



# PGIM FIXED INCOME

## GLOBAL MACRO MATTERS

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### What's Up with Global Inflation?

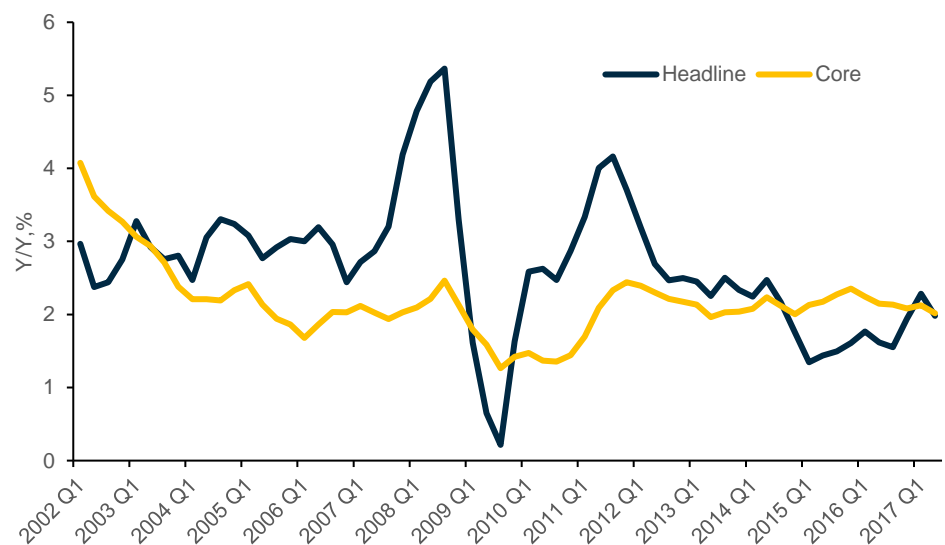
A striking feature of global economic performance over the past 15 years has been the low and steady performance of inflation. In the years before the financial crisis, global headline inflation (shown in Figure 1) cycled around 3%. After some volatility during the financial crisis, reflecting sharp moves in commodity prices and the severe economic downturn, headline inflation stepped down to a 2% rate—and moved even a bit lower through much of the last two years.



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Similarly, global core inflation trended down during the first half of the last decade, but then stabilized around 2% until well into the financial crisis. Following the crisis, core inflation returned to 2%, where it has remained subsequently.

**Figure 1: Global Inflation**



Source: Haver Analytics and PGIM Fixed Income. Data as of 2017 Q2.

Given the divergent economic conditions in the years before and after the financial crisis, the broad similarities in global inflation performance are remarkable. The pre-crisis period saw rapid growth, building leverage in the financial system, and overheating in asset markets. The post-crisis period has seen softer growth and a gradual reduction in unemployment rates from very high levels. Financial markets have generally been on a recovering trajectory through the post-crisis period, but central banks have emphasized that there is now much less leverage in the core of the system than before the crisis. In addition, both before and after the financial crisis, inflation has typically shown very little imprint of variations in resource slack—the Phillips Curve has been very flat.

This discussion highlights some important questions about the features and drivers of global inflation. In this paper, we seek to document some properties of the global inflation process. To do this, we use a data set of 18 major advanced and emerging-market economies, which together account for roughly 85% of global GDP.<sup>1</sup> We compare the performance of global inflation in the period before the financial crisis (2002 Q1 to 2007 Q2) to its performance in a comparable-length period after the financial crisis (2012 Q1 to 2017 Q2). As we will show, this approach provides us a relatively clean read on the evolution of inflation over the past 15 years. In contrast, inflation performance during the financial crisis was buffeted by a range of extraordinary shocks.

Our work yields several insights regarding the features of global inflation. For the advanced economies, inflation performance has been remarkably stable, with the overall distribution of inflation outcomes—judged by both means and standard deviations—looking very similar in the pre-crisis and the post-crisis periods. Central banks in these economies conquered inflation in the years before the financial crisis and have maintained these gains through the post-crisis period. The bad news for central banks is that this stable distribution is centered somewhat below their 2% targets. As a related matter, we also find tantalizing evidence suggesting that China's impact on the inflation process has diminished during the post-crisis period.

Inflation performance in the major emerging market countries splits these economies into two broad groups. A set of countries with relatively high inflation in the pre-crisis period—including Turkey, Russia, and Indonesia—has achieved markedly lower inflation since the crisis, although Turkey has given back some of these gains over the past two years. Many other emerging market economies have seen quite stable inflation performance—similar to the advanced economies (albeit with moderately higher average rates and somewhat more variability).

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<sup>1</sup> Our choice of countries mirrors the membership of the G-20 with just three deviations. First, we include the euro area as an aggregate rather than Germany, France, and Italy individually. Second, due to data limitations, we replace Argentina with Chile. And third, we add Poland to the panel to increase the footprint of central Europe. Our data are quarterly observations at a seasonally adjusted annual rate (SAAR). Where necessary, we have seasonally adjusted the data using the U.S. Census Bureau algorithm in Haver.

