A Comparative analysis of the Phillips Curve relationship in Inflation Targeting Economies

Abstract

Our study examines the Phillips curve relationship in 87 Inflation-targeting (IT) economies, intending to compare and analyse this relationship for all 87 IT economies, 51 Non-OECD (Organisation for Economic Cooperation and Development) IT economies, 20 founding OECD IT economies, and 35 present OECD IT economies using both Accelerationist and New Keynesian Phillips Curve approaches with panel data econometric methods. The study also covers pre- and post-global financial crisis periods (GFC). The result from the study suggests the presence of a statistically strong Phillips curve relationship in founding OECD IT economies, which hints that the Phillips curve is valid only for high-income developed economies where inflation expectations are well anchored and macroeconomic variables like inflation and unemployment rate are less volatile as compared to other IT economies. We also found a hint of weakening/flattening of the Phillips curve relationship post-GFC.

Introduction

Inflation and unemployment are the two most critical macroeconomic indicators that concern every country. The formal relationship between the two was first documented by Willian Phillips in 1958 as the Phillips curve. Using United Kingdom (U.K.) data from 1861-1957, Phillips found an inverse relationship between the unemployment rate and wage inflation. A similar study conducted by Solow and Samuelson (1960) in the context of the United States gave identical results reconfirming the Phillips curve's existence curve. Later, several other studies explored this relationship in different contexts and periods, and the following empirical results presented mixed results. Some results demonstrated a positive relationship between the unemployment and inflation rates, leading to strong criticism of the Phillips curve. The first evidence of the breakdown of the Phillips curve was observed during the episode of stagflation in the early 1970s, where both the unemployment rate and inflation were rising simultaneously. Eminent economist Milton Friedman was the first to criticize the Phillips curve in his study "The Role of Monetary Policy." He concluded that the Phillips

curve holds in the short run, but there is no trade-off between the unemployment rate and inflation in the long run. He explained the role of inflationary expectations by the households and the firms in shaping the relationship between the two variables. He argued that these inflationary expectations by the household and the firms are indeed responsible for no trade-off between inflation and unemployment rate in the long run.

Many studies have come up since then which have studied this relationship in a country-level and cross-country framework using different methodologies and periods. Also, few studies have come up that have analyzed this relationship using sub-national data (Behera et al., 2017). Still, most of them have been confined to the United States (US) and a few advanced economies. Most of these studies were best suited to measure the linear relationship between unemployment rate and inflation. However, Ball et al. (1988) concluded that the Phillips curve is convex in the short run. This led to further studies exploring the Phillips curve's nonlinearity assumption. Palley (2003), using the backward-bending Phillips curve, concluded that a negative relationship between inflation and the unemployment rate holds when the level of inflation is low, but this relationship gets reversed when the level of inflation is high. Since then, many other pieces of literature have studied this relationship using output gap/economic growth as a demand-side proxy for the unemployment rate and found mixed results. These studies found a threshold level of inflation that has a positive/negative effect on economic growth.

Some recent literature presented another interesting dimension, i.e., the flattening of the Phillips curve, which raised further questions on its empirical validity. The observed flattening of the Phillips curve could be due to anchored inflationary expectations, as Blanchard et al. (2016) argued. An IMF (2013) study presented evidence of the weakening of the Phillips curve. In their seminal work, Fitzgerald et al. (2013) also argued that this relationship might become loose if the central bank can rein in inflation and anchor inflationary expectations. The study concluded that during excessive disinflation, the flattening of the Phillips curve could be partly explained by the underutilization of labor. In contrast, the stronger impact of global factors on core inflation suggests strengthening indirect effects. Some recent literature in the NKPC framework too claims that the slope is flattening, though the slope is negative (Costain et al. (2022); Galí and Gambetti (2019); Hazell et al. (2022)).

Our study contributes to the above discussion by analysing the Phillips curve relationship for 87 Inflation-targeting (IT) economies. The list of these IT economies has been derived from Dubey & Mishra (2023). The list provides a detailed list of IT countries with their adoption dates divided into advanced IT economies, emerging market IT economies, low-income IT economies, and IT lite economies (countries that float their currency and announce IT regime but are not able to maintain IT as a priority policy objective). The analysis done in our study has been divided into all 87 IT countries, 51 non-OECD (Organisation of Economic Cooperation and Development) IT economies, and 20 founding and 35 present OECD IT economies, respectively. The study aims to compare the Phillips curve relationship (coefficient of unemployment rate) for these IT economies, which are divided into different groups. We expect to find a negative trade-off between inflation and the unemployment rate in an IT regime, as the performance of the Phillips curve is much better in the IT regimes, as especially in the later periods (Gabrielyan, 2018). The study has also been divided into different regimes, such as before and after the global financial crisis. The results have been estimated using both the Accelerationist Phillips Curve (APC) and New Keynesian Phillips Curve (NKPC) approaches, and the panel data econometric methods have been used for analysis.

The paper is organized as follows. Section 1 presents a literature review and theoretical framework in Section 2. Section 3 presents empirical strategy followed by data and methodology in section 4. Section 5 presents results and findings followed by conclusion and policy discussion in section 6.

Literature review

In his influential paper "The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861–1957" (1958), William Phillips found an inverse relationship between wage inflation and the unemployment rate. In a similar study in the US context, Solow and Samuelson (1960), using twenty-five years of data, found similar results. Since then, numerous works have come up that have studied this relationship in different contexts and using various methodologies. However, not all studies presented similar results. The Phillips curve was first observed to break down during an episode of stagflation in the early 1970s, where the relationship between inflation and the unemployment rate was positive. The idea of the Phillips curve was first criticized by Milton

Friedman (1968) in "The Role of Monetary Policy." He argued that the Phillips curve relationship is more of a loose association but not a permanent one. It may hold in the short run but not in the long run. Various empirical studies have found this relationship very unstable and sometimes even positive. King et al. (1995) documented the instability of the Phillips curve for the US in their study. They found that the relationship between inflation and unemployment appeared positive during normal periods and negative during business cycles, i.e., during periods of boom and recession. In other words, their study concludes that the Phillips curve is a business cycle phenomenon

Ball et al. (1988) concluded that the Philips curve is convex shaped in the short run. They argued that it was costly for workers to change prices frequently due to adverse demand shock due to wage contracts and menu costs between firms and the workers. However, when inflation increases due to an increase in demand, firms will be more willing to raise prices in response to this increase in demand. Hence, the relation between output and inflation varies with the level of inflation. Similarly, based on the downward nominal wage rigidity assumption, Palley (2003) proposed a theory of the backward-bending Phillips curve, in which he argued that a negative relationship between inflation and unemployment exists when inflation is low. Vinayagathasan (2013) used dynamic panel threshold growth to study the relationship between inflation and economic growth in the context of 32 Asian economies from 1980 to 2009 and found a non-linear relationship between the two variables. Similarly, few other literatures also talked about the threshold level of inflation above which the relationship between inflation and output growth changes (Sarel, 1996; Ghosh & Phillips, 1998; Khan & Senhadii, 2001; Kremer, Bick, and Nautz, 2009; Guimaraes & Papi, 2016).

Dua and Gaur (2009), in their paper using the instrumental variable approach, analyzed the Phillips curve relationship using both backward (APC approach) and forward-looking (NKPC approach) for eight Asian economies, i.e., Japan, Korea, Hong Kong, Singapore, Philippines, Thailand, China and India (a mix of both developed and developing economies). Their analysis was conducted using the time-series data for each country separately. They concluded from their study that backward-looking and forward-looking inflation expectations are important in explaining inflation. They forecasted forward inflation using an ARIMA-based approach and concluded that four quarters ahead of inflation expectations provide a better fit than one quarter ahead. The output gap is significant across all estimations, i.e., for developed and developing Asian economies. The important point they made in their study is

that though both forward-looking and backward-looking Phillips Curves are important in explaining inflation, forward-looking measures provide a better fit than backward-looking measures.

Some recent studies on the relationship between inflation and the unemployment rate present another dimension, i.e., the flattening of the Phillips Curve, which raised further questions on its empirical validity. This has important policy implications: "To the extent that the unemployment gap has a smaller effect on inflation, monetary policy rules should put relatively more weight on the unemployment gap relative to inflation. Trying to stabilize inflation may require vast movements in the unemployment gap" (Blanchard et al., 2015). The observed flattening of the Phillips curve could be due to anchored inflationary expectations, as Blanchard et al. (2015) argued. An IMF (2013) study presented evidence of the weakening of the Phillips curve. The study concluded that the Phillips curve has become flatter in present times than in the past. Fitzgerald et al. (2013) also argued that the relationship between inflation and unemployment might become flat if the central bank rein in inflation and anchored inflationary expectations well. Laseen and Sanjani (2016) studied the Phillips curve relationship in the wake of changing inflation dynamics and its interaction with the unemployment rate. They concluded that the global financial crisis (GFC) did not break the Phillips curve.

Jasova et al. (2019), in their study using quarterly data from 1994 to 2017, analyzed the role of domestic and global output gaps as inflation drivers for a panel of 26 advanced and 22 emerging economies. Based on the NKPC approach, they concluded that in the case of emerging economies, the domestic output gap (a measure of domestic economic activity) had remained the major driver of inflation both in the pre-crisis (1994-2008) and post-crisis (2008-2017), while the role of foreign output gap has declined. Gao et al. (2023), using quarterly data from 1996 to 2019 for fifteen emerging economies utilizing the smooth transition regression (STR) approach, concluded that the domestic output gap remains one of the major drivers of inflation in these fifteen emerging economies. In contrast, the foreign output gap remains the insignificant driver. They also concluded that globalization based on the trade-weighted average of the domestic output gap did not affect the inflation process compared to other variables like trade openness, import prices, real exchange rate, and international oil prices. These pieces of literature suggest that traditional global factors are

important as they can act as a measure of global supply shock impacting inflation dynamics in an economy. It gives an idea about the control variables needed for the estimation of the Phillips curve in these economies, and following this, we have included crude oil inflation and exchange rate inflation in our analysis. Food inflation is an important driver of general inflation, especially in developing countries. Following Behera et al. (2017) argument that food inflation acts as an important supply-side factor impacting headline and core inflation, we have also included food inflation as a control variable as our dependent variable is headline inflation.

