İzmir İktisat Dergisi
İzmir Journal of Economics

E-ISSN: 1308-8505 **Year:** 2026 **Vol:** 41 **No:** 1 **Pages:** 112-132
Received: 27.08.2024 **Accepted:** 14.05.2025 **Published Online:** 06.03.2026 **Doi:** 10.24988/ije.1538317
RESEARCH ARTICLE

Inflation Convergence Still Alive on Emerging Markets: What are the Determinants of Convergence?[1]

Melisa GİRGİN [2] , Uğur AKKOÇ [3]

Abstract

In addition to measuring the cost of living, inflation is an important macroeconomic variable affecting financial markets and all areas of the economy. Post-COVID-19, supply shocks and supply chain disruptions affected pricing behavior and created an inflationary environment worldwide, especially in emerging countries. At the same time, debate on inflation convergence is ongoing in the literature. This study analyzes the inflation convergence in emerging economies in the post-2008 global financial crisis period using the Phillips-Sul Club Convergence approach. Annual inflation of the consumer price index at monthly frequency is considered. The findings show that there is no convergence for the entire panel. However, there are two convergence clubs, one with a higher inflation rate. The findings also reveal that most countries have experienced an inflation convergence process. So, this study extends the literature by analyzing inflation convergence determinants. It can be understood from this effort the most preeminent factor is the exchange rate regime employed by the countries. The flexibility of exchange rates in a controlled interval caused co-movements of inflation in emerging countries. The other significant factors are fiscal deficit and consumer price index level.

Keywords: *Inflation, Inflation Convergence, Club Convergence, Emerging Markets, Panel Logit Models*
Jel Codes: *E31, E52, C38, C23*

Enflasyon Yakınsaması Gelişmekte Olan Ülkelerde Hala Geçerli mi: Yakınsamanın Belirleyicileri Neler?

Özet

Enflasyon, hayat pahalılığını ölçmenin yanı sıra, finansal piyasaları ve ekonominin tüm alanlarını etkileyen önemli bir makroekonomik değişkendir. COVID-19 sonrası arz şokları ve tedarik zinciri aksaklıkları fiyatlama davranışlarını etkilemiş ve özellikle gelişmekte olan ülkelerde olmak üzere dünya genelinde enflasyonist bir ortam yaratmıştır. Aynı zamanda literatürde enflasyon yakınsamasına ilişkin tartışmalar da devam etmektedir. Bu çalışmada, 2008 küresel finansal krizi sonrası dönemde gelişmekte olan ülkelerdeki enflasyon yakınsaması Phillips-Sul Club Yakınsama yaklaşımı kullanılarak analiz edilmektedir. Aylık frekanstaki tüketici fiyat endeksinin yıllık enflasyonu dikkate alınmıştır. Bulgular, tüm panel için yakınsama olmadığını göstermektedir. Ancak, biri daha yüksek enflasyon oranına sahip olmak üzere iki yakınsama kulübü bulunmaktadır. Bulgular ayrıca çoğu ülkenin bir enflasyon yakınsama süreci yaşadığını ortaya koymaktadır. Dolayısıyla, bu çalışma enflasyon yakınsamasının belirleyicilerini analiz ederek literatürü genişletmektedir. Bu çalışmadan da anlaşılacağı üzere, en önde gelen faktör ülkelerin uyguladığı döviz kuru rejimidir. Döviz kurlarının kontrollü bir aralıkta esneklik göstermesi, gelişmekte olan ülkelerde enflasyonun birlikte hareket etmesine neden olmuştur. Diğer önemli faktörler ise mali açık ve tüketici fiyat endeksi seviyesidir.

Anahtar kelimeler: *Enflasyon,Enflasyon Yakınsaması, Klüp Yakınsaması,Gelişmekte Olan Ülkeler, Panel Logit Modeli*
Jel Kodu: *E31, E52, C38, C23*

---

[1] Bu çalışma, Melisa Girgin'in Haziran 2023 tarihinde Pamukkale Üniversitesi Sosyal Bilimler Enstitüsü bünyesinde hazırlamış olduğu "Gelişmekte Olan Ülkelerde Enflasyon Yakınsaması: Yakınsama Klüpleri Analizi" başlıklı yüksek lisans tezinden türetilmiştir.

CITE (APA): Girgin, M., & Akkoç, U. (2026). Inflation Convergence Still Alive on Emerging Markets: What are the Determinants of Convergence?. *İzmir İktisat Dergisi*. 41(1). 112-132. Doi: 10.24988/ije.1538317

[2] Master Degree, Pamukkale University, Social Sciences Institution, International Trade and Department, Denizli, Türkiye.

EMAIL: melisayilmaaz94@gmail.com. **ORCID:** 0009-0004-0910-4671

[3] Associate Professor, Pamukkale University, FEAS, International Trade and Finance, Denizli, Türkiye.

EMAIL: uakkoc@pau.edu.tr **ORCID:** 0000-0002-9949-2097

1.INTRODUCTION

Inflation is a phenomenon at the heart of macroeconomics. While inflation has prominent effects on growth, financial stability, and trade, it is also strongly linked to economic welfare. On the other hand, the complexity of global economic relations leads to co-movements of inflation in most countries. Rocketing inflation rates after the oil crisis in the 1970s drew the attention of economists to the inflation problem. In this period, efforts of macroeconomic policies were predominantly focused on the fight against inflation. The fading of high inflation waves of the 1970s and 1980s in developed countries allowed them to focus on other macroeconomic issues they should overcome. Still, in the 1990s, more vulnerable emerging countries needed to keep disinflationary efforts in their policy agenda.

The pandemic that caused a worldwide economic crisis led to many changes in the economic environment, including a higher inflation period worldwide (Kraus et al., 2020). The volatility of exchange rates, demand shocks, and disruptions in the supply chain are the main reasons for higher inflation in the post-pandemic period. Negative demand shocks on goods and services during lockdowns in the pandemic also cause a cutback on the supply side. Pessimistic expectations and uncertainties reduce demand. It has been observed that economies have experienced an increase in inflation rates after 2020. Despite demand rebounding with the end of strict regulations and imposing fiscal expansion, supply chains cannot be repaired in the long term after the pandemic. Also, money expansion is one of the reasons for inflation after the pandemic. Expansionary monetary and fiscal policies in post Covid era led to a large increase in money supply. For example, the money supply increased by seven trillion dollars between 2020 and 2022, while the expansion of the money supply was ten trillion dollars from 2000 to 2020 (Gahrehgozli and Lee, 2022). This is because inflation is a complex concept that needs to be investigated by policymakers, central banks, and macroeconomics (Hussain and Malik, 2011).

The synchronicity of inflation became an important issue after the crisis of the last two decades, the 2008 global financial crisis, and the European sovereign debt crisis (Kang et. al., 2019). Reciprocal dependencies and common economic policies after a crisis play a role in the synchronicity of inflation. The popular global inflation hypothesis in this period is based on the theoretical insights of exchange rate movements, relative purchasing power parity, and the one-price law, which tries to measure how much local prices depend on international prices. Empirical results on the global inflation hypothesis insist that global factors can explain a bigger part of the variance of inflation (Ciccarelli and Mojon, 2010). So, literature proves that many factors lead to inflation synchronicity, such as having a common currency, free trade agreement, or a border and proximity of countries (Yılmazkuday, 2023). So, globalization level, financial integration, and per capita GDP of income may drive inflation convergence (Liu and Lee, 2021). Literature about inflation dynamics is widely criticized for models of studies that are too nation-centric (Feldkircher and Siklos, 2019). Inflation convergence has become an important issue in domestic and international macroeconomics.

