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The International Real Estate Index – A hedge against expected inflation

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1. Introduction

Real estate has long had the reputation of being at least a partial hedge against inflation, since both rental income and property values typically respond positively to inflationary pressures. The iSTOXX® Developed and Emerging Markets ex USA PK VN Index ("Int'l Real Estate Index") has lived up to this reputation historically and is continuing to do so in the current inflationary environment.

Real estate tends to be positively correlated with inflation for multiple reasons: To start with, income generated from renters tends to keep pace with inflation because many leases are index-linked, particularly in Europe. In turn, income increases can lead to property values appreciating. Rents may also climb further as property values rise and more people abandon owning for renting due to the expense involved in owning.

In addition, *real* rental income increases as the value of existing owned fixed-interest debt falls with higher inflation. Inflation pressures also push up new construction costs so that new development projects become more expensive and the supply of real estate shrinks, leading to both higher property prices and rent increases for existing properties. These mechanisms are just some of the reasons why real estate has a reputation as an inflation hedge.

This paper provides a brief overview of the Int'l Real Estate Index and analyzes[1] the extent to which the index has been acting as a hedge against expected inflation since its inception[2]. The study also examines the impact expected inflation has had on the index so far in 2022 and what to anticipate from potential future changes in expected inflation in the EU, UK and US.

Inflation is expected to fall in the near future as central banks continue their efforts to combat it. However, this does not necessarily mean that a real estate index stands to lose from a such a decline. Rather, it is the index's *exposure* to expected inflation that determines its fate. Consequently, using a macroeconomic risk model better informs investors how a change in expected inflation will impact their real estate portfolio.

[1] This analysis is as of May 25, 2022 and denominated in US dollars.

[2] The inception date of the Int'l Real Estate Index is February 6, 2019.

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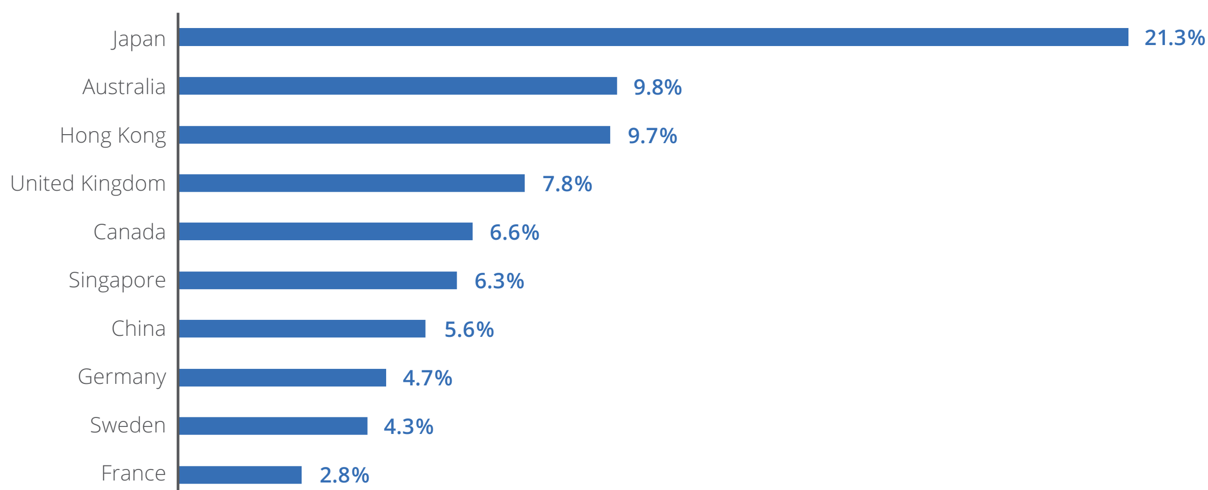
2. Index overview[3]

The Int'l Real Estate Index comprises real estate companies located mainly in Asia Pacific, Europe and the Americas, with the 10 largest country weights in the index accounting for roughly 80% (Figure 1). Japanese stocks represent a little over one-fifth of the index.

Figure 1: Country weights in the Int'l Real Estate Index, as of May 25, 2022



Source: Qontigo.

