8.0 %

Source: Synthesis based on the studies listed in Table 4

Studies of African countries reveal substantial heterogeneity in the inflation-growth relationship; however, nonlinear threshold effects constitute the dominant finding across the reviewed evidence.

- **Positive Relationship:** Umaru and Zubairu (2012) and Chude and Chude (2015) find a positive impact of inflation on growth in Nigeria.
- **Negative Relationship:** Hodge (2006), Inyama (2013), and Mkhathshwa et al. (2015), Opeyemi (2020), and Shitundu and Luvanda (2000) identify the negative effects of inflation on growth in South Africa, Swaziland, Tanzania, and other African countries.
- **Nonlinear Relationship:** More than half of the reviewed studies identify nonlinear threshold effects. Iyke and Odhiambo (2017), Rao and Abate (2015), Yabu and Kessy (2015), Rutayisire (2015), Fabayo and Ajilore (2006), Salami and Kelikume (2010), Bawa and Abdullahi (2012), Frimpong and Oteng-Abayie (2010), and Phiri (2010) found nonlinear relationships with varying threshold levels, suggesting that the optimal inflation rate for growth may vary significantly across African countries, with several studies reporting threshold levels above 10 percent.

Overall, the African evidence suggests that the inflation-growth relationship is predominantly nonlinear, with most studies identifying country-specific inflation thresholds beyond which growth effects become less favourable. The positive relationship found in some studies may be due to the role of moderate inflation in stimulating investment and consumption in developing economies. The negative relationships found in other studies may be due to the adverse effects of high inflation on price stability and resource allocation. Nonlinear findings, with threshold levels ranging from 5.4 percent to 18.5 percent, suggest that the optimal inflation rate for growth may vary significantly across African countries. Nevertheless, a large proportion of the estimated thresholds are concentrated within the 6 to 11 percent range, indicating some degree of convergence despite country-specific differences. These variations can be attributed to differences in economic structure, trade openness, institutional frameworks, and macroeconomic policy environments.

• **Americas, Oceania and other regions**

Table 5 presents the key findings from studies on the inflation-growth relationship covering countries in the Americas and Oceania.

Table 5

Summary of Studies on the impact of inflation on economic growth in the Americas and Oceania

Author(s)	Country(ies)	Period of Analysis	Methodology	Key Findings
Grier and Grier (2006)	Mexico	1970-2001	GARCH	Negative relationship
Risso and Sanchez Carrera (2009)	Mexico	1970-2006	Cointegration, error correction	Nonlinear, threshold at 9 %
Gokal and Hanif (2004)	Fiji	1970-2000	Cointegration, error correction	Nonlinear, threshold at 3 %
Espinoza et al. (2012)	GCC (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE)	1970-2007	Panel data models	Nonlinear, threshold at 9 %
Kremer et al. (2013)	Latin America (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Venezuela)	1960-2004	Panel data models	Nonlinear, threshold at 19.1 %
Bittencourt (2012)	Latin America	1970-2007	Panel time-series data and analysis	Negative
Baharumshah, Slesman, Wohar (2016)	Latin America	1980-2011	Panel data models	Nonlinear, threshold at 19 %
De Gregorio (1993)	Latin America	1950-1985	Endogenous growth model	Negative
Black, Dowd, and Keith (2001)	USA	1964-1989	Correlation	Positive if the inflation rate is low
Tajra (1999)	Brazil	1965-1994	Regression model	Negative
Brook and Scrimgeour (2002)	New Zealand	-	Threshold regression	Nonlinear, threshold at 0-3 %
Jarrett and Selody (1982)	Canada	1963-1979	Regression	Negative

Source: Synthesis based on the studies listed in Table 5

Although the evidence from the Americas and Oceania is more limited than that of other regions, the reviewed studies predominantly support either a negative or a nonlinear relationship between inflation and economic growth.

- **Positive Relationship:** One study by Black, Dowd, and Keith (2001) found a positive relationship between inflation and growth in the USA.
- **Negative Relationship:** Jarrett and Selody (1982), Tajra (1999), Grier and Grier (2006), De Gregorio (1993) and Bittencourt (2012) find a negative relationship between inflation and growth in the Americas.
- **Nonlinear Relationship:** Half of the reviewed studies identify nonlinear threshold effects. Risso and Sanchez Carrera (2009), Baharumshah et al. (2016), Gokal and Hanif (2004), Espinoza et al. (2012), Brook and Scrimgeour (2002), and Kremer et al. (2013) found nonlinear relationships with varying threshold levels, suggesting that the impact of inflation on growth can change at certain inflation rates.

