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KUS**

RISK BASED  
GOVERNANCE

MARKET VOLATILITY RISK NEWSLETTER – January 2022

*End of the road?*

Member of the Profidata Group

# Executive Summary

- **Region's volatility results were mixed.** Region volatility spanned a range that goes from 14.1% (Asia ex-Japan) to 18.6% (Japan Nikkei).
- **Realized volatility** (of the Euro Stoxx 50 index over 30 days) increased from 18.2% to 20.9% (high).
- **Equity price sector results were all upward trending**, with Consumer Staples increasing the most (+8.2%). **Sector volatilities** spanned a range that goes from 9.4% (Consumer Staples) to 25.6% (IT).
- **Sovereign bond price movements were all downwards**, with Italy losing the most(-3%). **Volatility** moves were all upwards and spanned a range that goes from 1.2% (Japan) to 5.7% (Italy).
- **€ price results were mixed**, with the EUR losing the most against GBP(-1.3%) and gaining the most against the Japanese Yen (+2.3%). **FX volatility results were mixed**; ended ranging between 3.9%(€/CHF) and 6.1% (€/\$/).
- **Options' implied volatility decreased in both observed markets**, with the VIX going down from 27.2 to 17.2, and the VSTOXX from 30.1 to 19.3.
- **Commodities price changes were all upward trending**; with Iron Ore gaining the most (+20.9%). **Volatility changes were all downwards** and spanned a ranged between 11.2% (Gold) to 46.1% (Iron Ore).
- **Real Estate (equity) prices movements were all upwards**, with US gaining the most (+8.1%). **Volatility moves were mixed**, ranging between 12.3% (Europe) to 18.3% (US).
- **The average PE Funds** gained +4.2%, while the **average Hedge Fund** +0.3%. **Volatility** for the average hedge fund fell from 3.5% to 3.1%, while for the average PE fund went down from 18% to 11.47%.

**The Arkus Risk Team**



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# Summary volatility matrix and outlook

Despite optimism from the UK Government that Coronavirus and its variants have now reached their peak, the rest of Europe do not share the same buoyancy, with record cases across Germany, France and Denmark, the World Health Organisation have issued a warning to world leaders that Coronavirus pandemic "is nowhere near over".

Widespread criticism on alleged parties at 10 Downing Street when most of the population were in house arrest and obliged to follow government-imposed restrictions has caused an avalanche of disturbing questions for Mr Boris Johnson at the helm. Fierce public reactions and a gripping attack from political opposition have triggered an outcry for resignation.

On other pressing matters, persistently high global energy prices have continued to hurt consumer pockets as the cost of living has surged by 5.4% in the last 12 months to December. According to the Office of National Statistics, the consumer price index has not hit current levels since 1997. Moreover, supply chain disruption from Russia and OPEC has caused more anguish and pessimism that energy prices will not return to pre-pandemic levels. Not surprisingly, all eyes are now looking towards the BoE and whether another rate hike could possibly be in the horizon for Q1.

ASSET CLASS	AREA	LATEST VOLATILITY	LATEST Z-SCORE	REGIME
EQUITIES	North America	17.4%	1.4	high
	Asia ex-Japan	14.1%	-0.1	medium
	Europe	15.0%	1.2	high
	Japan (Nikkei)	18.6%	0.3	medium
	Energy	20.9%	-1.0	low
	Consumer Staples	9.4%	0.4	medium
	Financials	15.9%	0.5	high
	IT	25.6%	1.5	high
VOLATILITY OF VOLATILITY	Volatility of VIX	147%	0.1	medium
	Volatility of VSTOXX	159%	0.6	high
GOVERNMENT BONDS	Germany	4.7%	1.0	high
	US	4.5%	0.8	high
	Japan	1.2%	0.2	medium
	Italy	5.7%	0.7	high
FX VS \$	€/\$	6.1%	0.5	high
	€/Yen	6.0%	0.6	high
	€/CHF	3.9%	0.2	medium
	€/£	5.6%	0.2	medium
COMMODITIES	Oil (Brent)	32.8%	0.3	medium
	Gold	11.2%	-1.1	low
	Copper	19.2%	-1.1	low
	Iron Ore	46.1%	0.5	high
PROPERTY	US	18.3%	0.9	high
	Europe	12.255%	-0.7	low
	Japan	14.546%	0.4	medium
ALTERNATIVES	HFRX Global HF	3.1%	0.4	medium
	Avg PE Fund	11.5%	-1.3	low
KURTOSIS	ZCF 1% left (vs - 2.33 for normal curve)	-3.87	-1.6	high
CORRELATION	Average market correlation with euro equities	32%	1.1	high

