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Is the Romer Hypothesis valid for Newly Industrialized Countries? Evidence from panel ARDL

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Abstract

Purpose — This study investigates the effect of trade openness on inflation, referred to as the Romer hypothesis, for Newly Industrialized Countries (NICs) from 1990 to 2022.

Methods — It uses a panel ARDL method and the Dumitrescu-Hurlin (2012) causality test. Economic growth, credit, and the money supply are included as independent variables in the model.

Findings — The findings reveal no statistically significant long-term and short-term relationships between trade openness and inflation. However, the money supply has a statistically significant positive effect on inflation in the long run, while economic growth and credit have no statistically significant effect. In the short run, money supply and economic growth reduced inflation. According to the Dumitrescu-Hurlin (2012) panel causality test, bidirectional relationships exist between inflation and economic growth, as well as between inflation and the money supply and credit. In contrast, a unidirectional relationship is observed between inflation and trade openness.

Implications — Reducing the external dependency of sectors that rely on imported inputs is necessary to mitigate the adverse effects of trade openness on inflation in Newly Industrialized Countries (NICs). It is crucial to ensure that monetary policy aligns the money supply and credit expansions with real-sector trends.

Originality — This research is pioneering in its focus on testing the Romer hypothesis for Newly Industrialized Countries (NICs).

Keywords — Romer Hypothesis, Trade openness, Panel ARDL, New industrialization countries.

Introduction

One of the critical issues facing economies today is inflation (Girdzijauskas et al., 2022; Doğan, 2023). Excessive inflation, which is desired to be kept within a certain range for economic stability and social welfare, may lead to economic imbalances and social hardships. Persistently high inflation is a crucial factor hindering economic growth and reducing the wealth of low-income groups. Maintaining control over inflation to ensure the sustainability of price stability is a significant macroeconomic goal for countries. The rise of global inflation to historical levels due to

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COVID-19 underscores the significance of combating inflation. Furthermore, these developments have ensured that inflation remains a significant research topic. A review of the literature indicates many studies on the interaction of inflation with various factors, such as economic growth, income distribution, unemployment, current account deficit, and balance of payments (Khan & Hanif, 2020; Uddin & Rahman, 2023; Sintos, 2023; Valogo et al., 2023; Pham & Sala, 2022).

Trade openness is a crucial factor in analyzing inflation. Trade openness indicates the extent to which a country is integrated into foreign trade and often contributes to the improvement of a country's economic performance. Specifically, trade openness increases capital flows, enhances capital formation, and fosters technology transfer and the accumulation of technical knowledge, thereby increasing production levels. Thus, increases in real production lead to higher trade openness, and high trade openness can become a factor that lowers the general price level (Rogoff, 2003). Trade openness primarily alleviates price pressures and reduces inflation by promoting production through increased efficiency, higher foreign investment, better resource allocation, and greater capacity utilization (Binici et al., 2012). However, the effect of increased trade openness on inflation is not always positive. In an economy with high trade openness, imports can have adverse effects on the national economy. Specifically, increases in the prices of imported goods may exert pressure on domestic prices and trigger inflation. Moreover, when a country's trade openness is associated with exchange rate fluctuations, particularly fluctuations in the value of its national currency, it can affect inflation through import prices. Therefore, considering a country's trade openness when analyzing inflation behavior is crucial for understanding inflationary pressures and developing appropriate policy responses.

The nexus between trade openness and inflation is intricate and influenced by many factors, including a country's trade policies, currency value, and trade balance. Consequently, researchers have examined this relationship by considering a variety of variables. The concept of a connection between trade openness and inflation was initially introduced by David Romer in 1993, known as the Romer Hypothesis. According to Romer (1993), there is an inverted linkage between inflation and trade openness. Various studies have supported this negative correlation (Rajagopal, 2007; Terra, 1998). Conversely, other research, including Evans' (2007) study, has identified a positive relationship between inflation and trade openness. These conflicting findings have sparked empirical and theoretical debates, suggesting that the relationship may vary across countries. As a result, this study examines the relationship between trade openness and inflation in newly industrializing countries. These countries are characterized by rapid economic growth, industrialization, and a dynamic trade structure. The significant contributions of this study to the literature are: (i) To our knowledge, this is one of the rare studies empirically examining the Romer Hypothesis in the context of newly industrializing countries and (ii) employing the Panel ARDL method to examine this hypothesis in these nations in the literature, (iii) Another difference from other studies in the literature is that the data set belongs to the period between 1990-2022, which is very important in terms of covering the Covid-19 pandemic period, which had significant effects around the world. (iv) In this sense, it offers a renewed perspective on how inflation is affected by global economic integration. Additionally, this study incorporates country-specific internal variables (such as the degree of financial liberalization and credit) and trade openness.