The Int'l Real Estate Index is almost evenly split (Figure 2) between Equity Real Estate Investment Trusts (REITs) and the Real Estate Management & Development industries, as defined in the GICS 2018 classification.

The REITs industry encompasses companies or trusts that invest directly in income-producing real estate companies engaged in the acquisition, development, ownership, leasing, management and operation of various types of properties (industrial, hotels, office, residential, retail, etc.). REITs are required to distribute most (90% or more) of their taxable income to investors as dividends, but do not have to pay corporate income tax.

Real Estate Management & Development covers normal real estate companies that are engaged in a wide range of real estate activities such as development and sales, management and services.

[3] I would like to thank my colleague Twinkle Singh for providing the data for this study.

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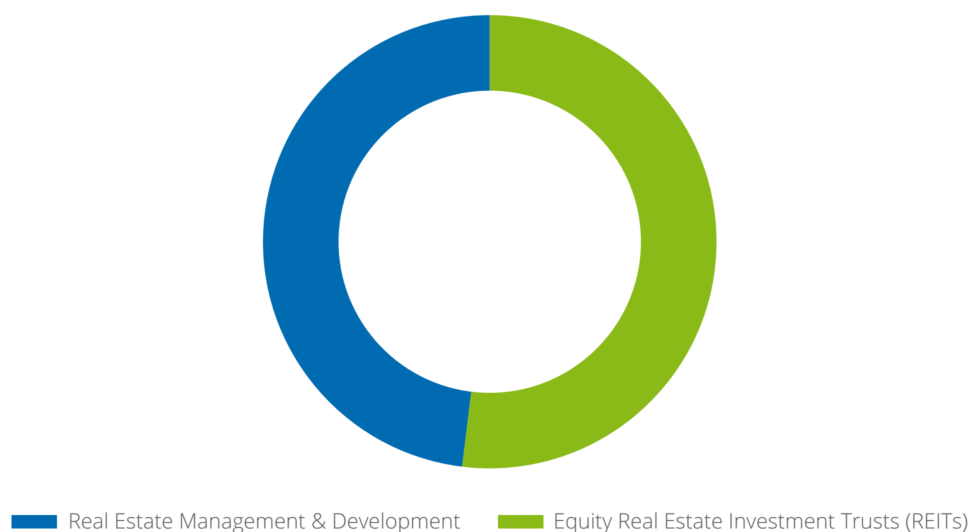
Figure 2. Industry weights in the Int'l Real Estate Index, as of May 25, 2022



Source: Qontigo.

3. The Int'l Real Estate Index has acted as an inflation hedge since 2019

Over the past two-and-a-half years, the Int'l Real Estate Index has shown positive average exposures[4] to the EU, UK and US inflation factors in Axioma's Macroeconomic Projection Model. In other words, it was expected to benefit from higher inflation.

The inflation factor in the Macroeconomic Projection Model captures the sensitivity to daily changes in the 5Y breakeven[5] inflation rate, and therefore represents the sensitivity to *expected* inflation. We will therefore refer to this factor as "expected inflation" in the remainder of this paper.

The chart that follows (Figure 3) shows the ranges of daily exposures to EU, UK and US expected inflation between February 2019 and May 2022, with the horizontal line in the box representing the median and "x" marking the mean. Please note that the index was not always anticipated to benefit from higher expected inflation, especially in the case of EU inflation, but that this has been the case for most of the time.

A positive average exposure to expected inflation means that an increase in the latter should translate into a positive return for the Int'l Real Estate Index.

[4] A fundamental risk model computes exposures to the factors in the model for each asset in the model universe. Each factor's exposures are standardized across the model estimation universe, much like z-scores. An asset's exposure to a factor denotes its sensitivity/beta/loading to that factor.

In contrast, exposures in a macroeconomic projection model are constructed differently. Macroeconomic factor returns are regressed against industry, country, market and style (fundamental) factor returns, with a beta between each fundamental factor and each macro factor as the result. A company's exposure to a macro factor is the sum of its betas times the fundamental factor exposures.

