Phinance Technologies

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Inflation Expectations Report

Models for 1-year inflation expectations.

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By Phinance Technologies

Contents

1 Introduction

1.1 Aim

The aim of this report is to provide a tool for anticipating future inflation on a 1-year time scale, using the information conveyed by known inflation expectation measures and our own Phinance Technologies model (Early Inflation Indicator - EII) for anticipating future changes in inflation.

This report compares the performance of different inflation expectation models and builds a composite inflation indicator, which provides a powerful tool for assessing future inflation.

1.2 Executive Summary

Inflation is a hot topic at the moment. After lying dormant since 1990, it seems as though inflation has made an unexpected comeback. If in the last decade, deflationary forces seemed to dominate the macroeconomic landscape, the Covid-19 pandemic brought about significant political and social changes, which led to the inflation genie "escaping out of the bottle".

Carlos Alegria in his book[1] "Economic Cycle, Debt and Demographics" described the coming period as the inflation roller coaster where periods of inflation would be followed by short deflation or disinflation periods as central bank policy makers tighten monetary policy and precipitate demand destruction (periods of recession).

Geopolitical tensions would add noise to this already uncertain environment for inflation and policymakers' actions, which is evidenced by the Ukraine-Russia conflict and the recent Iran-Israel-US conflict that led to the closure of the strait of Hormuz.

The ongoing inflation uncertainty will provide challenges to fixed income investors both professional (pension funds, bond fund managers, hedge funds) as well as private individuals as their sources of stable income could be eroded by rising prices, as occurred during the 2021-2023 pandemic inflationary burst.

This report is a step in addressing these challenges by providing a powerful model for estimating future changes in inflation on a 1-year time scale. For such, we analyse the performance of different known inflation expectations metrics in estimating future changes in inflation. We also include our own proprietary early inflation indicators (EII) and a composite inflation model that is shown to be the more powerful tool to estimating future inflation.

It should be noted that with this tool we address the "problem" of estimating medium-term (1-year time frame) changes in total CPI and core CPI, but **not** short-term fluctuations or longer-term expectations derived from changes in monetary policy preferences.

[1] https://a.co/d/0bEqcdQ7

1.3 Main highlights

The main highlights within the report are:

➔ Comparison of the performance of different inflation expectations models in anticipating future 1-year changes in **total CPI**.

➔ Presentation of the proprietary Phinance Technologies Early Inflation Indicator (EII) for estimating 1-year changes in **total CPI**. This model provides an new framework for estimating future inflation, which is uncorrelated with existing approaches.

➔ Presentation of the composite model for estimating 1-year total CPI changes that combines different models/indicators which results in the most powerful tool for estimating future inflation changes in a medium-term time frame (1-year).

➔ Analysis of models for estimating 1-year **core-CPI** changes, which is a key inflation metric as it avoids short-term volatility from food and energy shocks.

➔ Discussion of the latest estimates for inflation (both core-CPI and total CPI) as of the 12th of April of 2026 in the context of the ongoing oil shock due to the Hormuz closure.

1.4 Who would benefit from this report?

Inflation is a key economic variable in the economy. It has a large impact on the bond market which, through the setting of rates of interest, moderates or enhances economic growth. Bond investors and central bankers all monitor inflation and bond yields as the key barometers for the status of the economy. As Alan Greenspan declared: "the yield on the 10-year tells me how the economy is doing".

Consequently, the main beneficiaries of this report are:

- Fixed income investors.
- Risk managers, HNWIs or asset allocators who are uncertain on how to quantify inflation risks and scenarios on different time scales.
- Sectors or industries that have interest rate exposure (Banks, Real Estate, Leveraged Buyouts, etc).
- Economists and policy makers would benefit from our proprietary EII (Early Inflation Indicators) to have more accurate estimates of future inflation on a 6 to 15 months' time-scale.

2 Inflation - background information

To understand the challenges of estimating inflation on different time frames, in this chapter we provide a brief summary of the characteristics of inflation, including a succinct historical overview.

2.1 The birds-eye view: A monetary approach to inflation

A general approach to think about inflation is by using Fisher's formulation of the quantity theory of money in terms of the equation of exchange:

$$M \cdot V = P \cdot T \approx GDP \qquad \text{(Equation 2-1)}$$

Where if M is the money stock and V the velocity of money, which multiplied are equal to the product of T, the real transactions of goods and services and P, the prices of the goods and services. The product PxT is approximated by economists by using nominal GDP. For a proxy for the money stock, economists use different measures of money; the one which is mostly used today is M2 money stock, comprising of cash, checking deposits and short-term deposits easily converted into cash.

The velocity of money is an elusive notion which economists represent as the speed at which money passes from one hand to the other, creating a multiplying effect in the economy. Anna Schwartz and Milton Friedman equate the money multiplier to the demand for money, implying, the demand for credit. The velocity of money is an indirect measurement which is inferred from the equation of exchange, by dividing nominal GDP by the money stock.

One of Milton Friedman's famous quotes, "Inflation is always and everywhere a monetary phenomenon" has its roots in the equation of exchange above. However, Friedman assumed that the velocity of money was rather constant over time at a value of about 1.7 and therefore inflation originated in increases in the money supply. Friedman's assumption of a constant velocity was incorrect. Since 2000, the velocity of money has been steadily decreasing, giving rise to deflation fears and a more active Fed to avoid a deflationary trap.

Central banks have a mandate to maintain stable price changes over time and at moderate values of change, of typically 2%-2.5% per year. The preference towards having a positive level of inflation in the economy is that it provides central banks a buffer in order to moderate economic swings by managing interest rates. The bias for positive inflation is also justified by being necessary to help adjust wages (and reduce unemployment) as wages are sticky and difficult to reduce. Additionally, central bankers fear a deflationary environment (with negative inflation expectations) leading to a deflationary trap due to individuals hoarding cash and deferring consumption.

2.2 What is inflation?

To understand the relevance of current developments in inflation we need to understand different aspects of inflation, such as how it is defined, what it measures and how it has behaved historically. Inflation is defined as a rate of rise in general prices of goods or services, while in opposition deflation refers to the rate of falling prices. Furthermore, disinflation is an environment with a declining rate of inflation.

There are different measures of inflation that serve the purpose of providing proxies for the overall changes in prices in the economy. The most popular and representative is the Consumer Price Index (CPI). Central bankers at the Fed prefer to use core CPI which is the CPI index with the volatile components of food and energy inflation removed.

Other metrics for inflation include the Produce Price Index (PPI) and Wage Price Inflation (WPI). Some economists argue that inflation measures should include asset prices as sometimes excess money inflates asset prices producing asset bubbles. We prefer to monitor different inflation measures related to goods or services and keep the analysis of asset prices separate.

2.3 Inflation in historical context – from 1948 to 1980

The historical evolution of inflation rates, from 1948 onwards, is illustrated in Figure 2-1 where, for comparison, 10y US government bond yields are also shown. The graph paints an interesting picture of two multi-decade periods in inflation and bond yields.

The first period was of rising interest rates from 1930 to 1980. The Great Depression was a great reset in asset prices, ending a previous period of globalisation and prosperity, and ushering the world into an era of big government interventions and protectionism. The transition was slow, starting with the Great Depression in 1930 and finishing in 1945, at the end of WWII. The transition period was characterised by the rise of Fascism and Communism in Europe and the Second World War which brought a new reality as the world entered the "Cold War". The great globalisation that started in the 1870s with a world interconnected by trade came to an end.

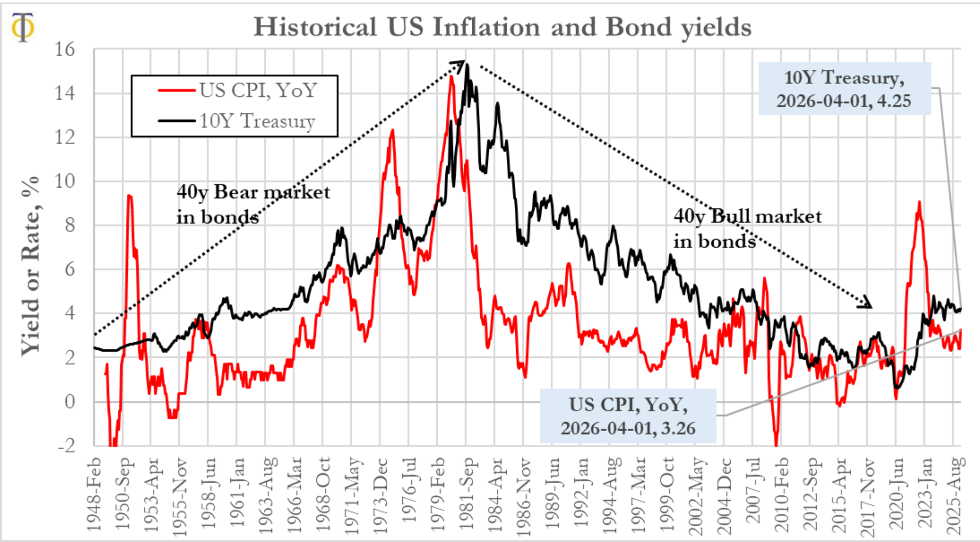

Figure 2-1 - Historical US inflation and 10y government bond yields

As can be observed in Figure 2-1, this period was characterised by a slow but steady rise in inflation and bond yields from 1948 until 1980. Both inflation and the 10y bond yield seem have risen in bursts and not steadily. After every burst in inflation, an economic slowdown brought inflation sharply down again, but the overall trend was one of rising inflation. The 1970s marked the transition from the era of rising inflation to one of disinflation, from 1980 onwards. It was marked by the end of Breton Woods and Nixon's ending of the convertibility of dollars to gold in 1971. Thereafter, inflation ran rampant and the 1970s were a turbulent economic and social period.

2.4 Inflation in historical context – from 1980 to 2021

The second period that started around 1980 is characterised by the reverse trend of the one that occurred in the previous period (see Figure 2-1). It was a period of increasing trade and globalisation, with the end of the Cold War marked by the fall of the Berlin wall in late 1989. The more liberal trade policies were associated with falling inflation and a large increase in prosperity, first in the developed countries (USA, Europe, Japan, etc) and later in the emerging markets (China, India, Brazil, Mexico, etc).

The emergence of global supply chains with outsourcing of cheap labour, economies of scale and increased specialisation, led to a dramatic containment of inflation. Japan, Korea, Malaysia, Thailand, and most importantly China (as the emergent factory for the world) followed a development path of increased urbanisation, bringing millions of individuals out of the extreme poverty of agricultural subsistence. Developed nations also saw a rise in prosperity as their consumers had access to cheaper products.

2.5 Inflation in historical context – from 2021 onwards

The SARS-CoV-2 pandemic seems to have been the event that set in motion forces that will shape the coming decades. As a response to the pandemic measures in early 2020, governments ran huge deficits that were financed by an unprecedented expansion of central banks' balance sheets. In the US, the Fed balance sheet expanded by $1.8 Tn in 2020 alone, leading to a $4 Tn increase in the M2 Money Stock, a 25.6% rise in a single year, as shown in Table 2-1.

Date	Monetary Base Tn, $	Change Tn, $	M2 Money Stock Tn, $	Change %
01/01/2020	3.44		15.43	
01/01/2021	5.25	1.81	19.38	25.6%
01/01/2022	6.10	0.86	21.65	11.7%
01/01/2023	5.33	-0.77	21.28	-1.7%
01/01/2024	5.84	0.51	20.84	-2.0%
01/01/2025	5.61	-0.23	21.55	3.4%
01/01/2026	5.40	-0.21	22.47	4.3%

Table 2-1 - Increase of the monetary base and money stock as a response to the Covid-19 pandemic.

The 25.6% expansion in the M2 money stock was followed by an 11.7% expansion in 2021, which led to a spike in inflation, which peaked in mid-2022 at about 9% on a year-on-year basis. The 25.6% expansion of the money stock did not lead to an equivalent rise in prices because the velocity of money dropped precipitously due to the pandemic lockdowns and individuals' inability to spend, as well as uncertainty due to fear of the virus. The consensus view by central bankers and economists was that the spike in inflation was temporary, caused in part due to the temporary accommodation provided by central banks but mostly due to the disruption in global supply chains caused by the government measures to tackle the pandemic.