## A QUICK LOOK AT THE INFLATION DATA

Figure 2 reports the average rates of inflation for the 18 economies in our sample over the pre-crisis and post-crisis periods. We focus on four measures of consumer price inflation—headline, the so-called “Western core” (which excludes food and energy), services, and core goods (i.e., goods inflation excluding food and energy).

Figure 2: Average Inflation (Q/Q, %, Annualized)

	Headline		Core		Services		Core Goods	
	Period 1	Period 2	Period 1	Period 2	Period 1	Period 2	Period 1	Period 2
<b>Advanced Economies</b>								
<i>United States</i>	2.8	1.3	2.0	1.9	3.2	2.6	-0.6	-0.3
<i>Euro area</i>	2.1	0.9	1.9	1.1	2.5	1.3	1.2	0.9
<i>Japan</i>	-0.1	0.4	-0.4	0.2	0.0	0.3	-1.2	0.1
<i>United Kingdom</i>	1.8	1.6	1.4	1.8	3.6	2.6	-1.3	0.7
<i>Australia</i>	2.8	1.9	2.1	2.0	3.6	2.7	0.9	1.4
<i>Canada</i>	2.4	1.3	2.0	1.5	2.9	1.9	-0.1	0.5
<b>Emerging Markets</b>								
<i>Chile</i>	2.7	3.3	2.3	3.3	3.0	4.3	--	--
<i>Brazil</i>	7.5	6.6	7.5	6.5	6.1	7.4	--	--
<i>Mexico</i>	4.2	3.9	3.7	3.2	4.4	2.7	2.9	3.9
<i>China</i>	2.0	1.9	0.6	1.7	--	--	--	--
<i>India</i>	4.8	6.4	--	5.8	--	--	--	--
<i>Indonesia</i>	9.1	5.3	--	4.1	--	--	--	--
<i>Korea</i>	3.0	1.3	2.6	1.7	2.9	1.7	1.8	1.8
<i>Poland</i>	2.0	0.7	1.3	0.9	2.3	1.9	0.5	0.0
<i>Russia</i>	11.6	8.1	11.1	7.7	19.5	7.8	7.5	7.7
<i>Saudi Arabia</i>	1.3	2.5	--	--	--	--	--	--
<i>South Africa</i>	5.3	5.6	2.8	5.3	3.9	5.8	1.4	4.2
<i>Turkey</i>	15.5	8.4	15.7	8.4	18.4	8.1	13.6	8.6
<b>Aggregate Averages</b>								
<i>All Countries</i>	4.5	3.4	3.9	3.4	5.5	3.7	2.2	2.5
<i>Advanced Economies</i>	2.0	1.2	1.5	1.4	2.6	1.9	-0.2	0.6
<i>Emerging Markets</i>	5.8	4.5	5.6	4.4	7.6	5.0	4.7	4.4
<b>Aggregate Medians</b>								
<i>All Countries</i>	3.2	2.6	2.3	2.3	3.3	2.7	0.8	1.2
<i>Advanced Economies</i>	2.1	1.4	1.7	1.5	2.8	2.0	-0.3	0.6
<i>Emerging Markets</i>	4.3	3.8	3.6	4.0	4.5	4.7	2.8	3.7

Note: Period 1 is 2002 Q1 through 2007 Q2; Period 2 is 2012 Q1 through 2017 Q2. Source: Haver Analytics and PGIM Fixed Income.