Further considering the role of global factors, Borio & Filardo (2007), in their study, argued that global factors are important factors influencing a country's inflation dynamics, and these factors have increased since the 1990s. Several studies have explored the behavior of the Phillips curve, taking trade/financial openness (a proxy for an economy's openness). Forbes (2019), in her study, also found that globalization was an important factor that influenced the inflation dynamics of the country. On the contrary, Ball (2006) concluded that global factors do not affect the inflation dynamics in the US context. Auer et al. (2013), in their study based on the Asia-Pacific region, concluded that the integration of economies (globalization) affects domestic prices through the cost-push channel as it affects the sensitivity of prices in a home country. On the contrary, Kohlscheen & Moessner (2022), in their study based on OECD countries, found that the positive effect of the output gap on inflation decreases as the degree of integration of an economy into the world economy increases. In other words, economic integration is a responsible force behind the flattening of the Phillips Curve.

Earlier, Romer (1993), in his work based on cross-country framework, concluded that the more open economies, the lower the inflation. He argued that this negative relationship was due to the dynamic inconsistency of discretionary monetary policy. The underlying theoretical reasoning for the argument followed from the work of Rogoff's (1985) model, which showed that the more open the economy, the less the surprise from gain or loss from inflation. On the contrary, Laura (2004), in her study, argued that the openness of an economy is not negatively related to inflation, and her results are robust after controlling for other variables that determine inflation and performing some sensitivity analysis. Temple (2002), too, finds little evidence of a correlation between openness and output-inflation trade-off.

Most of the studies discussed above have studied the impact of trade openness on the slope of the Phillips curve, while some studies have also addressed the role of financial openness on the slope of the Phillips curve. Loungani et al. (2001) argued that the restrictions on capital mobility make the Phillips curve steep, i.e., the trade-off between inflation and output is low, meaning the loss in output due to a reduction in inflation is low in countries with higher capital movement restrictions. Razin and Loungani (2005) studied the role of both financial openness and trade openness on the slope of the Phillips curve. They concluded that both trade and financial openness have a negative effect on inflation and a positive impact on inflation-output trade-off. Badinger (2009), using a large cross-section of 91 countries over the period 1985–2004, also considered the role of financial openness in estimating its effect on the slope of the Phillips curve, as omitting it in the regression analysis could lead to endogeneity issues due to omitted variable bias. The study concluded that countries with less financial and trade restrictions have lower inflation rates and higher output-inflation trade-offs. Hence, following the arguments in the above-mentioned literature, we have included KOF financial openness from the KOF Swiss Economic Institute portal index as a control variable in our estimation. We have used two indexes in our estimation that differ in composition, i.e., financial openness index, de facto for our baseline estimation, financial openness index, and de jure for robustness test. The underlying argument is that financial openness can affect the inflation dynamics in an economy, as Guender et al. (2023) found an inverse relationship between financial openness and inflation based on CPI in over 100 countries. Also, as discussed above, regarding the growing role of global factors in shaping the domestic inflation dynamics of an economy, we have controlled for traditional global factors in our estimation, i.e., exchange rate inflation and crude oil inflation.

Theoretical framework

The relationship between inflation and unemployment is one of the most discussed themes in macroeconomic theory, and the evolution of the Phillips Curve is rooted in this relationship. We used predominantly two frameworks to examine this relationship: the APC and the NKPC. These frameworks are mostly used in analysing the Phillips Curve relationship in different economies (or group of economies).

The APC, evolved from the criticism of Keyensian Phillips Curve as proposed by Friedman and Phelps in the late 1960s, laid emphasis on the adaptive inflation expectations. Friedman

and Phelps concluded that the Phillips Curve relationship only holds in the short run, but in long run, when economic agents fully adjust their inflation expectations based on past inflation, this relationship does not hold. They argued that once people adjusted their inflation expectations fully in the long run (by adapting to higher inflation), the trade-off would disappear, meaning that efforts to reduce unemployment through inflationary policies would ultimately fail and result in higher inflation without reducing unemployment. But this also signifies a very high trade-off coefficient in the Phillips curve equation, as this means for low changes in unemployment rate, there is very high changes in inflation which becomes infinite when the Phillips curve become vertical. This vertical Phillips curve is also referred to as no-trade-off condition. They also brought in the concept of natural rate of unemployment and argued that economy is stable at the level of natural rate of unemployment in the long run. In the long term, attempts to maintain unemployment below the natural rate result in accelerating inflation due to the upward adjustment of inflation expectations. Hence, the APC framework as presented by Friedman and Phelps, very closely resembles the classical approach, which posits that there is no long run relationship between inflation and unemployment due to non-existence of wage-price rigidity (wages and prices are fully flexible in the long run).

The NKPC framework, another widely used approach for analysing the Phillips Curve relationship, replaced adaptive inflation expectations with forward looking inflation expectations, also called as expected inflation in our analysis. This approach derives its essence from the rational expectations model which implies that current inflation is dependent on expected future inflation. The rational expectations theory implies that economic agents with all available information make predictions about future inflation. The proponents of rational expectations model argue that people don't make any systematic error in forming inflation expectations. They may however be fooled but monetary authorities by unexpected monetary expansion and rise in price level, in believing that their real wages had risen. Similarly, firms also believe the prices of their products have risen. This means there might be trade-off between economic activity and inflation in the short run. But, in the long run economic agents adjust to their mistakes, and there is no long run trade-off. An important dimension that differentiates NKPC approach from APC approach is that it attributes changes in inflation dynamics to changes in real cost of production rather than strictly labor market metrics.

The confluence of the APC and NKPC models captures both retrospective and prospective inflation expectations, allowing detailed insight into variations across different economies within IT regimes. This theoretical orientation positions our empirical investigation to interrogate how variations in adaptive and rational expectations bear upon inflation and unemployment dynamics. Through examining heterogeneous groups such as OECD and non-OECD economies, our research contributes to explaining the applicability of Philips Curve relationship across diverse macroeconomic landscapes.

Empirical Strategy

We estimated the results using panel data econometric methods. The estimated equations are given below –

$$inf_{i,t} = \propto + \beta_1 inf_{i,t-1} + \beta_2 (U - \overline{U})_{i,t} + \beta_3 exc_{i,t} + \beta_4 food_{i,t} + \beta_5 crude_{i,t} + \beta_6 gog_{i,t} + \beta_7 it_{i,t} + \beta_8 gidf_{i,t} + \mu_i + e_{it} \ldots\ldots\ldots (1)$$

$$inf_{i,t} = \propto + \beta_1 einf_{i,t} + \beta_2 (U - \overline{U})_{i,t} + \beta_3 exc_{i,t} + \beta_4 food_{i,t} + \beta_5 crude_{i,t} + \beta_6 gog_{i,t} + \beta_7 it_{i,t} + \beta_8 gidf_{i,t} + \mu_i + e_{it} \ldots\ldots\ldots (2)$$

Where,

$inf_{i,t}$ = Inflation rate of countries in time-period t based on Consumer Price Index (CPI).
$inf_{i,t-1}$ = Inflation rate of countries in time-period t-1.
$(U - \overline{U})_{i,t}$ = Unemployment rate of countries in time-period t (Deviation of actual unemployment rate from the natural rate of unemployment).
$\overline{U}$ = The natural rate of the unemployment rate is calculated from the trend component of the Hodrick Prescott filter series.
$exc_{i,t}$ = Exchange rate inflation of countries vis-à-vis US dollar in time-period t.
$einf_{i,t}$ = The expected inflation rate is calculated from the trend component of inflation from the Hodrick Prescott filter series in time-period t.
$crude_{i,t}$ = Annual global prices of brent crude oil in U.S. dollars per barrel of countries in time-period t (inflation form).
$food_{i,t}$ = Global food inflation of countries in time-period t.

$gog_{i,t}$ = Global output gap of countries in time-period t.
$it_{i,t}$ = IT dummy variable (takes the value 1 from the year when countries officially adopted IT regime; otherwise, 0).
$gidf_{i,t}$ = Financial globalization index of countries in time-period t (Financial globalization, de facto from KOF Swiss Economic Institute portal).
μ_t = Within entity error term.
e_{it} = Overall error term.

In equation (1), we have used adaptive inflation expectations ($inf_{i,t-1}$), whereas, in equation (2), this is replaced with future inflation expectations ($einf_{i,t}$). Equation 1 is the Phillips curve based on the APC approach, whereas equation 2 is based on the NKPC approach.

We used specification tests like the existence of unit roots, cross-sectional dependence, and panel heterogeneity. We found the presence of strong cross-sectional dependence in all the variables used in the estimation using the test used for cross-sectional dependence described in Pesaran (2004) and Pesaran (2015). We also found the presence of heteroskedasticity in the residuals of a fixed effect regression model, following Greene (2000, p. 598). Lastly, we found the presence of serial correlation in the idiosyncratic errors following Wooldridge (2002).

Then, we tested for a unit root using the Pesaran panel unit root test in the presence of cross-sectional dependence (Pesaran, 2007) and found that all the variables were stationary. Then, we resorted to various panel regression specifications: driscoll kraay standard errors, dynamic panel estimation using Blundell and Bond (1998), tobit model for high, medium, and low inflation regimes, and regression results with structural breaks.