The US treasury market agreed with this view, as market-implied 5-y 5y forward rates remained relatively unchanged at around 2.4%, as shown in Figure 2-2. Curiously, even though the treasury markets appear to react aggressively to deflationary periods caused by recessions (such as in 2009 and 2020), the bond markets missed the inflation spike from 2021 to 2023.

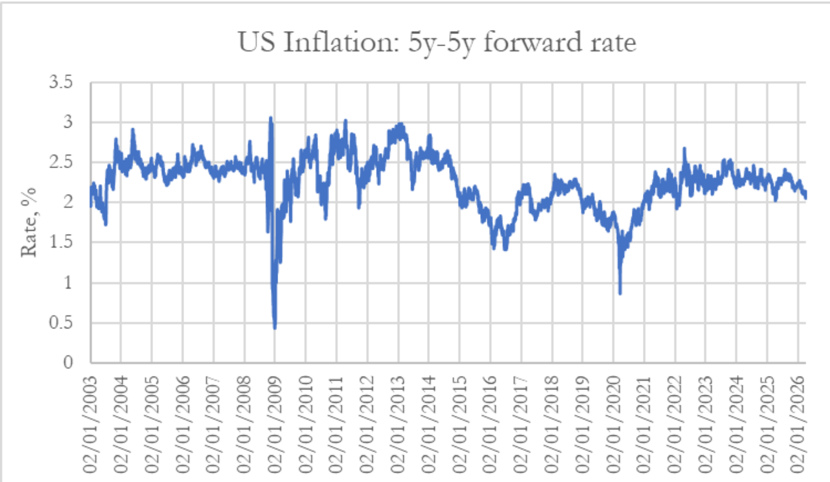

Figure 2-2 - Market-implied inflation expectations. 5y - 5y forward rate

We believed that the market was underestimating the risk for persistent inflation in the coming decade and that, at its core, a new inflation regime was emerging, driven by the expansion of the money supply[2]. From early 2022, the aggressive monetary tightening by the Fed inflation led to an unprecedented **fall** in the money supply (see Table 2-1) leading to a downward trend in inflation rates (disinflation). However, the Fed seems to have tightened monetary policy too aggressively and for too long, which could lead to an economic recession and short period deflation, which we believe will subsequently be followed by another round of unconventional monetary policy (QE).

2.6 Inflation - The start of a new phase: 2022-2035?

The (mis)management of monetary policy in response to the pandemic will likely be viewed in hindsight as the major turning point for inflation and interest rates in the US and the world. The current burst in inflation is not a transient phenomenon, but instead it is likely the start of a new

[2] Carlos Alegria explains the reasoning behind this risk in chapter 8 of the 2nd edition of his book "Economic Cycles, Debt and Demographics" https://a.co/d/0bEqcdQ7

historical period: a characterised by periods of high inflation and disinflation (an inflation roller coaster) that will likely be coupled with social and geo-political upheaval.

The expansion of the central banks' balance sheets in 2020 and to a lesser extent in 2021 set in motion inflationary forces that will take a decade or more to rein in. Those who are late to adapt to the change in the economic landscape and keep anchored to the "old" paradigm of declining interest rates and subdued inflation of the last three decades, will suffer the largest disappointment when they are eventually forced to confront the new reality which is unfolding now.

Consequently, the main motivation of this report is to have a framework for monitoring inflation developments by using key inflation expectation indicators that we believe should be closely monitored in the coming decade. We do not know the outcome for inflation in the coming years, but we can keep a close eye on the relevant indicators.

2.7 Inflation measures

To monitor inflation, economists focus on two measures that we are key in providing a good barometer, namely: the CPI and core CPI (excluding food and energy). Each of these measures captures slightly different aspects of changing prices, which are explained below:

- The CPI. It measures the general increase in price of a "basket of goods" that affects the final consumer. As the consumer represents about 70% of GDP in the US, the CPI is a good indicator for changing prices in the economy.
- Core CPI. This is the preferred measure used by Fed economists. It refers to the general CPI with the food and energy items removed from the calculation. The justification for these items being removed from the index is their volatility due to supply/demand issues, which tend to be transient in nature.

Figure 2-3 shows the inflation measures plotted in terms of year-on-year (YoY) changes which eliminate seasonal effects. However, as a drawback, it provides a slow moving, after the fact, value for inflation.

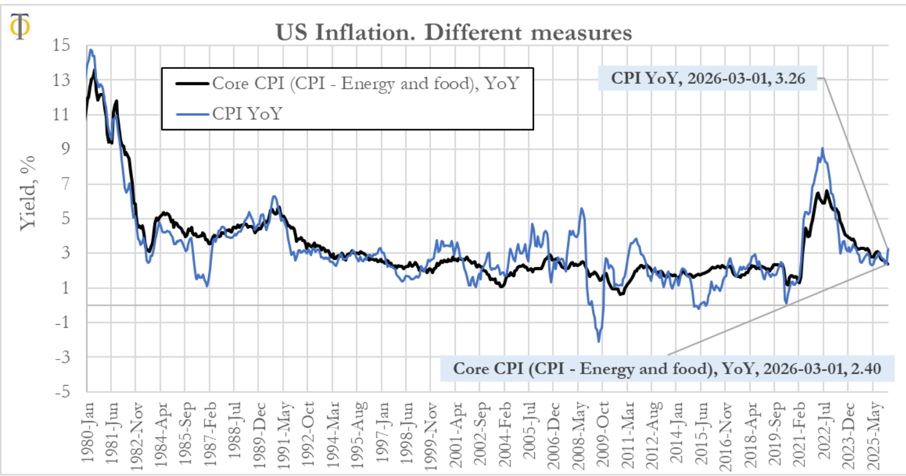

Figure 2-3 - US Inflation measures. CPI and Core CPI from January of-1980 to March of 2025.

We can observe that Core CPI is the least volatile of the measures and in general tracks very closely with the general CPI (all items). The CPI is more volatile due to the supply/demand-induced price changes in food and energy items.

2.8 Inflation seasonality

When investigating the changes in the CPI index in more detail, we come to the conclusion that there is a pronounced seasonality in inflation, as illustrated in Figure 2-4, which compares the year-on-year changes in the CPI with the 3m changes in the CPI and in the seasonally adjusted (sa) CPI index. The seasonally adjusted CPI time series was obtained from the St. Louis Fed[3].

We can observe that the 3m changes to the CPI index (non-seasonally adjusted) shows large periodic variations which makes us pause whenever using any annualised instantaneous measures for inflation. Interestingly, when plotting the seasonally adjusted CPI index, there appear to only produce a slight improvement in the seasonal oscillations of the unadjusted index. Therefore, we conclude that we need to be careful when taking any instantaneous CPI measure into consideration.

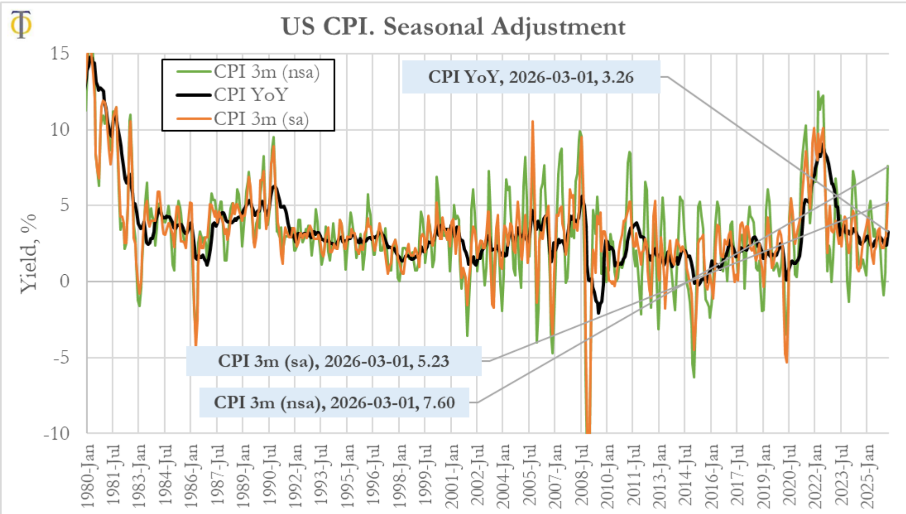

Figure 2-4 - US CPI seasonality. The plotted series correspond to: 3m changes in CPI. YoY changes in CPI. 3m changes in the Seasonality adjusted CPI index.

When investigating seasonal patterns in changes in the CPI, shown in Figure 2-5, we observe that the spring and summer months, from March to August, tend to have had much higher levels of inflation than the other months. Figure 2-5 shows both absolute monthly changes in total CPI as well as relative monthly changes that is obtained by removing the average inflation over the measurement period. Relative values can be understood as “excess” monthly inflation.

[3] U.S. Bureau of Labor Statistics, Consumer Price Index for All Urban Consumers: All Items in U.S. City Average (CPIAUCNS), retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/CPIAUCSL, January 13, 2022.

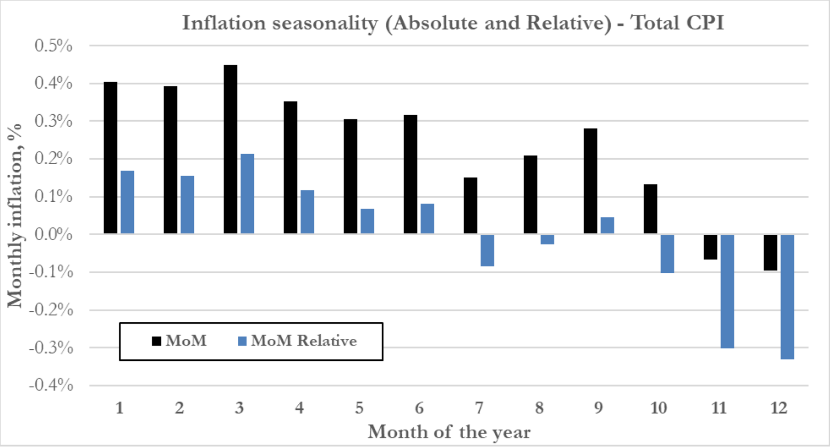

Figure 2-5 - Inflation seasonality. Monthly changes in the CPI by calendar month, from 1983 to 2025

Furthermore, the winter months of December, January and February tend to have close to zero or negative inflation. CPI changes seem to be a highly seasonal phenomenon, which should be taken into account when projecting future short-term price changes.

3 Inflation Expectations – Exploring different indicators/models

In this section, we investigate the extent to which different inflation expectation indicators could be used to anticipate future changes in the headline CPI on a year-on-year (YoY) basis.

Before describing the different inflation indicators/models below, we need to explain the main difficulties that arise from any attempt to make inflation predictions.

3.1 Considerations to predicting future CPI

All-item (total) CPI is a complex measurement, resulting from aggregating CPI indexes for different sectors of the economy, ultimately reflecting overall changes in prices felt by US consumers. The relative weights attributed to each category is determined by the BLS[4], and suffers slight changes over time.

The different components have different seasonality patterns and different volatility profiles. Some components (such as housing inflation and medical care inflation) are slow moving, presenting high degree of autocorrelation, while others (such as energy inflation and food and beverages) can suffer quick intra-year ebbs and flows or sharp (but temporary) spikes due to geopolitical concerns or weather.

Additionally, central bank policy makers have a strong mandate to keep inflation stable close to 2%, which implies that analysts that use different models to predict future inflation need to account to the fact that the rate of inflation will likely suffer a constant pull towards the target 2% rate, driven by actions of central bank policy makers.

Models that predict future inflation need to contend, not only with year-on-year changes in overall CPI being highly impacted by short-term, temporary, changes in energy CPI, but also with infrequent events such as economic crisis and the expansion of central bank balance sheets.

As shown in Figure 2-1 inflation had been on a long-term disinflation trend from 1982 until 2021, which was interrupted by the Covid-19 pandemic measures, as previously mentioned. Any quantitative model that uses historical economic data as explanatory factors will have to content with the inherent disinflation bias within this period. Furthermore, changes in inflation tend to be slow over time and large movements tend only to occur during large economic crisis.

Finally, only since the great financial crisis in 2008 have policy makers used changes in the central bank balance sheet (QE) as tools for monetary policy, which is likely to add confounding factors to any quantitative models to predict inflation.

With these considerations in mind, next we examine different models/metrics of inflation expectations and how they perform in estimating actual future inflation. We should also note that the inflation "prediction" models described below are targeted at 1y forward inflation, as estimating short-term inflation is prone to high volatility energy-related factors and seasonal effects.