This study aims to analyze inflation convergence for emerging countries in 2011 and 2022 using the Phillips and Sul (2007) Club Convergence method. In the literature, few studies analyze inflation convergence with this method. However, none of these studies have analyzed inflation convergence in emerging countries. Examining inflation convergence in emerging economies is of great importance for understanding the international interactions of macroeconomic variables in the increasing process of global integration. Determining the effects of exchange rate regimes and fiscal policies on inflation convergence will significantly contribute to policymakers' efforts to control inflation and ensure economic stability. Therefore, there are two potential contributions to this study. The first contribution is that it is the first study to analyze inflation convergence in the sample of emerging economies for the post-2008 crisis period using the clustering method.

The second contribution of the study is to estimate the determinants of the inflation convergence process. In the literature, only Liu and Lee (2021) and Yılmazkuday (2023) examined the determinants of inflation convergence. Our study differs from them by providing new convergence variables to estimate factors that affect it. The former one, Liu and Lee (2021), uses the unit root test statistics they used as a convergence variable. It can be criticized as it considers the increase of the unit root test statistics at every point more convergence. The latter study of Yılmazkuday (2023) uses unit root tests and a rolling window approach to create a dummy convergence variable. However, Yılmazkuday (2023) utilizes the gravity model equation in estimation that covers only commonalities of countries, distance, and country and time-specific effects as the possible determinant.

On the other hand, carbon emission literature newly uses this technique to specify the determinants of convergence (e.g., Bhattacharya et al., 2020; Ivanovski and Churchill, 2020; Saba and Ngepah, 2022). This study departs and enhances this technique by specifying convergence clubs and using the rolling windows approach to generate a dummy variable that defines convergence. After that, it estimates with some logistic and regression models to test some economic variables that affect the inflation convergence process.

As a result of the study, while convergence was not found in the entire sample, it was found that 36 out of 53 countries formed two separate convergence clubs. One of the two convergence clubs is defined as a high-inflation club, while the other has a more moderate inflation level. Sixteen developing countries are not included in the convergence club. So, this study investigates the determinants of inflation convergence. It proves that policy variables such as fiscal policy exchange rate regimes are important determinants and a level of income and consumer price index. On the other hand, globalization has no significant impact on inflation convergence.

The first section of the study explains the definitions and types of convergence in detail. The second section analyzes the literature on Phillips and Sul Club convergence and inflation convergence and studies on the same topic using different methods. The third section explains the methodology used. The fourth section presents the data and findings. The last section contains the conclusion.

2.LITERATURE REVIEW

It is understood that convergence studies are mostly about income convergence. The first empirical attempt is Baumol (1986), which investigates the convergence of real per capita income among the sixteen OECD countries. It states that there is a strong income convergence in these economies. However, relevant literature suggests that the main finding of Baumol (1986) is that income convergence is valid only for advanced economies (De Long,1988). The literature about income convergence is expanded with a dozen studies that prove weak or strong income convergence between countries (e.g., Dowrick and Nguyen (1989), King and Rebelo (1989), Barro (1991), Barro and Sala-i Martin (1990, 1992), Mankiw, Romer, and Weil (1992), Sala-i Martin (1996a, 1996b)).

Another strand of the convergence literature is about inflation convergence, which is within the scope of this study. Although many studies analyze inflation convergence, it is clear that results vary according to methodological approaches and the samples in which studies are used. On the other hand, it is possible to say that inflation convergence literature is dominated by European Union studies (e.g., Busetti et al., 2006; Broz and Kocenda, 2018; Tsafa-Karakatsanidou and Fountas, 2018). Constructing a common currency area in the European Union opens the inflation convergence debate in the relevant literature. One of the pioneer studies is Siklos and Wohar (1997), which provides evidence of inflation convergence in the European Monetary System countries and some other developed countries. The following studies that examine the existence and changes in the speed of inflation converge amongst European countries have controversial findings. Some studies prove that convergence disappears after the exchange rate mechanism (Holmes, 2002; Mentz and Sebastian, 2003).

On the other hand, some studies support the existence of inflation convergence in the scope of a common currency with more specific econometric techniques. For example, Lopez and Papell (2012) and Tsafa-Karakatsanidou and Fountas, (2018) state that passing to a common currency reduces differentials of price levels amongst European countries. Similarly, Karanasos et. al. (2016), who utilize the club convergence approach, find that convergence is on the table and higher, especially in the comers club to common currency area.

The inflation convergence process in the European Union countries has been examined in different manners many times. Spiru (2008), who explores differences between countries, shows that convergence in price levels is strongest in Baltic countries. Other studies consider the 2008 global financial crisis as one of the determinants of convergence. When Simionescu (2015) suggests that convergence has slowed down in the crisis period but has not disappeared, Broz and Kocenda (2018) found evidence of a re-disappear of inflation convergence after the crisis. Besides this, Yılmazkuday (2023) analyzes the sectoral behavior of price levels and concludes that price level convergence occurs in most sectors. However, some of them experienced disruptions in the crisis.

Despite most European studies on inflation convergence literature, many studies also investigate the convergence of other country groups. Convergence in price levels is observed in other countries despite the lack of economic integration. For example, while Anouro and Murthy (2014) show a convergence amongst the South African countries, Valera and Valera (2014) validate South Asian results. Besides them, Hepsağ (2017) for N11 and Güriş et al. (2020) for fragile five countries confirm the existence of inflation convergence. Another important aspect of inflation convergence is inter-regional inflation convergence. How are price level differentials of different regions in the same country, and whether there is catching up? These are important questions. The common finding of regional inflation convergence literature is a strong convergence process between regions, and differences have a closure trend over time (e.g., Busetti et al., 2006; Yılmazkuday, 2013).

Phillips and Sul's (2007) algorithm is used in this study to analyze the inflation convergence based on unit root tests and the club convergence approach. It tries to specify different convergence clubs in the sample. Phillips and Sul's (2007) approach is major in convergence literature thanks to the advantages of considering non-linearities and producing time-varying coefficients. It is very popular in the literature that analyses the existence of income convergence by Phillips and Sul's (2007) method. One of the early studies in the relevant literature by Fritsche and Kuzin (2008) is about convergence in prices, income, and productivity in Europe. They report that there are three regional connected convergence clubs. Following this, Apergis et. al. (2010) found two income convergence clubs that have heterogeneous characteristics on sources of growth according to Phillips and Sul's (2007) approach. It can easily find studies that specify European income convergence clubs (e.g., Borsi and Metiu, 2015; Cavallero and Villani, 2021). Similar results are provided for other countries in the relevant literature, for example, Russia (Gluschenko, 2010), Colombia (Peiro-Palomino et al., 2023), Latin American countries (Barrios et al., 2019), South Africa (Nzimande 2021), Türkiye (Karagöl et al., 2019), OECD countries (Nyong and Omobitan, 2013).

