Introduction

We live in a changing world where inflation is staging a frightening comeback! Since 2008, inflation throughout most of the developed world has hovered close to zero, raising the specter of disinflation and its associated problems. Nothing, not massive monetary and fiscal stimulus, exchange rate gyrations or political upheavals seemed to be able to change it, and it came to gradually deserve the title of the "new normal."

But was this really so unusual, and should we really have expected it to persist? The finest database of inflation in the past comes from the Bank of England, and contains 800 years of the best approximations to inflation year by year, created by scholars of history and econometricians, that can be made from the surprisingly rich records we have available. In the final chapter of the book we graph this data, and it can be seen that long fallow periods of low or even negative inflation were often seen, along with multiple spikes and higher phases, which means that this recent long trough should not raise any eyebrows. While we can certainly make the case that our current world, with its automation and connectivity, differs greatly from the past, a similar argument could probably have been made in every one of the eight centuries in the database. In short, to anticipate that we had reached a new paradigm, a forever period of lowflation and government support, was to make the same mistake that humankind has always made – to assume that things will never change.

Now, Covid and war in Europe have changed everything. Ever since the demise of Lehman Brothers in 2008, the outlook for inflation had almost exclusively been focused on the downside risks for prices and how to deal with the prospect of structural disinflation. These discussions now seem lightyears away. The disruptions on supply chains and consumption patterns triggered by the pandemic together with stimulus packages that came close to helicopter money have catapulted inflation rates to levels last seen in the 1970s.

The subsequent policy tightening of central banks eager to protect their inflation credibility has also reversed the trend of ever lower real yields which in turn has triggered sharp re-pricings across all asset classes.

For inflation markets, it's hard to understate this sudden and enormous change in fortunes. Trading volumes in inflation-linked products have exploded given the seismic change in the demand for these products. At the same time, understanding the information contained in index-linked products on the future evolution of consumer prices has become crucial for investors across all asset classes as central banks tailor their policy responses with a view to anchoring inflation expectations. This exercise is not always straightforward, however, as the specific characteristics of inflation-linked products as well as those of the underlying consumer price indices require specific analytical techniques which go beyond those of the standard of (nominal) rates products.

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In this book, we condense more than 15 years of dedicated coverage of inflation markets. We hope to provide investors, issuers and policy makers with all relevant tools to navigate inflation markets, starting with the nuts and bolts of consumer price indices to advanced topics like seasonality adjustments and the use of inflation options.

In Chapter 1, "Inflation Indices," we introduce the concept of inflation-linked products and inflation indices, which determine the payouts of these products. We describe the main European inflation index family, the HICP and associated indices, and describe the history of this index which has undergone several revisions over the last decade. We see how well the index represents actual experienced inflation. We then move on to the main US inflation indices, the US CPI and PCE, and discuss how they are constructed and how well they represent US inflation.

In Chapter 2, "The CPI linkage, the Concept of Break-even Inflation, and the Deflation Floor," we build on the on the indices introduced in Chapter 1 and go into the details of how to calculate these reference indices and how index-linked bonds ensure investors receive a certain real return. We then go on to discuss break-even inflation, which links traded inflation products to the real world, and following on from this, the deflation floor, which comprises the unique behavior of products whose strike levels lie close to or at the zero value of actual inflation – the border between inflationary and deflationary environments.

Chapter 3, "Inflation-linked Products and Curves," begins with a discussion of the motivations of market participants for buying inflation-linked products, and how well these products tend to deliver. We go on to look at inflation-linked product supply/demand, volumes and the type of investors who trade them. Linker issuance tends to have a strongly seasonal pattern which we examine. Next we look at inflation curves and introduce the concept of break-even inflation, that level of future inflation at which market participants become indifferent to inflation linked or nominal bonds – in other words, a way to derive what market participants will pay to lock in a value of future inflation. These calculations form the basis of the inflation curve, analogous to a yield curve for underlying interest rates. These give rise to curve-based and spread-based inflation products like asset swaps and other derivatives of the inflation linked market. We outline the mechanics for constructing these inflation curves which are made more complex by the strong seasonality factors.

Chapter 4, "Forwards, Carry and Trading Strategies," begins to go into the reality of trading in this market. Carry is an essential part of trading any curve-based product, and inflation is no exception. It refers to the fact that if a curve stays roughly constant, profits may be made by buying and selling at different curve tenors, and rolling those positions to retain their approximate tenor properties. Even if a curve does not stay constant, this carry element will contribute to profits and losses. We show how carry is calculated for inflation products, which is non-trivial as interest rate carry will also impact valuations. We discuss how carry may be incorporated

into trading strategies involving spot and forward trades on the inflation curve. As might be expected, it is essential to incorporate seasonality effects into these calculations and we show how to take this into account.

Moving on to Chapter 5, "Inflation Expectations, Seasonality and Base Effects," we tackle the central issue of future inflation. Where do people think that inflation will go? Up, down, static? While we can extract forward inflation prices from the inflation products, does this actually reflect genuine inflation expectations? And how do we account for the seasonal effects embedded in consumer price indices, like post-Christmas sales or July reductions in the retail sector? Relying on one measure only can be misleading given the various structural and mechanical pitfalls of inflation products. In this chapter, we present a broader set of metrics and cross-checks in order to obtain a robust and comprehensive picture of market-based inflation expectations.

In Chapter 6, "Risk Measures and Risk Premia," we examine the nature of risk in the inflation market. It's usual to assign the work 'risk' to volatility – i.e., price variability, usually related in the literature as the standard deviation of returns. However, the "risk premium" is a subtly different concept, and a consequence of uncertainty. Inflation-linked products trade at a spread to similar nominal counterparts, and this spread is due to both the expected value of genuine inflation, and a risk premium which compensates for the uncertainty surrounding future inflation. Though it is an intuitive concept, it is surprisingly difficult to estimate these two components. In this chapter we go into detail about the nature of both risk measures and risk premia, and illustrate how it is possible to derive values for both under certain assumptions.

Finally in Chapter 7, "Inflation Options," we discuss inflation derivatives and whether their implicit "view" of the future is a useful forecast. Though inflation options have been mentioned before, this chapter treats them in detail. They offer the possibility of extracting an underlying "expected distribution" of future inflation, which is an alluring prospect, especially to investors and policymakers trying to derive probabilities of large inflation moves in the future. However, a deep dive into the nature of this calculation reveals that much of the data should not be relied upon for this purpose; while extracting market expectations about the deflation floor is likely to be well-founded, much of the rest of these derived distributions need to be treated with caution.

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