[5] The 5-year breakeven inflation rate represents a measure of expected inflation derived from 5-Year Treasury Constant Maturity Securities (BC_5YEAR) and 5-Year Treasury Inflation-Indexed Constant Maturity Securities (TC_5YEAR) (Source: FRED).

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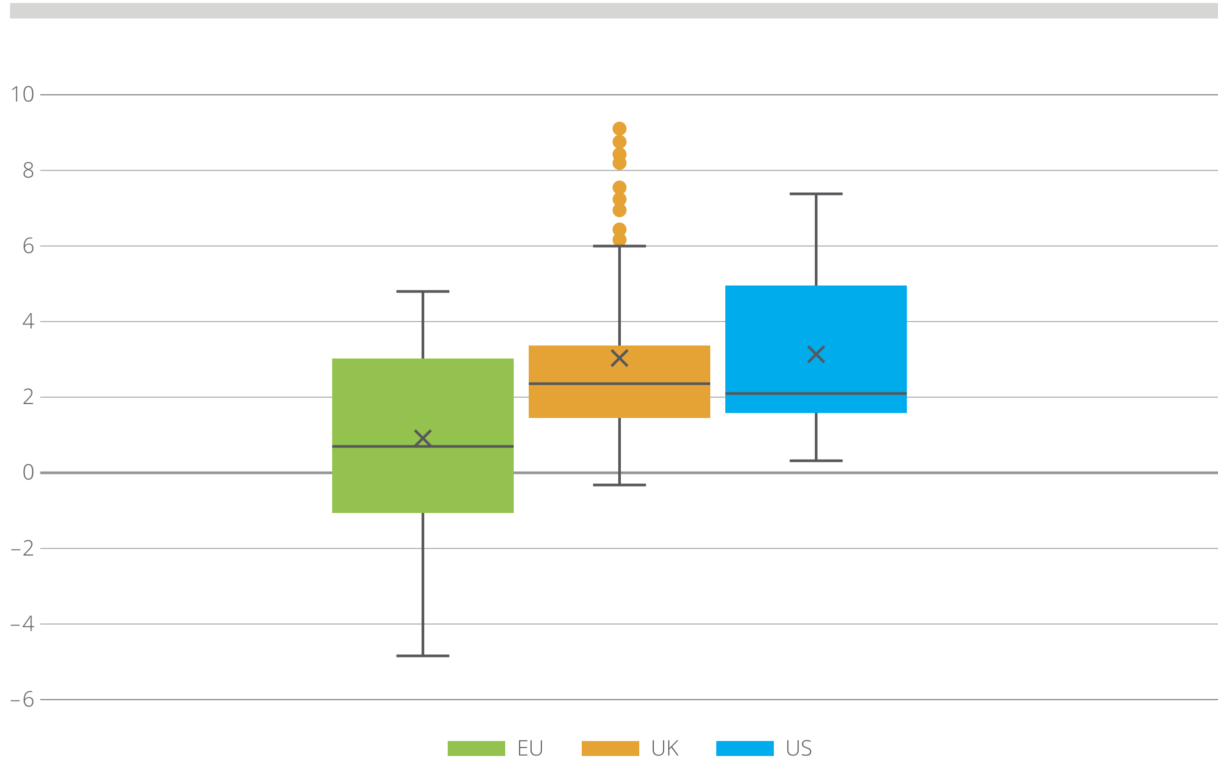
Figure 3: Ranges of exposure to expected inflation 2019–2022



Source: Qontigo.

Since expected inflation (Figure 4) has been on the rise in the EU, the UK and the US between 2019 and 2022 – particularly after March 2020 when the COVID-19 crisis hit the equity markets globally – the combination of average positive exposures and the positive changes in expected inflation resulted in a positive contribution to the Int'l Real Estate Index's return in all three regions. This confirms that the index proved to be a good hedge against rising expected inflation during that period.