The present study is organized into five parts. The first part presents the introduction; the second part reviews the literature; the third part provides the theoretical background; the fourth part addresses the dataset and methodology; the fifth part presents the empirical findings and discussion; and the final part concludes with a summary and recommendations.

The Romer hypothesis, posited by economist Paul Romer in 1993, asserts that increased trade openness tends to reduce inflation rates. The general validity and effects of the Romer hypothesis have been debated in the economic literature, yielding different results across countries. Based on their findings, studies on the relationship between trade openness and inflation can be categorized into three groups. Studies in the first group, including Romer (1993), have demonstrated an inverse relationship between trade openness and inflation. Some of these studies include works by Salimifar et al. (2015), Lin et al. (2017), Şimşek & Hepaktan (2019), Atgür (2021), and Yılmaz (2024). For instance, Salimifar et al. (2015) used the ARDL method to explore the trade

openness-inflation relationship in Iran from 1973 to 2010. Both short- and long-term results indicated that trade openness negatively affected inflation, corroborating the Romer hypothesis for Iran. Lin et al. (2017) examined the validity of Romer's hypothesis in Sub-Saharan African countries using Panel 2SLS and OLS methods. The study found a negative relationship between inflation and trade openness, confirming the validity of Romer's hypothesis in these countries. Şimşek & Hepaktan (2019) investigated the validity of Romer's hypothesis for the Turkish economy from 2005 to 2018 using Granger causality and VAR models. Their findings revealed a negative relationship between trade openness and inflation, supporting the hypothesis. Similarly, the relationship between trade openness and inflation in Türkiye was analyzed from 1980 to 2018 using Johansen Cointegration and FMOLS methods. The results showed a long-term relationship among trade openness, inflation, and other variables, with trade openness negatively affecting inflation. Lastly, Yılmaz (2024) demonstrated that, between 1970 and 2021, economic and social globalization had a significant negative impact on inflation in Turkey, whereas political globalization did not have a meaningful effect.

The second group of studies does not support the Romer hypothesis; instead, they identify a positive relationship between trade openness and inflation. Research by Munir & Kiani (2011), Samimi et al. (2012); Sepehrivand & Azizi (2016), Çoban (2020); Nasrat (2020); Bošnjak et al. (2022); Hamidi et al. (2022), Munir et al. (2023), Kaukab & Anggara (2024), indicates this inflationary effect. For example, Munir & Kiani (2011) studied the Pakistani economy and found a positive relationship between trade openness and inflation. Samimi et al. (2012) analyzed developing countries and revealed a positive relationship, indicating that the Romer hypothesis does not hold in these contexts. Sepehrivand & Azizi (2016) examined the impact of trade openness on inflation using the Romer theory, finding that trade openness positively affects inflation. Nasrat (2020) analyzed the relationship between trade openness and inflation in South Asian countries from 1980 to 2016 and found a positive correlation between the two variables. Similarly, Çoban (2020) investigated this relationship for the Next-11 countries using the panel ARDL method. It concluded that there is a significant positive relationship between trade openness and inflation in the short and long term. Bošnjak et al. (2022) explored the relationship between trade openness and inflation in selected European countries from 2000 to 2019 using the Panel GMM methodology. Their findings also showed a positive relationship between trade openness and inflation, contradicting the Romer hypothesis. Hamidi et al. (2022) tested the Romer hypothesis for ASEAN countries using the System GMM and Threshold Panel methods. Their study revealed that trade openness had a positive and significant impact on inflation from 2010 to 2021, further challenging the validity of the Romer hypothesis in these regions. Munir et al. (2023) examined the effects of trade openness on inflation in Pakistan from 1990 to 2021 using cointegration analysis and found a positive long-term relationship between the two variables. Similarly, Kaukab & Anggara (2024) investigated the relationship between commercial investments and inflation in Indonesia from 1985 to 2022 using the ARDL approach and identified a positive long-term correlation.