[4] https://www.bls.gov/cpi/news.htm

3.2 Reversion to 2% inflation model

The simplest model to use is to assume that YoY CPI will revert to its policy "target" of 2%, this is to have the posture: "I trust the central bank policy makers will bring back inflation to its target value, eventually".

This approach could, at first glance, could be deemed as "not sophisticated", but the fact is that, to a greater or lesser extent, it is used by most economists or inflation forecasters (even if invertedly). The reason being, is that it actually performs reasonably well, as we show below.

It should be mentioned that for each of the indicators/models for estimating future inflation we will assess the performance of the indicator/model in predicting 1-year **changes** in YoY inflation, and not the absolute value of inflation in 1 year.

To start our analysis, we first show the time series of YoY changes in total CPI and expected inflation in 1-year time, which for the case of the reversion model is the policy target rate of 2%, shown in Figure 3-1.

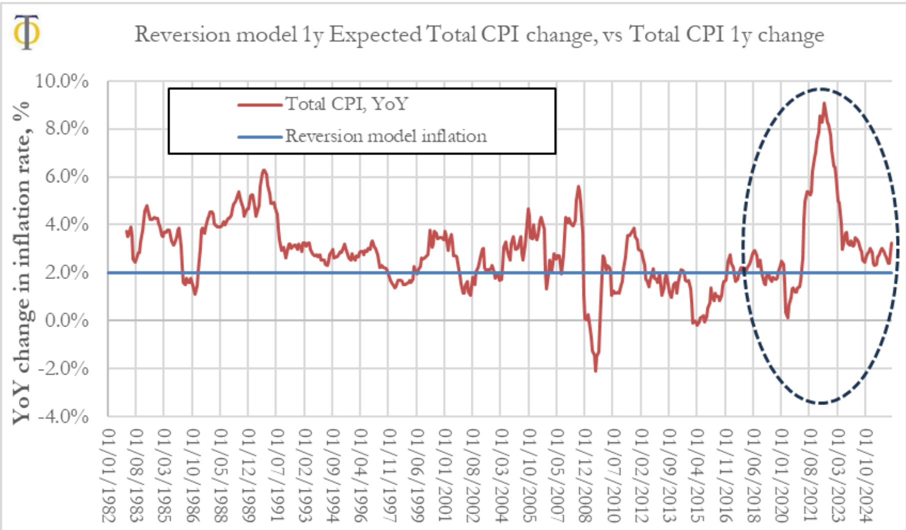

Figure 3-1 - Time series of YoY changes in total CPI and expected inflation in 1-year time for the inflation reversion model.

As we can observe from Figure 3-1, YoY changes in CPI experienced periods above the 2% target rate, but also some periods below the target rate. The area highlighted by the dashed ellipsis shows the recent spike in inflation occurring from 2021 to 2023, which is the reason why policy makers and the broader public are still concerned with higher inflation. This period is also the most relevant for "testing" different models as it was the only one that was preceded by a large expansion in the money supply due to large scale central bank unconventional monetary policy (QE).

To measure the performance of the 2% target rate to "predict" future inflation, we perform a slightly modified analysis, namely, by performing a linear regression of the expected change in inflation 1 year ahead, $X = E(\Delta CPI)_{t+12}$, with actual YoY CPI in 1 year, Y=ΔCPI_{t+12}.

$$X = E(\Delta CPI)_{t+12} = E(CPI)_{t+12} - CPI_t$$

$$Y = \Delta CPI_{t+12} = CPI_{t+12} - CPI_t$$

The expected change in CPI corresponds to the model/indicator expected inflation in 1 year **minus** current CPI. The regression results are shown in Figure 3-2.

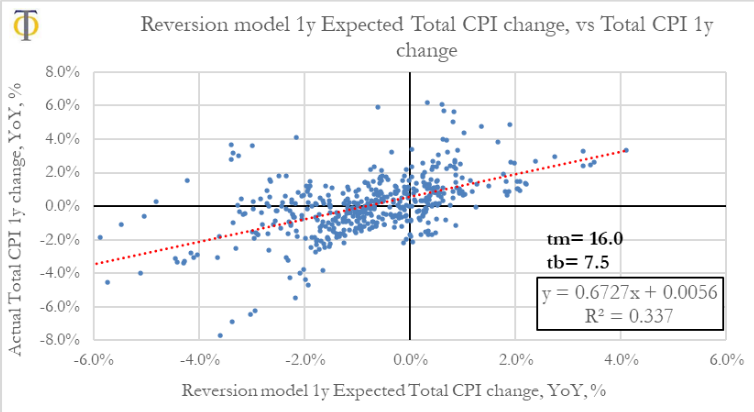

Figure 3-2 - Scatter plot of 1-year changes in total CPI versus 1-year expected CPI change using the inflation reversion model.

The results show that the t-statistic for slope coefficient of the regression model is tm=16.0. This implies a very large degree of statistical significance, which means that the simple reversion to 2% model appears to be a factor with some explanatory power for forward 1-year changes in CPI.

3.3 Bond yield inferred - 5y breakeven inflation

The 5-year break-even rate of inflation is derived by computing the difference between 5-year constant-maturity treasury bond yields and 5-year TIPS (Treasury Inflation-Protected Securities).

This approach has the advantage of using the US treasury market, which one of the most liquid markets in the world, is that it relies on market participants to "infer" their expectations of future inflation. However, it has the disadvantage of being subject to changes in risk aversion to inflation and liquidity issues[5] which could bias market participants preferences, particularly after recent inflation spikes.

In Figure 3-3 we show the time series of YoY changes in total CPI and expected inflation in 1-year time, which for this case, is the 5-year breakeven inflation rate.

[5] https://www.researchgate.net/publication/227437536_TIPS_liquidity_breakeven_inflation_and_inflation_expectations

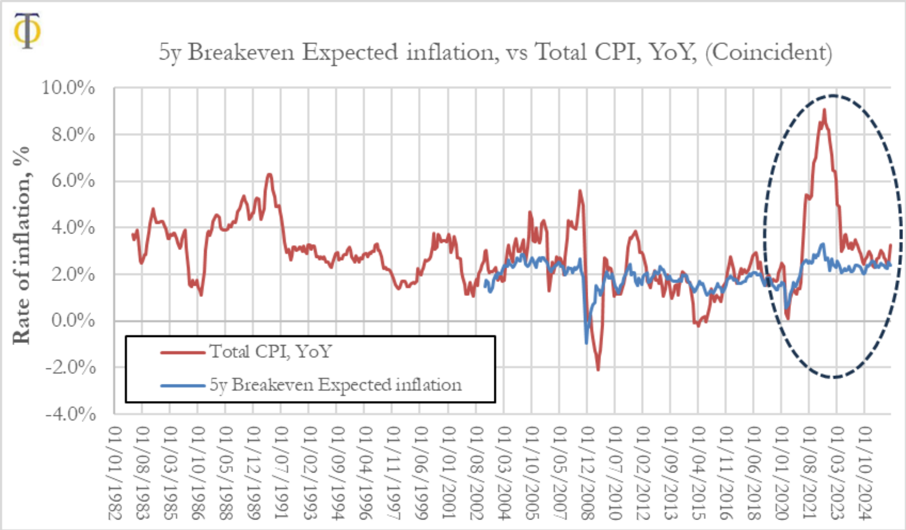

Figure 3-3 - Time series of YoY changes in total CPI and expected inflation in 1-year time for the 5y breakeven inflation model.

As we can observe from Figure 3-3, YoY the 5y breakeven inflation rate tends to hover close to the 2% target rate. At some periods, such as in 2008 and 2020, we can observe sharp drops in inflation expectations, which are likely due to inflation risk aversion or liquidity effects from the availability of TIPS relative to constant maturity treasuries.

Overall, bond investors appear to have the posture: "I trust the central bank policy makers will bring back inflation to its target value, eventually". As we showed in the previous section, this approach actually performs reasonably well.

It should be noted that this method infers 5-year inflation expectations which tend to look through short-term variations[6]. Additionally, it tends to ignore inflation spikes, such as the 2004-2006 inflation rise due to energy prices and the 2021-2023 spike due to the Covid-19 pandemic monetary expansion, as illustrated in Figure 3-3.

To measure the performance of the 5y breakeven inflation rate to "predict" future inflation, we perform a linear regression of the expected change in inflation 1 year ahead, $X = E(\Delta CPI)_{t+12}$, with actual YoY CPI in 1 year, Y=ΔCPI_{t+12}.

The expected change in CPI corresponds to the model/indicator expected inflation in 1 year **minus** current CPI. The regression results are shown in Figure 3-4.

[6] https://fraser.stlouisfed.org/title/economic-synopses-6715/accurate-measures-long-term-inflation-expectations-624446

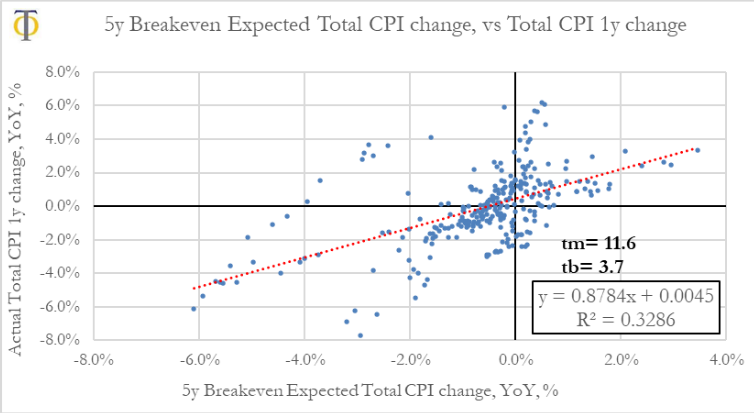

Figure 3-4 - Scatter plot of 1-year changes in total CPI versus 1-year expected CPI change using the 5y breakeven inflation model.

The regression results show that the t-statistic for slope coefficient is tm=11.6. This implies a very large degree of statistical significance, which implies that the 5-year breakeven inflation model appears to be a factor with some explanatory power for forward 1-year changes in CPI.

However, it should be stated that the simple reversion to 2% model seems to perform even better (with a t-statistic for the slope coefficient of 16.0), as shown in the previous section. Furthermore, as we'll show below, both these models (reversion to 2% target and 5-year breakeven rate) are highly correlated in anticipating future 1-year changes in inflation (total CPI).

3.4 Cleveland Fed 1y expected inflation

In this section, we investigate the Cleveland Fed model for 1-year inflation expectations. The Cleveland Fed model is a measure of expected inflation that is somewhat similar to the 5-year breakeven rate which is based on the bond market. However, it has an advantage over the breakeven rate derived from TIPS as it adjusts for the inflation risk premium. Which arises from inflation risk aversion as bond investors pay less for a nominal, unprotected bond, which means it has a higher interest rate. Consequently, the difference between nominal bonds and TIPS tends to overstate the expected inflation rate.

Cleveland Fed produces expected annual inflation rates for the next 30 years combining data from constant-maturity Treasury bills, survey forecasts of inflation, and inflation swap rates[7]. In this section we only investigate 1-year inflation expectations.

In Figure 3-5 we show the time series of YoY changes in total CPI and expected inflation in 1-year time, which for this case, is the Cleveland Fed 1-year inflation expectation.

[7] https://www.clevelandfed.org/publications/economic-commentary/2010/ec-201005-inflation-noise-risk-and-expectations

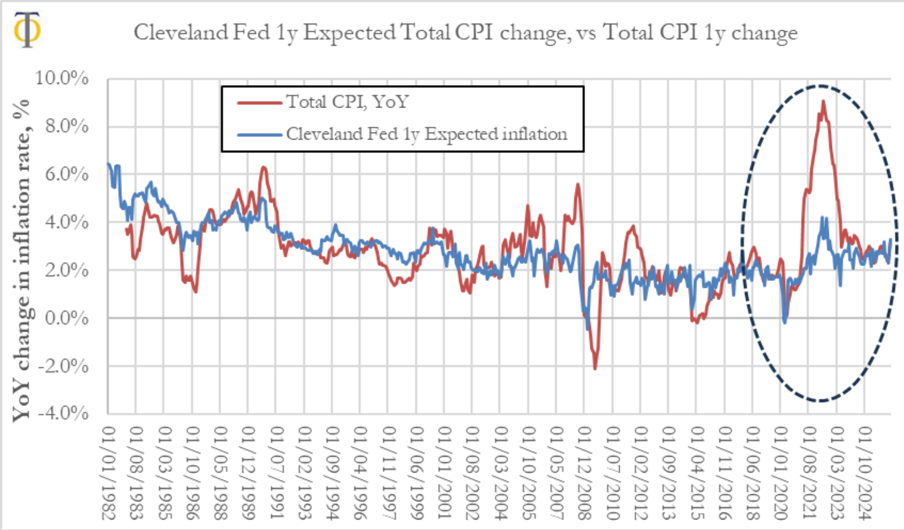

Figure 3-5 - Time series of YoY changes in total CPI and expected inflation in 1-year time for the Cleveland Fed 1y inflation indicator.