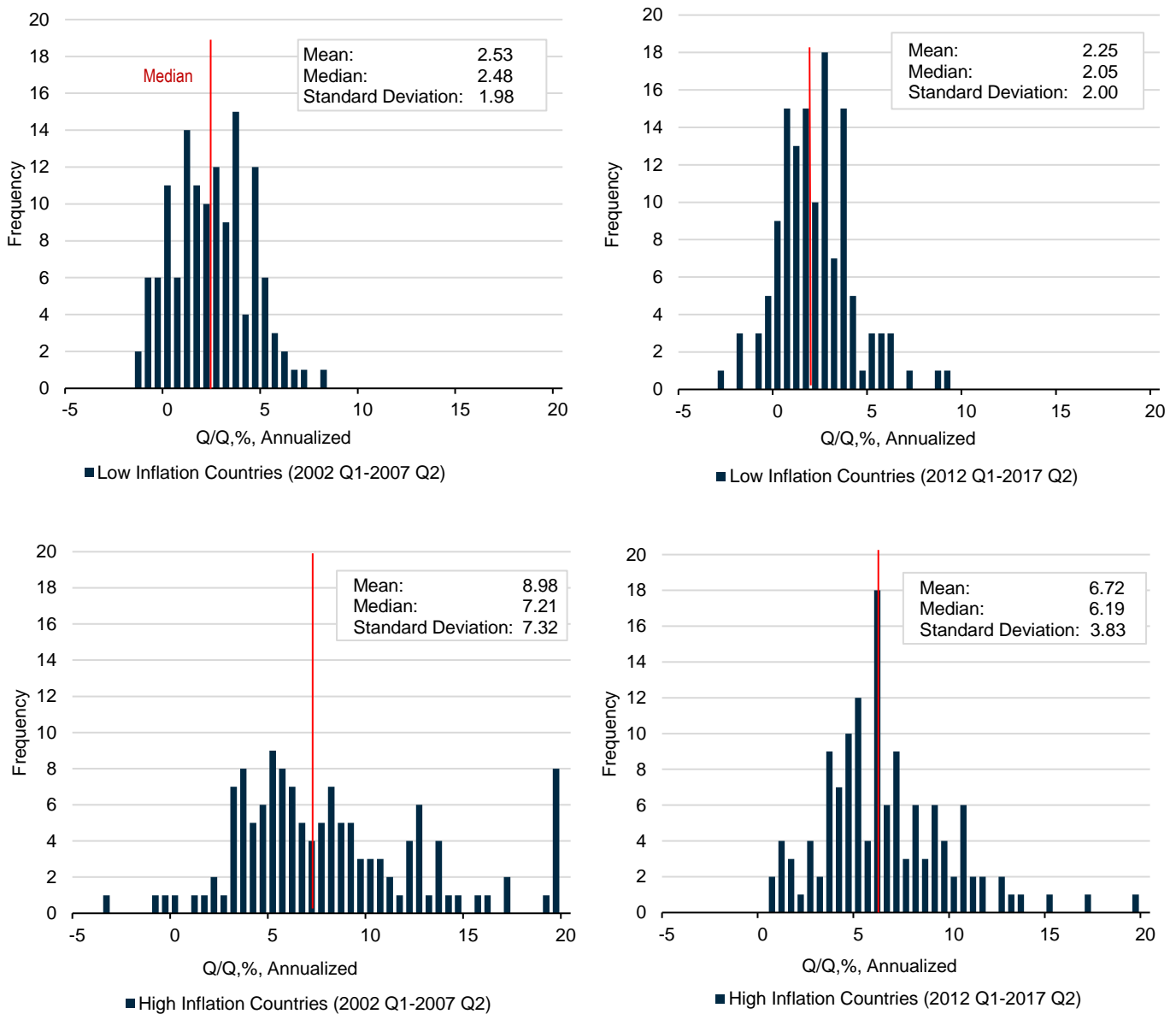
For the advanced economies, a quick perusal of these data shows headline and core inflation rates in both periods running between 1% and 3%, except for Japan where inflation was lower.<sup>2</sup> Notably, these countries saw a marked drop in services price inflation during the second period, with Japan again the only exception.

For the emerging market economies, we are plagued by limited data availability. Only eight of the countries in our panel have data for services inflation and only six report core goods inflation (or publish data that are sufficient enough for us to calculate it). Looking at the emerging markets, we see a sharp drop in headline inflation for the three countries with the highest inflation rates in the first period—Turkey, Russia, and Indonesia. The fact that the highest inflation countries prior to the crisis subsequently recorded strong disinflation after the crisis is an important feature of inflation performance that we will discuss below.

<sup>2</sup> To streamline the analysis, we exclude the quarter when Japan raised its consumption tax (2014 Q2). Given that we are working with quarterly changes (annualized), the effects of the tax increase should be primarily localized in that quarter.

The data in Figure 3 amplify this discussion. The upper panels show histograms for the six emerging market economies with the lowest headline inflation (Chile, Mexico, China, Korea, Poland, and Saudi Arabia). The mean and median of this group decline a bit across the two periods, but the distribution is generally stable and inflation is typically low. The lower panels show histograms for the remaining six emerging markets in our sample. These countries saw significant disinflation across the two periods, with the mean falling from 9% to 6¾% and the standard deviation of the distribution tightening by nearly half. Thus, another important observation highlighted by our work is the heterogeneity of inflation performance across the emerging market economies—i.e., a decline in inflation among those that started with higher inflation versus the relative stability of inflation in those with lower inflation initially.

**Figure 3: Emerging Market Headline Inflation**



Source: Haver Analytics and PGIM Fixed Income.

## HOW HAS INFLATION PERFORMANCE EVOLVED?

We now turn to Figure 4, which is the keystone of our work. It shows how measures of aggregate inflation performance changed between “Period 1” (2002 Q1 to 2007 Q2) and “Period 2” (2012 Q1 to 2017 Q2). Two comments about these data are helpful. First, the data reported in each cell are the simple (unweighted) means of the underlying country data. We use this approach because it highlights the experience of the underlying countries and avoids the difficulties of picking an appropriate weighting scheme. That said, as a check on our work, we replicated the top half of Figure 4 using market-GDP weights, and the results were broadly similar. Second, as previously noted, several of the emerging market economies do not report the full slate of inflation data that we are examining. The various cells in the table below report the averages and medians for all countries where the data are available.<sup>3</sup>