The studies in the third group contend that trade openness does not significantly impact inflation. For example, Aliyev & Gasimov (2014) explored this relationship in the South Caucasus region, specifically Georgia, Armenia, and Azerbaijan, from 1996 to 2012. Their findings indicated that, except for Georgia, trade openness did not significantly affect inflation levels in these countries. Similarly, Ceyhan et al. (2023) investigated the relationship between trade openness and inflation in MIKTA countries using data from 1960 to 2020. Employing the causality test proposed by Kónya (2006), their panel causality analysis revealed no significant relationship between trade openness and inflation, invalidating the Romer hypothesis for these countries. Nguyen et al. (2023) analyzed the relationship between trade openness and macroeconomic stability in 20 Asian countries from 2011 to 2019 using the ARDL model. They found a positive short-term relationship with macroeconomic stability but no significant relationship with inflation stability.

Methods

This study aims to test the validity of the Romer hypothesis by examining the impact of trade openness on inflation in newly industrialized countries (Brazil, China, India, Indonesia, Malaysia,

Mexico, the Philippines, South Africa, South Korea, Thailand, and Türkiye). Like newly industrialized nations, developing countries typically exhibit high and volatile inflation rates. Additionally, these countries possess dynamic structures regarding their foreign trade potential. For these reasons, newly industrialized countries were selected as the sample for this study. The data set used in the study is shown in Table 1. The period from 1990 to 2022 was selected to represent the widest range of years for which data were available. These variables were sourced from the World Development Indicators (WDI) database.

Table 1. Variables and explanations

Variables	Description	Source
INF	Inflation is measured by the consumer price index	WDI
GDP	Gross domestic product constant 2015 US dollars	WDI
OPEN	The ratio of the sum of exports and imports to gross domestic product	WDI
MONEY	Annual growth rate of broad money supply	WDI
CREDIT	Domestic credit provided by banks to the private sector	WDI

The relationship between inflation and trade openness was examined using the model specified in Equation 3. The model for this study was based on the studies of Munir & Kiani (2011), Nasrat (2020), and Salimifar et al. (2015).

$$INF_{it} = \alpha_0 + \beta_1 GDP_{it} + \beta_2 OPEN_{it} + \beta_3 MONEY_{it} + \beta_4 CREDIT_{it} + \varepsilon_{it} \quad (1)$$

This study employs panel data methods. First, the cross-sectional dependency of the series was tested, as series with cross-sectional dependency require examination using second-generation panel unit root tests. Utilizing first-generation tests without accounting for cross-sectional dependency can lead to erroneous results. For this purpose, the CD_{lm2} cross-sectional dependency test developed by Pesaran (2004) was applied. In the next stage, the stationarity of the series with cross-sectional dependence was examined using the CIPS unit root test developed by Pesaran (2007). It was determined that the series was stationary at different levels, either I(0) or I(1). Therefore, the Panel ARDL approach was adopted. An important feature of the Panel ARDL approach is its ability to examine the relationship between variables in models composed of stationary series at different levels.

To determine the appropriate unit root test, the cross-sectional dependence of the series was assessed using the Pesaran (2004) CD_{lm2} test. This test, asymptotically normally distributed as $T \to \infty$ and $N \to \infty$, provides reliable results. The null hypothesis of the CDlm2 test is that there is no cross-sectional dependence, while the alternative hypothesis is that there of cross-sectional dependence (Pesaran, 2004). The test statistic is calculated using the formula outlined in Equation 2.

$$CD_{lm2} = \sqrt{\frac{2T}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij}^2 \quad (2)$$