As we can observe from Figure 3-5, the Cleveland Fed 1-year expected inflation rate has lower variability than actual YoY CPI changes. The model seems to track inflation quite closely, with the exception of periods when inflation spikes (either up or down). The model also appears to have under-reacted to the 2005-2007 spike in inflation that was caused by rising oil prices (energy shock), and also to the 2021-2023 rise in inflation (pandemic monetary shock).

To measure the performance of the Cleveland Fed 1y inflation expectation rate to "predict" future inflation, we perform a linear regression of the expected change in inflation 1 year ahead, $X = E(\Delta CPI)_{t+12}$, with actual YoY CPI in 1 year, Y=ΔCPI_{t+12}.

The expected change in CPI corresponds to the model/indicator expected inflation in 1 year **minus** current CPI. The regression results are shown in Figure 3-6.

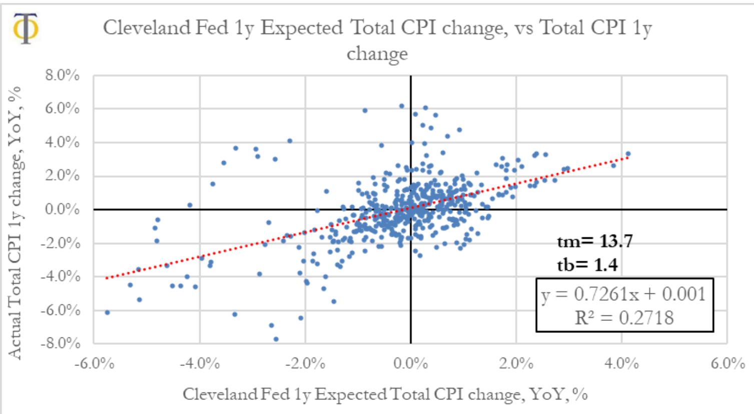

Figure 3-6 - Scatter plot of 1-year changes in total CPI versus 1-year expected CPI change using the Cleveland Fed 1y expected inflation indicator.

The regression results show that the t-statistic for slope coefficient is tm=13.7. This implies a very large degree of statistical significance, which means that the Cleveland Fed 1y inflation expectation model appears to be an indicator with some explanatory power for forward 1-year changes in CPI.

However, it should be mentioned that the simple reversion to 2% model seems to perform even better (with a t-statistic for the slope coefficient of 16.0), as shown in section 3.2. The Cleveland

Fed's model however, despite its conservative nature, performs better at anticipating the periods of inflation spikes than the simple reversion to 2% model.

3.5 Michigan University Survey on expected inflation in 1 year

The University of Michigan together with Thomson Reuters, compiles and publishes the surveys of consumers, which ask many questions to evaluate different sentiment indicators for US consumers and businesses. One of the questions that is asked is "what the inflation rate will be over the next year".

As an important element of monetary policymaking as well as financial market pricing, is the level of inflation expectations that individuals hold. There is no direct measure of each individual's inflation expectations, but surveys are used to estimate expectations at the aggregate level. Survey from the University of Michigan regarding inflation expectations 1 year ahead produces several metrics including the **average** and the **median** estimate for inflation. In this section, we analyze the **median** estimate.

In Figure 3-7 we show the time series of YoY changes in total CPI and expected inflation in 1-year time, which for this case, is the Michigan University 1-year inflation expectation.

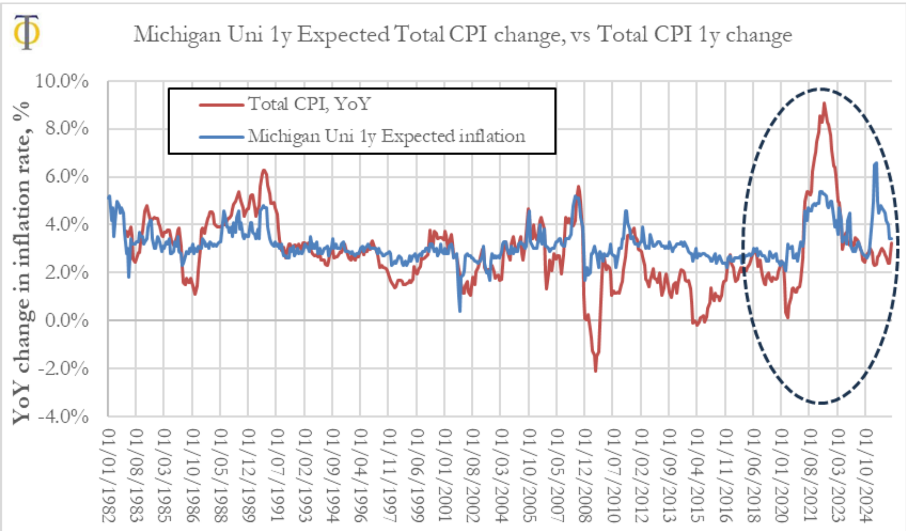

Figure 3-7 - Time series of YoY changes in total CPI and expected inflation in 1-year time for the Michigan University 1y median inflation expectation.

As we can observe from Figure 3-7, the Michigan University 1-year expected inflation rate has lower variability than actual YoY CPI changes. The model seems to have tracked inflation quite closely during the period from 1982 until 2008, capturing the 2005-2007 spike in inflation that was caused by rising oil prices (energy shock). However, since 2008, inflation expectations seem to have over estimated actual inflation and missed the 2021-2023 rise in inflation (pandemic monetary shock). The Michigan University inflation survey saw a large rise in inflation expectations in 2024 and onwards, which completely missed the mark, over-estimating actual inflation. We speculate that this is due to sentiment from the previous (2021-2023) inflation scare, which created a "scalded cat" effect on consumers.

To measure the performance of the Michigan University 1y inflation expectation rate to "predict" future inflation, we perform a linear regression of the expected change in inflation 1 year ahead, $X = E(\Delta CPI)_{t+12}$, with actual YoY CPI in 1 year, Y=ΔCPI_{t+12}.

The expected change in CPI corresponds to the model/indicator expected inflation in 1 year **minus** current CPI. The regression results are shown in Figure 3-8.

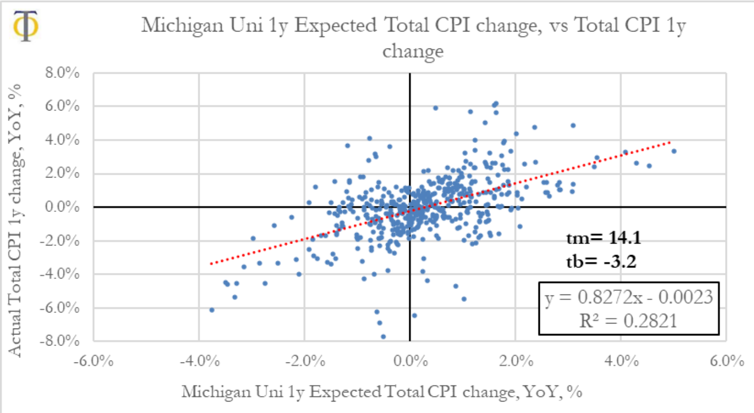

Figure 3-8 - Scatter plot of 1-year changes in total CPI versus 1-year expected CPI change using the Michigan University 1y expected inflation indicator.

The regression results show that the t-statistic for slope coefficient is tm=14.1. This implies a very large degree of statistical significance, which implies that the Michigan University 1y inflation expectation model appears to have some explanatory power for forward 1-year changes in CPI.

However, it should be mentioned that the simple reversion to 2% model seems to perform even better (with a t-statistic for the slope coefficient of 16.0), as shown in section 3.2. This model seems to perform quite well during energy shocks of temporary nature.

3.6 Phinance Technologies 1y EII (Early Inflation Indicator)

At Phinance Technologies we compute our own model for estimating inflation targeted at 6-months to 15-months ahead. Our EII models are based upon quantitative multi-factor analysis of factors that impact overall inflation, through supply/demand economic factors, sentiment, or monetary variables. Our models target not only overall CPI, but also different components of CPI such as core-CPI.

In this section, we'll investigate the 1 year ahead EII, targeted at estimating **total** CPI changes. Figure 3-9 shows the time series of YoY changes in total CPI and expected inflation in 1-year time, which for this case, is the Phinance Technologies EII 1-year inflation expectation.

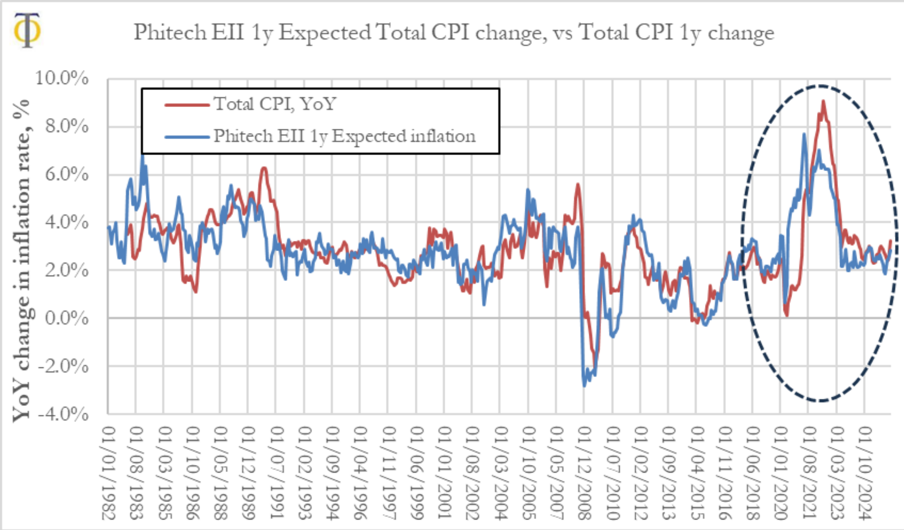

Figure 3-9 - Time series of YoY changes in total CPI and expected inflation in 1-year time for the Phinance Technologies EII 1y total CPI model.

As we can observe from Figure 3-9, the Phinance Technologies EII 1-year expected inflation rate has similar variability to actual YoY CPI changes. The model seems to track inflation quite closely, with the exception of periods when inflation spikes (either up or down).

The model also appears to have somewhat under-reacted to the 2007 spike in inflation that was caused by rising oil prices (energy shock), and also to the 2021-2023 rise in inflation (pandemic monetary shock), even though it appears to have performed better than all the other previous inflation metrics.

To measure the performance of the Phinance Technologies EII 1y inflation expectation rate to "predict" future inflation, we perform a linear regression of the expected change in inflation 1 year ahead, $X = E(\Delta CPI)_{t+12}$, with actual YoY CPI in 1 year, Y=ΔCPI_{t+12}.

The expected change in CPI corresponds to the model/indicator expected inflation in 1 year **minus** current CPI. The regression results are shown in Figure 3-10.

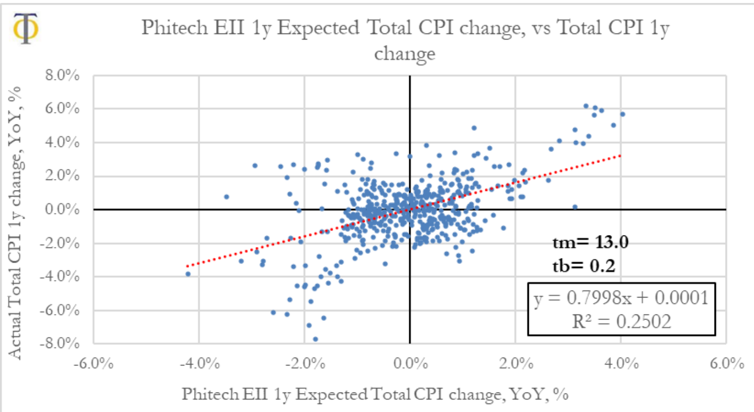

Figure 3-10 - Scatter plot of 1-year changes in total CPI versus 1-year expected CPI change using the Phinance Technologies EII 1y total CPI model.