Estimating driscoll kraay standard errors provides estimates that are robust to heteroscedasticity, cross-sectional dependence, and autocorrelation up to some lags; in addition to that, we have used dynamic panel estimations to address endogeneity issues related to the static regression model. The residuals obtained from static regression (driscoll kraay standard errors) were found to be correlated with $inf_{i,t-1}$ and $einf_{i,t}$. Hence, we chose results from the dynamic panel. For tobit model regressions, we defined three regimes as high, medium, and low inflation regimes. For each group of countries, for example, founding

OECD countries, we calculated the average inflation target rate of all the countries in this group, i.e., 2 percent. Then, we created an inflation band of $\pm$ 1.5 percent, i.e., 0.5 to 3.5 percent, and categorize this as a medium inflation regime. An inflation rate above 3.5 percent has been categorized as a high inflation regime, and an inflation rate below 0.5 percent has been categorized as a low inflation regime. We also tested for structural breaks and presented results in different regimes accounting for break periods (for founding and present OECD IT economies only). We used yearly data, and the period of our analysis is from 1992 to 2021. We have not specifically controlled for time-fixed effect in our regression model as our three independent variables i.e. food, crude oil and global output gap capture the time-fixed effect since they change over time within each entity but remain fixed for all entities.

Data sources

The inflation data (based on CPI), unemployment rate, and exchange rate (local currency against US dollar) data are sourced from World Bank Development Indicators (WDI). The financial globalisation index, de facto is sourced from the KOF Swiss Economic Institute portal. The list of IT countries (IT dummy variable) was sourced from Dubey & Mishra (2023) and IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). Crude oil price data and Fed rate were obtained from the Federal Reserve Bank of St. Louis portal, and food prices were obtained from the Food and Agricultural Organisation (FAO) portal.

Results and findings

Table 1: Summary statistics of variables used in estimation.

Variable	Obs	Mean	Std. Dev.	Min	Max
Inflation (inf)	2594	18.418	153.495	-6.243	4734.91
Lag 1 inflation (linf)	2515	18.85	155.867	-6.243	4734.91
Unemployment gap (uubar)	2640	0	1.35	-9.26	12.158
Exchange rate (exci)	2572	9.697	86.506	-99.946	3070.25
Crude oil (crude)	2640	8.002	27.518	-46.628	63.455
Food prices (food)	2640	3.152	12.678	-21.997	29.892
Global output gap (gog)	2552	.005	.956	-3.502	3.367
Fed rate (fed)	2640	2.46	2.131	.08	6.24
Inflation Targeting (it)	2640	.219	.414	0	1
Financial globalization gidf)	2550	59.653	20.552	3.068	99.781

Table 2: Pairwise correlation of variables used in estimation.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) inf	1.000									
(2) linf	0.579	1.000								
(3) uubar	-0.053	0.016	1.000							
(4) exci	0.968	0.453	0.026	1.000						
(5) crude	-0.039	-0.025	-0.050	-0.066	1.000					
(6) food	0.001	0.023	-0.112	-0.050	0.558	1.000				
(7) gog	-0.008	-0.011	-0.033	-0.017	0.561	0.333	1.000			
(8) fedrate	0.063	0.100	-0.104	0.065	0.138	-0.017	0.013	1.000		
(9) it	-0.052	-0.053	0.014	-0.047	0.000	0.027	0.005	-0.194	1.000	
(10) gidf	-0.178	-0.172	0.002	-0.137	0.005	0.017	-0.048	-0.252	0.216	1.000

Table 3: Results based on APC (All IT countries).

Model	**Coefficient of Unemployment rate**
Dynamic panel	-1.732
Sub-sample 1: 1992-2007 (Dynamic panel)	-1.702*
Sub-sample 2: 2008-2021 (Dynamic panel)	-0.176
Above 4.87 percent (High inflation regime)	-0.369
Between 1.87 to 4.87 percent (Medium inflation regime)	-0.237
Below 1.87 (Low inflation regime)	-0.206
Robustness 1 (including another financial globalisation index, de jure-Dynamic panel)	-1.800

*Note: *, **, and *** indicate significance at 10, 5, and 1 percent levels, respectively.*

In Table 3 above, we have presented a summary of regression results for all 87 IT countries used in the analysis using the APC approach. We got an insignificant negative coefficient of the unemployment rate, i.e., -1.732 (dynamic panel). Adaptive inflation expectations (lag 1 inflation), exchange rate inflation, crude oil inflation, and food inflation are found to be significantly positively affecting inflation (Appendix Table 1). The results obtained from the sub-sample analysis, i.e., from 1991 to 2007 (pre-GFC), suggest a negative coefficient of unemployment rate of. –1.702*. The results obtained from tobit regression are insignificant though the coefficient is negative. The results obtained using another index of financial

openness index also found an insignificant coefficient of the unemployment rate as in our baseline estimation (-1.800).

Table 4: Results based on NKPC (All IT countries).

Model	**Coefficient of Unemployment rate**
Driscoll Kraay standard errors	-0.481
Dynamic panel	-1.603
Sub-sample 1: 1992-2007 (Dynamic panel)	-0.820
Sub-sample 2: 2008-2021 (Dynamic panel)	-0.176
Above 4.87 percent (High inflation regime)	-0.369
Between 1.87 to 4.87 percent (Medium inflation regime)	-0.237
Below 1.87 (Low inflation regime)	-0.206
Robustness 1 (including another financial globalization index, de jure- Dynamic panel)	-0.142

*Note: *, **, and *** indicate significance at 10, 5, and 1 percent levels, respectively.*

In the results obtained from Table 4 above for all 87 IT countries using the NKPC approach, we again found an insignificant coefficient of unemployment rate. The sub-sample analysis results are found to be insignificant again. The results from all tobit regression in high, medium, and low inflation regimes are found to be insignificant. Our robustness test also suggests an insignificant coefficient of the unemployment rate.

Table 5: Results based on APC (Non-OECD IT countries).

Model	**Coefficient of Unemployment rate**
Dynamic panel	-2.550
Sub-sample 1: 1992-2007 (Dynamic panel)	-1.638
Sub-sample 2: 2007-2021 (Dynamic panel)	-4.343
Above 5.60 percent	-0.648
Between 2.60 to 5.60 percent	-0.143
Below 2.60 percent	-0.256***

Robustness 1 (including another financial globalisation index, de jure- Dynamic panel)	-3.413

*Note: *, **, and *** indicate significance at 10, 5, and 1 percent levels, respectively.*

The results from Table 5 above based on the APC approach for 51 non-OECD IT countries found no significant coefficient of unemployment rate. Also, all our estimations in the above table found insignificant coefficient of unemployment rate.

Table 6: Results based on NKPC (Non-OECD IT countries).

Model	**Coefficient of Unemployment rate**
Driscoll Kraay standard errors	-0.513
Dynamic panel	-1.816
Sub-sample 1: 1992-2007 (Dynamic panel)	-2.573
Sub-sample 2: 2008-2021 (Dynamic panel)	-0.139
Above 5.60 percent	-0.451
Between 2.60 to 5.60 percent	-0.243
Between 2.60 percent	-0.264
Robustness 1 (including another financial globalisation index, de jure)	-0.950

*Note: *, **, and *** indicate significance at 10, 5, and 1 percent levels, respectively*.

We found similar results using the NKPC approach for these 51 non-OECD countries (Table 6 above), as seen in the previous table (Table 5). Also, we only found exchange rate and food prices to be significantly positively affecting the inflation rate (Appendix: Table 2). We cannot conclude the presence of the Phillips curve as both APC and NKPC found an insignificant coefficient of unemployment rate.

Table 7: Results based on APC (Founding OECD IT countries).

Model	**Coefficient of Unemployment rate**
Dynamic panel	-0.157*
Sub-sample 1: 1992-2007 (Dynamic panel)	-0.481***

Sub-sample 2: 2008-2021 (Dynamic panel)	-0.127**
Above 3.5 percent	-0.288***
Between 0.5 to 3.5 percent	-0.129***
Below 0.5 percent	-0.199***
Robustness 1 (including another financial globalisation index, de jure- Dynamic panel)	-0.208**
Regression with structural break (Regime 1- 1993 to 2005)	-0.213**
Regression with structural break (Regime 2 -2006 to 2009)	-0.380***
Regression with structural break (Regime 3 -2010 to 2021)	-0.141**

*Note: *, **, and *** indicate significance at 10, 5, and 1 percent levels, respectively.*

The results above in Table 7 summarize regression output obtained for 20 IT founding members of the OECD using the APC approach. We found a significant negative coefficient of the unemployment rate, i.e., -0.157*. Also, exchange rate inflation, adaptive inflation expectations, global output gap and food inflation are significant. Our sub-sample regression results suggest a significant negative coefficient of unemployment rate. However, we find a declining unemployment rate coefficient post-GFC (-0.481*** to -0.127**). In all three regimes, we found a negative significant coefficient of unemployment rate. The results from our robustness test suggest a significant negative coefficient. As an additional measure of the robustness test, we have provided results accounting for structural breaks, which split the regression results (fixed effect regression) into different regimes depending on the number of breaks found. In all three regimes, we found a significant negative coefficient of unemployment rate with declining value after GFC.

Table 8: Results based on NKPC (Founding OECD IT countries).

Model	**Coefficient of Unemployment rate**
Driscoll Kraay standard errors	-0.118***
Dynamic panel	-0.100**
Sub-sample 1: 1992-2007 (Dynamic panel)	-0.652*
Sub-sample 2: 2008-2021 (Dynamic panel)	-0.158***
Above 3.5 percent	-0.222***
Between 0.5 to 3.5 percent	-0.121***

Below 0.5 percent	-0.235***
Robustness 1 (including another financial globalisation index, de jure-Dynamic panel)	-0.345**
Regression with structural break (Regime 1- 1992 to 2006)	-0.372***
Regression with structural break (Regime 2 -2007 to 2010)	-0.302***
Regression with structural break (Regime 3 -2011 to 2021)	-0.150**

*Note: *, **, and *** indicate significance at 10, 5, and 1 percent levels, respectively.*

The results obtained for 20 IT founding member countries using the NKPC approach also find a significant negative coefficient value, i.e., -0.118**. The results from our sub-sample analysis also suggest similar findings as in the APC approach, with a decline in coefficient value (from -0.652** to -0.158***). Our robustness test satisfies our baseline finding. The results accounting for structural breaks found similar results with a negative coefficient of unemployment rate in different regimes. Also, exchange rate inflation, adaptive inflation expectations, global output gap and food inflation are significant. As in our previous estimate using the APC approach, the coefficient of the unemployment rate is negative and significant in all estimations. Hence, based on the above discussion, we can conclude that the statistical presence of the Phillips curve relationship in founding OECD IT economies, as all our results are significant for both APC and NKPC (Table 7 and Table 8).