Here, T and N represent the time and unit dimensions of the panel series, respectively. As seen in Table 3 below, cross-sectional dependence was found in the series included in the study. Therefore, the CIPS unit root test developed by Pesaran (2007), which considers cross-sectional dependence, was used for the analysis. Pesaran (2007), calculates the test statistic shown in Equation 3 when investigating the stationarity of the series:

$$t_i = (N,T) = \left(\frac{\Delta y_i' \bar{M}_w y_{i-1}}{\bar{\sigma} (y_{i-1}' \bar{M}_w y_{i-1})^{1/2}} \right) \quad (3)$$

With the formula provided in Equation 4, the test statistic for the overall panel is calculated.

$$CIPS(N,T) = \bar{\tau} = \frac{1}{N} \sum_{i=1}^{n} \tau_i(N,T) \quad (4)$$

As shown in Table 4, unit root test results indicated that the variables were stationary at different levels, both at the level and the first difference. In this case, it is not possible to use regression analysis, which can be applied when all variables are stationary at the level, or cointegration analysis tests, which can be applied when all variables are stationary at the same level (I(1) or I(2)). Therefore, to examine the relationship among the variables constituting the model, the Panel ARDL (Autoregressive Distributed Lag) method was utilized, allowing for the investigation of the cointegration relationship between stationary series at both levels and after the first difference.

Pesaran et al. (1999) introduced two different test statistics for two different estimators in the Panel ARDL method: MG (Mean Group) and PMG (Pooled Mean Group). When calculating the test statistic for the MG estimator, there are no restrictions in the ARDL specification. Long-run coefficients are calculated from the averages of unit ARDL predictions obtained through individual ARDL estimations. The main criticism of the MG estimator is that various parameters are not the same across units in the panel. This issue, considered a drawback of the MG estimator, is addressed in the PMG estimator. In the PMG estimator, the long-run coefficients must be identical across countries within the panel. However, in the short run, coefficients, intercepts, and error variances can differ across countries in the panel. The decision on which estimator's values to use is made using the Hausman test (Pesaran et al., 1999).

In the analysis section of this study, the causal relationships among the variables in the model specified in Equation 1 were investigated using the panel causality test introduced by Dumitrescu & Hurlin (2012). The panel causality test by Dumitrescu & Hurlin (2012) examines the null hypothesis of the absence of a Granger causality relationship, using a test statistic calculated from Equation (4). The alternative hypothesis, on the other hand, is formulated as the presence of a Granger causality relationship.

$$W_{N,T}^{HNC} = \frac{1}{T}\sum_{i=1}^{N} W_{i,T} \quad (5)$$

Results and Discussion

This study employed panel data methodology to examine the constructed model. A critical issue is whether to use first- or second-generation panel data methods. Therefore, an investigation was conducted to determine whether the study's variables exhibit cross-sectional dependence.

Table 2 presents basic statistics for all measures, including dependent and independent variables used in the empirical analysis.

Table 2. Description statistics

VARIABLE	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
INF	39.564	5.590	2947.733	-1.401	233.190	367
GDP	11.741	11.651	13.212	10.734	0.47487	367
OPEN	18.761	9.421	2613.497	-296.121	142.854	367
MONEY	52.136	14.320	3280.653	-43.738	267.556	367
CREDIT	60.379	50.338	185.363	11.037	40.3197	367

Source: Authors' calculations

Table 3. Cross-sectional dependence analysis results

Variables	Test CD_{lm2} (Pesaran 2004) t- Statistics
INF	12.920[0.000]***
GDP	8.120[0.000]***
OPEN	5.436[0.000]***
MONEY	6.855[0.000]***
CREDIT	19.340[0.000]***

Note: *p< 0.10, **p< 0.05, ***p< 0.01, respectively.

The results regarding cross-sectional dependence are presented in Table 3. According to the results of this study, at the 1% significance level, the null hypothesis that "there is no cross-sectional dependence" is rejected for all variables, and the alternative hypothesis that "there is cross-sectional dependence" is accepted. In other words, all variables exhibit cross-sectional dependence. This outcome indicated that an economic shock in one of the countries in the panel affected the others, demonstrating the interdependence of national economies. Countries are interdependent in terms of economic indicators, a phenomenon parallel to globalization.