The regression results show that the t-statistic for slope coefficient is tm=13.0. This implies a very large degree of statistical significance, which implies that the Phinance Technologies EII 1y inflation expectation model appears to have some explanatory power for forward 1-year changes in CPI.

However, it should be mentioned that the simple reversion to 2% model seems to perform even better (with a t-statistic for the slope coefficient of 16.0), as shown in section 3.2. The EII model seems to perform better during large shocks to inflation occurring during recessions or the 2021-2023 monetary expansion.

3.7 Correlation matrix (between inflation indicators)

The inflation models/indicators described in the previous sections are based upon different approaches to infer future 1-year changes in inflation.

Do these different approaches convey uncorrelated information which could be used in a combined manner to build a composite indicator for future changes in inflation?

To answer this question, we examine the correlation matrix between the different approaches, shown in Table 3-1.

Correlation Matrix		1	2	3	4	5
Cleveland Fed 1y Expected inflation	1	1	-0.001	0.309	0.533	-0.236
Michigan Uni 1y Expected inflation	2	-0.001	1	0.821	0.784	0.347
Reversion model inflation	3	0.309	0.821	1	0.883	0.249
5y Breakeven Expected inflation	4	0.533	0.784	0.883	1	0.343
Phitech EEI 1y Expected inflation	5	-0.236	0.347	0.249	0.343	1

Table 3-1 - Correlation matrix between the different inflation expectations models.

From Table 3-1 we can conclude that the Michigan University 1-year inflation expectation survey, the 5-year breakeven inflation and the reversion to the 2% target model are highly correlated. As we previously mentioned when explaining each one of the inflation models/indicators, this is due to these indicators under-reacting to rapid changes in inflation, in particular when the changes are large changes. Consequently, these models can be understood as variants of the thought process "inflation will eventually revert to the 2% target rate". As we've shown in the previous sections, this approach is in fact a good starting point which works reasonably well in anticipating future changes in inflation (total CPI).

The Cleveland Fed model also shows somewhat high correlation (0.53) with the reversion to 2% target model.

The Phinance Technologies EII model is the least correlated with the reversion to 2% target model, and also least correlated with all other models. Consequently, it could be a useful addition to estimating 1-year ahead inflation when aggregating estimates from different information sources.

Next, we construct a composite indicator for estimating future inflation in 1 year.

3.8 Phinance Technologies 1y Inflation Composite Indicator

At Phinance Technologies we also construct a composite model for estimating inflation 1 year ahead using the previously described models/indicators. Figure 3-11 shows the time series of YoY changes in total CPI and expected inflation in 1-year time, which for this case, is the Phinance Technologies Composite 1-year inflation expectation model.

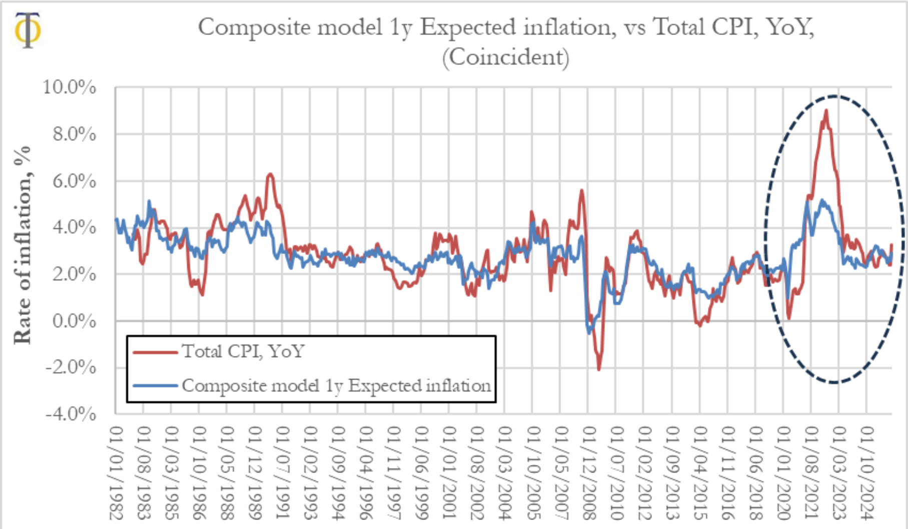

Figure 3-11 - Time series of YoY changes in total CPI and expected inflation in 1-year time for the Phinance Technologies Composite 1y total CPI model.

We can observe from Figure 3-11, that the Phinance Technologies Composite 1-year expected inflation rate has slightly lower variability than actual YoY CPI changes. This is due to the weighting given to the more conservative inflation models/indicators.

The composite model seems to track inflation quite closely, with the exception of periods when inflation spikes (either up or down). The model missed the 2007 spike in inflation that was caused by rising oil prices (energy shock), and also to the 2021-2023 rise in inflation (pandemic monetary shock).

To measure the performance of the Phinance Technologies composite 1y inflation expectation rate to "predict" future inflation, we perform a linear regression of the expected change in inflation 1 year ahead, $X = E(\Delta CPI)_{t+12}$, with actual YoY CPI in 1 year, Y=ΔCPI_{t+12}.

The expected change in CPI corresponds to the model/indicator expected inflation in 1 year **minus** current CPI. The regression results are shown in Figure 3-12.

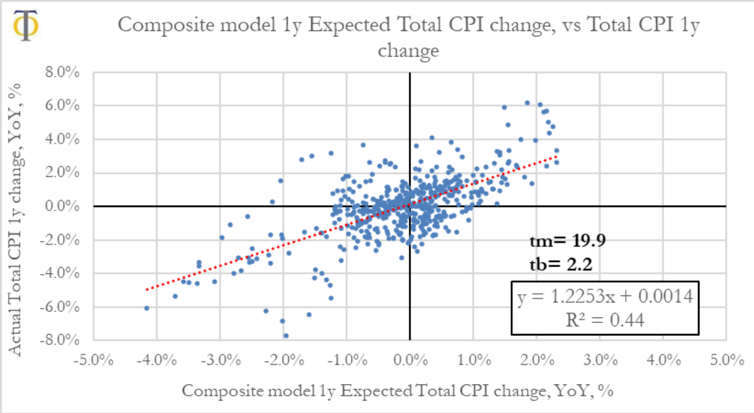

Figure 3-12 - Scatter plot of 1-year changes in total CPI versus 1-year expected CPI change using the Phinance Technologies Composite EII 1y total CPI model.

The regression results show that the t-statistic for slope coefficient is tm=19.9. This is a very large degree of statistical significance, implying that the Phinance Technologies composite 1y inflation expectation model has good explanatory power for forward 1-year changes in CPI.

The composite model performs better than the simple reversion to 2% model (with a t-statistic for the slope coefficient of 16.0), that was shown in section 3.2. This model seems to perform better during large shocks to inflation occurring during recessions or the 2021-2023 monetary expansion.

However, as the composite model aggregates the information contained within each one of the indicators we examined previously, it has the effect of diluting any advantage specific to a particular model. For example, even though the composite model is superior in tracking CPI over time, in periods of stress (either inflationary or deflationary), where CPI suffers large variations, it seems to perform worse than the Phinance Technologies EII model.

4 Models for estimating Core-CPI

In this chapter we perform a similar analysis of that of chapter 3, but targeting core-CPI instead of total CPI as the explanatory variable. We examine if the existing inflation expectation indicators/models provide information relative to future changes in core-CPI and present our own proprietary models for estimating future changes in core-CPI.

4.1 Phinance Technologies 1y EII Core-CPI indicator

At Phinance Technologies we compute our own model for estimating core-CPI targeted at 6-months to 15-months ahead. Our EII-core models are based upon quantitative multi-factor analysis of factors that impact core-CPI, through supply/demand economic factors, sentiment, or monetary variables.

In this section, we'll investigate the 1 year ahead EII-core, targeted at estimating **core** CPI changes. Figure 4-1 shows the time series of YoY changes in core CPI and expected core-CPI inflation in 1-year time, using Phinance Technologies EII-core model for 1-year inflation expectation.

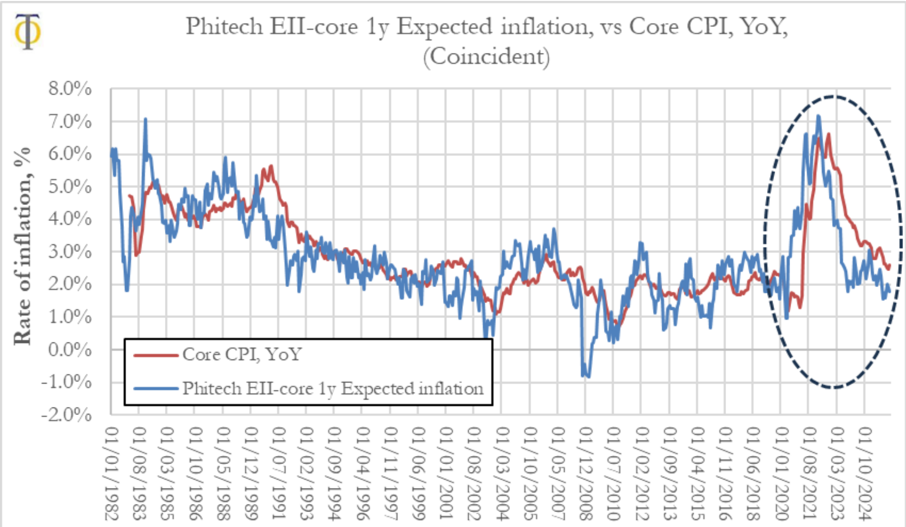

Figure 4-1 - Time series of YoY changes in core-CPI and expected inflation in 1-year time for the Phinance Technologies EII 1y core-CPI model.

As we can observe from Figure 4-1, the Phinance Technologies EII-core 1-year expected inflation rate has higher variability than actual YoY core-CPI changes. The model seems to track core-CPI quite closely, even during periods when inflation spikes (either up or down).

To measure the performance of the Phinance Technologies EII-core 1y inflation expectation rate to "predict" future core-CPI, we perform a linear regression of the expected change in core-CPI 1 year ahead, $X = E(\Delta CPI)_{t+12}$, with actual YoY core-CPI in 1 year, Y=ΔCPI_{t+12}.

The expected change in core-CPI corresponds to the model/indicator expected inflation in 1 year **minus** current core-CPI. The regression results are shown in Figure 4-2.

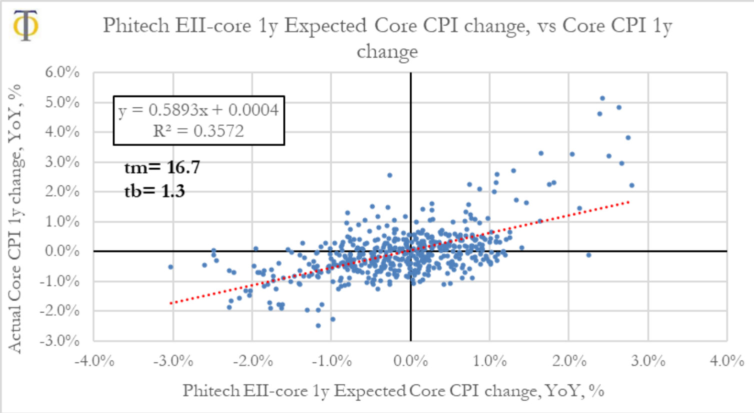

Figure 4-2 - Scatter plot of 1-year changes in core-CPI versus 1-year expected core-CPI change using the Phinance Technologies EII 1y core-CPI model.

The regression results show that the t-statistic for slope coefficient is tm=16.7. This implies a very large degree of statistical significance, which implies that the Phinance Technologies EII-core 1y inflation (for core-CPI) expectation model appears to have large explanatory power for forward 1-year changes in core-CPI.

The model appears to have superior performance, particularly in periods of large changes in core-CPI, which is a very interesting characteristic, as it allows to anticipate large inflation (core-CPI) moves. Figure 4-3 illustrates the model performance by showing the time series of 1-year forward changes in core-CPI and the 1-year expected change from the Phinance Technologies EII-core model. This chart is equivalent to the information conveyed in Figure 4-2, which shows the relationship in a scatter plot format.