Table 9: Regression results (Founding OECD IT countries).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
linf	0.480***		
	(0.077)		
uubar	-0.157*	-0.100**	-0.147**
	(0.088)	(0.047)	(0.059)
exci	0.017	0.063***	0.015*
	(0.010)	(0.012)	(0.008)
crude	0.011***	0.022***	0.009**
	(0.004)	(0.005)	(0.004)
food	0.040***	0.033***	0.024***
	(0.007)	(0.008)	(0.005)

gog	0.151*	0.100*	0.022
	(0.087)	(0.052)	(0.108)
it	-5.412	-1.555	-0.030
	(9.193)	(1.534)	(0.110)
gidf	-0.004	-0.097**	-0.001
	(0.096)	(0.039)	(0.005)
tinf		0.811***	1.022***
		(0.273)	(0.065)
Constant	2.292	8.589**	0.299
	(5.520)	(3.458)	(0.486)
Observations	560	560	560
R^2			0.736

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 10: Results based on APC (Present OECD IT countries).

Model	**Coefficient of Unemployment rate**
Dynamic panel	-0.585***
Sub-sample 1: 1992-2007 (Dynamic panel)	-0.926
Sub-sample 2: 2007-2021 (Dynamic panel)	-0.456***
Above 3.82 percent	-0.798***
Between 0.82 to 3.82 percent	-0.172***
Below 0.82 percent	-0.178***
Robustness 1 (including another financial globalisation index, de jure)	-0.182
Regression with structural break (Regime 1- 1993 to 1996)	0.807**
Regression with structural break (Regime 2 -1997 to 2021)	-0.223**

*Note: *, **, and *** indicate significance at 10, 5, and 1 percent levels, respectively.*

The results presented in Table 10 above summarize regression results for the present 35 OECD IT countries based on the APC approach. We found a significant negative coefficient of the unemployment rate, i.e., -0.585***. Adaptive inflation expectations and exchange rates

have also been found to affect inflation significantly positively. In the sub-sample analysis, we only found results to be significant post-GFC crisis, i.e., -0.456***. The results from tobit regressions found a significant negative coefficient of unemployment rate in high, medium, and low inflation regimes. Our robustness test does not satisfy our baseline estimation. However, the results with structural breaks found 1 breakpoint presenting regression results for 2 regimes. We found a significant coefficient of unemployment rate in regime 2 (1997-2021) with a value of -0.223** only.

Table 11: Results based on NKPC (Present OECD IT countries).

Model	**Coefficient of Unemployment rate**
Driscoll Kraay standard errors	-0.698**
Dynamic panel	-0.372***
Sub-sample 1: 1992-2007 (Dynamic panel)	-0.496
Sub-sample 2: 2007-2021 (Dynamic panel)	-0.427***
Above 3.82 percent	-1.688***
Between 0.82 to 3.82 percent	-0.186***
Below 0.82 percent	-0.146***
Robustness 1 (including another financial globalisation index, de jure)	-0.026
Regression with structural break in the unemployment rate (Regime 1- 1992 to 1995)	0.341
Regression with structural break (Regime 2 -1996 to 2001)	-0.179
Regression with structural break (Regime 3- 2002 to 2007)	-0.265
Regression with structural break (Regime 4 -2008 to 2021)	-0.202

*Note: *, **, and *** indicate significance at 10, 5, and 1 percent levels, respectively.*

The results using the NKPC approach for present OECD IT countries found a negative coefficient of unemployment rate with a value of -0.372***. However, in this model, we found exchange rate inflation, crude oil inflation, global output gap and food inflation to be significantly affecting the inflation. Again, we found significant results after GFC, i.e., -0.427***. The results from regressions accounting for structural breaks have mostly remained insignificant, including our robustness test, though the coefficient is negative (Table 11).

However, in the present list of IT OECD economies, there were few economies that were in the phase of economic transition and witnessed high levels of inflation. The level of inflation in these economies remained high in these transition economies for a few initial years. This might lead to a high-value coefficient of unemployment rate or even a positive coefficient during the initial years, as found in regime 1. So, we conducted our analysis from the year 2000 (by this year, inflation has become almost stable) and got coefficient values of -0.395*** and -0.372*** for APC and NKPC, respectively. Hence, we still find a significant coefficient of the unemployment rate with a slightly deflated value of the coefficient for the APC model. However, compared to our results of founding OECD IT economies, we found weak evidence of the existence of the Phillips curve as our robustness tests are inconsistent with baseline findings.

Table 12: Regression results (Present OECD countries).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.223***		
	(0.076)		
uubar	-0.585***	-0.372***	-0.698**
	(0.177)	(0.118)	(0.301)
exci	0.455***	0.027**	0.275*
	(0.112)	(0.011)	(0.148)
crude	0.033	0.026***	0.044*
	(0.032)	(0.008)	(0.024)
food	0.247	0.058***	0.061
	(0.166)	(0.010)	(0.038)
gog	0.058	0.373**	0.490
	(0.504)	(0.164)	(0.405)
it	-1.932	-0.269	-1.159***
	(2.662)	(1.977)	(0.342)
gidf	-0.314	-0.053	-0.034
	(0.284)	(0.090)	(0.037)
tinf		0.051	0.453***
		(0.140)	(0.095)
Constant	8.975*	6.863	4.163

	(9.177)	(7.478)	(3.349)
Observations	977	977	977
R^2			0.694

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 13: Regression results for founding OECD IT (including fedrate and excluding global output gap and US data).

Model	**Coefficient of Unemployment rate**
Full sample (APC)	-0.160*
From 1991 to 2007 (APC)	-0.515**
From 2008 to 2021 (APC)	-0.106
Full sample (NKPC)	-0.164*
From 1991 to 2007 (NKPC)	-0.371
From 2008 to 2021 (NKPC)	-0.041

*Note: *, **, and *** indicate significance at 10, 5, and 1 percent levels, respectively.*

Table 14: Regression results for present OECD IT (including fedrate and excluding global output gap and US data).

Model	**Coefficient of Unemployment rate**
Full sample (APC)	-0.334
From 1991 to 2007 (APC)	-0.127
From 2008 to 2021 (APC)	-0.623***
Full sample (NKPC)	-0.471***
From 1991 to 2007 (NKPC)	-7.825
From 2008 to 2021 (NKPC)	-0.248

*Note: *, **, and *** indicate significance at 10, 5, and 1 percent levels, respectively.*

Since, US dollar is used as international currency, most of the countries want to have sufficient stock and steady inflow of US dollar. To have that, the policy interest rate of these

countries follows the Fed rate. Thus, the changes in Fed rate are likely to affect domestic interest rate of most of the economies including the OECD economies. Further, change in Fed rate impact the global demand as US is big market for most of the countries. Thus, we have used Fed rate as control variable, which can affect the trade-off dynamics between inflation and unemployment rate. We excluded global output gap and US data in our panel data estimation as a test of robustness (Table 13 and Table 14) for both founding OECD IT economies and present OECD IT economies. We still found significant coefficient of unemployment rate for founding OECD IT economies (for full sample) in both APC and NKPC frameworks, with almost similar values as compared to our estimations where we have not controlled for fed rate. This suggests that inclusion of fed rate (and exclusion of US data) has not altered the trade-off dynamics. Whereas, in case of present OECD IT economies, the results are not significant in APC framework but significant in NKPC framework (full sample). This again suggests weak statistical evidence of Philips curve relationship for present OECD IT economies, in consistence of our previous findings. This hints that inclusion of fed rate again has only marginal impact on trade-off dynamics in present OECD IT economies.

Table 15: Results based on expected inflation calculated from five period moving average inflation (NKPC).

Model	**Coefficient of Unemployment rate**
Founding OECD IT economies (Dynamic panel)	-0.123**
Founding OECD IT economies (Driskoll kray standard error)	-0.154**
Present OECD IT economies (Dynamic panel)	-0.339***
Present OECD IT economies (Driskoll kray standard error)	-0.515**

*Note: *, **, and *** indicate significance at 10, 5, and 1 percent levels, respectively.*

Additionally, we have also provided robustness results for founding OECD IT economies and present OECD IT economies, where we calculated expected inflation as five period moving average instead of inflation calculated from Hodrick Prescott fitter series. We still found very similar results as we found in our baseline estimations.

Concluding remarks and discussion

The Phillips curve relationship was first presented by William Phillips in 1958 as a negative relationship between inflation and unemployment rate in the UK context utilizing data from 1861-1957. However, it was criticized on the ground that it was just a loose association between the two variables, and in the long run, this relationship does not hold. In his study, Milton Friedman argued that inflation expectations by households and firms are responsible for the lack of trade-off between inflation and the unemployment rate in the long run. He criticized the Keynesian approach, which assumed that people's expectations were static. Edmund Phelps also argued that people form adaptive inflation expectations based on past inflation values, and they adjust their economic behaviour accordingly, shifting the short-run Phillips curve, thus making it harder to exploit any trade-off between inflation and the unemployment rate. In other words, changing inflation expectations act as a moderating variable between the two variables, causing a lowering of trade-off. The first evidence of the breakdown of the Phillips curve was observed during an episode of stagflation in the 1970s when high inflation was accompanied by a high unemployment rate, further casting doubts on its empirical validity. Some literature has also presented evidence of a non-linear association between the two variables, i.e., the threshold level of inflation above which the relationship is positive (Palley, 2003; Vinayagathasan, 2013; Sarel, 1996; Khan and Senhadii, 2001; Ghosh and Phillips, 1998; Kremer, Bick, and Nautz, 2009). This Phillips curve relationship has been widely studied in the literature. The results from these studies differ depending on the context, methodology, and time-period of estimation. However, it is largely believed that the Phillips curve still holds.