The outcomes of the unit root test are presented in Table 4. According to the results of the CIPS unit root tests, the GDP and CREDI variables exhibited unit roots at the level in the stationary model results. In contrast, the other variables were stationary at the level. Furthermore, it was observed that the variables with unit roots at the level become stationary after first differencing. Therefore, it was concluded that the GDP and CREDI variables were integrated of order I(1), indicating they require first differencing to achieve stationarity. In contrast, the INF, OPEN, and MONEY variables were integrated of order I(0), implying they were stationary at the level.

Table 4. CIPS unit root test results

Variables	Level		1. Difference	
	Constant	Constant & Trend	Constant	Constant &Trend
INF	-4.187***	-3.340***	-4.902***	-5.078***
GDP	-1.909	-1.933	-2.743*	-3.146***
OPEN	-3.136***	-3.507***	-5.650***	-5.536***
MONEY	-2.770***	-2.522**	-5.646***	-5.856***
CREDIT	-1.987	-2.512**	-2.867***	-3.038***

Note: *p< 0.10, **p< 0.05, ***p< 0.01, respectively. Critical value for the Constant model: -2.57 (1%), -2.33 (5%), -2.21 (10%), and Constant and trend model: -3.10 (1%), -2.86 (5%), -2.73 (10%) (Pesaran, 2007).

Table 5. Panel ARDL long and short-run results

Variables	PMG		MG	
	Coefficient [Prob.]	Error Term	Coefficient [Prob.]	Error Term
Long-term coefficients				
GDP	3.548 [0.172]	2.599	15.821 [0.357]	17.185
OPEN	0.006 [0.718]	0.019	-0.362 [0.215]	0.292
MONEY	0.867 [0.000]***	0.027	0.554 [0.000]***	0.133
CREDIT	0.005 [0.904]	0.044	-0.001 [0.996]	0.073
Short-term coefficients				
GDP	-402.766 [0.000]***		-342.252 [0.205]	269.946
OPEN	0.086 [0.192]		0.232 [0.177]	0.172
MONEY	-0.093 [0.048]**		-0.076 [0.215]	0.061
CREDIT	-2.955 [0.223]		-3.306 [0.223]	2.711
EC	-0.492 [0.000]***		-0.756 [0.000]***	0.098
Countries	10			
Observation	37			
Hausman X^2	19.82 [0.005]***			

Note: *p< 0.10, **p< 0.05, ***p< 0.01, respectively.

Based on the unit root results, the relationship among the model's variables was investigated using the Panel ARDL method. Table 5 presented the panel ARDL results, encompassing both PMG and MG. The Hausman chi-square statistic displayed at the bottom of the table is crucial. According to the Hausman test results, because the model's slope coefficients were homogeneous, the MG results should be prioritized (Salisu & Isah, 2017). According to the MG results, the MONEY variable exerted a statistically significant positive effect on inflation in the long term.

However, the GDP, OPEN, and CREDIT variables did not demonstrate a statistically significant impact on inflation in the long term. Notably, the coefficients of OPEN and CREDIT were negative, while the coefficient of GDP was positive. The short-term coefficient results showed that the GDP and MONEY variables significantly negatively influenced inflation. Conversely, the OPEN and CREDIT variables did not exhibit a statistically significant effect in the short term. Specifically, the OPEN variable showcased a positive coefficient, whereas the CREDIT variable displayed a negative coefficient.

Table 6 presents the short-term MG results for the countries within the panel. In Brazil, all variables had statistically significant effects on inflation. GDP and CREDI demonstrated negative coefficients, whereas OPEN and MONEY displayed positive coefficients. In the case of China, all variables exerted statistically significant effects on inflation. Except for CREDI, other variables had positive effects. For India, statistical significance was absent for all variables except CREDI, which also exhibited a negative coefficient. In the results for Indonesia, GDP and CREDI variables were statistically significant, with negative coefficients, while the other variables were statistically insignificant. In Mexico and Türkiye, the MONEY and CREDI variables were statistically significant, but they had negative coefficients. In contrast, statistically significant results were not obtained for GDP and OPEN. Statistically significant results could not be obtained for Malaysia, the Philippines, South Africa, and Thailand.