**Figure 4: Changes in Inflation Performance (Q/Q, Percentage Points, Annualized)**

	Headline	Core	Services	Core Goods
<b>Aggregate Average</b>				
<i>All Countries</i>	-1.1	-0.5	-1.8	0.3
<i>Advanced Economies</i>	-0.8	-0.1	-0.7	0.8
<i>Emerging Markets</i>	-1.3	-1.2	-2.6	-0.3
<b>Aggregate Median</b>				
<i>All Countries</i>	-0.6	0.0	-0.6	0.4
<i>Advanced Economies</i>	-0.7	-0.2	-0.8	0.9
<i>Emerging Markets</i>	-0.5	0.4	0.2	0.9

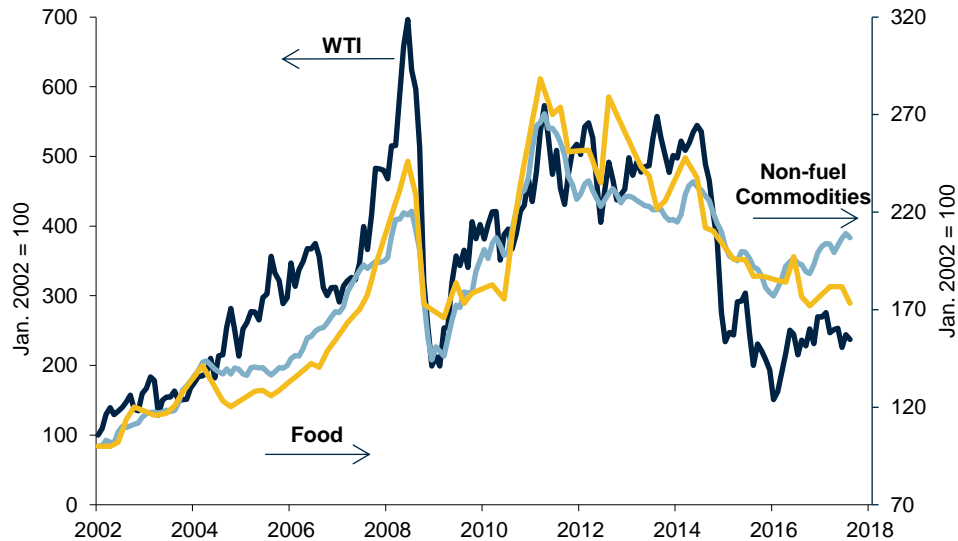
Note: Change is the difference between average inflation in the post-crisis period (2012 Q1-2017 Q2), and average inflation in the pre-crisis period (2002 Q1-2007 Q2). Source: Haver Analytics and PGIM Fixed Income.

The data shown in Figure 4 yield several important observations.

First, advanced and emerging market economies both showed a decline in headline inflation over the two periods. Average headline inflation across these 18 economies moved down by roughly 1 percentage point, in line with the much softer performance of oil and other commodity prices in the years after the crisis (Figure 5). The decline in average headline inflation was particularly large for the emerging markets, but sizable for both groups of countries. By comparison, the change in median headline inflation (shown in the bottom half of the table) was qualitatively similar but, for the emerging markets, somewhat smaller.

<sup>3</sup> This means that in some cases the country composition of the reported statistics varies a bit between the two periods and that the measures of inflation may have somewhat different country coverage. We prefer working with this unbalanced panel rather than excluding some countries entirely. As a robustness check, however, we recalculated Figure 3 using the 12 countries, six advanced economies, and six emerging markets for which the full set of data is available, and the results were broadly similar to those reported.

**Figure 5: Commodity Prices**



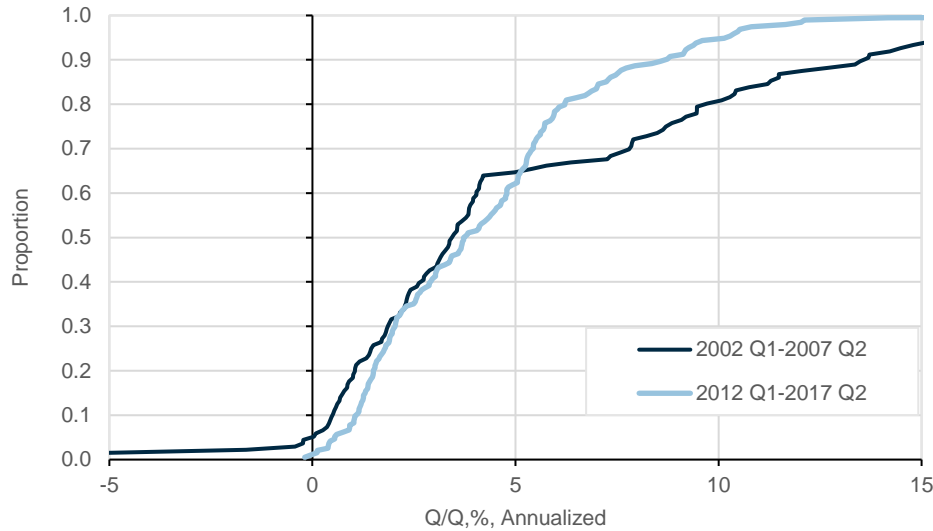
Source: Haver Analytics, CRB, BEA, and Standard & Poor's. Data as of August 2017.