The latest debate in the Phillips curve revolves around the flattening of the Philips curve relationship, i.e., the weakening of the trade-off between inflation and unemployment rate. Some seminal studies have also provided this evidence. This flattening is attributed to various factors, such as the globalization of economies, technological advancements that increase productivity and thus put less pressure on prices, stable global commodity prices, and less disruption of global supply chains, which leads to less imported domestic inflation and other structural factors such as demographic shifts and changes in the consumption pattern. However, the most important factor contributing to this flattening is central banks' increased monetary policy commitment in terms of controlling inflation and anchoring inflation expectations. When the central banks anchor the inflation expectations, economic agents

expect inflation to remain stable without much volatility and do not change their economic behaviour, at least in the short run. Less volatility of inflation means that changes in the unemployment rate (or, say, government actions to reduce the unemployment rate) will not induce proportionate change in inflation, which signifies flattening/weakening of the Phillips curve. Through an IT regime, the central bank signals its commitment of maintaining inflation and indirectly stabilizes inflationary expectations. Hence, we expect a flattened Phillips curve in an IT regime. But at the same time, we expect to find a statistically significant negative trade-off between inflation and the unemployment rate (though a weak/flat relationship) in an IT regime, as the performance of the Phillips curve is much better in IT regimes (Gabrielyan, 2018).

The purpose of our study is to compare the Phillips curve relationship for 87 IT countries divided into four groups, i.e., all 87 IT countries, 51 non-OECD (Organisation of Economic Cooperation and Development) IT economies, and 20 founding and 35 present OECD IT economies, respectively. When we compare the results for four groups of countries, we found no statistically significant Phillips curve relationship for all IT countries, which includes both high-income developed and middle and low-income developing countries (though the slope is negative but insignificant). Again, we found no statistically significant Phillips curve relationship for non-OECD IT countries, which mainly include middle-income and low-income countries.

The analysis done for 20 founding OECD IT economies confirms the existence of a statistically significant Phillips curve relationship irrespective of the theoretical framework used, i.e., for APC = -0.157** and NKPC = -0.100***, which suggests a 1 percent increase in the unemployment rate leads to 0.157 percent decrease in inflation in an APC framework and 0.10 percent decrease in inflation in an NKPC framework respectively. This result suggests that the Phillips curve is highly valid for developed high-income group IT countries as all the economies in this group are advanced. In a stable IT regime, like in the case of high-income developed economies where macroeconomic parameters like inflation, unemployment rate, output growth rate, etc., are less volatile and stable, performance of the Phillips Curve is expected to be much better (Gabrielyan 2019). Also, the results obtained including fed rate as exogenous supply-shock and excluding global output gap and US data present similar significant coefficient values to our baseline estimation (for full sample).

Also, from our sub-sample analysis for these economies, we found slight evidence of a weakening of the Phillips curve post-2008 Global Financial Crisis (GFC) as the trade-off value declined. This could be explained by changes in inflation and unemployment rate dynamics in these countries post-GFC era. It has been observed in many advanced economies post-GFC that a sharp reduction in the unemployment rate is not accompanied by a proportionate increase in the inflation rate as the Phillips curve predicted. For example, in the US, the unemployment rate fell from 10.508 percent in 2010 to 3.721 percent in 2019, but inflation remained at the Federal Reserve's target of 2 percent or below that level. Also, inflation expectations in these advanced economies have been firmly anchored due to credible monetary policies by central banks, such as effective communication strategies, forward guidance, etc. Central banks in these economies employed unconventional monetary policies such as quantitative easing (QE), which have influenced financial conditions but often had a more muted effect on variables like inflation. Most of these have also adopted austere fiscal policies post-GFC, which have a dampening effect on inflation. This flattened Phillips curve relationship has implications for monetary policy as it is like a double-edged sword with both bad and good consequences. On one hand, a decrease in the unemployment rate is likely to trigger less increase in inflation, but if the central bank's objective is to decrease inflation in an economy, then a rise in interest rates might trigger a higher unemployment rate in an economy. Hence, central banks in these economies frequently resort to unconventional monetary policy tools like QE and forward guidance to stimulate economic growth instead of raising interest rates.

Overall, the results from non-OECD IT countries provide no evidence of Phillips curve relationship. On the contrary, the results from 35 present OECD IT economies provide weak evidence of the existence of the Phillips curve (as our robustness tests did not satisfy the baseline estimation). However, the trade-off values -0.585^{***} for APC and -0.372^{**} for NKPC, i.e., respectively, are higher than founding OECD IT economies (APC = -0.157^{**} and NKPC = -0.100^{***}). The results including fed rate (and excluding global output gap and US data did not alter our results significantly. In the present list, many countries that were later added to the OECD list were not developed economies, and they were classified as high-income countries as per the World Bank later from the period where our analysis begins (1992), unlike the founding member countries. A few of these economies were in the stage of economic transformation in the initial years. They witnessed high levels of inflation and unemployment with higher volatility, which might have affected the trade-off dynamics. High

inflation volatility and less anchored inflation expectations might have contributed to statistically random trade-offs between inflation and unemployment rates in these economies.

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Appendix

Table 1: Regression results (All IT Countries).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.278**		
	(0.114)		
uubar	-1.732	-1.603	-0.481
	(1.997)	(3.331)	(0.478)
exci	0.467**	0.332***	0.992***
	(0.185)	(0.100)	(0.045)
crude	0.133*	0.039	0.068*
	(0.077)	(0.099)	(0.039)
food	0.154***	0.293*	0.386***
	(0.029)	(0.164)	(0.076)
gog	0.636	0.396	0.876
	(0.788)	(1.250)	(0.787)
it	-0.681	-1.496	-0.233
	(1.571)	(2.286)	(0.511)
gidf	-0.034	-0.056	-0.022
	(0.169)	(0.746)	(0.032)
tinf		0.073	0.143***
		(0.370)	(0.040)
Constant	3.033	2.624	1.911
	(6.710)	(5.912)	(2.323)
Observations	2389	2396	2396
R^2			0.948

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 2: Regression results (All IT countries (1992-2007)).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.282		
	(0.320)		
uubar	-1.702*	-0.820	-0.359
	(2.133)	(2.320)	(0.976)
exci	0.386	0.935**	1.001***
	(0.851)	(0.422)	(0.046)
crude	0.016	0.267	0.094

	(0.394)	(0.210)	(0.067)
food	0.183*	1.038*	0.512***
	(0.355)	(0.588)	(0.096)
gog	0.207	0.050	1.014
	(0.670)	(0.537)	(0.829)
it	-5.609	-4.643	-0.131
	(8.320)	(7.098)	(0.926)
gidf	-0.223	-1.187	-0.059
	(0.330)	(1.295)	(0.052)
tinf		0.034	0.139***
		(0.196)	(0.045)
Constant	4.909	4.121	6.372
	(4.776)	(4.758)	(3.334)
Observations	1263	1270	1270
R^2			0.953

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 3: Regression results (All IT countries (2008-2021)).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.474		
	(0.287)		
uubar	-1.220	-0.176	-0.204*
	(1.073)	(0.122)	(0.104)
exci	0.409***	0.224*	0.208***
	(0.102)	(0.128)	(0.040)
crude	0.069	0.052*	0.040*
	(0.079)	(0.029)	(0.019)
food	0.278***	0.107**	0.077*
	(0.101)	(0.049)	(0.041)
gog	0.018	0.419	0.360
	(0.963)	(0.433)	(0.349)
it	-1.247	-2.440	-0.537
	(2.738)	(25.637)	(0.320)
gidf	0.017	-0.212	-0.069***
	(0.093)	(0.320)	(0.021)
tinf		0.097	0.154
		(0.326)	(0.137)
Constant	1.219	2.398	7.478***
	(2.436)	(1.531)	(2.313)
Observations	1126	1126	1126

R^2	0.409

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 4: Tobit regression results (All IT countries- APC).

	Above 4.87 percent Inflation	Between 1.87 to 4.87 percent Inflation	Below 1.87 percent Inflation
	b/se	b/se	b/se
inf			
uubar	-0.369	-0.237	-0.206
	(0.477)	(0.041)	(0.031)
exci	1.027***	0.062***	0.020***
	(0.010)	(0.005)	(0.003)
linf	0.073***	0.306***	0.094***
	(0.004)	(0.014)	(0.011)
crude	0.008	0.006**	0.010***
	(0.031)	(0.003)	(0.002)
food	0.660***	0.064***	0.035***
	(0.060)	(0.005)	(0.004)
gog	0.049	0.015	0.013
	(1.086)	(0.077)	(0.056)
it	-3.385**	-0.056	-0.337*
	(2.150)	(0.117)	(0.180)
gidf	-0.541***	-0.039***	-0.025***
	(0.051)	(0.003)	(0.004)
Constant	11.265***	4.225***	3.953***
	(2.985)	(0.209)	(0.307)
/			
sigma_u	14.682***	0.000**	0.887***
	(1.855)	(0.000)	(0.106)
sigma_e	23.153***	2.052***	1.367***
	(0.520)	(0.060)	(0.044)
Observations	2389	2389	2389

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 5: Tobit regression results (All IT countries- NKPC).