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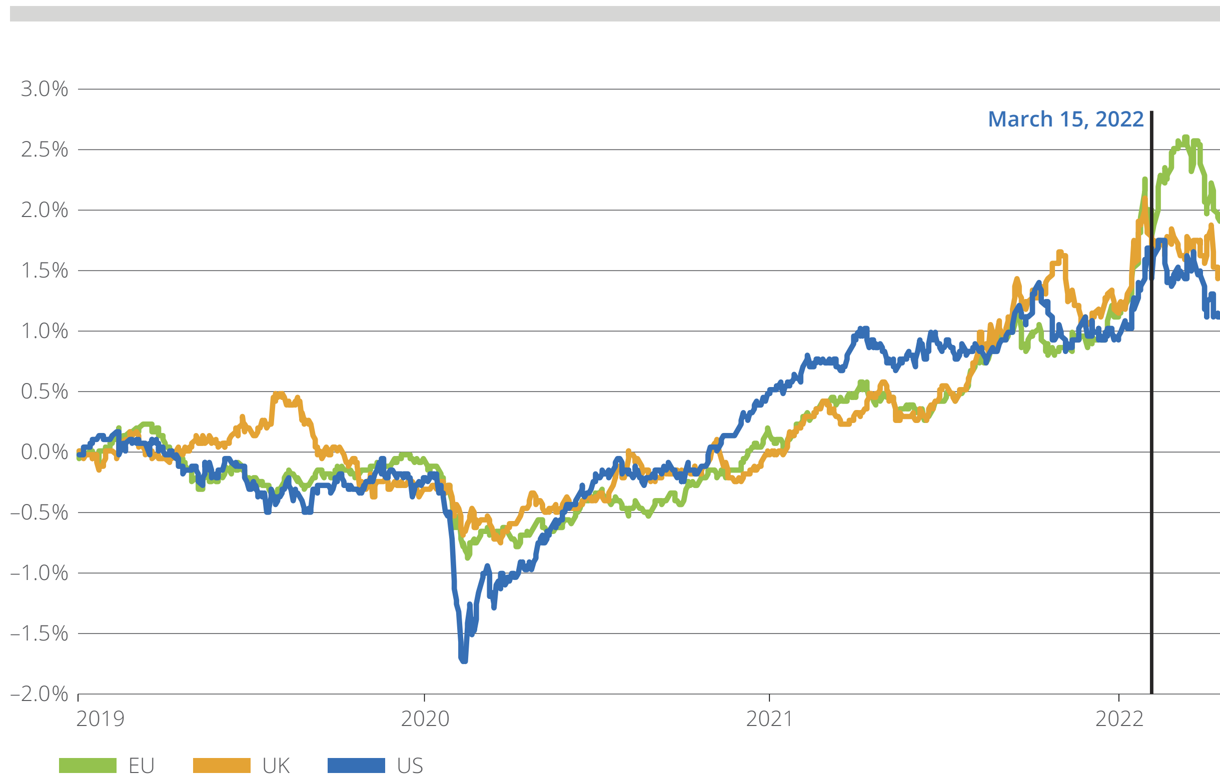
Figure 4: Expected inflation – Cumulative factor return 2019–2022



Source: Qontigo.

The increase in US expected inflation (Figure 5) contributed the most to the 2019–2022 index return, even though the cumulative return for the US expected inflation factor was the lowest among the three regions. This is because the largest positive average exposure to expected inflation for the index was in the US, with no periods of negative exposure being recorded between 2019 and 2022.

Prior to March 2020, the index had negative exposure to EU expected inflation, but at the same time the return for EU expected inflation factor was negative and this combination ultimately resulted in a positive EU contribution. After March 2020, both the exposure and the factor return for EU expected inflation were positive, adding to the pre-COVID-19 gain.