Second, average core inflation for the advanced economies was unchanged across the two periods. This observation, combined with results we will present below, suggests that core inflation in the advanced economies converged to low levels in the years before the financial crisis—and essentially remained there after the crisis. We see this entrenched stability in advanced economy inflation as an important factor influencing the recent performance of global bond markets.

The behavior of core inflation in the emerging market economies is a surprisingly nuanced issue. As shown in the top half of Figure 4, average core inflation for the emerging markets fell significantly, by 1.2 percentage points, across the two periods. However, the medians tell a different story, with the median for emerging market inflation posting a moderate 0.4 percentage point increase. What is going on?

To address this issue, we calculate the cumulative density functions (CDF) for emerging market core inflation in Figure 6. This shows the percent of the underlying observations that have a value less than (or equal to) the indicated value. The yellow line shows the pre-crisis period, and the blue line shows the post-crisis period. Notably, the first two-thirds or so of the distribution is shifted toward slightly higher inflation during the second period. This explains the small increase in median core inflation. But clearly, the higher inflation countries in the sample (Turkey, Russia, and Brazil) moved in a marked way toward lower inflation, with the top portion of the CDF shifting sharply to the left, which explains the decline in average inflation for the group as a whole.



**Figure 6: Emerging Market Core Inflation (CDF)**

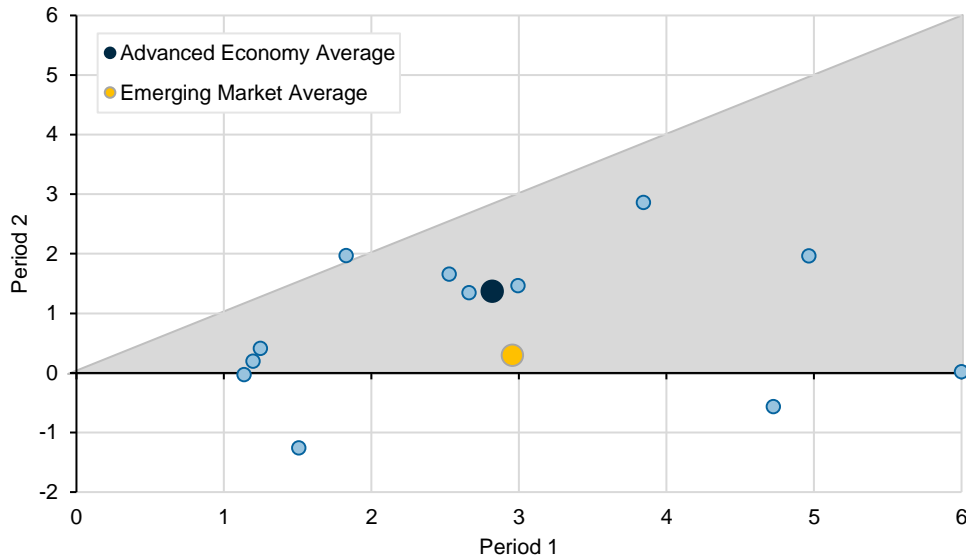
Source: Haver Analytics and PGIM Fixed Income.

This discussion yields two other important insights. Roughly two thirds of our emerging market distribution saw core inflation essentially stabilize during the second period relative to the first. In this sense, the results echo the stability of inflation in the advanced economies. In addition, however, *the emerging market economies with high inflation in the first period saw meaningful drops in inflation during the second period, and this accounts for the lion's share of the observed decline in core inflation globally.*

The third and fourth columns of Figure 4 break core inflation into services and core goods. For both groups of countries, average services inflation moved down in the second period—by nearly  $\frac{3}{4}$  of a percentage point in the advanced economies and by over  $2\frac{1}{2}$  percentage points in the emerging markets. In contrast, core goods inflation in the advanced economies moved up meaningfully, offsetting the decline in services inflation, while core goods inflation in the emerging markets declined slightly (mainly reflecting a large drop in Turkey). Despite these moves, however, average core goods inflation across our panel of countries (Figure 2) remained below the average rate of services inflation—just not to the extent prior to the crisis.

Amplifying this point, Figure 7 charts the differential between the inflation rates for services and core goods in the two periods. Notably, the observations fall mainly into (or very near) the shaded region, highlighting two conclusions. First, the fact that the observations are below the 45-degree line indicates that the gap between services inflation and core goods inflation typically narrowed across the two periods. Second, the y-coordinate for most observations is positive, showing that services inflation in the second period typically remained higher than that for core goods. Thus, an important observation is that *services inflation globally continues to run above that for core goods, but by less than before the crisis.*

**Figure 7: Gap Between Services and Core Goods Inflation (Q/Q, Percentage Points, Annualized)**



Source: Haver Analytics and PGIM Fixed Income. Period 1 is 2002 Q1 through 2007 Q2; Period 2 is 2012 Q1 through 2017 Q2.