	Above 4.87 percent Inflation	Between 1.87 to 4.87 percent Inflation	Less than minus 1.87 percent Inflation
	b/se	b/se	b/se

inf			
uubar	-1.189	-0.283	-0.220
	(0.620)	(0.048)	(0.033)
exci	1.010***	0.080***	0.021***
	(0.009)	(0.006)	(0.003)
tinf	0.110***	0.031***	0.010***
	(0.010)	(0.004)	(0.004)
crude	0.008	0.006**	0.010***
	(0.036)	(0.003)	(0.002)
food	0.783***	0.070***	0.035***
	(0.077)	(0.006)	(0.004)
it	-8.665***	-0.265*	0.168
	(2.866)	(0.141)	(0.199)
gidf	0.624***	0.069***	0.036***
	(0.066)	(0.004)	(0.004)
Constant	11.612***	7.488***	5.228***
	(3.852)	(0.230)	(0.320)
/			
sigma_u	16.650***	0.000**	1.189***
	(2.238)	(0.000)	(0.131)
sigma_e	30.484***	2.537***	1.456***
	(0.669)	(0.075)	(0.046)
Observations	2464	2464	2464

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 6: Regression results (All IT Countries - Robustness).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.415***		
	(0.155)		
uubar	-1.800	-0.142	-0.475
	(2.620)	(3.130)	(0.450)
exci	0.464*	0.275	0.993***
	(0.236)	(0.170)	(0.045)
crude	0.147	0.001	0.066
	(0.101)	(0.069)	(0.040)
food	0.161***	0.223**	0.386***
	(0.055)	(0.217)	(0.076)
gog	0.716	0.865	0.899

	(1.117)	(0.998)	(0.774)
it	-0.487	-0.610	-0.765
	(7.328)	(13.727)	(0.576)
gidj	-0.042	-0.163	-0.081*
	(0.117)	(0.452)	(0.045)
tinf		0.039	0.143***
		(0.159)	(0.039)
Constant	2.239	3.089	5.446
	(8.464)	(23.396)	(3.259)
Observations	2389	2396	2396
R^2			0.949

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 7: Regression results (Non-OECD Countries).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.262*		
	(0.138)		
uubar	-2.550	-1.816	-0.513
	(2.413)	(2.966)	(1.085)
exci	0.489***	0.745***	1.018***
	(0.135)	(0.124)	(0.034)
crude	0.132*	0.002	0.022
	(0.067)	(0.150)	(0.060)
food	0.176***	0.832***	0.515***
	(0.026)	(0.637)	(0.130)
gog	0.291	0.903	0.481
	(0.734)	(3.096)	(0.859)
it	-3.419	-3.225	-1.240
	(5.523)	(3.374)	(0.805)
gidf	-0.101	-0.367	0.000
	(0.209)	(1.385)	(0.044)
tinf		0.220	0.119***
		(0.275)	(0.035)
Constant	5.676	8.781	5.897
	(14.711)	(73.539)	(3.134)
Observations	1384	1391	1391
R^2			0.961

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 8: Regression results (Non-OECD countries (1991-2007)).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.156***		
	(0.027)		
uubar	-1.638	-2.573	-0.348
	(1.679)	(11.022)	(1.929)
exci	0.658***	0.765***	1.024***
	(0.085)	(0.137)	(0.037)
crude	0.083	0.693	0.067
	(0.168)	(0.957)	(0.075)
food	0.153**	1.056***	0.722***
	(0.257)	(1.330)	(0.158)
gog	-2.251	-4.517	-2.793
	(5.173)	(10.382)	(5.361)
it	-0.208	-3.259	-0.345
	(2.590)	(8.767)	(1.696)
gidf	-0.342	-1.654	-0.032
	(0.568)	(2.984)	(0.060)
tinf		0.147	0.118***
		(0.491)	(0.039)
Constant	17.675	73.099	-5.074
	(27.837)	(143.888)	(4.663)
Observations	726	733	733
R^2			0.964

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 9: Regression results (Non-OECD countries(2008-2021)).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.355		
	(0.222)		
uubar	-4.343	-0.139	-0.164
	(2.594)	(0.245)	(0.094)
exci	0.549***	0.367***	0.279***
	(0.107)	(0.081)	(0.073)
crude	0.130*	0.030	0.039
	(0.067)	(0.041)	(0.028)
food	0.294**	0.208***	0.109*

	(0.113)	(0.047)	(0.051)
gog	-0.806	-0.595	-0.298
	(0.946)	(0.706)	(0.434)
it	-0.060	-1.397	-0.159
	(2.876)	(1.720)	(0.391)
gidf	0.275	0.024	-0.054**
	(0.263)	(0.371)	(0.019)
tinf		0.103	0.119
		(0.252)	(0.107)
Constant	-15.635	4.593	6.616**
	(15.344)	(2.555)	(2.237)
Observations	658	658	658
R^2			0.395

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 10: Tobit regression results (Non-OECD- APC).

	Above 5.10 percent Inflation b/se	Between 2.60 to 5.60 percent Inflation b/se	Below 2.60 percent Inflation b/se
inf			
uubar	-0.648	-0.143	-0.256***
	(0.742)	(0.093)	(0.079)
exci	1.048***	0.087***	0.079***
	(0.011)	(0.009)	(0.012)
linf	0.069***	0.179***	0.079***
	(0.004)	(0.017)	(0.014)
crude	-0.005	-0.001	0.005
	(0.040)	(0.004)	(0.004)
food	0.708***	0.089***	0.066***
	(0.075)	(0.009)	(0.009)
gog	1.576	0.183	0.046
	(1.411)	(0.121)	(0.106)
it	-6.419**	-1.010***	-0.063
	(3.222)	(0.355)	(0.344)
gidf	-0.260***	-0.022**	-0.014*
	(0.072)	(0.009)	(0.008)
Constant	-2.426	4.767***	4.201***
	(4.143)	(0.571)	(0.509)
/			
sigma_u	11.722***	1.867***	1.493***
	(1.788)	(0.233)	(0.215)

sigma_e	24.418***	2.347***	1.823***
	(0.650)	(0.105)	(0.079)
Observations	1384	1384	1384
R^2			
Pseudo R^2			

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 11: Tobit regression results (Non-OECD- NKPC).

	Above 5.60 percent Inflation b/se	Between 2.60 to 5.60 percent Inflation b/se	Below 2.60 percent Inflation b/se
inf			
uubar	-0.451	-0.243	-0.264
	(1.002)	(0.128)	(0.082)
exci	1.026***	0.155***	0.077***
	(0.010)	(0.014)	(0.012)
tinf	0.129***	0.024***	0.006
	(0.012)	(0.006)	(0.004)
crude	0.018	0.001	0.003
	(0.053)	(0.006)	(0.004)
food	0.876***	0.116***	0.066***
	(0.100)	(0.012)	(0.009)
gog	1.878	0.186	0.037
	(1.875)	(0.170)	(0.110)
it	-3.697**	0.055	-0.580
	(1.325)	(0.336)	(0.360)
gidf	-0.193**	-0.051***	-0.017**
	(0.096)	(0.007)	(0.008)
Constant	-11.442**	6.815***	4.896***
	(5.390)	(0.402)	(0.449)
/			
sigma_u	14.591***	0.000	1.786***
	(2.271)	(0.000)	(0.220)
sigma_e	32.716***	3.551***	1.874***
	(0.869)	(0.163)	(0.080)
Observations	1391	1391	1391
R^2			
Pseudo R^2			

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 12: Regression results (Non-OECD countries- Robustness).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.382*		
	(0.199)		
uubar	-3.413	-0.950	-0.501
	(1.357)	(2.186)	(1.084)
exci	0.487***	0.737***	1.018***
	(0.095)	(0.156)	(0.034)
crude	0.147***	0.063	0.022
	(0.055)	(0.118)	(0.060)
food	0.187***	0.864**	0.514***
	(0.048)	(0.547)	(0.130)
gog	0.519	2.527	0.482
	(0.675)	(2.061)	(0.852)
it	-0.674	-1.155	-1.043
	(4.811)	(21.510)	(0.851)
gidj	-0.143	-0.381	-0.025
	(0.141)	(0.735)	(0.033)
tinf		0.215	0.119***
		(0.174)	(0.034)
Constant	5.854	5.971	3.109
	(7.323)	(7.171)	(2.627)
Observations	1384	1391	1391
R^2			0.961

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 13: Regression results (Founding OECD countries).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.480***		
	(0.077)		
uubar	-0.157*	-0.100**	-0.147**
	(0.088)	(0.047)	(0.059)
exci	0.017	0.063***	0.015*
	(0.010)	(0.012)	(0.008)
crude	0.011***	0.022***	0.009**

	(0.004)	(0.005)	(0.004)
food	0.040***	0.033***	0.024***
	(0.007)	(0.008)	(0.005)
gog	0.151*	0.100*	0.022
	(0.087)	(0.052)	(0.108)
it	-5.412	-1.555	-0.030
	(9.193)	(1.534)	(0.110)
gidf	-0.004	-0.097**	-0.001
	(0.096)	(0.039)	(0.005)
tinf		0.811***	1.022***
		(0.273)	(0.065)
Constant	2.292	8.589**	0.299
	(5.520)	(3.458)	(0.486)
Observations	560	560	560
R^2			0.736

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 14: Regression results (Founding OECD countries- 1991 to 2007).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.409***		
	(0.107)		
uubar	-0.481***	-0.652*	-0.247***
	(0.115)	(0.341)	(0.035)
exci	0.015***	0.040	0.009**
	(0.005)	(0.040)	(0.003)
crude	0.008**	0.002	0.011***
	(0.003)	(0.012)	(0.001)
food	0.008	0.048	0.012***
	(0.005)	(0.029)	(0.003)
gog	0.369	0.726	2.240***
	(0.619)	(1.164)	(0.285)
it	-1.319	-0.412	-0.089
	(2.683)	(1.494)	(0.118)
gidf	-0.071*	-0.017	-0.000
	(0.037)	(0.018)	(0.003)
tinf		0.385	0.957***
		(0.739)	(0.062)
Constant	6.444**	0.000	-0.046
	(2.420)	(.)	(0.322)
Observations	300	300	300

R^2	0.827

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 15: Regression results (Founding OECD countries – 2008 to 2021).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.447***		
	(0.124)		
uubar	-0.127***	-0.158**	-0.099**
	(0.039)	(0.057)	(0.069)
exci	0.055***	0.053**	0.079***
	(0.019)	(0.023)	(0.015)
crude	0.016**	0.026***	0.032***
	(0.006)	(0.008)	(0.005)
food	0.052**	0.024**	0.021*
	(0.019)	(0.009)	(0.012)
gog	0.128	0.085	0.183*
	(0.096)	(0.090)	(0.085)
it	-5.608	-2.978*	-0.120
	(11.541)	(1.588)	(0.158)
gidf	-0.125	-0.110	-0.001
	(0.176)	(0.064)	(0.007)
tinf		1.252***	1.062***
		(0.368)	(0.095)
Constant	13.544	10.215	-0.417
	(17.587)	(5.934)	(0.649)
Observations	260	260	260
R^2			0.761

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 16: Tobit regression results (Founding OECD- APC).