The most related studies to this study are analyses of inflation convergence by Phillips and Sul's (2007) approach. A literature review shows quite a few studies on this topic. One of the preliminaries, Nagayasu (2010), examined Japan's regional inflation convergence from 1975 to 2015. It reports that no overall convergence covers all regions together; however, there are regional convergence clubs. Afterward, Cuestas et. al. (2016), who tried to specify convergence clubs using Philips and Sul's (2007) approach, concluded that all Middle and Eastern European countries form a convergence club for inflation except Bulgaria and Poland. In a more comprehensive study, Fan et al. (2023) provide solid evidence for inflation convergence clubs by analyzing the data of 198 countries in the period 2000 to 2020. So, Çakır and Gündüz (2022) obtained similar results about regional inflation clubs in Türkiye despite the lack of overall convergence. Özdurak and Uzunoğlu (2023) state that monetary policy dynamics, exchange rates, and divergence between policy and lending rates strongly impact inflation by expectations channel in economies with soft currencies like Türkiye.

3.ANALYSIS AND FINDINGS

3.1. Methodology

After 1980, the concept of convergence has been used extensively to explain economic inequalities and income differences between regions and economic unions. However, inflation convergence has also been recently analyzed frequently in the literature (Belke and Al, 2019). Inflation convergence has been analyzed in the literature using different methods and samples. The most used sample is European countries because establishing the European and Monetary Union creates a good laboratory example to test inflation convergence. (e.g. Mentz and Sebastian, 2003; Busetti et al., 2006; Simionescu, 2015; Yilmazkuday, 2023). The studies show that there is weak convergence across the European countries. (e.g. Halka and Leszczynska-Paczesna, 2019; Karanassos et. al., 2016). In addition, studies in the literature examine inflation convergence across regions within a country (e.g., Brito and Correia, 2000; Belke and Al, 2019). In the methodological aspect, the panel unit root tests are the most commonly used techniques (e.g., Kocenda and Papell, 1997; Holmes, 2002; Beck et al., 2006; Lopez and Papell, 2012; Hepsag, 2017; Güriş et al., 2020). However, studies are also conducted using cointegration test methods (e.g., Siklos and Wohar, 1997; Valera and Valera, 2014). So, another strand of the relevant literature uses clustering methods to detect convergence clubs.

Panel unit root tests are frequently used in the literature to test whether a variable is converged, and the presence of a unit root implies the absence of convergence (Islam, 2003). A unit root process indicates no convergence between horizontal cross-sectional units in testing convergence with panel data, which has both time and horizontal cross-sectional dimensions. In this context, it is possible to test the convergence of an economic variable across countries with panel unit root tests. However, an important criticism of this approach is that it assumes that the variable tested in all countries is affected similarly by other factors that influence it. According to this criticism, if some countries are converging when the number of non-converging countries is high enough, the panel unit root tests conclude that there is no convergence. Therefore, a common policy recommendation based on a homogeneous result obtained for all countries in the panel cannot be effective (Herrerias 2013; Kurozumi et al. 2012).

To overcome this issue, Phillips and Sul (2007) make groups of the countries according to similarities in data by using a clustering algorithm. Therefore, a convergence test is performed, named the "log t-test," on each group. Log t-test is not based on any panel unit root. Phillips and Sul's (2007) approach proposes a new model that captures the behaviors of cross-section units in the transition while modeling heterogeneity at the same time. The main advantage of this approach is that it permits the handling of nonlinear and time-varying factors. This modeling strategy makes it possible to get time-varying results about membership in any convergence club for each country. Another advantage is that transitions to convergence or divergence processes are endogeneously modeling (Bartkowska and Riedl, 2012). As a sum, Phillips and Sul's (2007) approach makes it possible to classify countries into convergence clubs with the help of a log t-test and clustering algorithm.

The first step of the Phillips and Sul (2007) approach is testing overall convergence. The overall convergence implies a convergence process amongst all countries in the sample. To test overall convergence, it models the interested variable as:

$$X_{it} = g_{it} + a_{it} \tag{1}$$

X_it and a_it represent the permanent common component and transitory component, respectively. So, it is assumed that X_it contains common and individual transitory components. To extract the following formulae are used:

$$X_{it} = \left(\frac{g_{it} + a_{it}}{\mu_t}\right) \mu = \delta_{it}\mu_t \tag{2}$$

In Equation (2), when δit represents an individual country-specific factor, μ_t is a common and time-varying component of X_{it}, respectively. This equation models the dynamic factors using trend term (u_t) and time-varying factor loadings (δ_{it}) that measure the distance from X_t to u_t. With the extraction of the common component from Equation (2), Phillips and Sul (2) derive the equation:

$$h_{it} = \frac{X_{it}}{N^{-1}\sum_{i=1}^{N} X_{it}} = \frac{\delta_{it}}{N^{-1}\sum_{i=1}^{N} \delta_{it}} \tag{3}$$

In Equation (3)$h_{,it}$ is a relative transition parameter. It measures the speed of loading coefficients converge to the panel average. Finally, Phillips and Sul (2007) develop a t-test for convergence by using this equation:

$$\log\left(\frac{H_1}{H_t}\right) - 2\log L(t) = \alpha + \beta \log t + u_t \tag{4}$$
$$t = [rT], [rT] + 1 \ldots, T \text{ and } r > 0$$

Log t-test that is constructed based on regression of Equation (4) has a null hypothesis of convergence:

$$H_0 : \delta_i = \delta, \alpha \geq 0 \tag{5}$$
$$H_1 : \delta_i \neq \delta \ \forall \mathrm{i}, \alpha < 0 \tag{5a}$$

So, Phillips and Sul (2007) suggest discarding the first rT observations from a sample after sorting descending. Based on Monte Carlo studies, they suggest that if the r time series dimension is less than 50, r should be equal to 0.3.

The above methodology of Phillips and Sul (2007) is suggested to be implemented in several steps. In summary, these steps are i) last observation ordering, ii) core group formation, iii) sieve individuals for club membership, iv) stopping rule, and finally (Phillips and Sul, 2007) v) merging clubs (Schnurbus et al., 2017).

i) Last Observation Ordering: Data organization is the very first step of the Phillips and Sul (2007) algorithm. In this step, observations of each cross-section unit are sorted by the last observation. The idea of using the last observation came from the fact that convergence tends to exist in the last observations.

ii) Core Group Formation: After sorting the observations, the algorithm constructs a core convergence group. The core group is the most crowded, and there is convergence among its members. To determine its members, a log t-test is implemented for all alternative groups that have k members. After that, the group with the highest k value is the core group. The algorithm stops and reports no convergence clubs if there is no core group.

iii) Sieve Individuals for Club Membership: In this step, the algorithm tries to expand the core group to include all countries not in the core convergence group. To do this, each time one country is added to the core group, the log t-test is repeated. Core groups will expand with this new country if the new log t-test proves the convergence. If the new log t-test does not support the convergence, this new country is removed from the core group. This search procedure continues to complete testing of all countries not in the core convergence group. After all, the final members of the core group are determined.

iv) Stopping Rule: After constructing the core group, there may still be outside countries. In this step, the algorithm first tests whether there is another convergence group that includes all of these countries. If there is, the algorithm stops with two convergence groups. If not, steps 1 to 3 are repeated to detect sub-groups of convergence.

v) Club Merging is the final step of the algorithm offered by Schnurbus et al. (2017). If there is more than one core convergence group, the algorithm iteratively tests whether groups can be merged. The new clubs are determined by t-test results. The procedure is repeated until no clubs can be merged.