Overall, the available evidence suggests that inflation becomes increasingly detrimental to growth once it exceeds country-specific threshold levels, while sustained high inflation is generally associated with weaker economic performance. The available evidence is consistent with findings from other regions, indicating that high inflation rates tend to hinder economic growth, potentially through channels such as increased uncertainty, resource misallocation, and negative impacts on investment and productivity. The nonlinear findings further emphasise the importance of considering context-specific factors when analysing the inflation-growth relationship. Notably, estimated threshold levels vary considerably, ranging from around 0-3 percent in New Zealand to approximately 19 percent in Latin America, indicating substantial regional heterogeneity in inflation tolerance.

4.1.3 Strengths and weaknesses of different study designs

The literature reviewed in this section employs a variety of methodological approaches ranging from large panel studies to small panel/regionally focused analyses and single-country investigations. Each of these study designs offers unique strengths and weaknesses that should be considered when interpreting findings.

- Large panel studies, such as those by Khan and Senhadji (2001) and Ndoricimpa (2017), provide a broad perspective on the inflation-growth relationship, allowing for cross-country comparisons and the identification of general trends. However, these studies may overlook country-specific nuances and the

influence of contextual factors on the relationship between inflation and growth.

- In contrast, small panel studies and regionally focused analyses, exemplified by the works of Sepehri and Moshiri (2004) and Yabu and Kessy (2015), offer deeper insights into the inflation-growth nexus within a group of culturally or economically similar countries. These studies shed light on the role of institutional frameworks, policy environments, and other regional factors in shaping the relationship between the two variables.
- Single-country analyses, such as those by Aydın et al. (2016) and Misiri and Fetai (2022), provide the most granular understanding of the inflation-growth dynamics within a specific economic and institutional context. These studies can uncover the unique characteristics and drivers underlying the observed relationships; however, their findings may have limited generalizability to other settings.

An important pattern emerging from the reviewed studies is that nonlinear and threshold effects are identified more frequently in studies employing threshold regression, smooth transition, and autoregressive threshold models than in studies relying on conventional linear estimation techniques. This suggests that methodological choice may partly explain the variation in reported findings across the literature and reinforces the importance of accounting for possible nonlinearities when examining the inflation-growth relationship.

Collectively, the reviewed literature demonstrates the importance of considering the strengths and weaknesses of each study design when synthesising empirical evidence on the inflation-growth nexus. A combination of large-panel, small-panel/regional, and single-country studies can provide a more comprehensive and nuanced understanding of this complex relationship, allowing for the identification of both general patterns and context-specific factors that influence the impact of inflation on economic growth.

4.2 Empirical findings on causality between inflation and economic growth

The existing literature on the inflation-growth nexus has not only explored the directionality and magnitude of the relationship but

has also delved into the deeper question of causality: Does inflation lead to changes in economic growth, or is it the other way around?

4.2.1 Directions of causality

Determining the direction of causality between inflation and growth is crucial to understanding the underlying mechanisms and designing appropriate policy interventions. A total of 24 studies in the reviewed literature have employed advanced econometric techniques such as Granger causality tests and vector autoregressive (VAR) models to investigate the causal linkages between the two variables.

- **Bidirectional causality between inflation and economic growth**

A first set of studies (n=6) found evidence of bidirectional causality, indicating that inflation and growth may be simultaneously determined and mutually reinforced. Studies finding bidirectional causality include Huang et al. (2010) in a cross-country analysis, Behera and Mishra (2016) in BRIC countries, Koulakiotis et al (2012) in European countries, Özyilmaz (2022) in 27 EU countries, Singh and Singh (2015) in Japan and Rao and Abate (2015) in Ethiopia. This suggests a more complex, dynamic relationship between the two macroeconomic variables, where they can both act as drivers and consequences of each other depending on the specific economic context.

- **Growth-driven inflation**

A subset of studies (n=5) identified a causal relationship between economic growth and inflation. Studies supporting this causal direction include Gokal and Hanif (2004) in Fiji, Bakare, Kareem, and Oyelekan (2015) in Nigeria, and Kanca (2017) and Özpençe (2016) in Turkey and Tenny (2022) in Liberia. This implies that expansions in real output and income can generate inflationary pressures, potentially through demand-pull or cost-push mechanisms, as emphasised in some New Keynesian models (Mankiw, 1985; Romer, 1986).