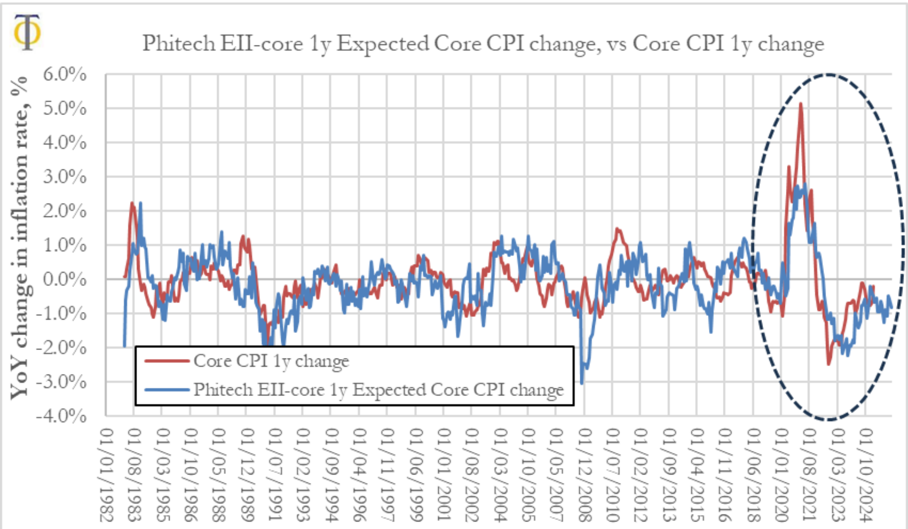

Figure 4-3 - Time series of 1-year changes in core-CPI (lagged 12m) and expected 1-year changes in core-CPI for the Phinance Technologies EII core-CPI model.

We can observe that the EII core-CPI model is highly correlated to future changes in the core-CPI rate. It should be noted that the latest datapoint for core-CPI changes is March-2025, which corresponds to the change in core-CPI from March-2025 to March 2026. The EII model is anticipating negative changes to core-CPI in the year ahead.

4.2 Performance of the different inflation indicators for core-CPI

In this section, we investigate the performance of the inflation models/indicators described in chapter 3, in estimating future changes in core-CPI. As we previously mentioned, the different models are quite conservative to changes in total CPI and are highly correlated with the simple approach represented by the "reversion to 2%" model. How do these models fare in anticipating core-CPI changes?

To answer this question, Table 4-1 shows the t-statistic of the slope coefficient of the regression between the respective estimator/model and changes in YoY core-CPI. In effect, this table summarises the more detailed analysis provided for each of the models, when targeting total CPI, in chapter 3.

Core Inflation expectation model	Model t-stat
Cleveland Fed 1y	9.1
Michigan Uni 1y	9.5
Phitech EII-Core 1y	16.7
Reversion Model	8.8
5y Breakeven	8.6
Composite model	**19.5**

Table 4-1 – Performance of the different inflation expectations models measured by the regression slope coefficient t-statistic.

We can observe from Table 4-1 all the models, with the exception of the Phinance Technologies core-CPI model, are worse at estimating future changes in core-CPI than total CPI. The Michigan University 1-year inflation expectation survey has a t-stat of 9.5, while the Cleveland Fed 1-year inflation expectation model has a t-stat of 9.1.

The 5-year breakeven inflation and the reversion to the 2% target model, which are highly correlated have even lower performance with t-stats close to 8.7.

The Phinance Technologies Core-CPI model has a t-stat of 16.7, which shows far greater explanatory power than any of the other inflation models.

Next, we construct a composite indicator for estimating future core-CPI in 1 year.

4.3 Phinance Technologies 1y core-CPI Composite Indicator

We construct a composite model for estimating core-CPI 1 year head using the previously described models/indicators. Figure 4-4 shows the time series of YoY changes in core-CPI and expected core-CPI in 1-year time, which for this case, is the Phinance Technologies Composite core-CPI 1-year expectation model.

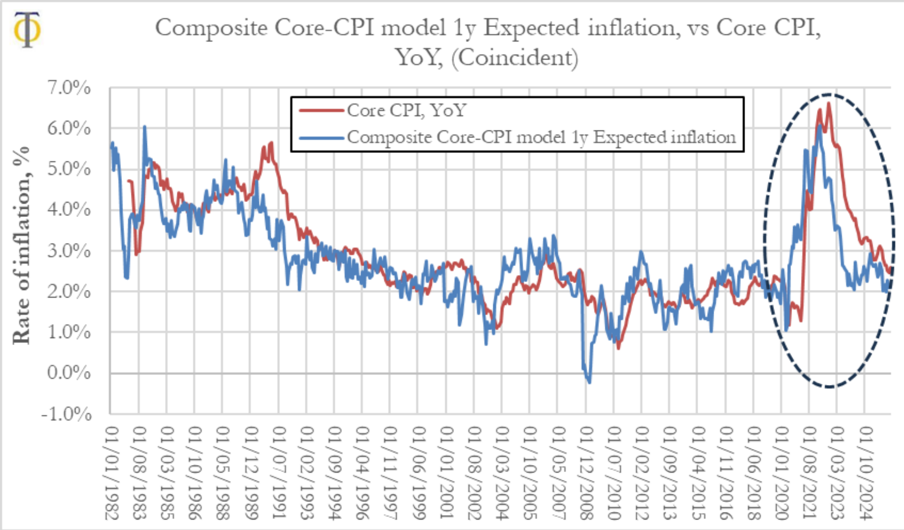

Figure 4-4 - Time series of YoY changes in core-CPI and expected inflation in 1-year time for the Phinance Technologies Composite 1y core-CPI model.

We can observe from Figure 4-4, that the Phinance Technologies Composite 1-year expected core-CPI rate has slightly higher variability than actual YoY core-CPI changes. This is due to the higher weighting given to Phinance Technologies EII-core model that to the other inflation models/indicators.

The composite model seems to track inflation quite closely, even during periods when inflation spikes (either up or down). The model followed the disinflationary drop in core-CPI in 2009, caused by the great financial crisis of 2008, and also anticipated and tracked the 2021-2023 rise in inflation (pandemic monetary shock).

To measure the performance of the Phinance Technologies composite 1y core-CPI expectation rate to "predict" future core-CPI, we perform a linear regression of the expected change in inflation 1 year ahead, $X = E(\Delta CPI)_{t+12}$, with actual YoY CPI in 1 year, Y=ΔCPI_{t+12}.

The expected change in core-CPI corresponds to the model/indicator expected inflation in 1 year **minus** current core-CPI. The regression results are shown in Figure 4-5.

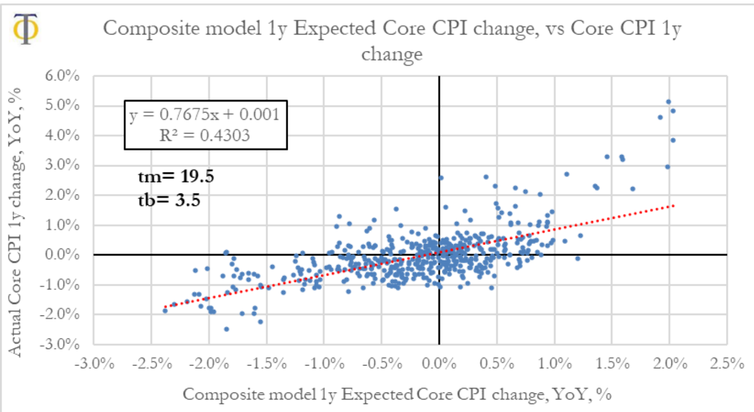

Figure 4-5 - Scatter plot of 1-year changes in total CPI versus 1-year expected CPI change using the Phinance Technologies Composite EII 1y total CPI model.

The regression results show that the t-statistic for slope coefficient is tm=19.5. This is a very large degree of statistical significance, which implies that the Phinance Technologies composite 1y core-

CPI expectation model appears to have large explanatory power for forward 1-year changes in core-CPI.

The composite model performs slightly better than the Phinance Technologies EII core-CPI model as it incorporates some information conveyed by the other indicators/models. However, even though it performs better on the full sample, the composite model performs worse than the EII-core model during large shocks to inflation such as that which occurred during the 2021-2023 monetary expansion.

5 Inflation expectations on April-2026

In this section, we'll apply the information conveyed by the different inflation expectation indicators to the current inflation situation, as of the 12th of April of 2026.

First however, we'll address an important ongoing development, an oil shock that will impact the energy component of CPI in the months ahead with its effect lingering for at least a year due to the nature of using the year-on-year metric for assessing the rate of inflation.

5.1 New development: Hormuz closure oil shock

Apart from the historical developments in inflation, a recent geo-political development sparked a new ongoing oil shock, which will impact YoY changes in energy CPI and total CPI for at least the next 12 months.

On the 28th of February of 2026, a major armed conflict was initiated by coordinated U.S. and Israeli airstrikes targeting Iranian military infrastructure and regime leadership. The strikes took the lives of Supreme Leader Ali Khamenei and other top officials of the Iranian regime, triggering Iranian retaliation against Israel, U.S. bases, Gulf state infrastructure and restrictions on movement across the strait of Hormuz.

The spike in oil prices precipitated by the armed conflict in Iran that resulted in the closure of the strait of Hormuz and the bombing of oil and gas infrastructure in the Gulf states, led to a large rise in energy prices with a spillover to total CPI, jumping from 2.46% in February of 2026 to 3.26% in March 2026, on a YoY basis.

Consequently, we entered a period of an ongoing energy shock, which started in March 2026 and for which the severity and duration are still unknown. In a post[8] where we analyse the impact of the Hormuz closure oil shock, we outlay possible scenarios for oil prices and inflation, resulting only from the energy shock and not including the spillover effects of the oil shock to the economy and actions by policy makers.

5.2 Impact of the oil shock.

To assess the impact of the oil shock on inflation, we are currently working on short-term inflation models such as the ones used for estimating of different scenarios of oil-price shock in the context of the Hormuz crisis, on energy CPI and total CPI, which we provide in a short-post we published on the 2nd of April 2026[9]. To exemplify, in Figure 5-1 we show the relationship between monthly changes in WTI oil prices and monthly changes in total CPI. The change in oil prices in the x-axis

[8] https://phinancetechnologies.com/content/2026-4-2_Post-22%20-%20Inflation%20Oil%20shock%20-%20Hormuz%20closure%20v1.pdf
[9] https://www.linkedin.com/posts/carlos-alegria-b68878a_inflation-impact-of-the-hormuz-closure-oil-activity-7446125466677170176-uhDw

of the chart refers to the average change (in $/barrel) over the current month and prior month, while the y-axis refers to monthly changes in total CPI for the current month.

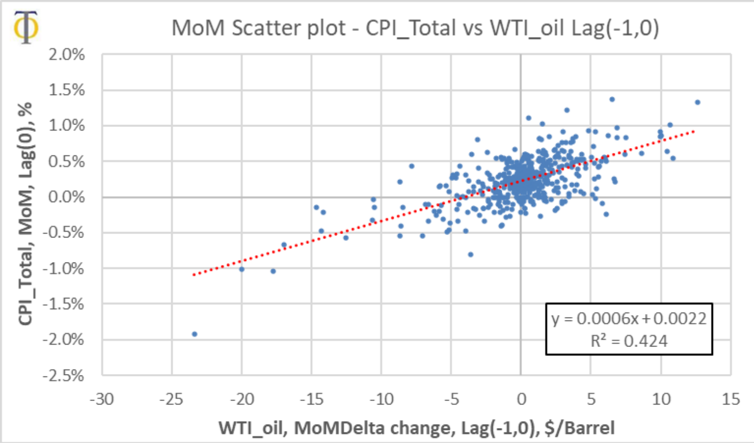

Figure 5-1 - Relationship between Month-on-Month (MoM) changes in WTI oil prices and total CPI.

We can observe that oil prices are a powerful predictor of changes in total CPI. In effect the change in oil prices impacts energy CPI, which accounts for about 8% of overall CPI. By using this relationship, we can project forward the evolution total CPI based upon different assumptions (scenarios) for oil prices.