This study expands the analysis to identify determinants of inflation convergence in emerging economies. After classifying countries as convergent or non-convergent and assigning convergent countries to specific clubs, it employs regression analysis to determine which factors influence the convergence process. While much of the existing literature focuses primarily on testing for convergence, understanding why price levels across countries converge to the same equilibrium is equally important. This research fills this gap by examining whether inflation convergence occurs and investigating the underlying economic mechanisms that drive countries toward similar inflation patterns.

Firstly, a dependent variable that defines the convergence process is needed to measure the effects of some explanatory variables on the convergence process. Liu and Lee (2021) use the test statistics of the unit root test as a dependent variable. It suggests that an increase in test statistics refers to more convergence. So, Yılmazkuday (2023) uses dummy variables. The time series dimension is provided by the rolling window approach. The innovation of this study is using alternative dependent variables to define the convergence and estimation methods.

There are three alternative variables to present the convergence process. The first alternative relies on the idea that convergence is an event taking place at some observations. This idea leads us to create a categorical dependent variable. The first alternative of the dependent variable is a categorical variable that takes a value of 1 if convergence occurs. However, Phillips and Sul's (2007) approach produces convergence results over a whole period. This study utilizes rolling windows to gain a time dimension to the convergence variable. Phillips and Sul's (2007) algorithm was employed repeatedly for all windows, starting in January 2011. The width of windows is determined to be three years. With this method, we make it possible to assign a value to the dependent variable for the last year of each window. For example, if one country is a member of any convergence club on the first window covers the years of 2009, 2010, and 2011, the dependent variable takes a value of one for this country. Windows rolls with 12 month period.

The second alternative dependent variable is the continuous variable based on the transition parameter of the Phillips and Sul (2007) algorithm. The transition parameter of the algorithm (h_{it}) reflects the co-movements of price levels. As it converges to unity, the possibility of convergence increases. The reciprocal distance of the transition parameter from unity is used as the second dependent variable that defines the convergence.

$$h_{t\_convergence} = (-1) * |1 - h_t| \quad (6)$$

Finally, as a third variable, it is important to which convergence clubs the countries belong to. Results indicate that there are two convergence clubs in emerging countries: one is a moderate inflation club, while the other is a high-inflation convergence club. The third dependent variable was constructed according to club membership to measure the effects of explanatory variables on club membership. The third alternative of the dependent variable takes the value of one (two) if any country belongs to a moderate (high) inflation club.

3.2. Data

A large sample of 53 emerging economies is used to analyze the inflation convergence. The period of this study is between January 2011 and March 2022, which started after the effects of the 2008 global financial crisis. The chosen criteria for the countries is data availability. As an inflation measure, this study uses yearly percentage changes in the consumer price indices of each country in the sample. Then, annual-based monthly inflation data is constructed by calculating the percentage change in consumer price indices compared to the previous year's month. The main dataset of consumer price indices of 53 emerging countries is derived from the International Monetary Fund.

In regression analysis with all convergence variables, some derivative variables measure the effects on inflation convergence. The first of them is the globalization index. The theoretical expectation is that as globalization increases, countries' price levels' dispersion reduces, just like other economic variables. This study uses the KOF Globalization Index of Dreher (2006) and Gygli et al. (2019). Another possible effect of inflation convergence comes from the exchange rate regimes. Exchange rate regimes of the countries may be determinants of the inflation convergence process by effects on inflation levels. However, it is hard to classify the regimes of exchange rates. This study constructs the exchange rate regime variable into four categories: unclassified exchange rate regime, crawling peg exchange rate regime, sliding exchange rate bands regime, and free-floating regime, using data from Ilzetzki et al. (2019). Lastly, the consumer price index is added to the model to reflect the scale effect of the price level.

3. 3. Findings

Table 1 shows the log t-test results for all panel members, which test the existence of inflation convergence for the group of all countries. According to the results, the null hypothesis of convergence is declined because the t-stat for all panels (-9.78) is lower than the critical value (-1.65). In other words, there is no inflation convergence for the group that includes all countries in the sample. As emerging countries have unique characteristics, it is possible to say that it is expected.

Table 1: Log t-test for all panel

Category	Countries	t-stat	b coefficient
All Panel	53 Emerging Countries	-9.78	-0.66

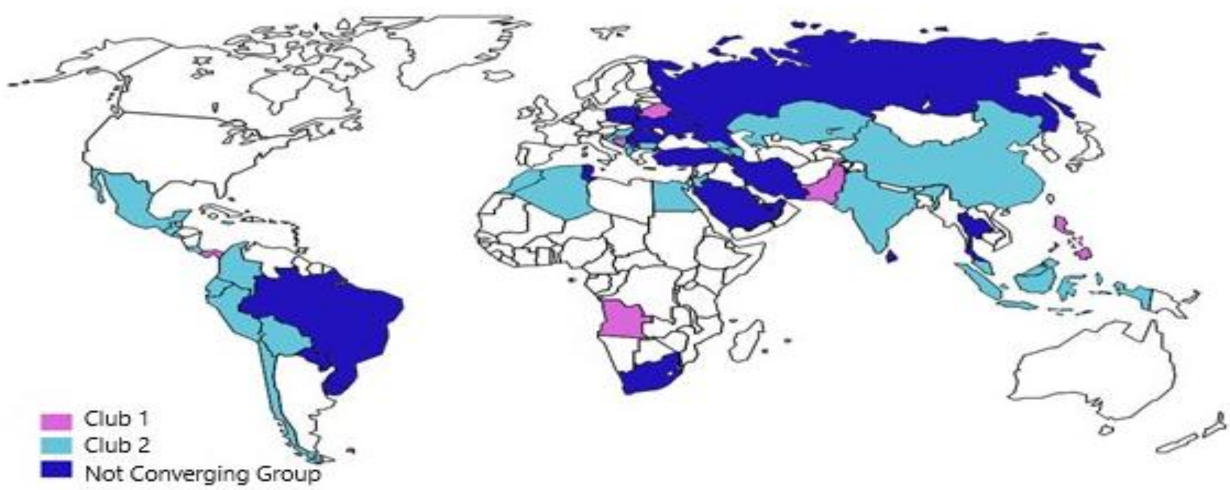
However, it is possible to observe inflation convergence in some sample sub-groups. Steps of the Phillips and Sul (2007) algorithm are employed to answer whether inflation convergence clubs exist in emerging countries. The algorithm tries to choose the most crowded inflation convergence club and sub-groups if they exist. The final results of the Phillips and Sul (2007) algorithm can be found in Table 2. Table 2. reports that Phillips and Sul's (2007) club convergence algorithm specifies two inflation convergence clubs amongst the 53 emerging countries. The first club, named "Club 1," includes six countries. The second club has 31 members. The other 16 countries not in clubs have no convergence process in inflation with other counterparts. The table also shows the t-stats and b-coefficients of all clubs.

Table 2: Convergence Clubs according to Phillips and Sul's (2007) algorithm[1]

Clubs	t-stat	b coefficient
Club 1 (6 Countries)	-12.19	-0.58
Club 2 (31 Countries)	-1.07	-0.31
Not Converging Group (16 Countries)	-3.71	-0.62

Figure 1 shows the map of members of the two inflation convergence clubs and one non-convergent group. While the figure implies that geography is not a factor in inflation convergence, the second convergence club members are mostly from Southeast Asian and Latin American countries.