It is tempting to give this an economic interpretation. Over the past 15 years, as China has become increasingly integrated into the global economy, Chinese exporters—mainly of various types of core goods—have engaged in vigorous price competition. Accordingly, we hypothesize that the integration of China into the global economy over this period has tended to drive down the price of core goods (and other tradables) relative to the price of services (and other non-tradables). This relative price adjustment has both restrained the rate of core goods inflation and lifted services inflation, given that central banks have targeted the pace of inflation overall.

Consistent with this observation, during the pre-crisis period—immediately following China’s WTO accession in late 2001, when the effects of China’s integration were most intense—services inflation exceeded core goods inflation by 3 percentage points on average across our panel of observations (Figure 2). In the second period, this gap declined to a little over 1 percentage point, suggesting that the impact of the “China shock” on global inflation has diminished. This effect is particularly apparent in the data for the advanced economies. Of course, this interpretation is admittedly speculative—other factors (such as the effects of technological advances) could also be in play.

### THE VARIABILITY OF INFLATION

In assessing global inflation performance, a closely related issue is whether the dispersion of inflation across countries and within countries over time has shifted in any appreciable ways. In response to this question, Figure 8 examines how inflation variability has changed. Looking at data for all the countries, the standard deviation of headline inflation was down a striking 2 percentage points and was down by even more, 2½ percentage points, for core inflation. This result, however, masks very different performances in the advanced economies and the emerging markets.



**Figure 8: Changes in Inflation Volatility (Q/Q, Percentage Points, Annualized)**

	Headline	Core	Services	Core Goods
<b>Aggregate Standard Deviation</b>				
<i>All Countries</i>	-2.0	-2.5	-4.1	-2.0
<i>Advanced Economies</i>	-0.3	-0.2	-0.4	-0.3
<i>Emerging Markets</i>	-2.5	-3.5	-5.4	-2.9

Note: Change is the difference between the standard deviation of inflation in the post-crisis period (2012 Q1–2017 Q2) and the standard deviation of inflation in the pre-crisis period (2002 Q1–2007 Q2). Source: Haver Analytics and PGIM Fixed Income

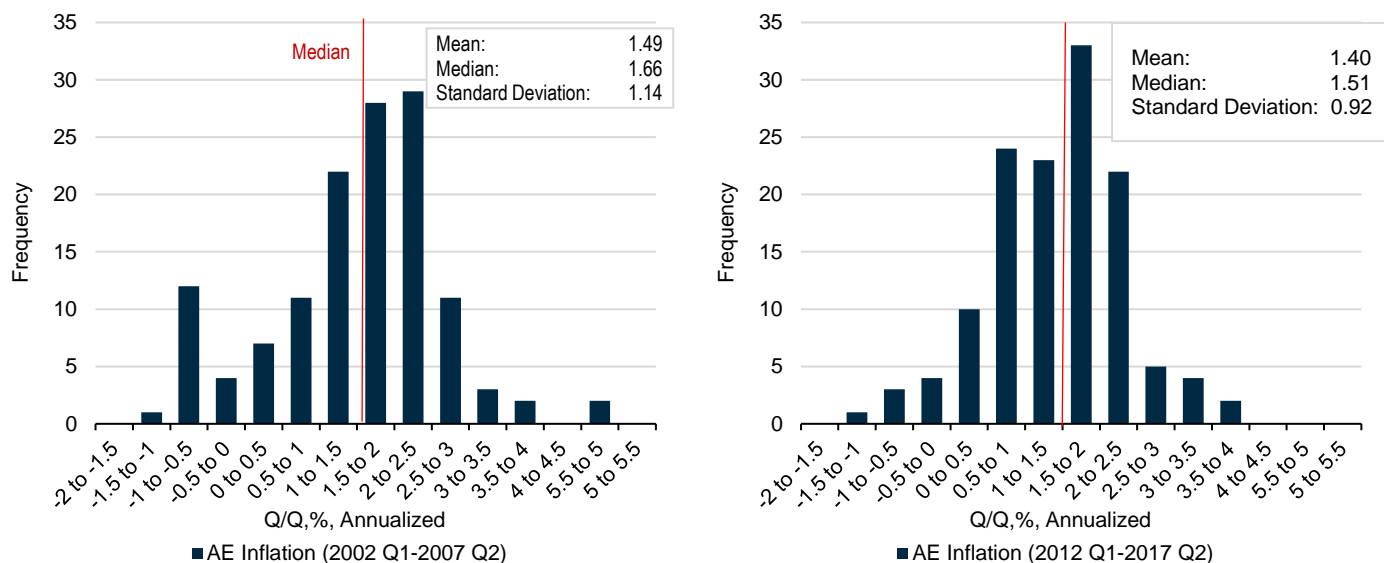
*The standard deviation of inflation in the emerging markets fell sharply, by a hefty 2½ percentage points for headline and 3½ percentage points for core. This reflected a particularly sizable drop (of more than 5 percentage points) in the variability of services inflation. Turkey, South Africa, and Russia all saw sharp falls, while Chile, Mexico, and Korea also posted declines. This reduction in the variability of services inflation—a key indicator for the non-traded sectors of the economy—suggests that the emerging markets achieved greater internal economic stability in the years after the financial crisis. The variability of core goods prices also declined.*<sup>4</sup>