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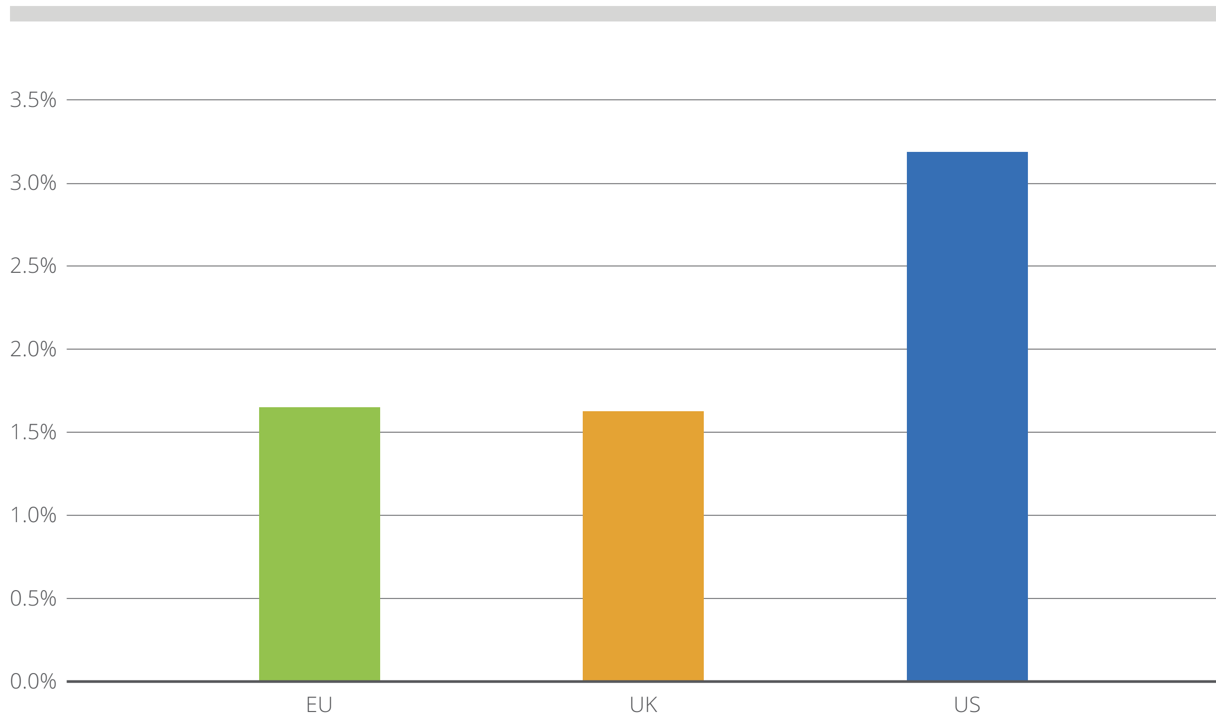
Figure 5: Expected inflation – Contribution to the 2019–2022 index return



Source: Qontigo.

4. 2022 inflationary conditions: A tale of two regimes

This year's inflationary circumstances (Figure 6) can be divided into two regimes corresponding to the periods before and after March 16 – the day the Federal Reserve (the "Fed") raised rates for the first time since 2018. The increase amounted to 0.25 percentage points and the Fed also projected six more rises in the course of the current year to contain *reported* US inflation, which had accelerated to a 40-year high.

A day after the Fed announced its rate rise, the Bank of England (BoE) decided to raise its key interest rate (from 0.5% to 0.75%) to counter UK reported inflation, which hit a 30-year high in January. Around the same time, the European Central Bank (ECB) also signaled a reduction in QE and potential increases in interest rates later in the year for the first time in more than a decade.