Figure 1: Convergence Club Members and Not Converge Countries



Source: Author’s own calculations

[1] The algorithms work for merging clubs to mark final clubs. To prevent overestimating the number of clubs, tests for merging are employed for Club 1 and Club 2. According to the table, the cause of the joint convergence hypothesis is unacceptable, and merging is not statistically significant. Similar results are obtained for merging Club 2 and Club 3. In summary, Club 1 and Club 2 are the final clubs formatted using the Philips and Sul (2007) algorithm.

So, Table 3 shows which are all members of each final convergence club and not converge countries. So, the table provides group averages of annual inflation, per capita GDP, and unemployment rate to discuss any similarity in members of clubs. According to the table, it is possible to infer some results. The first is that 37 of the 53 emerging countries in the sample are members of any convergence club. This means that inflation convergence is present in most emerging countries. Second, annual inflation averages of the convergence clubs show that there are high-inflation convergence clubs and low-inflation convergence clubs. The first convergence club consists of 6 emerging countries (Angola, Belarus, Bosnia and Herzigova, Phillippines, Pakistan, and Panama) that have an %8.38 annual inflation on average. The second convergence club consists of 31 emerging countries (Albania, Azerbaijan, Bolivia, Bulgaria, Algeria, China, Hong Kong, Ecuador, El Salvador, Indonesia, Armenia, Morocco, Guatemala, Georgia, Croatia, India, Jamaika, Montenegro, Kazakhstan, Colombia, Kosovo, Costa Rika, Kuwait, North Macedonian Republic, Hungary, Malaysia, Mexico, Egypt, Peru, Chile, Jordan) has %3.45 annual inflation on average. It is very moderate compared to the first club.

Table 3 also presents convergence clubs' average GDP per capita and unemployment rate. As seen in the table, the per capita GDP of the first convergence club has higher average inflation rates, which are lower than the second convergence club average. Similarly, the first convergence club experiences a higher unemployment rate than the second. In sum, the first convergence club with higher inflation is also characterized by a lower per capita income and higher unemployment.

According to the World Bank classification, while the first club has only two members that are middle-high or high-income, 24 members of the second club are from middle-high or high-income countries. So, we re-examined the convergence procedure of Phillips and Sul (2007) for each income group. Appendix A shows that there are two convergence clubs in the high-income group, three convergence clubs in the upper-middle-income group, and two convergence clubs in the lower-middle-income income group. Also, when there are no convergent countries in high and upper-middle-income groups, all countries have a convergence process in lower-middle-income groups. In a nutshell, the robustness exercises provide to get some results. Firstly, there is no significant difference in coverage of the inflation convergence process across countries. Second, different convergence clubs exist in each income group with different average inflation. This finding supports the conclusion that clusters of countries converge to different inflation rate levels. Third, some exceptional countries such as China and India, with huge economic power, or El Salvador and Ecuador, with a full dollarization economy, are still in convergence clubs even if we analyze in income group specification.

Table 3: Convergence Clubs, Inflation, per capita GDP and Unemployment Rates

Clubs	Countries	Annual Inflation Rate on Average (%)	Per capita GDP on average (thousand USA dollars)	Unemployment Rate on Average (%)
Club 1	Angola, Belarus, Bosnia and Herzigova, Philippines, Pakistan, Panama	8.38	5,133	12.65

Club 2	Albania, Azerbaijan, Bolivia, Bulgaria, Algeria, China, Hong Kong, Ecuador, El Salvador, Indonesia, Armenia, Morocco, Guatemala, Georgia, Croatia, India, Jamaika, Montenegro, Kazakhstan, Colombia, Kosovo, Costa Rika, Kuwait, North Macedonian Republic, Hungary, Malaysia, Mexico, Egypt, Peru, Chile, Jordan	3.45	7,279	8.82
Not Converging Group	United Arab Emirates, Brazil, South Africa, Iran, Paraguay, Poland, Romania, Russian Federation, Serbia, Sri Lanka, Saudi Arabia, Thailand, Tunisia, Türkiye, Ukraine, Uruguay	6.42	10,632	9.13

The relevant literature about inflation convergence gives importance to the test of the existence of convergence. Convergence of inflation implies co-movements of price levels among countries. However, analyzing why price levels of the countries converge to the same equilibrium level is as important as specifying inflation convergence is there. Although the literature owns few studies to analyze the determinants of income convergence (Bartkowska and Riedl, 2012) or carbon emission convergence (Bhattacharya et al., 2020), only two studies, Liu and Lee (2021) and Yılmazkuday (2023) applied that to inflation convergence. This study also tries to specify the determinants of inflation convergence in emerging economies by expanding their analysis of them. After defining the convergent and non-convergent countries and associated convergent countries to clubs, it uses regression analyses to analyze which factors affect the convergence.

The regression model includes explanatory variables for the convergence process. It is possible to say that there is no guide to choosing these variables because the literature lacks empirical studies that directly focus on setting which variables affect inflation convergence. This study uses explanatory variables to follow Liu and Lee (2021). Besides them, the literature puts forward some variables that affect inflation rather than inflation convergence. The first variable used to explain inflation convergence is per capita GDP. The empirical literature proves the relationship between inflation and growth (e.g., Barro, 1991). In line with the theoretical contribution of Philips (1958), which explores the linkage between unemployment and inflation, the unemployment rate is included in the model. The Phillips curve offers a negative relation between unemployment and inflation. Our two convergence clubs show that the higher inflation group has a lower unemployment rate on average. So, theoretical models offer various channels, from monetary and fiscal policy to inflation. A fiscal policy variable is added to the set of explanatory variables to cover their potential effects. This study utilizes the government principal deficit to represent a fiscal policy strongly affecting inflation. The government's principal deficit is successfully representative of fiscal stance.

The third fact is that 16 countries (United Arab Emirates, Brazil, South Africa, Iran, Paraguay, Poland, Romania, Russian Federation, Serbia, Sri Lanka, Saudi Arabia, Thailand, Tunisia, Türkiye, Ukraine, Uruguay) that are not in convergence process have %6.42 annual inflation on average. The inflation in this group is independent from other countries and has a middle ground. On the other hand, these countries do not have any significant common characteristics. So, this group of countries does not differ importantly from convergence clubs regarding inflation and unemployment. However, it is strikingly that the per capita GDP of the convergence group is dramatically higher than that of convergence clubs on average.

Table 4: Estimation Results of Inflation Determinants

	Model 1: Panel Login	Model 2: Panel Regression	Panel 3: Panel Ordered Logit
	Odds Ratios	Coefficients	Odds Ratios
GDPpc	0.998***	0.00006	0.999
Fiscal Balance	1.143***	-0.0024	0.837***
Exchange Rate Regimes			
- Crawling Peg	123.4***	2.008***	1.083
- Sliding Bands	207.1***	1.826***	0.479**
- Free Floating	0.005	1.709**	2.780
Globalization	1.012	-0.036***	1.004
Unemployment	1.072	0.042	0.971
CPI	0.974***	-0.0015***	1.0004
Constant	0.037	4.691*	
N	510	510	348
Wald Statistics	74.25 (0.00)	-	51.66 (0.00)

Note: *,**, and *** denotes the significance of %10, %5 and %1 level, respectively.