**Note:** Throughout the text we refer to volatilities as being "low", "medium" or "High". We define this by defining three equal "sized" regimes over the last 12 months. i.e. "High" volatility implies that volatility is in the upper third of its statistical range over the last 12 months. The table shows the "z-score" of the volatility of each market, i.e. how many standard deviations above (or below) the mean over the last 12 months each market's volatility is.

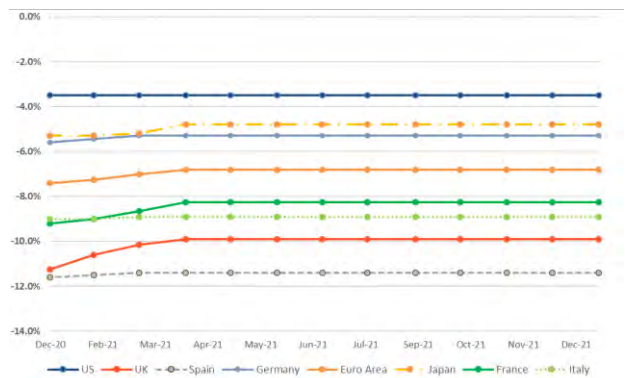
# Key News

## Major Volatility-Driving Events

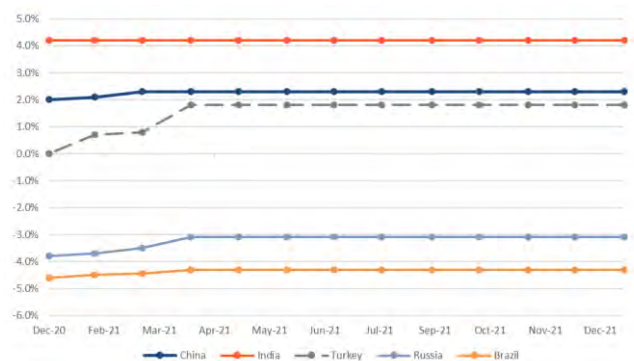
- Among other external drivers, a persistent rise in energy prices has maintained the U.K. inflation rate at the highest recorded for over ten years. The increased rate in the average 'basket of goods' is straining consumers who have been experiencing the fastest rise in living costs for over 30 years.
- Speculations that the attack on a fuel facility in the middle east might affect supply levels have worried traders, resulting in the price of oil hitting its highest level in more than seven years.
- All is not well at 10 Downing Street; Boris Johnson faces a perilous moment in his leadership of the country. Investigations on whether he and his inner team were partying up while most of the country obeyed strict lockdown restrictions has caused an avalanche of criticism from the public, political opposition, and even his own conservative party.
- The UK government remain cautiously optimistic that COVID cases may have potentially reached their peak. Health secretary Sajid Javid has recently told MP's that restrictions could be substantially reduced by next week. On the other hand, the world health organisation (WHO) warned world leaders that the Corona-virus pandemic is far from over, stating that the new omicron variant has led to over 18 million new infections across the globe in just the past week.
- Assets under management (AUM) at Blackrock has surged to an all-time high of just over USD 10 trillion, benefiting from record flows of its active funds and ETFs in 2021.
- Due to the colossal amount of energy required to mine cryptocurrency, the EU markets regulator has called for a ban on all energy-intensive crypto mining, which currently poses a considerable risk and obstacle in meeting the climate change goals.
- KPMG has been fined over £3m for audit failures relating to Conviviality's collapse in 2018, which only adds more anguish to the large auditor who are currently undergoing FRC hearings for the collapse of outsourcer Carillion.

- French President Emmanuel Macron has urged fellow member states to share his enthusiasm that climate change, digital transformation and security are the main challenges facing the European Union.