- **Inflation-driven growth**

By contrast, another group of studies (n=8) found evidence of inflation-driven growth, suggesting that changes in the inflation rate precede and lead to subsequent changes in economic output. Studies supporting this causal direction include Al-Khulaifi (2018) in Qatar, Behera and Mishra (2016) in India, Datta and Kumar (2011) in Malaysia, Erbaykal and Okuyan (2008) in Turkey, Hossain et al. (2012)

in Bangladesh, Hussain and Zafar (2018) in Pakistan, Mubarik (2005) in Pakistan and Omoke (2010) in Nigeria. This finding supports theoretical frameworks that propose channels through which inflation can stimulate investment, capital formation, and productivity gains, as in the case of the Mundell-Tobin effect (Mundell, 1963; Tobin, 1965).

- **No causality between inflation and economic growth**

A last set of studies (n=5) found no evidence of causality, indicating that inflation and growth may be determined by other factors like external shocks, fiscal policies, or structural changes. Studies finding no causality include Anochiwa and Maduka (2015) in Nigeria, a cross-sectional study by Dada et al. (2017) in five ECOWAS countries, Faria and Carneiro (2001) in Brazil, Özçelik and Uslu (2017) in Turkey and Shuaib et al. (2015) in Nigeria.

Taken together, the causality evidence does not support a single dominant direction of influence between inflation and economic growth. However, inflation-driven growth and bidirectional causality are reported more frequently than growth-driven inflation or insignificant relationships, suggesting that inflation may play a more active role in shaping growth dynamics than is implied by purely growth-driven explanations.

Table 6 presents a summary of the key findings from a limited number of studies on the direction of causality between inflation and economic growth.

Table 6

Summary of studies on the direction of causality between inflation and economic growth

Author(s)	Region/Country	Methodology	Direction of Causality
Behera and Mishra (2016)	BRIC countries	ARDL technique	Bidirectional
Huang et al. (2010)	140 countries	Instrumental-variable threshold regression approach	
Koulakiotis et al. (2012)	14 European countries	VAR-Granger causality	
Özyilmaz (2022)	27 EU countries	Dumitrescu and Hurlin's (2012) causality approach	
Rao and Abate (2015)	Ethiopia	VAR and VECM models	
Singh and Singh (2015)	Japan	Granger-causality test	

Author(s)	Region/Country	Methodology	Direction of Causality
Bakare, Kareem, and Oyelekan (2015)	Nigeria	Granger-causality test	
Gokal and Hanif (2004)	Fiji	Granger-causality test	Growth → Inflation
Kanca (2017)	Turkey	Toda Yamamoto causality test	
Özpence (2016)	Turkey	Granger-causality test	
Tenny (2022)	Liberia	Granger-causality test	
Al-Khulaifi (2018)	Qatar	Granger-causality test	
Behera and Mishra (2016)	India	VAR analysis	
Datta and Kumar (2011)	Malaysia	Granger-causality test	
Erbaykal and Okuyan (2008)	Turkey	Toda Yamamoto causality test	Inflation → Growth
Hossain et al. (2012)	Bangladesh	VAR-Granger causality	
Hussain and Zafar (2018)	Pakistan	ARDL-bounding testing approach	
Mubarik (2005)	Pakistan	Granger-causality test	
Omoke (2010)	Nigeria	Granger-causality test	
Anochiwa and Maduka (2015)	Nigeria	Granger-causality test	
Dada et al. (2017)	Five ECOWAS countries	UVAR-based Toda and Yamamoto Modified Granger causality approach	Insignificant
Faria and Carneiro (2001)	Brazil	Bivariate model	
Özçelik and Uslu (2017)	Turkey	VAR model	
Shuaib et al. (2015)	Nigeria	Granger-causality test	

Notes: ARDL = Autoregressive Distributed Lag, VAR = Vector Autoregression, VECM = Vector Error Correction Model, UVAR = Unrestricted Vector Autoregression.