	Above 3.5 percent Inflation b/se	Between 0.5 to 3.5 percent Inflation b/se	Below 0.5 percent Inflation b/se
inf			
uubar	-0.288***	-0.129***	-0.199***
	(0.077)	(0.025)	(0.044)
exci	0.092***	0.009***	0.003

	(0.012)	(0.002)	(0.005)
linf	0.765***	0.514***	0.345***
	(0.052)	(0.032)	(0.066)
crude	0.014***	0.013***	0.009**
	(0.005)	(0.002)	(0.004)
food	0.059***	0.025***	0.036***
	(0.011)	(0.003)	(0.009)
gog	0.315	0.131**	0.261***
	(0.213)	(0.053)	(0.077)
it	0.370	0.123	0.139
	(0.229)	(0.099)	(0.231)
gidf	-0.015**	-0.016***	-0.020**
	(0.007)	(0.003)	(0.009)
Constant	0.357	1.945***	2.752***
	(0.629)	(0.302)	(0.824)
/			
sigma_u	0.000	0.155***	0.349***
	(0.201)	(0.050)	(0.112)
sigma_e	1.210***	0.719***	0.784***
	(0.103)	(0.026)	(0.073)
Observations	560	560	560

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 17: Tobit regression results (Founding OECD- NKPC).

	Above 3.5 percent Inflation b/se	Between 0.5 to 3.5 percent Inflation b/se	Between 0.5 percent Inflation b/se
inf			
uubar	-0.222***	-0.121***	-0.235***
	(0.071)	(0.025)	(0.042)
exci	0.082***	0.010***	0.005
	(0.011)	(0.002)	(0.006)
tinf	1.084***	0.887***	1.111***
	(0.068)	(0.046)	(0.136)
crude	0.001	0.009***	0.009**
	(0.005)	(0.002)	(0.004)
food	0.063***	0.025***	0.030***
	(0.011)	(0.003)	(0.009)
gog	0.353**	0.044	0.185**
	(0.160)	(0.052)	(0.075)
it	-0.062	-0.047	-0.298*

	(0.216)	(0.069)	(0.170)
gidf	-0.000	-0.003	-0.008
	(0.007)	(0.003)	(0.008)
Constant	-1.114*	0.259	0.683
	(0.643)	(0.288)	(0.697)
/			
sigma_u	0.000	0.000	0.000
	(0.129)	(0.048)	(0.129)
sigma_e	1.135***	0.711***	0.758***
	(0.096)	(0.025)	(0.067)
Observations	560	560	560

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 18: Regression results (Founding OECD countries- robustness).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.371**		
	(0.145)		
uubar	-0.208**	-0.345**	-0.151**
	(0.085)	(0.137)	(0.058)
exci	0.013	0.009	0.015*
	(0.009)	(0.012)	(0.008)
crude	0.008	0.015***	0.009**
	(0.005)	(0.004)	(0.004)
food	0.035***	0.009	0.024***
	(0.010)	(0.010)	(0.005)
gog	0.176	0.016	0.022
	(0.103)	(0.073)	(0.109)
it	-7.942	-2.223	-0.050
	(13.753)	(2.395)	(0.090)
gidj	-0.087	-0.231***	-0.004
	(0.055)	(0.059)	(0.009)
tinf		1.037***	1.006***
		(0.263)	(0.055)
Constant	10.430	11.226***	0.174
	(7.199)	(4.943)	(0.667)
Observations	560	560	560
R^2			0.737

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 19: Regression results with structural breaks (Founding OECD countries - APC).

	Accelerionist b/se
uubar - 1993 to 2005	-0.213**
	(0.091)
uubar - 2006 to 2009	-0.380***
	(0.089)
uubar - 2010 to 2021	-0.141**
	(0.060)
Constant	2.011***
	(0.060)
Observations	609
R^2	0.050

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 20: Regression results with structural breaks (Founding OECD countries- NKPC).

	New Keyensian Phillips Curve b/se
uubar - 1992 to 2006	-0.372***
	(0.082)
uubar - 2007 to 2010	-0.302***
	(0.091)
uubar - 2011 to 2021	-0.150**
	(0.068)
Constant	2.084***
	(0.063)
Observations	630
R^2	0.058

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 13: Regression results (Founding OECD countries).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.480***		
	(0.077)		
uubar	-0.157*	-0.100**	-0.147**
	(0.088)	(0.047)	(0.059)
exci	0.017	0.063***	0.015*
	(0.010)	(0.012)	(0.008)
crude	0.011***	0.022***	0.009**
	(0.004)	(0.005)	(0.004)
food	0.040***	0.033***	0.024***
	(0.007)	(0.008)	(0.005)
gog	0.151*	0.100*	0.022
	(0.087)	(0.052)	(0.108)
it	-5.412	-1.555	-0.030
	(9.193)	(1.534)	(0.110)
gidf	-0.004	-0.097**	-0.001
	(0.096)	(0.039)	(0.005)
tinf		0.811***	1.022***
		(0.273)	(0.065)
Constant	2.292	8.589**	0.299
	(5.520)	(3.458)	(0.486)
Observations	560	560	560
R^2			0.736

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 21: Regression results (Present OECD countries).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.223***		
	(0.076)		
uubar	-0.585***	-0.372***	-0.698**
	(0.177)	(0.118)	(0.301)
exci	0.455***	0.027**	0.275*
	(0.112)	(0.011)	(0.148)
crude	0.033	0.026***	0.044*
	(0.032)	(0.008)	(0.024)
food	0.247	0.058***	0.061
	(0.166)	(0.010)	(0.038)
gog	0.058	0.373**	0.490
	(0.504)	(0.164)	(0.405)
it	-1.932	-0.269	-1.159***
	(2.662)	(1.977)	(0.342)

gidf	-0.314	-0.053	-0.034
	(0.284)	(0.090)	(0.037)
tinf		0.051	0.453***
		(0.140)	(0.095)
Constant	8.975*	6.863	4.163
	(9.177)	(7.478)	(3.349)
Observations	977	977	977
R^2			0.694

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 22: Regression results (Present OECD countries – 1991 to 2007).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.178***		
	(0.053)		
uubar	-0.926	-0.496	-1.264**
	(0.852)	(0.429)	(0.509)
exci	0.818***	0.615	0.321*
	(0.141)	(0.497)	(0.176)
crude	0.018	0.130	0.048
	(0.087)	(0.194)	(0.039)
food	0.472***	0.628	0.035
	(0.115)	(0.592)	(0.073)
gog	2.606	4.772	4.502
	(7.751)	(10.143)	(9.885)
it	-0.653	-0.000	-1.350
	(16.038)	(.)	(0.771)
gidf	-0.392***	-0.431	-0.009
	(0.140)	(0.283)	(0.058)
tinf		0.247	0.450***
		(0.149)	(0.109)
Constant	9.068***	9.425*	2.924
	(6.503)	(14.602)	(5.102)
Observations	522	522	522
R^2			0.703

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 23: Regression results (Present OECD countries (2008-2021)).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.612***		
	(0.064)		
uubar	-0.456***	-0.427***	-0.083
	(0.085)	(0.066)	(0.127)
exci	0.039*	0.011	0.039**
	(0.020)	(0.031)	(0.017)
crude	0.016*	0.033*	0.037***
	(0.008)	(0.018)	(0.002)
food	0.073***	0.010	-0.019***
	(0.024)	(0.041)	(0.003)
it	0.976	-163.599	-0.159
	(4.836)	(290.570)	(0.154)
gidf	0.015	0.093	-0.036*
	(0.091)	(0.334)	(0.019)
tinf		-0.603**	0.584**
		(0.241)	(0.236)
Constant	-1.085	66.035	4.243*
	(8.915)	(116.590)	(2.058)
Observations	455	455	455
R^2			0.610
Time fixed effect	Yes	Yes	Yes

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 24: Tobit regression results (Present OECD countries- APC).

	Above 3.82 percent Inflation b/se	Between 0.82 to 3.82 percent Inflation b/se	Below 0.82 percent Inflation b/se
inf			
uubar	-0.798***	-0.172***	-0.178***
	(0.300)	(0.023)	(0.028)
exci	0.620***	0.013***	0.008***
	(0.036)	(0.003)	(0.003)
linf	0.217***	0.451***	0.306***
	(0.009)	(0.024)	(0.034)
crude	0.032	0.011***	0.012***
	(0.026)	(0.002)	(0.003)
food	0.444***	0.035***	0.029***
	(0.054)	(0.003)	(0.005)

gog	0.007	0.077	0.151***
	(1.111)	(0.056)	(0.052)
it	-1.305	-0.157	-0.211
	(1.688)	(0.111)	(0.159)
gidf	-0.413***	-0.020***	-0.008*
	(0.045)	(0.003)	(0.005)
Constant	16.923***	2.368***	1.614***
	(2.915)	(0.295)	(0.428)
/			
sigma_u	5.737***	0.271***	0.368***
	(1.063)	(0.058)	(0.075)
sigma_e	11.031***	0.954***	0.782***
	(0.471)	(0.031)	(0.049)
Observations	977	977	977
R^2			
Pseudo R^2			

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 25: Tobit regression results (Present OECD countries- NKPC).