### GDP ESTIMATES FOR 2021, DEVELOPED COUNTRIES



### GDP ESTIMATES FOR 2021, DEVELOPING COUNTRIES



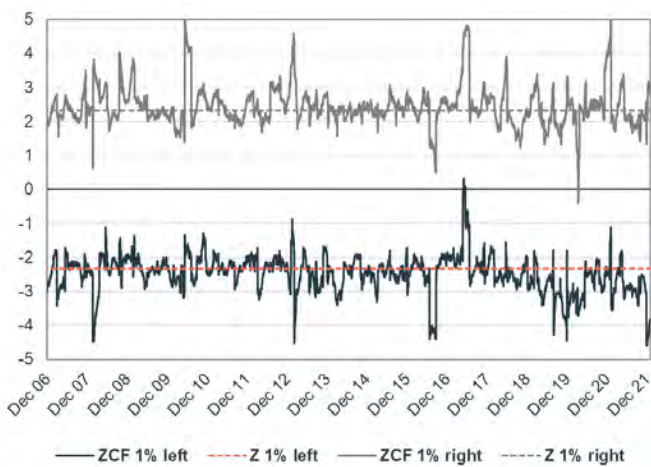
# Kurtosis

## Correlation in the equity markets

Kurtosis (against normal +/- 2.33)

The distribution of risks in European equity market displays denormalization on the left side with the ZCF 1% left at -3.87 and the right ZCF 1% at +2.91 (both as of 31st of December).

### ***Cornish-Fischer expansion of Eurostoxx50 (60 days)***



### **Methodology**

To capture a measure of both Skewness and Kurtosis we look at the Cornish-Fischer expansion, which gives a good measure of the tails of the equity market. (We use a 60-calendar day rolling basis). The underlying market we plot is the Euro Stoxx 50, but other equity markets normally show very similar results.

We plot on the chart the expected Z-scores for 1% left tail (i.e., a 99% VaR) and a 1% right tail assuming a normal distribution: +/-2.33.

We also show the Cornish-Fischer expansion result for the same market. This indicates how far from a normal distribution each tail was.

On a long-term basis, on average, the tails are slightly fatter than the normal distribution would suggest, which should not come as a surprise. What is perhaps more surprising is how much variation in fat-tailedness there has been: a daily 99% VaR has varied between -1 and -4.5 standard deviations over time.

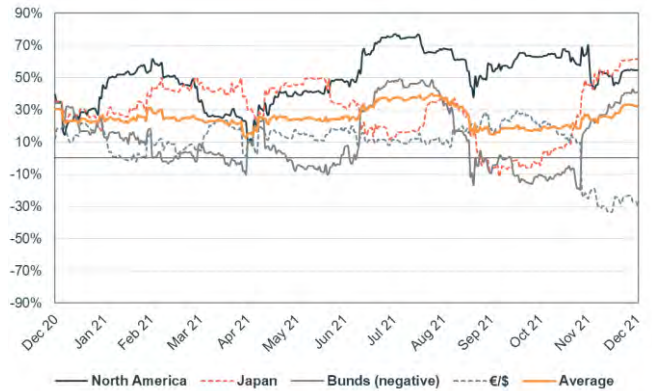
# Inter-market correlations with EU equities



32.0%

AVERAGE  
CORRELATION

## Inter-market correlations (with EU equities)



Correlation with euro equities increased after our last report, leading our average correlation indicator to go up from 27.23% to 32% (medium up to high).



13.55%

AVERAGE  
VOLATILITIES

## Multi-asset portfolio volatility



We also look at a hypothetical multi-asset portfolio consisting of equities, bonds, gold, oil, and hedge funds.

The average asset volatility decreased, moving from 15.32% to 13.55%, while the benefit of multi-asset diversification increased, moving from 4% to 4.8%.

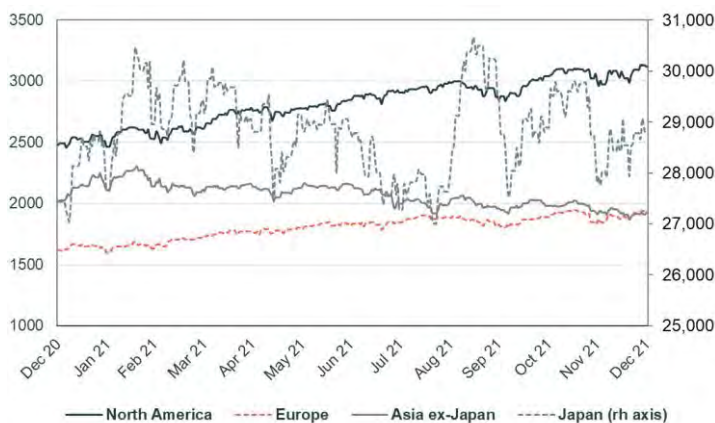
In combination, multi-asset portfolio volatility decreased from 11.3% to 8.8%.