Table 4 presents the estimation results of both models that analyze inflation convergence determinants. Firstly, it is possible to say that most of the explanatory variables significantly affect inflation convergence. GDP per capita is meaningful in determining whether the country is a member of the convergence club in all estimations. The one-point increase in GDP per capita leads to a decreased possibility of being in the convergence club by 0.2%, according to panel logit estimation. Other estimations prove the negative effects of GDP per capita growth. However, we can not observe similar results for globalization. Globalization is statistically significant in only panel regression estimation. So, the striking result that it can be said that higher globalization levels have no significant effects on inflation convergence in the sample of emerging countries contradicts the global results of Liu and Lee (2021).

On the other hand, the literature on the global inflation hypothesis supports this result. According to Ball (2006), although it is natural to look for new ideas for inflation, such as globalization, there is little reason to think that globalization has changed the structure of inflation. So, when Ihrig et al. (2010) find little support for the hypothesis that globalization has an increased role in international factors on inflation for eleven industrial countries, empirical studies on emerging countries suggest that there is no relation (e.g., Gao et al., 2023; Mazumder, 2017). They prove that the domestic output gap remains a main driving factor of inflation, and globalization has no significant effect when inflation rates are calculated based on CPI. Results suggest emerging economies can walk through their unique equilibriums with higher income.

On the other hand, Table 4. proves the efficiency of monetary and fiscal policies. Fiscal policy has positive and relatively strong effects on inflation convergence. As the primary deficit increases by one percent, the possibility of inflation convergence reduces by 14%. Literature regards fiscal actions as one of the most powerful sources of inflation (Fischer et al., 1996; Domaç and Yücel, 2005). Cottarelli (1998), in a seminal work, states that fiscal deficit significantly affects inflation in countries where the government securities market is not well developed. According to the results of this study, the fiscal balance affects inflation convergence for emerging markets after global financial crises. The other branches of macroeconomic policy, exchange rate regimes, are also determinants of inflation convergence. The exchange rate regimes variable that represents the monetary policy is found to be by far the strongest determinant of inflation convergence in emerging markets. Table 4. shows the effects of some defined exchange rate regimes compared to unclassified ones. It shows that implementing crawling peg and sliding band regimes increases the possibility of being in a convergence club compared to unclassified exchange rate regimes by 123 and 207 times, respectively. Despite the huge effects of a crawling peg and sliding band regimes, implementing free-floating is not a matter for or has a very small effect on inflation convergence. These results extend Liu and Lee's (2021) results to the efficiency of exchange rate regimes that adjust the rates in some bands on inflation convergence. So, the result is also compatible with the literature about inflation determinants. Many studies (e.g., Fischer et al., 1996; Cottarelli, 1998) claim that pegged exchange rate regime is related to lower inflation rates.

Lastly, theoretical literature offers a relationship between unemployment and inflation, called the Phillips curve. In line with the empirical results of many studies that extensively discussed the phenomenon of the disappearing Phillips curve (Furuoka et al., 2021; Murphy, 2018), this study obtains an unremarkable effect of unemployment. On the other hand, there is a negative level effect on consumer prices. The price level of each country has negative effects on inflation convergence. Higher levels of price cause divergence from other emerging countries in inflation and drive through their unique equilibrium.

The last question is about which countries attain higher or lower inflation convergence clubs in the convergence process. To answer this question, we employed another panel-ordered logit estimation after estimating determinants of inflation convergence. The last column of Table 4. provides panel-ordered logit model estimation results. According to the results, only two factors determine which converging countries belong to the higher inflation club: fiscal primary balance and sliding band exchange rate regimes. Fiscal policy function is as expected that countries that have more deficit tend to be members of higher inflation clubs. A point increase in fiscal primary balance increases the possibility of being a higher inflation club member by 16% relative to a lower inflation club member. A stronger factor is the implementation of a sliding band exchange rate regime. Suppose a country experiences a sliding band, with the possibility of convergence in higher inflation rates increasing by 52% rather than lower rates in inflation as compared to an unclassified regime. However, the crawling peg regime has no significant effect.

4.CONCLUSION

Last year's world economy was characterized by high inflation with the effects of some economic crises and pandemics. In the first phase, the 2008 global financial crisis and the European debt crisis that started in 2014 caused tough times for economic activity in the world. Economic policies used to overcome economic crises' effects provide a hospitable environment for inflation. The COVID-19 outbreak and the shutdowns it triggered emerged while the effects of the economic crisis that produced price increases persisted. With the impact of the financial aid and economic policies implemented during the COVID-19 pandemic, a new period of high inflation began in the world economy.

This paper investigates the inflation convergence phenomenon for emerging countries after the 2008 global financial crisis. It uses Phillips and Sul's (2007) approach of club convergence to analyze inflation convergence. This study determines the convergence clubs and their members using this approach. Most of the emerging countries have experienced a convergence process on inflation. Also, results reveal two different convergence lines amongst the countries; one has a lower inflation rate on equilibrium while the other has higher rates. Consequently, this study proves that the inflation convergence phenomenon is still alive in emerging countries after the 2008 global financial crisis.

The main contribution of this study is to try to determine factors that affect inflation convergence with a novel strategy that is partly a part of carbon emission literature and enhance the inflation convergence literature to analyze by emerging countries. Three different convergence variables are constructed to understand which factors determine the membership of inflation convergence clubs and so in which club. In the first step, per capita income, fiscal policy, and exchange rate regimes determine whether an emerging country has an inflation convergence process. Also, it can be said that there is a negative level effect on prices. However, the most powerful determinant is the exchange rate mechanisms of countries by far. The flexibility of exchange rates in a controlled interval caused co-movements of inflation in emerging countries.

On the other hand, this study can not find any evidence of the inflation globalization hypothesis. As a second step, the study tried to answer the question of what factors determine which convergence club converging countries attain. Fewer factors, such as fiscal deficit and implementation of sliding regime, are determinants of club attendance. While more deficit increases the possibility of membership to a higher inflation club, a sliding band regime reduces the possibility of membership to a higher inflation club.

The results indicate that inflation convergence is still valid after the 2008 global financial crisis, albeit in the form of "club convergence" at different levels. When evaluated based on convergence clusters, it becomes evident that different policy measures are necessary. For countries in the low-inflation convergence cluster (Club 2), maintaining and strengthening the existing monetary and fiscal policy frameworks is important. In these countries, the continuation of exchange rate regimes, particularly sliding bands or crawling pegs that allow for fluctuations within a band, supports inflation convergence (Fischer et al., 1996; Cottarelli, 1998). In contrast, stricter fiscal discipline policies must be implemented for countries in the high-inflation convergence cluster (Club 1). Since this group is characterized by high fiscal deficits and employment problems, fiscal consolidation and structural reforms should be prioritized.

A critical inference for policymakers is that globalization does not significantly affect inflation convergence, whereas exchange rate regimes and fiscal balance are determining factors. Consistent with the studies of Ball (2006) and Ihrig et al. (2010), it is observed that local policy preferences in emerging economies are still the main determinants of inflation. In this context, economic policy sets still determine the inflation levels of national economies, and it should not be forgotten that growth-oriented policies historically observed in developing countries may pose obstacles in the fight against inflation. Strengthening fiscal discipline and implementing a compatible exchange rate regime are key to successful policy design.