*In contrast, the variability of inflation in the advanced economies declined only modestly. This result is broadly consistent with what we saw for average inflation performance for the advanced economies—very little change in the overall distribution of inflation across the two periods.*

Figure 9, which shows histograms for quarterly core inflation prints for these six advanced economies, highlights this point. The overall distributions of quarterly inflation performance across the two periods are remarkably similar. In both distributions, nearly half of the observations fall between 1½% and 2½% and roughly 70% are between 1% and 3%. The distribution for the post-crisis period has more observations between zero and 1%, but fewer observations in negative territory.

<sup>4</sup> In interpreting these results, it should be recalled that, while core inflation is constructed as a weighted average of services inflation and core goods inflation, the relationship between the standard deviation of core inflation and the standard deviations of services inflation and core goods inflation will also reflect the covariance of services inflation and core goods inflation.

**Figure 9: Advanced Economy Core Inflation**



Source: Haver Analytics and PGIM Fixed Income

Notably, Japan accounts for all but one of the observations in negative territory. In the first period, Japan recorded core deflation in 17 of 22 quarters. During the second period, which saw Governor Kuroda take strong action to raise inflation, Japan had deflation in seven of 22 quarters—four of these quarters occurred before the onset of Kuroda’s program and three of them occurred afterwards (2016 Q3 and 2017 Q1-Q2). The only other negative quarterly observation was recorded by Canada in 2012 Q3. Finally, it’s worth mentioning that the mode of the distribution shifted slightly, from a little above 2% before the crisis to a little below 2% afterwards.

The observed distribution of inflation performance raises an interesting question of whether it is well aligned with central banks’ policy objectives. Several observations seem relevant. First, central banks have clearly been successful in their long-term effort to avoid break-out inflation on the upside. In both periods, inflation—even on a quarterly basis—does not typically stray much above 2%. Second, excluding Japan, central banks have also been successful at avoiding deflation, even in terms of seeing negative inflation outcomes for a single quarter. A related observation is that Japan’s experience has become something of a cautionary tale for central banks, highlighting that once deflationary expectations become entrenched they are difficult to dislodge. Third, the center of the distribution of outcomes (whether judged by mean or median) has come in closer to 1½% than to 2%, particularly in the second period.

The bottom line is that advanced economy central banks have had much success conquering high inflation, but precisely nailing a distribution centered at 2%—the objective that most of these central banks have identified—has not yet been fully achieved. A deeper question is whether hitting a target with greater precision is achievable as a practical matter. Given the multiple factors in play, how exact can central banks hope to be in their management of inflation?

**INFLATION PERFORMANCE MORE RECENTLY**

We now divide the post-crisis period into two separate periods—2012 Q1-2015 Q2 and 2015 Q3-2017 Q2. The second period is somewhat shorter than the first because we want to focus, in particular, on the recent performance of inflation and assess whether there have been any changes relative to the overall post-crisis period. With this in mind, Figure 10 highlights several points. First, headline inflation has declined somewhat further in both the advanced economies and the emerging markets over

the past two years, in line with the softening of food and oil prices globally (See Figure 4). Second, echoing the results shown above, average core inflation in the advanced economies was unchanged, with a slight further decline in services inflation offsetting a rise for core goods. Third, the emerging markets also saw a small rise in core goods inflation, but this was more than offset by a decline in services inflation. As a result, emerging market core inflation moved down.

**Figure 10: Changes in Inflation Performance (Q/Q, Percentage Points, Annualized)**

	Headline	Core	Services	Core Goods
<b>Aggregate Average</b>				
<i>All Countries</i>	-0.6	-0.2	-0.3	0.1
<i>Advanced Economies</i>	-0.2	0.0	-0.2	0.1
<i>Emerging Markets</i>	-0.8	-0.3	-0.4	0.1

Note: Change is the difference between average inflation in the most recent period (2015 Q3–2017 Q2) and average inflation in the initial post-crisis period (2012 Q1–2015 Q2). Source: Haver Analytics, PGIM Fixed Income

The underlying country data are shown in Figure 11. *For the advanced economies, the data continue to highlight a very muted and stable inflation process.* In both periods, core and headline inflation typically notched in at between 1% and 2%. Japan was again the outlier, avoiding deflationary outcomes, on average, but with inflation still an appreciable distance from the Bank of Japan's 2% target. *Overall, the recent inflation data show little signature of declining unemployment or diminishing resource slack more generally.*