Let's assume that the most likely scenario for oil prices over the coming months is scenario 1, the moderate scenario, where the oil shock lasts a few months and oil prices normalise to pre-crisis levels by July of 2026 (for details please read the short article/post).

In Figure 5-2 we show the updated moderate scenario, which includes the final reading for average oil prices for March 2026 and the latest CPI YoY rate for March 2026, published by the BLS on the 10th of April[10].

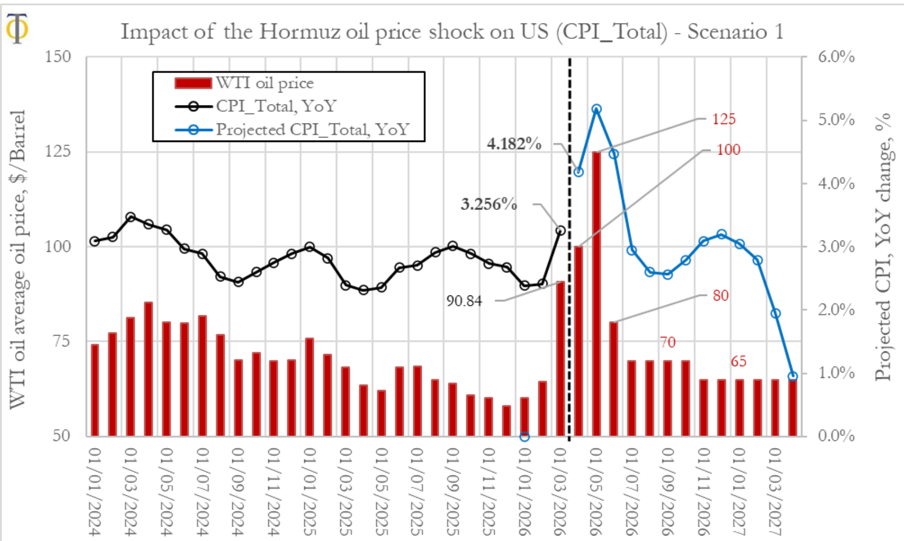

Figure 5-2 - Scenario 1 (moderate) for average monthly WTI oil prices and projected CPI. Update Date: 12-April-2026

[10] Bureau of Labor Statistics

The chart also shows projected values until April of 2027. The scenario assumes that average monthly oil prices (per barrel) are \$100 (April), \$125 (May), \$80 (June) and thereafter hover close to \$65 a barrel.

As we can observe from Figure 5-2, as oil prices continue rising, inflation is expected to peak in May at close to 5%. Thereafter, year-on-year CPI is expected to decline sharply reaching a value of 3% by July. However, YoY changes in CPI are expected to hover close to 3% for an extended period, due to the shock in oil prices. In the early months of 2027, year-on-year changes in the CPI is expected to decline close to 1%, reflecting the sharp drop in oil prices after peaking in May of 2026 at 125\$/barrel.

The impact of the temporary oil shock on the dynamics of YoY CPI is made clear by the analysis above. The rise in oil prices will lead to a temporary spike in CPI which will linger for a whole year, when inflation is computed on a YoY basis, which is the headline inflation metric most economists/analysts give relevance to.

Furthermore, the normalization of oil prices leads to temporary drop in energy inflation, which will be reflected into YoY CPI in a year's time, by June 2027. At that stage, headline CPI will suffer a sharp drop, arising from the temporary spike (and subsequent drop) in oil prices a year before.

5.3 Inflation (total CPI) Expectation models: Situation on the 12th of April 2026

We now examine the latest estimates for the different inflation expectation models. Table 5-1 shows, the latest data (for March 2026) the 1y inflation expectation and the expected change in total CPI in 1 year, for each of the inflation expectation models described before.

- ➔ Michigan University Survey 1y inflation expectations still refer to the February 2026 values.
- ➔ Phinance Technologies 1y EII model is still provisional.
- ➔ Composite model is also provisional as it includes the Phitech EII 1y model and Michigan University 1y inflation estimates.

Date	Mar-2026		
Total CPI	**3.256%**		
Inflation expectations model	**1y expected**	**1y expected change**	**Model t-stat**
Cleveland Fed 1y	3.259%	0.002%	13.7
Michigan Uni 1y	3.400%	0.144%	14.1
Phitech EII 1y	2.843%	-0.413%	13.0
2% Reversion Model	2.000%	-1.256%	16.0
5y Breakeven	2.400%	-0.856%	12.3
Composite model	**2.911%**	**-0.345%**	**19.9**

Table 5-1 - Inflation expectation models on April 12th, 2026

From the latest inflation expectation values, shown in Table 5-1 and also in Figure 5-3 (in graphical format), we observe that the Cleveland Fed model reacted rapidly to the oil spike in March of 2026. At 3.259% expected inflation in 1-year and 3.256% current YoY CPI, the Cleveland Fed model is essentially "saying" that there will be no change in inflation from its current values, a year from now.

The Michigan University Survey has not been updated yet, so we still do not know the effect of the oil spike and associated news have caused on consumers' inflation expectations.

The bond markets however, remained sanguine regarding future inflation with the 5-year breakeven model implying 2.4% inflation (in the next 5 years), which was almost un-altered relative to its value in February of 2026.

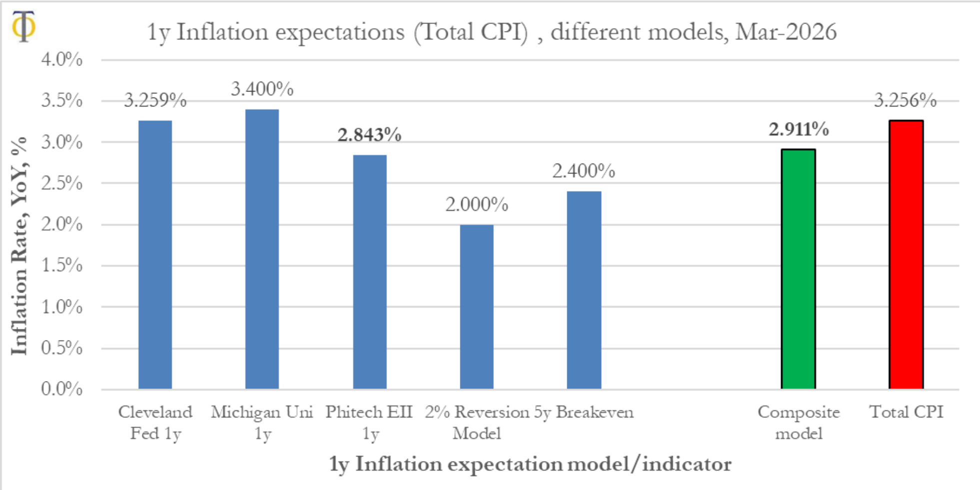

Figure 5-3 - Inflation expectation models and YoY total CPI on April 12th, 2026

The Phinance Technologies 1y EII also rose substantially, following the rise in CPI in March. However, the model is anticipating a decline in overall CPI in 1 year time of -0.413%, to a value of 2.843%.

Finally, the composite inflation model, that reflects the change in Cleveland Fed and Phinance Technologies EII models points to an expected rate of inflation of 2.911% in 1 year. In the next section, we discuss the composite model in more detail.

5.3.1 Composite 1y inflation model for total CPI

The composite inflation model is the most accurate measure of inflation in 1 year time. However, as we've discussed previously, as it includes the 2% regression model and other more conservative models, it tends to under-react to large changes in CPI due to energy shocks.

As we can observe from Figure 5-4 that shows the recent developments of YoY inflation as well as the composite model, the Hormuz oil shock led to a jump in YoY CPI from 2.414% in February to 3.256% in March of 2026. The impact on the composite model was for an estimated rise in inflation in 1 year from 2.563% in February to 2.911% in March (see Figure 5-4).

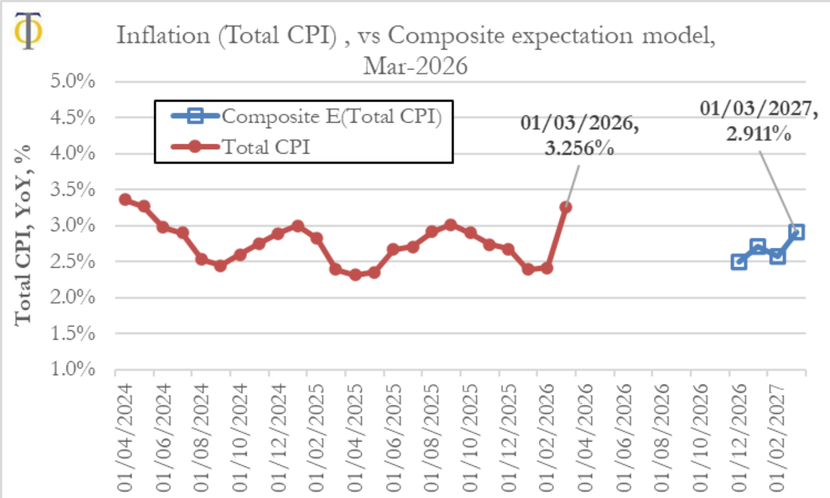

Figure 5-4 - Evolution of YoY total CPI and composite model expected 1y inflation, on April 12th, 2026

5.4 Core-CPI models: Situation on the 12th of April 2026

We now examine the latest estimates for core-CPI for the different inflation expectation models. Table 5-2 shows, the latest data (for March 2026) the 1y inflation expectation and the expected change in core-CPI in 1 year, for each of the inflation expectation models described before.

- ➔ Michigan University Survey 1y inflation expectations still refer to the February 2026 values.
- ➔ Phinance Technologies 1y EII-core model is still provisional.
- ➔ Composite model is also provisional as it includes the Phitech EII-core 1y model and Michigan University 1y inflation estimates.

Date	Mar-2026		
Core-CPI	**2.595%**		
Core Inflation expectation model	**1y expected**	**1y expected change**	**Model t-stat**
Cleveland Fed 1y	3.259%	0.664%	9.1
Michigan Uni 1y	3.400%	0.805%	9.5
Phitech EII-Core 1y	1.779%	-0.816%	16.7
Reversion Model	2.000%	-0.595%	8.8
5y Breakeven	2.400%	-0.195%	8.6
Composite model	**2.111%**	**-0.484%**	**19.5**

Table 5-2 - Inflation expectation models for core-CPI, on April 12th, 2026

From the latest inflation expectation values, shown in Table 5-2 and also in Figure 5-5 (in graphical format), we observe that the Cleveland Fed model reacted rapidly to the oil spike in March of 2026. At 3.259% expected inflation in 1-year and 2.595% current YoY core-CPI, the Cleveland Fed model is likely biased towards tracking total CPI and not core-CPI.

The bond markets however, remained sanguine regarding future inflation with the 5-year breakeven model implying 2.4% inflation (in the next 5 years), which was almost un-altered relative to its value in February of 2026. As core-CPI was 2.595% in March-2026, the 5-year breakeven model is expecting core-CPI to drop slightly in a years' time.

The Phinance Technologies 1y EII-core model did not react to the rise in CPI in March caused by the oil shock. The model is anticipating a decline in core-CPI in 1 year time of -0.816%, to a value of 1.779%.

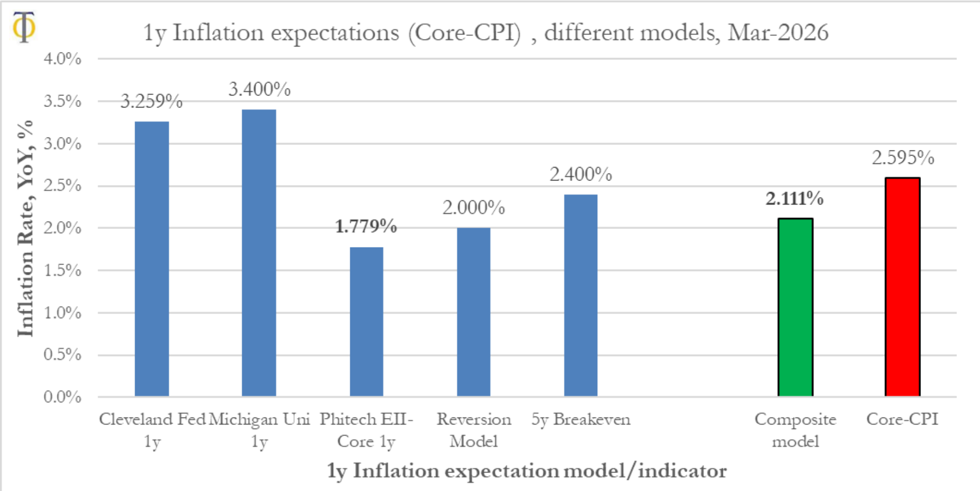

Figure 5-5 - Inflation expectation models and YoY core-CPI on April 12th, 2026

Finally, the composite core-CPI model points to an expected rate of core-CPI of 2.111% in 1 year. In the next section, we discuss the composite core-CPI model in more detail.