The results infer some insights for policymakers and market professionals. The co-movement of prices in emerging countries is a nonignorable fact in understanding inflation dynamics after the 2008 global financial crisis. Developing countries still have to devote much of their efforts to fighting inflation. Postponing this fight could cause a long-term inflationary environment and lead to higher economic costs as in previous big price shocks. The biggest threat comes from a historical tendency toward growth-oriented policies in emerging markets. Resistance to deceleration in growth could break by improving monetary policy communication about inflation costs to all segments of society. Enhancing fiscal discipline and implementing compatible exchange rate regimes are key to successful policy design. So, further research may come from individual country analysis and complementary determinants of inflation convergence analysis to all types of convergence methods.

DECLARATIONS

FUNDING / SUPPORT INFORMATION

No financial support was received.

CONTRIBUTIONS OF AUTHORS

The authors have contributed equally.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

DATA AVAILABILITY

The data are publicly available.

ETHICAL STATEMENT

The study does not require ethics committee approval.

ARTIFICIAL INTELLIGENCE (AI) USAGE STATEMENT

No AI-based tools were used in this study.

REFERENCES

Anoruo, E., & Murthy, V. N. (2014). Testing nonlinear inflation convergence for the Central African Economic and Monetary Community. *International Journal of Economics and Financial Issues*, 4(1), 1-7.

Apergis, N., Panopoulou, E., & Tsoumas, C. (2010). Old wine in a new bottle: Growth convergence dynamics in the EU. *Atlantic Economic Journal*, 38, 169-181.

Ball, L. (2006). Has Globalization Changed Inflation?. *NBER Working Paper*, (w12687).

Barrios, C., Flores, E., & Martínez, M. Á. (2019). Convergence clubs in Latin America. *Applied Economics Letters*, 26(1), 16-20.

Barro, R. J. (1991). Economic growth in a cross section of countries. *The quarterly journal of economics*, 106(2), 407-443.

Barro, R. J., & Sala-i-Martin, X. (1990). Economic growth and convergence across the United States. *NBER Working Paper*, (w3419).

Barro, R. J., & Sala-i-Martin, X. (1992). Convergence. *Journal of Political Economy*, 100(2), 223-251.

Bartkowska, M., & Riedl, A. (2012). Regional convergence clubs in Europe: Identification and conditioning factors. *Economic Modelling*, 29(1), 22-31.

Baumol, W. J. (1986). Productivity growth, convergence, and welfare: what the long-run data. *The American Economic Review*, 76(5), 1072-1085

Beck, G.W., Hubrich, K. ve Marcelliono, M. (2006). Regional inflation dynamics within and across Euro Area Countries and a Comparison with the US. *European Central Bank Working Paper Series*, No 681.

Belke, M., & Al, İbrahim. (2019). Türkiye'de bölgesel enflasyon yakınsaması: panel birim kök testlerinden kanıtlar. *Uluslararası Ekonomi ve Yenilik Dergisi*, 5(2), 301-323.

Bhattacharya, M., Inekwe, J. N., & Sadorsky, P. (2020). Consumption-based and territory-based carbon emissions intensity: determinants and forecasting using club convergence across countries. *Energy Economics*, 86, 104632.

Borsi, M. T., & Metiu, N. (2015). The evolution of economic convergence in the European Union. *Empirical Economics*, 48, 657-681.

Brito, P., & Correia, I. (2000). Inflation differential and real convergence in Portugal. *Banco de Portugal, Economic Bulletin*, 6(2).

Brož, V., & Kočenda, E. (2018). Dynamics and factors of inflation convergence in the European Union. *Journal of International Money and Finance*, 86, 93-111.

Busetti, F., Fabiani, S., & Harvey, A. (2006). Convergence of prices and rates of inflation. *Oxford Bulletin of Economics and Statistics*, 68, 863-877.

Cavallaro, E., & Villani, I. (2021). Club convergence in EU Countries. *Journal of Economic Integration*, 36(1), 125-161.

Ciccarelli, M., & Mojon, B. (2010). Global inflation. *The Review of Economics and Statistics*, 92(3), 524-535.

Cottarelli, C. (1998). The nonmonetary determinants of inflation: A panel data study. *IMF Working Papers*, 1998(023).

Cuestas, J. C., Gil-Alana, L. A., & Taylor, K. (2016). Inflation convergence in Central and Eastern Europe vs. the Eurozone: Non-linearities and long memory. *Scottish Journal of Political Economy*, 63(5), 519-538.

Çakır, M., & Gunduz, L. (2022). Price level convergence in Turkey. *Applied Economics Letters*, 29(20), 1921-1926.

De Long, J. B. (1988). Productivity growth, convergence, and welfare: comment. *The American Economic Review*, 78(5), 1138-1154.

Domaç, I., & Yücel, E. M. (2005). What triggers inflation in emerging market economies?. *Review of world economics*, 141, 141-164.

Dowrick, S., & Nguyen, D. T. (1989). OECD comparative economic growth 1950-85: catch-up and convergence. *The american economic Review*, 1010-1030.

Dreher, A. (2006). Does globalization affect growth? Evidence from a new index of globalization. *Applied economics*, 38(10), 1091-1110.

Fan, X., Wang, X., Xu, Z., & Skare, M. (2023). Food price inflation convergence: an international study from 2000–2020. *British food journal*, 125(3), 794-809.

Feldkircher, M., & Siklos, P. L. (2019). Global inflation dynamics and inflation expectations. *International Review of Economics & Finance*, 64, 217-241.

Fischer, S., Sahay, R., & Végh, C. A. (1996). Economies in transition: The beginnings of growth. The *American Economic Review*, 86(2), 229-233.

Fritsche, U., & Kuzin, V. (2008). Convergence in Europe in a nonlinear factor model. Ecomod.net

Furuoka, F., Pui, K. L., Chomar, M. T., & Nikitina, L. (2021). Is the Phillips curve disappearing? Evidence from a new test procedure. *Applied Economics Letters*, 28(6), 493-500.

Gharehgozli, O., & Lee, S. (2022). Money supply and inflation after COVID-19. *Economies*, 10(5), 101.

Gao, L., Abbas, S. K., & Lan, H. (2023). Globalization and inflation dynamics: evidence from emerging economies. *Applied Economics*, 1-18.

Gluschenko, K. (2010). Methodologies of analyzing inter-regional income inequality and their applications to Russia. *William Davidson Institute Working Paper*. No:984

Güriş, S., Ebru Ç., and Hoşeng B., (2020). Enflasyon yakınsamasının Fourier birim kök testleri ile incelenmesi: Kırılgan Beşli Örneği. *Sosyal Bilimler Araştırma Dergisi* 9. 85-92.

Gygli, S., Haelg, F., Potrafke, N., & Sturm, J. E. (2019). The KOF globalisation index–revisited. *The Review of International Organizations*, 14, 543-574.

Hałka, A., & Leszczyńska-Paczesna, A. (2019). Price convergence in the European Union–What has changed?. *Economic Modelling*, 79, 226-241.

Hepsag, A. (2017). Inflation convergence among the next eleven economies: Evidence from asymmetric nonlinear unit root test. *Theoretical & Applied Economics*, 24(4).

Herrerias, M. J. (2013). The environmental convergence hypothesis: carbon dioxide emissions according to the source of energy. *Energy policy*, 61, 1140-1150.

Holmes, M. J. (2002). Panel data evidence on inflation convergence in the European Union. *Applied Economics Letters*, 9(3), 155-158.

Hussain, S., & Malik, S. (2011). Inflation and economic growth: Evidence from Pakistan. *International Journal of Economics and Finance*, 3(5), 262-276.