Table 6. Panel ARDL Individual country results

Countries	*D(GDP)*	*D(OPEN)*	*D(MONEY)*	*D(CREDI)*
	Coefficient [Prob.]	Coefficient [Prob.]	Coefficient [Prob.]	Coefficient [Prob.]
Brazil	-2747.027 *** [0.000]	1.439 ** [0.022]	0.254 * [0.058]	-27.630 *** [0.000]
China	13.243 *** [0.004]	1.055 *** [0.005]	0.201 [0.163]	-0.350 *** [0.004]
India	-52.042 [0.120]	-0.155 [0.132]	0.034 [0.814]	-0.618 ** [0.010]
Indonesia	-323.720 *** [0.000]	-0.029 [0.649]	0.073 [0.578]	-0.576 ** [0.039]
Malaysia	7.853 [0.669]	0.001 [0.590]	0.006 [0.695]	-0.038 [0.293]
Mexico	-269.480 [0.106]	-0.008 [0.807]	-0.462 *** [0.000]	-2.006 *** [0.009]
Philippines	-4.236 [0.904]	0.009 [0.491]	-0.050 [0.520]	0.004 [0.984]
South Africa	-44.048 [0.309]	-0.0001 [0.858]	-0.109 [0.120]	-0.168 [0.110]
Thailand	1.187 [0.962]	0.008 [0.250]	-0.076 [0.363]	-0.003 [0.937]
Turkiye	-4.014 [0.960]	0.003 [0.952]	-0.234 *** [0.000]	-1.674 *** [0.000]

Note: *p< 0.10, **p< 0.05, ***p< 0.01, respectively.

The results show no statistically significant relationship between trade openness and inflation in newly industrialized countries. These results are similar to those of Aliyev & Gasimov (2014) and Ceyhan et al. (2023). The findings suggest that more dominant factors—such as money supply—play a role in inflation rather than trade openness in these countries. Therefore, it can be argued that no statistically significant relationship was found. According to country-specific results,

a statistically significant and positive relationship between trade openness and inflation was found for Brazil and China, indicating that the Romer hypothesis does not hold. These results are like those of Munir & Kiani (2011) and Samimi et al. (2012). According to the results for Brazil and China, the 'cost-push hypothesis' holds in both countries. This can be explained by the fact that, particularly in China, the level of imports exceeds that of exports, resulting in a trade surplus. Consequently, increased trade openness reduces the quantity of goods and services available for domestic demand through imports. No statistically significant relationship was found between trade openness and inflation in the other countries included in the study.

The effect of GDP on inflation is not statistically significant. However, it is statistically significant for Brazil, China, and Indonesia. While GDP has of positive effect on inflation in China, it is negative in Brazil and Indonesia. These results are similar to those of Ali & Asfaw (2023), Salamai et al. (2022), and Warsame et al. (2023). Gokal & Hanif (2004) emphasized that inflation negatively affects economic growth by increasing costs. Additionally, they noted a positive relationship between GDP and inflation because, under forward supply contracts made by firms, producers are obligated to meet demand even if the prices of goods increase in the future.

Although the money supply has short-term negative effects on inflation, a statistically significant positive relationship has emerged in the long term. In other words, the money supply increases inflation. (Akinbobola, 2012; Ali et al., 2023; Christian, 2023; Van, 2020; Warsame et al., 2023 have produced similar results and stated that the increase in the money supply, which raises inflation, is due to the growth of the money supply exceeding that of the supply of goods and services. In developing countries, particularly under populist approaches, increases in the money supply can be excessive.

The effects of loans on inflation are statistically insignificant in both the short and long term, and the coefficient is negative. Similar to Korkmaz (2015) no significant relationship was found between loans and inflation. The statistical insignificance of the effect of loans on inflation can be explained by the presence of other factors that significantly influence inflation. Additionally, the impact of loans on inflation may vary depending on the type of loan. For example, the effect of consumer loans on inflation may differ from that of investment loans.