Source: Synthesis based on the studies listed in Table 6

4.2.2 Regional variations in the direction of causal relationship

As with the directionality of the inflation-growth relationship, the causal linkages also exhibit notable regional differences. Evidence from developed economies is mixed, with studies reporting both bidirectional causality and inflation-led growth, although no single causal pattern dominates. In contrast, the literature on developing and emerging economies, particularly in Asia and Africa, more often reports growth-driven inflation or bidirectional causality. This may reflect the unique macroeconomic conditions and institutional environment

prevalent in these regions, which can shape the complex dynamics between inflation and economic growth.

4.2.3 Factors influencing the directions of causal relationships

Although the reviewed studies do not always explicitly identify the determinants of causality, several factors can explain the observed variations in the direction of causality between inflation and economic growth, including levels of economic development, institutional frameworks, and macroeconomic policy environments.

One possible explanation is that unidirectional causality from inflation to growth may be more prevalent in countries with weaker institutions, less-developed financial markets, and a history of high inflation. In such a context, the adverse effects of inflation on investment, productivity, and resource allocation can be more pronounced, leading to a stronger causal impact on economic growth.

On the other hand, unidirectional causality from growth to inflation may be more common in economies with robust macroeconomic policies and institutions that can effectively manage inflationary pressures. In such cases, the demand-pull effects of economic expansion may play a more significant role in driving inflation.

Bidirectional causality, in which inflation and growth mutually influence each other, may be observed in economies with more complex, intertwined relationships between the two variables. This can occur in countries with moderate inflation and growth levels, where the interactions between inflation and growth dynamics are less straightforward and may be affected by a range of contextual factors.

Overall, a review of the literature on the direction of the causality between inflation and economic growth highlights the multifaceted and context-dependent nature of this relationship. Policymakers should carefully consider the specific economic and institutional characteristics of their countries when formulating policies to manage inflation and promote sustainable economic growth.

5. Discussion and synthesis

A comprehensive review of the existing empirical literature on the inflation-growth nexus has revealed a complex, multifaceted relationship, with a diverse array of findings across regions and contexts. By synthesising key insights from this body of research, we

aim to provide a holistic understanding of the dynamic interplay between these two crucial macroeconomic variables.

5.1 Reconciling the divergent findings

A striking feature of the literature is the diversity of findings. Studies report positive, negative, and nonlinear relationships between inflation and economic growth. These differences may reflect variations in economic development, institutional quality, policy frameworks, and broader macroeconomic conditions.

Nevertheless, one of the most consistent findings across regions is the prevalence of nonlinear threshold effects, suggesting that the inflation-growth relationship is rarely purely linear and that the growth consequences of inflation depend critically on its level.

5.1.1 The role of economic development

The level of economic development appears to be a crucial determinant of inflation-growth dynamics. Studies focusing on developed economies such as those in Europe and North America tend to align more closely with the classical view of a negative relationship between inflation and growth, particularly at high levels of inflation. This is consistent with theoretical predictions, such as the Stockman effect (Stockman, 1981), which posits that high and volatile inflation can distort resource allocation, reduce investment, and erode productivity gains.

In contrast, studies on developing and emerging economies, particularly in Asia and Africa, more frequently report nonlinear or threshold-based relationships. Some studies also find a positive association between inflation and growth. This may reflect the unique macroeconomic conditions and institutional environments prevalent in these regions, where the Mundell-Tobin effect (Mundell, 1963; Tobin, 1965) suggests that moderate inflation levels can potentially have beneficial effects on growth.

5.1.2 The influence of monetary policy regimes

The nature of the monetary policy framework and the central bank's credibility in maintaining price stability also appear to play a significant role in the inflation-growth relationship. Studies of countries with well-established inflation-targeting regimes often find a stronger negative relationship between inflation and growth. Such policy frameworks help anchor inflation expectations and reduce the distortions associated with high inflation.

5.2 Causal linkages and feedback effects

A review of the literature on the causality between inflation and economic growth reveals an even more complex picture, with studies identifying inflation-driven growth, growth-driven inflation, and bidirectional causal relationships. Importantly, the reviewed evidence suggests that no single causal pattern dominates across all countries and regions, reinforcing the context-dependent nature of the inflation-growth nexus. These findings underscore the dynamic and interdependent nature of the two macroeconomic variables, where they can act as drivers and consequences of each other, depending on the specific economic context.

Studies that find evidence of inflation-driven growth lend support to the theoretical frameworks that propose channels through which inflation can stimulate investment, capital formation, and productivity gains, as in the case of the Mundell-Tobin effect. Conversely, the literature reporting growth-driven inflation emphasises the role of demand-pull or cost-push mechanisms, as highlighted in some New Keynesian models (Mankiw, 1985; Romer, 1986).