**Note:** The chart shows 30-day correlation over time between different markets and the pan-Euro equity market. Higher levels of correlation will in general lead to less ability to diversify risks, and higher portfolio volatility for given position holding volatility.

# Equities

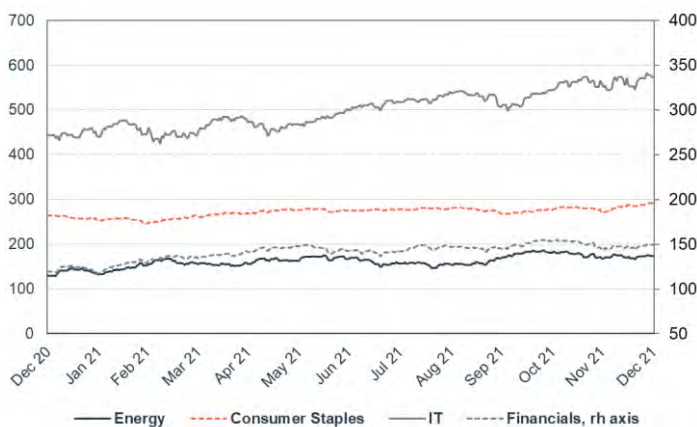
## Stock price

### STOCK PRICE PERFORMANCE: REGIONS (LOG SCALES)



Equity region price movements were all upward. North America gained +3.9%, Asia ex-Japan gained +0.9%, Europe gained +5.1%, Japan (Nikkei) gained +3.5%.

### STOCK PRICE PERFORMANCE: SECTORS (LOG SCALES)



Equity price sector results were all upward. Energy gained +3.7%, Consumer Staples gained +8.2%, Financials gained +4.2%, IT gained +2.6%.

**+5.1%**  
Europe

**+4.2%**  
FINANCIALS

**+2.6%** IT

**+3.7%**  
ENERGY

**+8.2%**  
CONSUMER  
STAPLES



# Equities Volatility

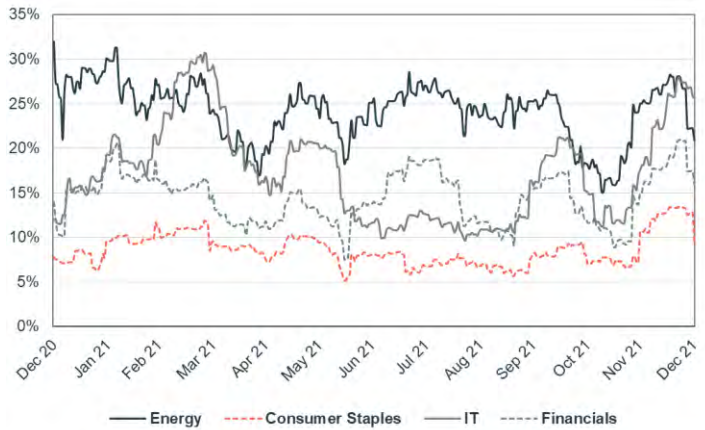
## EQUITY VOLATILITY: REGIONS



**15%** EUROPE

Region's volatility results were mixed. North America rose from 12.6% to 17.4% (high), Asia ex-Japan rose from 10.1% to 14.1% (medium), Europe rose from 13.8% to 15.0% (high), Japan (Nikkei) fell from 17.6% to 18.6% (medium).

## EQUITY VOLATILITY: SECTORS



Volatility results were mixed. Energy went down from 25% to 20.9% (low), Consumer Staples fell from 10.7% to 9.4% (medium), Financials rose from 15% to 15.9% (high), IT rose from 17.5% to 25.6% (high).