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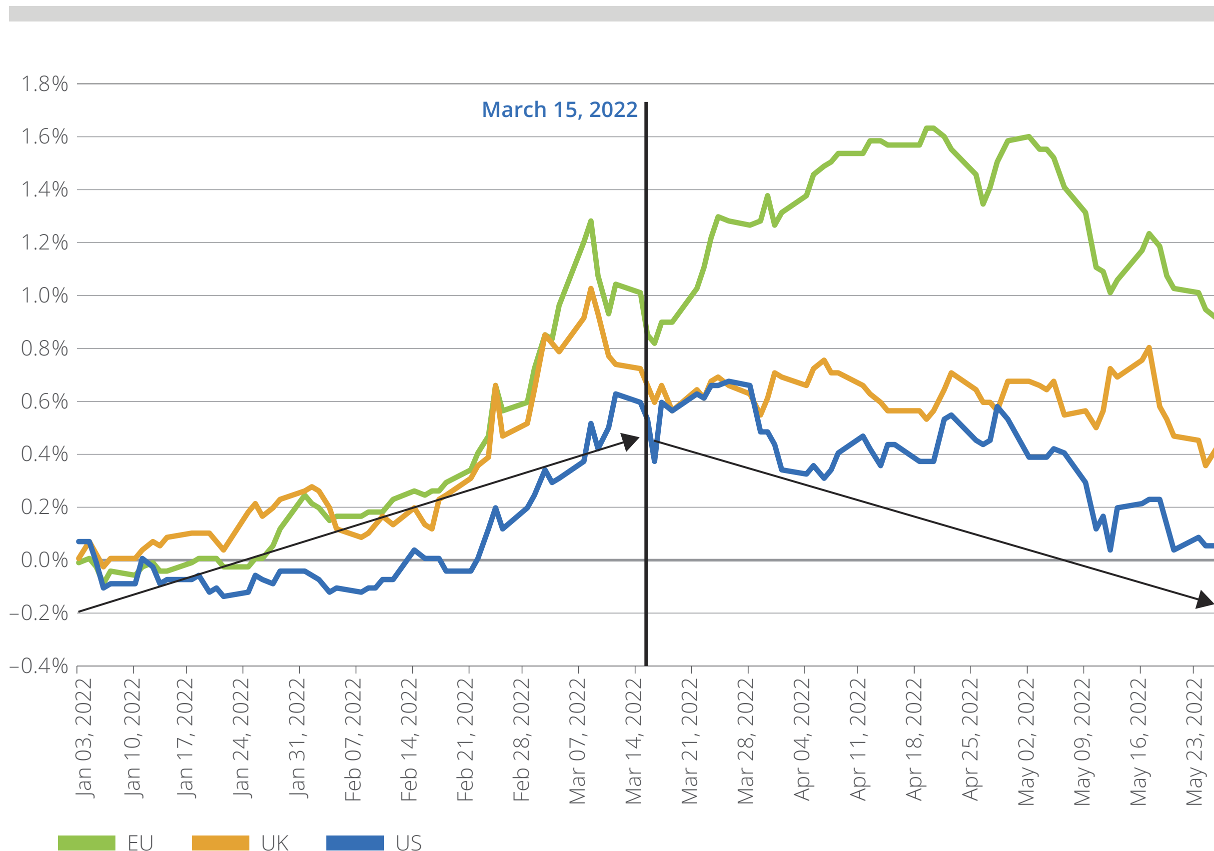
Figure 6: Expected inflation – YTD cumulative factor return



Source: Qontigo.

For the year to date prior to March 16, expected inflation increased in the EU, the UK and the US. The Int'l Real Estate Index had positive average exposures to this macro factor for this period in all three regions, and saw an aggregate contribution of more than two percentage points to its return from rising inflation expectations.

After the mid-March date, the three major central banks' efforts to combat inflation were reflected in a decline in expected inflation, particularly in the US and the UK. The index's average exposures remained positive in the US and the UK, and therefore expected inflation had a negative impact on the index return after March 16 in these two regions. Please note, however, that exposure to UK expected inflation has turned slightly negative in recent weeks.

The Int'l Real Estate Index's exposure to EU expected inflation fell significantly and turned negative immediately after Russia's invasion of Ukraine. The war in Ukraine put a spotlight on Europe's dependence on Russian oil and gas, boosting expected inflation in Europe. However, the ECB did not signal an intention to hike rates aggressively, so that Europe's expected inflation kept rising until late April, before plunging in May.

At the same time as EU expected inflation took off, European stock markets tanked due to their proximity to the war and concerns about a slowdown in the global economy. This dynamic of rising EU inflation and declining European stocks was also reflected in the Int'l Real Estate Index's negative exposure to EU

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expected inflation. As a result, the overall small positive return for EU expected inflation between March 15 and May 25, and the index's negative exposure to EU expected inflation both contributed negatively to the index's return.

In the entire year to date (December 31, 2021– May 25, 2022), the positive contributions made by EU and UK expected inflation to the Int'l Real Estate Index's year-to-date return were partly offset by the US year-to-date negative contribution. Nevertheless, in line with intuition, expected inflation aggregated across the three regions has made a positive overall contribution to the index's year-to-date return.