Studies reporting bidirectional causality suggest a more complex relationship between inflation and growth. In these cases, the two variables may influence each other simultaneously and reinforce one another over time. This underscores the importance of considering the broader economic and institutional environment to understand the interlinkages between these macroeconomic phenomena.

5.3 Implications for policymakers

The insights derived from this comprehensive literature review have important implications for policymakers tasked with promoting sustainable economic growth and maintaining price stability.

In developed economies, where evidence predominantly points to a negative relationship between inflation and growth, particularly at high levels of inflation, the findings underscore the importance of proactive and credible monetary policy frameworks that prioritise price stability. In these contexts, central banks should strive to anchor inflation expectations and minimise the distortionary effects of high and volatile inflation, which can erode investment, productivity, and long-term economic development.

The literature suggests a more nuanced approach for policymakers in both developing and emerging economies. The presence of nonlinear and threshold effects suggests that a uniform

policy approach may not be appropriate. Instead, policymakers should adopt strategies that reflect country-specific economic conditions. Carefully managing inflation within the optimal range while fostering other drivers of economic growth may be a more effective strategy for these economies.

Across all contexts, the literature on the causal linkages between inflation and growth emphasises the importance of policy coordination and a holistic macroeconomic management approach. Policymakers should be cognizant of the dynamic, interdependent nature of these variables and tailor their interventions accordingly to address the unique challenges and opportunities present in their respective economies.

6. Conclusion

The relationship between inflation and economic growth remains one of the most ambiguous as well as debatable issues in macroeconomic policy. This study reviewed the empirical literature on the inflation-growth nexus. The findings reveal substantial variation across countries and regions (Bruno & Easterly, 1998). The results underline the need to be read in light of economic development, institutions and wider macroeconomic contexts when exploring this association. A particularly robust finding across the reviewed literature is the presence of nonlinear threshold effects, indicating that the consequences of inflation for growth depend not only on its existence but also on its magnitude.

Inflation, especially when it rises beyond certain limits, typically comes with a cost in the form of slower growth even for the advanced economies. This is consistent with the classical implications that high inflation leads to distortions in resource allocation and tends to erode productivity. Conversely, research from developing and emerging nations points to threshold-like relationships in the majority of studies conducted, with some support for positive effects. One implication from these results is that moderate inflation may help investment and capital formation where financial markets are underdeveloped.

The implications of these findings for policymakers are significant. Price stability is more critical to ensure long-term prosperity in developed economies. This emphasises why credible monetary policy frameworks and inflation-targeting mechanisms remain critical. Yet in emerging markets, a more flexible type of adaptation might be required. Often, policymakers in such cases face the difficult task of

managing inflation while still promoting growth via investments in physical and human capital. Maintaining inflation within country-specific threshold ranges may support investment and economic expansion. At the same time, it can help preserve macroeconomic stability.

The evidence suggests that the inflation-growth relationship is often nonlinear and threshold-dependent. As a result, rigid inflation targets may not always be appropriate. Policymakers may benefit from adopting flexible target ranges that can accommodate changing economic conditions.

This review also identifies some limitations of the literature that could be addressed by future research. The heterogeneity of methodologies limits direct comparability across studies, and indeed calls for more consensus-driven empirical work. We recommend harmonising methodologies in future research, for example through meta-analyses or consistent datasets that allow for cross-country comparisons. Future research should examine inflation thresholds across different regions. Greater attention should also be given to how institutional quality, economic structure, and policy environments influence the inflation-growth relationship.

Causality is a key issue for further future research. Despite the number of studies that have found evidence for both directions of causality, the channels through which inflation impacts growth (and vice versa) are not well understood. Future work must adopt higher-level econometric methods to further disentangle these causal pathways, providing more manageable advice for policymakers.

The relationship between inflation and growth is complex and multidimensional. It is shaped by geopolitical conditions, socioeconomic factors, and the level of economic development. Policy makers must take sophisticated and well-differentiated means to fit the specifics of their economic scenario, balancing cost stability with exciting growth strategies. Addressing the methodological and empirical gaps identified in this review will enable future research to generate deeper, more useful insights into the inflation-growth nexus that can contribute to a better understanding of macroeconomic policy design.

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