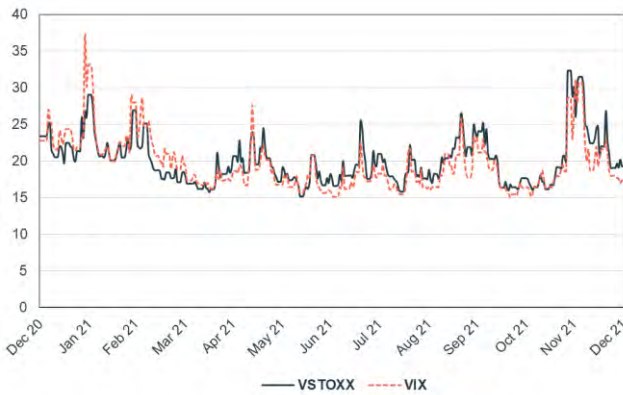
# Equity Implied Volatility

## Market-Implied Near Term Outlook

### Implied Volatility

Implied volatility decreased in both observed markets. VIX fell from 27.2 to 17.2 (low), VSTOXX fell from 30.1 to 19.3 (medium).

#### IMPLIED VOLATILITY



17.2% VIX

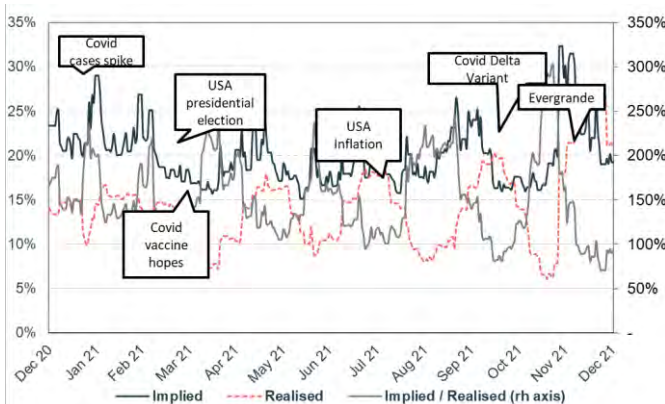
19.3% VSTOXX

### Implied vs Realised Volatility

The realised volatility (of the Euro Stoxx 50 index over 30 days) increased from 18.2% to 20.9% bringing the ratio of implied/realised volatility to move down from 165% to 92%.

This ratio is suggesting that the market is anticipating future volatility to be lower than current.

#### IMPLIED VS. REALISED VOLATILITY



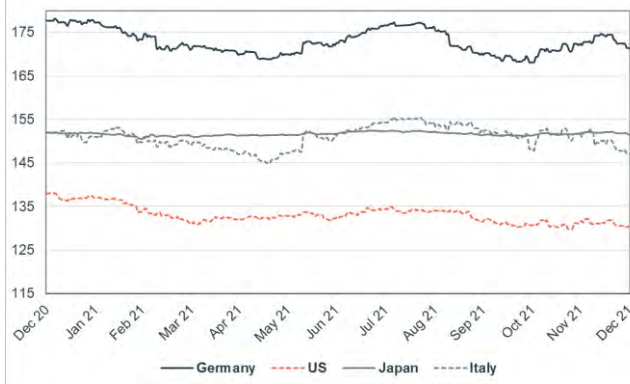
92% IMPLIED/REALISED VOLATILITY

**Note:** Note: the implied/realised volatility ratio gives an indication as to whether the market sees an event in the next 30 days (the implied volatility period) which will increase realised volatility (implied/realised >100%, e.g. within 30 days prior to the Greek elections during the Greek crisis) or a period of relative calm after high realised volatility (implied/realised <100%, e.g. immediately after Draghi's calming "whatever it takes" comments).

# Fixed Income

## 10-Year Government Bond Futures

**PRICES OF 10Y BOND FUTURES**



### Prices

Government bond prices movements were all downwards. Germany lost -0.6%, US lost -0.8%, Japan lost -0.2%, Italy lost -3.0%.

**10 YEAR BOND SPREADS OVER GERMANY, %**



Italian spreads over Germany increased from 1.32% to 1.35%, while the Spanish spreads against Germany decreased from 0.75% to 0.74%.