Table 7. Results of the pairwise Dumitrescu-Hurlin (2012) panel causality test

Lag (k)	INF=> GDP	GDP=>INF	INF=> OPEN	OPEN=>INF	MONEY=>INF	INF=>MONEY	INF=>CREDI	CREDI=>INF
1	2.539*** [0.003]	2.732*** [0.000]	1.670 [0.225]	14.015*** [0.000]	10.596*** [0.000]	3.764*** [0.001]	3.694*** [0.001]	6.606*** [0.000]
2	4.062*** [0.001]	1.813** [0.069]	3.861** [0.018]	16.200*** [0.000]	22.142*** [0.000]	9.200*** [0.000]	10.765*** [0.000]	6.940*** [0.000]
3	5.939*** [0.003]	4.909* [0.070]	6.673*** [0.000]	16.638*** [0.000]	15.875*** [0.000]	17.565*** [0.000]	18.122*** [0.000]	10.577*** [0.001]

Note: *p< 0.10, **p< 0.05, ***p< 0.01, respectively.

Table 7 presents the results of examining the model's variables using a causal approach. The Dumitrescu & Hurlin (2012) method was employed for the panel causality tests in this study. Given the difficulty of selecting an appropriate lag length in the Dumitrescu & Hurlin (2012) causality test and the dataset's annual frequency, causality was investigated for lag lengths of 1, 2, and 3. According to the results, at a lag of 1, a unidirectional causal relationship from trade openness to inflation was identified. In contrast, bidirectional causality relationships between inflation and the other variables were observed. At lag lengths of 2 and 3, bidirectional causality relationships were found between all independent variables and inflation at different statistical significance levels. The causality results are similar to those of Chimobi (2010), Eltejaei & Shoorekchali (2021), and Warsame et al. (2023).

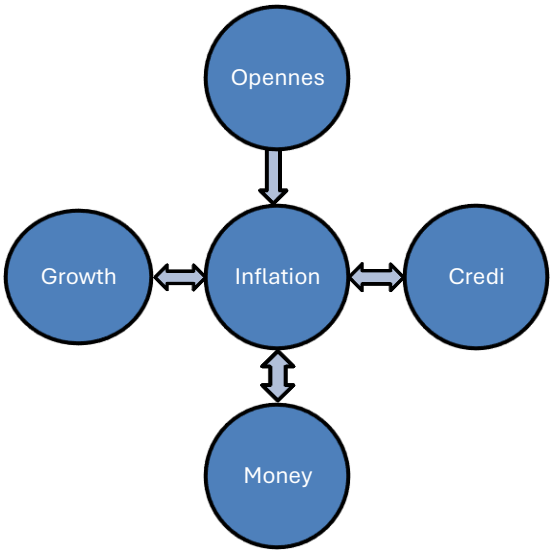

Figure 1. Graphical interpretation of the causality results

Conclusion

Studies examining the relationship between trade openness and inflation have found both positive and negative effects. Recently, economic globalization has often been regarded as an indicator of trade openness; however, traditional measures of trade openness based on international trade remain widely used. Based on traditional trade openness, the validity of the Romer Hypothesis for Newly Industrialized Countries was investigated from 1990 to 2022. According to the results, the Romer Hypothesis is not valid in Newly Industrialized Countries in the short or long term.

Increasing trade can help reduce inflation, but it may not be sufficient on its own. This is because inflation is caused of demand and supply imbalances, cost increases, changes in the money supply, and other factors. Inflation is a significant problem, especially in developing countries like newly industrialized ones. As a result, trade openness can increase as exports rise, driven by higher production, and imports increase. Importing intermediate goods and raw materials, especially for the manufacturing industry, can have an inflationary effect. Therefore, reducing dependence on imported intermediate goods and raw materials used in domestic demand and export-oriented production could positively impact inflation in these countries. It is crucial to ensure that the money supply and credit expansion, i.e., monetary policy, are aligned with real-sector trends. Additionally, monetary and fiscal policies need to be harmonized.

One limitation of this study is the calculation of trade openness based on the total exports and imports. Further research could examine the effects of trade openness on inflation by separately considering imports and exports. Moreover, if the dataset is available monthly or quarterly, the impact of trade openness on inflation can be analyzed at those frequencies. This study is expected to provide a new perspective on prior studies examining the relationship between openness and inflation in NIC countries. However, the study's findings indicate that the exchange rate should be considered to analyze this relationship fully. Based on the results of this study, we aim to develop a model that includes the exchange rate in future studies.

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