The table below (Figure 7) shows the Int'l Real Estate Index's average exposures to EU, UK and US expected inflation factors for the pre- and post-March 16 periods and the year to date. It also captures the contributions of the EU, UK and US expected inflation factors to the index return in each of the three periods.

Figure 7: Average exposures to EU, UK and US expected inflation factors and their contribution to the index return in 2022

	Dec 31, 2021 to Mar 15, 2022		Mar 15, 2022 to May 25, 2022		Dec 31, 2021 to May 25, 2022	
Expected inflation	**Contribution**	**Avg exposure**	**Contribution**	**Avg exposure**	**Contribution**	**Avg exposure**
EU	0.65%	0.1572	–0.49%	–0.7113	0.17%	–0.2728
UK	0.59%	0.6542	–0.07%	–0.0081	0.51%	0.3262
US	0.97%	2.2241	–1.38%	2.3708	–0.37%	2.2967
EU + UK + US	**2.21%**	**3.0**	**–1.95%**	**1.7**	**0.31%**	**2.4**

Source: Qontigo.

5. Effects of future changes in expected inflation vary by region

The Int'l Real Estate Index's most recent levels of exposures to EU, UK and US expected inflation (Figure 8) tell us what to anticipate from changes in expected inflation in these regions in the near future.

The index's current positive exposure to US expected inflation shows it would gain from a potential rise in this factor. Conversely, however, a rise in EU or UK inflation would hurt the index due to the latter's current negative exposure to EU and UK expected inflation.

Alternatively, if the ECB and BoE were to start hiking rates more aggressively, the result would be a decline in EU and UK expected inflation, respectively, which would contribute positively to the Int'l Real Estate Index's return. By contrast, the index would continue to be hurt by a further decline in US expected inflation.

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Figure 8: The Int'l Real Estate Index's exposure to expected inflation in 2022

Source: Qontigo.

6. Stress testing US, EU and UK inflation expectations[6]

One other method of determining inflation's impact on the index is to perform a stress test. This allows us to examine the impact of a change in a specific variable based on an exposure to that variable plus its correlations with other relevant inputs.

To stress test the current scenario, we tested the potential impact on the Int'l Real Estate Index of a 0.50 percentage point increase in each of the US, EU and UK *long-term* expected inflation rates (as represented by the 10-year breakeven rate in each region) should new inflationary pressures drive inflation expectations up again.

We used a transitive stress test calibrated on the daily returns for the period between September 21, 2021, and May 25, 2022. This period was chosen because market participants gradually adjusted their inflation expectations upward following the Fed meetings on September 21–22, 2021.

In this scenario, the stress test suggests that the index stands to gain 1.4 percentage points if US expected inflation were to rise by 0.50%.

[6] I would like to thank my Applied Research colleague Christoph Schon for creating these stress tests and providing detailed analysis, commentary and insights.

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By contrast, an increase of the same magnitude in either EU or UK expected inflation would have a negative impact on the index's return of –0.40 and –1.20 percentage points, respectively.

The table (Figure 9) below shows the contribution to the index return of the individual stress test shocks.

Figure 9: Stress test shocks and their contribution to index return

Stress test shock	Contribution to index return
US 10Y Breakeven inflation +0.5%	1.40%
EU 10Y Breakeven inflation +0.5%	–0.40%
UK 10Y Breakeven inflation +0.5%	–1.20%

Source: Qontigo.

In other words, the stress test results corroborate the Macroeconomic Model predictions (i.e., positive exposure to US expected inflation and negative exposures to EU and UK expected inflation). This shows that the Int'l Real Estate Index should currently benefit from higher US inflation expectations, but might be hurt by a rise in either EU or UK inflation expectations.

When it comes to investing in a real estate portfolio, it is a good idea to check whether the portfolio's exposure to expected inflation is positive or negative before deciding if this portfolio will benefit or be hurt by higher or lower inflation expectations. However, our analysis shows that, over the past couple of years, the Int'l Real Estate Index has indeed fulfilled its promise as an inflation hedge.

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