**Figure 11: Average Inflation (Q/Q, %, Annualized)**

	Headline		Core		Services		Core Goods	
	Period 1	Period 2	Period 1	Period 2	Period 1	Period 2	Period 1	Period 2
<b>Advanced Economies</b>								
<i>United States</i>	1.2	1.5	1.8	2.0	2.5	2.9	0.0	-0.6
<i>Euro area</i>	1.0	0.7	1.1	1.1	1.4	1.3	1.0	0.8
<i>Japan</i>	0.6	0.0	0.2	0.2	0.3	0.2	0.1	0.2
<i>United Kingdom</i>	1.6	1.6	1.8	1.8	2.7	2.5	0.6	0.8
<i>Australia</i>	2.2	1.5	2.1	1.6	3.2	1.9	1.3	1.5
<i>Canada</i>	1.2	1.4	1.3	1.7	1.8	2.1	0.3	0.7
<b>Emerging Markets</b>								
<i>Chile</i>	3.4	3.2	3.3	3.3	4.4	4.0	--	--
<i>Brazil</i>	6.7	6.4	6.6	6.3	8.1	6.2	--	--
<i>Mexico</i>	3.7	4.3	2.9	3.8	2.5	3.0	3.4	4.9
<i>China</i>	2.0	1.8	1.6	1.8	--	--	--	--
<i>India</i>	7.8	3.9	6.7	4.4	--	--	--	--
<i>Indonesia</i>	6.1	3.8	4.6	3.3	--	--	--	--
<i>Korea</i>	1.2	1.4	1.7	1.8	1.5	2.2	2.4	0.8
<i>Poland</i>	0.7	0.6	1.0	0.6	1.8	2.2	0.4	-0.8
<i>Russia</i>	9.4	5.8	8.6	6.2	8.8	5.9	8.5	6.3
<i>Saudi Arabia</i>	2.8	1.8	--	--	--	--	--	--
<i>South Africa</i>	5.5	5.7	5.3	5.1	6.0	5.6	4.2	4.2
<i>Turkey</i>	7.9	9.2	7.4	10.0	7.8	8.5	7.1	11.3

Aggregate Averages								
All Countries	3.6	3.0	3.4	3.2	3.8	3.5	2.4	2.5
Advanced Economies	1.3	1.1	1.4	1.4	2.0	1.8	0.5	0.6
Emerging Markets	4.8	4.0	4.5	4.2	5.1	4.7	4.3	4.4
Aggregate Medians								
All Countries	2.6	2.4	2.2	2.4	2.7	2.7	1.2	1.3
Advanced Economies	1.5	1.0	1.5	1.4	2.1	1.9	0.6	0.7
Emerging Markets	4.3	3.5	4.4	3.6	5.3	4.1	3.7	3.7

Note: Period 1 is 2012 Q1 through 2015 Q2; Period 2 is 2015 Q3 through 2017 Q2. Source: Haver Analytics and PGIM Fixed Income.

In the emerging markets, several countries with relatively high inflation initially—Russia, India, and Indonesia—posted significant declines in headline and core inflation. Turkey, on the other hand, saw inflation rise appreciably, reflecting ongoing political uncertainties and exchange rate depreciation. The changes in inflation for the other emerging markets were generally small and in varying directions.

The key point is that inflation performance over the past two years has continued to show features broadly similar to the earlier post-crisis period. Inflation in the advanced economies and many of the emerging markets has remained relatively low and stable, while several of the high-inflation emerging market economies have seen further disinflation.

## CONCLUDING THOUGHTS

Our work documents a generally stable global inflation process, with inflation performance in many countries remaining low and stable even in the face of a diverse range of economic conditions. This observation is undoubtedly of central importance in explaining the ongoing low levels—and relative stability—of longer-term bond yields. Stated bluntly, we find a compelling case for inflation expectations to be low, stable, and well anchored. This means that investors have good empirical reasons both for requiring low inflation compensation for holding bonds and for demanding relatively small compensation for inflation risk. Relative to previous decades, the inflation process has shifted, and these features of bond pricing reflect that reality. The stable nature of inflation also contributes to a more stable overall macroeconomic environment, and this should tend to reduce financial risks premiums more generally.

Our results are also encouraging for the emerging markets. The fact that inflation has moved toward stability in so many of these countries points to their increasing policy maturity and to the reliability of their core institutions.

In future work, we will look more carefully at the underlying drivers of global inflation, but the fact that overall inflation performance has been so similar in the years before and after the financial crisis—periods when economic circumstances differed meaningfully—hints at an inflation process that is not highly sensitive to the proximate economic environment. Of course, headline inflation bears the signature of shifting commodity prices, but this doesn't seem to have a powerful effect on core measures of inflation.

Finally, our sense is that central banks remain a crucial part of the story. The stability of inflation that we document no doubt reflects that central banks have done their jobs well over the past 15 years as they have responded to shocks in ways that have tended to deliver stable inflation. Accordingly, inflation expectations in both the real economy and in financial markets have reinforced these efforts. Preserving this equilibrium requires that central banks remain vigilant and prepared to respond as necessary to emerging inflationary risks.

**NOTICE: IMPORTANT INFORMATION**

Source(s) of data (unless otherwise noted): PGIM Fixed Income as of October 2017

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