Ihrig, J., Kamin, S. B., Lindner, D., & Marquez, J. (2010). Some simple tests of the globalization and inflation hypothesis. *International Finance*, 13(3), 343-375.

Ilzetzki, E., Reinhart, C. M., & Rogoff, K. S. (2019). Exchange arrangements entering the twenty-first century: Which anchor will hold?. *The Quarterly Journal of Economics*, 134(2), 599-646.

Islam, N. (2003). What have we learnt from the convergence debate?. *Journal of economic surveys*, 17(3), 309-362.

Ivanovski, K., & Churchill, S. A. (2020). Convergence and determinants of greenhouse gas emissions in Australia: A regional analysis. *Energy Economics*, 92, 104971.

Kang, S. H., Hernandez, J. A., & Yoon, S. M. (2019). Who leads the inflation cycle in Europe? Inflation cycle and spillover influence among Eurozone and non-Eurozone economies. *International Economics*, 160, 56-71.

Karagöl, E. T., Görüş, Ş., & Özgür, Ö. (2019). Club Convergence in Turkey: evidence from provincial income data. *Uluslararası Yönetim, Ekonomi ve Politika Kongresi*, İstanbul/Türkiye.

Karanasos, M., Koutroumpis, P., Karavias, Y., Kartsaklas, A., & Arakelian, V. (2016). Inflation convergence in the EMU. *Journal of Empirical Finance*, 39, 241-253.

King, R. G., & Rebelo, S. (1989). Transitional dynamics and economic growth in the neoclassical model. *NBER Working Papers*. No:3185

Kocenda, E., & Papell, D. H. (1997). Inflation convergence within the European Union: A panel data analysis. *International Journal of Finance & Economics*, 2(3), 189-198.

Kraus, S., Clauss, T., Breier, M., Gast, J., Zardini, A. and Tiberius, V. (2020). The economics of COVID-19: initial empirical evidence on how family firms in five European countries cope with the corona crisis, *International Journal of Entrepreneurial Behavior and Research*, 26(5), 1067-1092.

Kurozumi, E., Yamazaki, D., & Hadri, K. (2012). Covariate unit root test for cross-sectionally dependent panel data. *Queen's Management School Working Paper Series*. No: 13-01

Liu, T. Y., & Lee, C. C. (2021). Global convergence of inflation rates. *The North American Journal of Economics and Finance*, 58, 101501.

Lopez, C., & Papell, D. H. (2012). Convergence of euro area inflation rates. *Journal of International Money and Finance*, 31(6), 1440-1458.

Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The quarterly journal of economics*, 107(2), 407-437.

Mazumder, S. (2017). The impact of globalızatıon on inflatıon in Developıng Countrıes. *Journal of Economic Development*, 42(3).

Mentz, M., & Sebastian, S. P. (2003). Inflation convergence after the introduction of the Euro. *SSRN Working Paper*. No. 460820.

Murphy, A., The Death of the Phillips Curve? (2018). *FRB of Dallas Working Paper* No. 1801.

Nagayasu, J. (2010). Regional inflation (price) behaviors: heterogeneity and convergence. *MPRA Working Paper*, No: 25430

Nyong, M. O., & Omobitan, O. A. (2013). Nonlinear income convergence and structural breaks: further empirical evidence. *International Journal of Economics and Finance*, 5(4), 81-88.

Nzimande, N. (2021). Income convergence in Southern Africa: A Nonlinear Time-Varying Coefficients Framework. *Economic Research Southern Africa*. No. 858

Özdurak, C., & Uzunoğlu, S. (2023). The divergence of bank lending rates from policy rates in Turkey: A monetary experiment or an unconventional approach in dealing with high inflation. *SSRN Working Paper*. No:4659096.

Peiró-Palomino, J., Prieto-Bustos, W. O., & Tortosa-Ausina, E. (2023). Regional income convergence in Colombia: population, space, and long-run dynamics. *The Annals of Regional Science*, 70(2), 559-601.

Phillips, A. W. (1958). The relation between unemployment and the rate of change of money wage rates in the United Kingdom, 1861-1957. *Economica*, 25(100), 283-299.

Phillips, P. C., & Sul, D. (2007). Transition modeling and econometric convergence tests. *Econometrica*, 75(6), 1771-1855.

Saba, C. S., & Ngepah, N. (2022). Convergence in renewable energy sources and the dynamics of their determinants: An insight from a club clustering algorithm. *Energy Reports*, 8, 3483-3506.

Sala-i-Martin, X. X. (1996a). Regional cohesion: evidence and theories of regional growth and convergence. *European Economic Review*, 40(6), 1325-1352.

Sala-i-Martin, X. X. (1996b). The classical approach to convergence analysis. *The Economic Journal*, 106(437), 1019-1036.

Schnurbus, J., Haupt, H., & Meier, V. (2017). Economic transition and growth: a replication. *Journal of Applied Econometrics*, 32(5), 1039-1042.

Siklos, P. L., & Wohar, M. E. (1997). Convergence in interest rates and inflation rates across countries and over time. *Review of International Economics*, 5(1), 129-141.

Simionescu, M. (2015). The impact of economic crisis on inflation convergence in the European Union. A panel data approach. *CEA Journal of Economics*, 10(1).

Spiru, A. M. (2008). Inflation convergence in Central and Eastern European economies. *Romanian Economic and Business Review*, 3(4), 14-34.

Tsafa-Karakatsanidou, M., & Fountas, S. (2018). Testing for inflation convergence among European Union Countries: A panel approach. *Applied Economics Quarterly*, 64(1), 17-37.

Valera, M. L. G., & Valera, H. G. (2014). Testing the inflation convergence among the original ASEAN Members. *Journal of Global Business and Trade*, 10(2), 71-78.

Yilmazkuday, H. (2013). Inflation targeting, flexible exchange rates and inflation convergence. *Applied Economics*, 45(5), 593-603.

Yilmazkuday, H. (2023). Drivers of inflation convergence across countries: the role of standard gravity variables. Macroeconomic Dynamics, 27(6), 1664-1686.

Appendix A.: Convergence Clubs For Each Income Group

Income Groups	Clubs	Club Members	Annual Inflation Rate (Average of Last Five Years, %)
High Income Countries	Convergence Club 1	Bulgaria, Chile, Croatia, Hungary, Panama, Poland, Romania , Russian Federation, Saudi Arabia	5.28
	Not Convergent Club	Kuwait, United Arab Emirates, Uruguay	3.84
Upper Middle Income Countries	Convergence Club 1	Algeria, Brazil, China PR: Hong Kong, Colombia , Costa Rica, Ecuador, Guatemala, Indonesia, Jamaica , Kazakhstan, Mexico, Montenegro , North Macedonia Republic of, Peru, Serbia, South Africa , Thailand, Türkiye Rep of	4.95
	Convergence Club 2	Albania, Armenia, Bosnia and Herzegovina , China PR: Mainland, El Salvador, Kosovo, Malaysia , Paraguay	3.4
	Convergence Club 3	Azerbaijan, Georgia, Ukraine	8.12
	Not Convergent Club	Belarus, İran	24.10
Lower Middle Income Countries	Convergence Club 1	Angola, Egypt, India, Jordan, Pakistan, Sri Lanka, Tunisia	11.50
	Convergence Club 2	Bolivia, Morocco, Philippines	2.89