5.4.1 Composite 1y inflation model for core-CPI

The composite core-CPI model is the most accurate measure of core-CPI in 1 year time. As we've discussed previously in chapter 4, the composite core-CPI model is dominated by the Phinance Technologies EII-core model, which shows a good performance in anticipating changes in core-CPI, particularly during the 2021-2023 inflation burst.

However, it should be noted that the composite model also includes the 2% regression model, the 5y breakeven inflation model that tend to under-react to large changes in core-CPI. Additionally, it includes the Cleveland Fed model and Michigan Consumer Survey, that are more sentiment-driven and could over-react to oil shocks, such as the ongoing Hormuz oil shock.

Figure 5-6 shows the recent developments of YoY core-CPI as well as the composite core-CPI model. The Hormuz oil shock did not impact YoY core-CPI as denoted from its value of 2.51% in February to 2.595% in March of 2026. The impact of the oil shock on the composite core-CPI model was also subdued, as shown in Figure 5-6, which estimates core-CPI at 2.111% in 1-year (on March-2027).

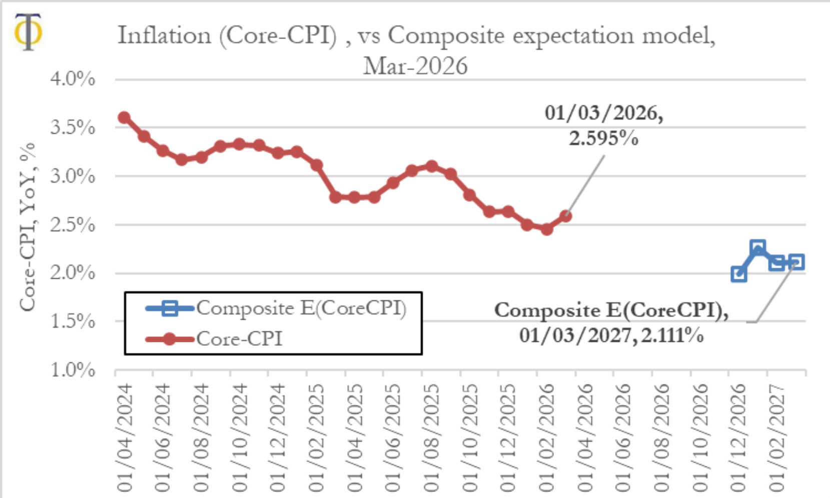

Figure 5-6 - Evolution of YoY core-CPI and composite model expected 1y core-CPI inflation, on April 12th, 2026

The composite model is anticipating further disinflationary forces in core-CPI in the coming year, which, even before the emergence of ongoing oil shock was already pointing to close to 2% core-CPI rate by early 2027.

5.5 Commentary

The dynamic of the impact of temporary energy shocks on total CPI, illustrated in the previous sections, makes clear the difficulty in "predicting" short-term changes in total CPI and in particular modelling YoY changes in total CPI. It also makes clear the challenges that the 1-year inflation expectations models/indicators have in estimating future CPI, in particular on the short-term.

As previously mentioned, most of the inflation expectations models we described above do not react quickly to temporary energy shocks. We've shown that most of the inflation expectation models are highly correlated with the "reversion to 2%" model, and the most reactive model is the Phinance Technologies EII model, albeit still being "conservative" towards periods of quick changes in energy prices, such as in energy shocks.

On the other hand, Core-CPI will be relatively immune to the energy shock and provide a more reliable assessment of the rate of the ongoing inflation. It must also be considered that the extended "temporary" oil shock will likely impact consumer demand and lead to extra disinflationary pressure and will be impacted on core-CPI over the coming months.

5.6 Summary

Table 5-3 summarises the latest estimates (for March 2026) for total CPI and core-CPI for the Phinance Technologies 1y expectation models, namely, the EII and composite models, for the latest available data on the 12th of April of 2026.

Date	Mar-2026	
CPI	**3.256%**	
Core-CPI	**2.595%**	
CPI expectation model	**1y expected CPI rate**	**1y expected change**
Phitech EII 1y	2.843%	-0.413%
Composite CPI model	2.911%	-0.345%
Core-CPI expectation model	**1y expected core-CPI rate**	**1y expected change**
Phitech EII-Core 1y	1.779%	-0.816%
Composite core-CPI model	2.111%	-0.484%

Table 5-3 - Inflation expectation summary for core-CPI and total CPI, on April 12th, 2026

Both of the CPI expectation models are pointing to lower CPI in 1 year. However, these were impacted from the rise in energy prices in March of 2026, caused by the Hormuz oil shock.

Our core-CPI expectation models are pointing to significantly lower inflation than headline CPI with a continuation of the disinflationary trend from 2023 onwards. Core-CPI was not affected by the energy shock and while it is currently running at 2.595% (March 2026) the EII-core model is estimating a core-CPI rate of 1.779% by March 2027, while the composite model 2.111%. Both these models point to core inflation being **close or below** the Fed target of 2% in the coming year.

Figure 5-7 illustrates the recent path of both total CPI and core-CPI since 2024, as well as the composite inflation models. The figure shows how the Hormuz oil shock impacted total CPI but did not impact core-CPI in March of 2026.

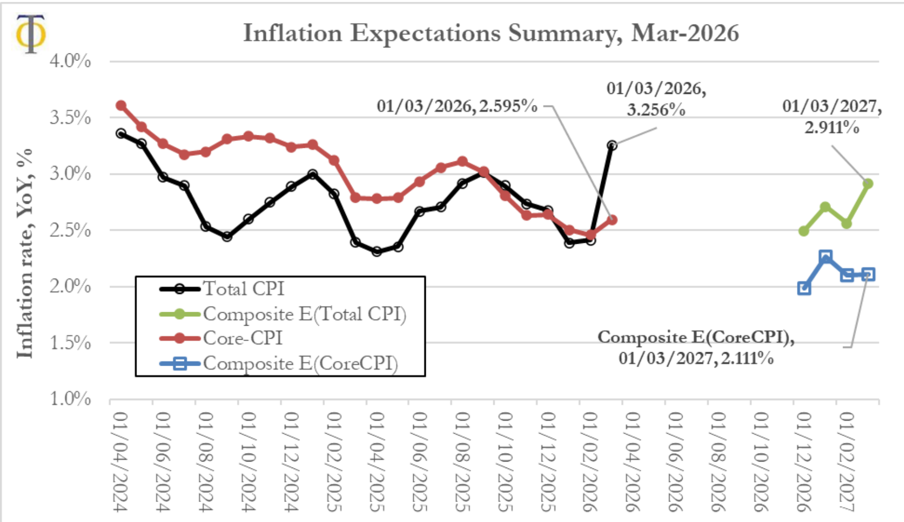

Figure 5-7 - Evolution of YoY core-CPI and total CPI and 1y inflation expectation models, on April 12th, 2026

CPI 1-year expectations

➔ The Phinance Technologies 1y EII is anticipating a decline in overall CPI in 1 year time of -0.413%, to a value of 2.843%.

- ➔ The composite inflation model, points to an expected rate of inflation of 2.911% in 1 year, corresponding to a -0.345% change.
- ➔ Total CPI will be impacted by the oil shock for at least a year, due to the nature of the computation of Year-on-Year (YoY) CPI.

Core-CPI 1-year expectations

- ➔ The Phinance Technologies 1y EII-core model is estimating a decline in core-CPI in 1 year time of -0.816%, to a value of 1.779%.
- ➔ The composite core-CPI model, points to an expected rate of inflation of 2.111% in 1 year, a decline of -0.484%.
- ➔ Both these models point to core inflation being **close or below** the Fed target of 2% in the coming year.
- ➔ The energy shock is an additional factor that will add to demand destruction and disinflationary pressures. The other already existing factors include the economic risks for the economies of the US[11] and China[12] that we outline in our reports.

Impact of short-term oil shock

- ➔ As the severity of the ongoing oil shock from the Hormuz closure is still a highly uncertain geopolitical event, we need to monitor closely developments in energy markets as well as core-CPI and inflation expectations models.
- ➔ We expect the next April 2026 BLS CPI release on the 12th of May to point to 4.2% YoY rate of inflation (total CPI), if average WTI oil prices for April remain close to 100$/barrel, as shown in Figure 5-2.

5.7 Other risks that could impact future inflation

Even though a deep analysis of the following considerations is beyond the scope of this report, it is important to highlight some additional factors that should be taken into account when assessing the inflation regime going forward.

- Global secular deflationary forces.

As Carlos Alegria described in his book[13] "Economic Cycle, Debt and Demographics", historically high debt levels across the world, stagnating or declining demographics and ageing populations (first in developed markets and now in emerging markets too), are strong deflationary forces.

- **Political will**.

[11] https://phinancetechnologies.com/Product_USEconomyOutlook2026.htm
[12] https://phinancetechnologies.com/Product_ChinaEconomy_Outlook2026.htm
[13] https://a.co/d/0bEqcdQ7

The Covid-19 pandemic brought about significant political and social changes, which led to the inflation genie "escaping out of the bottle". This was due to unprecedented monetary expansion by central banks across the world.

These policies were "allowed" by the older voting constituents (majority voters) due to fearing the Covid-19 pandemic more than the erosion of their purchasing power. Going forward, these voters might not be so sanguine relative to another period of high inflation.

- **Central bank management**. Since 2008 central banks have begun to use unconventional monetary-policy tools, which provide extra uncertainty on monetary policy going forward. These tools were implemented on a full force during 2020 and 2021, the Covid-19 pandemic, leading to a period of high inflation in 2022 and 2023.

We observed that since mid-2022 the Fed accomplished a reduction in its balance sheet and unprecedented decline in M2, without a hard economic landing, so far. This means that we are in uncharted territory going forward and need to consider a wider range of possible outcomes than anticipated by historical analysis in the last century.

- Geopolitical Dangers.

Recent events have shown us that geopolitical developments are a high risk for future periods of high inflation due to global supply chain disruptions, protectionism and economic and kinetic wars. The current Ukrainian/Russian, Middle East conflicts, and tensions between the US and China are cases in point.

- Economic recessions.

The other factors that could have a large impact on future inflation shocks (both positive and negative) are economic risks to the largest economies in the world, namely the US[14] and China[15]. Each of these risks could trigger a serious economic recession with spillovers throughout the world, which would lead to demand destruction and a deflationary scare. Both these economies are intricately linked by global supply chains with the US being the consumer of last resort and China the main world producer.

While the immediate impact of a global recession would lead to a short period of deflation, the policy response by central bankers would lead to another period of high inflation.

The inflation expectation models described within this report are tools that can be used to assess the changes in inflation regime in a data driven manner, in order to properly navigate inflation/disinflation risks as events unfold.

[14] https://phinancetechnologies.com/Product_USEconomyOutlook2026.htm
[15] https://phinancetechnologies.com/Product_ChinaEconomy_Outlook2026.htm

6 Important Disclosure

This report has been compiled from sources believed to be reliable high-quality sources, mostly official statistics offices, but we do not guarantee it as to accuracy, completeness, or in any other way. It is solely for information purposes and is not to be deemed a prospectus of solicitation for investment. Past results are not necessarily a guarantee for equivalent future results.

Our economic analysis should not be considered as investment advice as historical relationships are statistical in nature. These relationships can and do change over time and external events or other confounding variables have impact on them.

7 Contact

If you're interested in access to our reports and ongoing dashboards on inflation monitoring, please contact us through the email below. Our inflation monitoring tools ranging from: Our short-term energy model; to our medium-term EIIs (Early inflation indicators) detailed within this report; and to the monitoring of important monetary variables.

Email: support@phinancetechnologies.com

Private session:

If you're interested in booking a paid 1-on-1 private session with the authors, please include "US Inflation" in the email subject line to speed up our response time and specify precisely the topics you're interested in discussing.

Email: support@phinancetechnologies.com