	Above 3.82 percent Inflation b/se	Between 0.82 to 3.82 percent Inflation b/se	Below 0.82 percent Inflation b/se
inf			
uubar	-1.688***	-0.186***	-0.146***
	(0.382)	(0.026)	(0.028)
exci	0.727***	0.014***	0.010***
	(0.039)	(0.003)	(0.003)
tinf	0.415***	0.145***	0.068***
	(0.023)	(0.015)	(0.015)
crude	0.037	0.011***	0.017***
	(0.029)	(0.002)	(0.003)
food	0.466***	0.035***	0.020***
	(0.065)	(0.004)	(0.005)
it	-1.391	0.154	0.167
	(1.894)	(0.185)	(0.193)
gidf	-0.371***	-0.049***	-0.030***
	(0.052)	(0.004)	(0.006)
Constant	10.209***	5.484***	3.865***
	(3.433)	(0.320)	(0.487)
/			

sigma_u	5.538***	0.523***	0.508***
	(1.029)	(0.078)	(0.098)
sigma_e	13.699***	1.167***	0.882***
	(0.563)	(0.039)	(0.056)
Observations	1007	1007	1007

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 26: Regression results (Present OECD countries- robustness).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.226***		
	(0.069)		
uubar	-0.182	-0.026	-0.697**
	(0.315)	(0.313)	(0.278)
exci	0.569***	0.019	0.272*
	(0.164)	(0.072)	(0.149)
crude	0.016	0.052**	0.046*
	(0.027)	(0.022)	(0.023)
food	0.250	0.001	0.056
	(0.159)	(0.032)	(0.042)
gog	1.042**	0.376	0.457
	(0.389)	(0.737)	(0.437)
it	-7.863	-1..301	-1.317***
	(6.969)	(8.836)	(0.442)
gidj	-0.450	-0.730	-0.051
	(0.316)	(0.643)	(0.040)
tinf		0.168	0.460***
		(0.108)	(0.091)
Constant	9.345	8.074	5.568
	(6.244)	(5.837)	(3.753)
Observations	977	977	977
R^2			0.694

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 27: Regression results with structural breaks (Present OECD countries- APC).

	Accelerionist

	b/se
uubar - 1993 to 1996	0.807**
	(0.321)
uubar - 1997 to 2021	-0.223**
	(0.092)
Constant	3.315***
	(0.127)
Observations	870
R^2	0.014

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 28: Regression results with structural breaks (Present OECD countries- NKPC).

	New Keyensian Phillips Curve b/se
uubar - 1992 to 1995	0.341
	(0.312)
uubar - 1996 to 2001	-0.179
	(0.220)
uubar - 2002 to 2007	-0.265
	(0.232)
uubar - 2008 to 2021	-0.202
	(0.132)
Constant	3.538***
	(0.138)
Observations	900
R^2	0.006

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 29: Regression results (Present OECD countries (2000 to 2021)).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.703***		
	(0.025)		
uubar	-0.395***	-0.372***	-0.335**
	(0.100)	(0.118)	(0.131)
exci	0.092*	0.027**	0.073***

	(0.046)	(0.011)	(0.020)
crude	0.004	0.026***	0.015
	(0.012)	(0.008)	(0.011)
food	0.107***	0.058***	0.053**
	(0.018)	(0.010)	(0.019)
gog	0.041	0.373**	0.130
	(0.210)	(0.164)	(0.290)
it	-1.054	-2.087	-1.033**
	(2.611)	(2.092)	(0.435)
gidf	-0.021	-0.053	-0.068***
	(0.020)	(0.090)	(0.013)
tinf		0.051	0.493***
		(0.141)	(0.132)
Constant	2.363	7.000	6.934***
	(1.920)	(7.541)	(1.354)
Observations	735	735	735
R^2			0.635

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 30: Regression results (Founding OECD countries- APC including fed rate and excluding global output gap and US data).

	Full sample b/se	1991 to 2007 b/se	2008 to 2021 b/se
L.inf	0.436***	0.376**	0.387**
	(0.081)	(0.163)	(0.142)
uubar	-0.160*	-0.515***	-0.106
	(0.090)	(0.120)	(0.062)
exci	0.016*	0.016***	0.063**
	(0.009)	(0.004)	(0.025)
crude	0.015***	0.006**	0.021***
	(0.004)	(0.003)	(0.005)
food	0.039***	0.008	0.045**
	(0.009)	(0.005)	(0.017)
fedrate	-0.118	-0.044	0.086
	(0.134)	(0.075)	(0.205)
it	-11.348	1.486	-5.967
	(12.888)	(1.723)	(11.778)
gidf	0.024	-0.087***	-0.170
	(0.097)	(0.028)	(0.213)
Constant	2.821	7.975***	17.555
	(5.621)	(2.340)	(21.839)

Observations	560	300	260
R^2			

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 31: Regression results (Founding OECD countries- NKPC including fed rate and excluding global output gap and US data).

	Full sample b/se	1991 to 2007 b/se	2008 to 2021 b/se
tinf	0.862***	0.552	1.638***
	(0.275)	(0.461)	(0.447)
uubar	-0.164*	-0.377	-0.041
	(0.083)	(0.263)	(0.155)
exci	0.054***	-0.036	0.034*
	(0.009)	(0.033)	(0.016)
crude	0.020***	0.001	0.015**
	(0.004)	(0.009)	(0.006)
food	0.030**	-0.034**	0.030***
	(0.011)	(0.016)	(0.007)
fedrate	-0.081	0.088	0.492**
	(0.090)	(0.111)	(0.222)
it	-1.323	-0.435	-2.805
	(1.348)	(1.597)	(1.713)
gidf	-0.075	0.011	-0.091
	(0.050)	(0.009)	(0.067)
Constant	6.807	0.000	7.517
	(4.260)	(.)	(6.038)
Observations	580	320	260
R^2			

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 32: Regression results (Present OECD countries- APC including fed rate and excluding global output gap and US data).

	Full sample b/se	1991 to 2007 b/se	2008 to 2021 b/se
L.inf	0.229***	0.160***	0.630***

	(0.072)	(0.023)	(0.071)
uubar	-0.334	-1.273	-0.623***
	(0.265)	(0.823)	(0.073)
exci	0.399***	1.068***	0.057**
	(0.083)	(0.384)	(0.024)
crude	-0.036	-0.007	0.023*
	(0.042)	(0.043)	(0.012)
food	0.234	0.555***	0.065**
	(0.150)	(0.078)	(0.030)
fedrate	0.581	-1.476	-0.659**
	(0.681)	(1.786)	(0.257)
it	12.499	7.843	-0.998
	(26.130)	(16.502)	(5.054)
gidf	-0.213	-0.533**	0.059
	(0.160)	(0.228)	(0.090)
Constant	11.869***	43.678**	-3.388
	(4.047)	(18.249)	(8.725)
Observations	977	522	455
R^2			

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 33: Regression results (Present OECD countries- NKPC including fed rate and excluding global output gap and US data).

	Full sample b/se	1991 to 2007 b/se	2008 to 2021 b/se
tinf	-0.056	1.263	-0.589***
	(0.226)	(2.951)	(0.214)
uubar	-0.471***	-7.825	-0.248
	(0.085)	(21.898)	(0.148)
exci	0.046**	0.285	-0.019
	(0.020)	(1.044)	(0.029)
crude	0.012***	0.110	0.023
	(0.003)	(0.275)	(0.013)
food	0.075***	-0.148	0.018
	(0.006)	(0.692)	(0.033)
fedrate	-0.423	-6.405	0.932*
	(0.378)	(19.779)	(0.499)
it	6.741	0.000	-108.330
	(7.648)	(.)	(225.386)
gidf	-0.014	-1.255	0.035
	(0.146)	(3.369)	(0.281)
Constant	3.310	101.008	47.630
	(11.407)	(264.915)	(102.332)

Observations	1007	552	455
R^2			

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 34: Regression results (Founding OECD countries - with expected inflation calculated from 5 year moving average inflation (NKPC)).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.480***		
	(0.077)		
uubar	-0.157*	-0.123**	-0.154**
	(0.088)	(0.052)	(0.062)
exci	0.017	0.065***	0.017*
	(0.010)	(0.013)	(0.009)
crude	0.011***	0.023***	0.008*
	(0.004)	(0.005)	(0.004)
food	0.040***	0.034***	0.026***
	(0.007)	(0.008)	(0.005)
gog	0.151*	-0.118**	-0.018
	(0.087)	(0.054)	(0.118)
it	-5.412	-1.179	-0.046
	(9.193)	(1.759)	(0.125)
gidf	0.004	-0.122***	-0.004
	(0.096)	(0.039)	(0.006)
minf		0.653**	1.022***
		(0.301)	(0.101)
Constant	2.292	10.804***	0.162
	(5.520)	(3.334)	(0.610)
Observations	560	560	560
R^2			0.677

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 35: Regression results (Present OECD countries - with expected inflation calculated from 5 year moving average inflation (NKPC)).

	APC (Dynaimic panel) b/se	NKPC (Dynamic panel) b/se	NKPC (Driskoll kray standard error) b/se
L.inf	0.223***		

	(0.076)		
uubar	-0.585***	-0.339***	-0.515**
	(0.177)	(0.096)	(0.219)
exci	0.455***	0.036***	0.281*
	(0.112)	(0.003)	(0.152)
crude	-0.033	0.023**	0.034*
	(0.032)	(0.009)	(0.020)
food	0.247	0.042***	0.076*
	(0.166)	(0.008)	(0.044)
gog	0.058	-0.334*	-0.487
	(0.504)	(0.171)	(0.411)
it	14.932	-2.700	-0.796
	(28.662)	(2.247)	(0.497)
gidf	-0.314	0.060***	-0.016
	(0.284)	(0.021)	(0.049)
minf		0.570**	0.577***
		(0.254)	(0.201)
Constant	18.975*	-2.639	2.068
	(11.177)	(2.288)	(4.698)
Observations	977	977	977
R^2			0.600

robust standard error in parentheses
* p<0.1, ** p<0.05, *** p<0.01