**VOLATILITY OF 10Y BOND FUTURES**



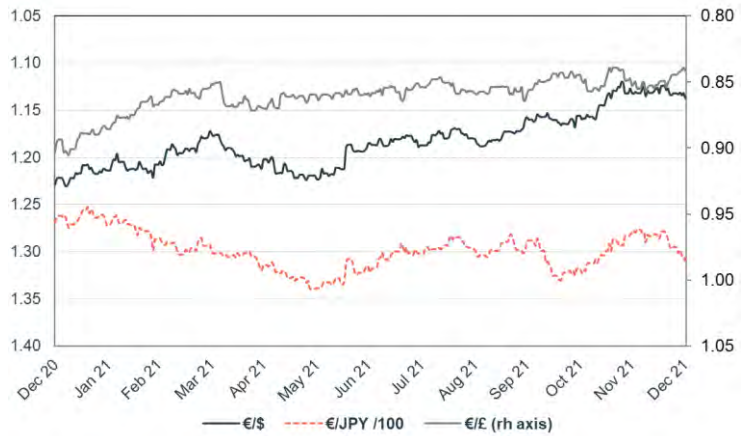
Volatility results were mixed. Germany fell from 5.8% to 4.7% (high), US fell from 5.4% to 4.5% (high), Japan rose from 1.1% to 1.2% (medium), Italy fell from 6.7% to 5.7% (high).

# Foreign Exchange

## Prices

Euro results were mixed. Euro gained 0.5% against the US Dollar, Euro gained 2.3% against the Japanese Yen, Euro lost 0.3% against the Swiss Franc, Euro lost 1.3% against the British Pound.

FX RATES VS. €



## Volatility

FX volatility moves were also mixed. €/£ fell from 6.7% to 6.1% (high), €/Yen fell from 6% to 5.99% (high), €/CHF increased from 3.8% to 3.9% (medium), €/£ fell from 6.9% to 5.6% (medium).

VOLATILITY OF FX RATES VS. €



↘ 6.1% € vs. \$  
↘ 5.6% € vs. £  
↘ 5.99% € vs. ¥

**Note:** The charts show currencies vs. the €. Axes on the first chart are inverted to show conventional currency quotations, but with higher on the chart representing a stronger currency vs. the euro.

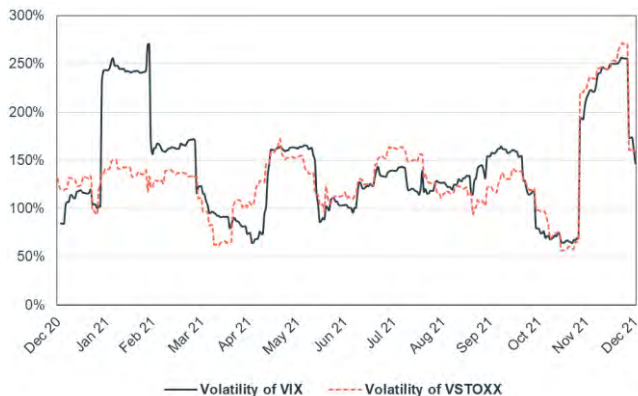
# (Equity) Options

Option volatility is mainly driven by the volatility of volatility and moves in prices of the underlying instruments affecting options' deltas.

## Implied volatility

Volatility of implied volatility decreased in both US and Europe. Volatility of VSTOXX fell from 225% to 159% (high), while the Volatility of VIX fell from 214% to 147.0% (medium).

### VOLATILITY OF VOLATILITY



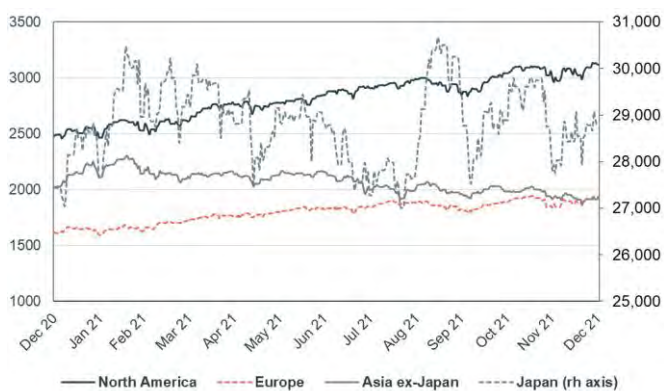
147% US

159% EUROPE

## Major (Regional Equity) price moves

Regions price movements were all upwards. North America gained +3.9%, Asia ex-Japan gained +0.9%, Europe gained +5.1%, Japan (Nikkei) gained +3.5%.

### CHANGE IN PRICES OF EQUITY INDICES, 30 DAYS



**Note on Treatment:** Options show more complex behaviour than the other instruments we look at in this report, so we make some simplifying assumptions. As Calls and Puts are in effect polar opposites and in and out of the money options behave very differently, it is hard to generalise all options' behaviour. However, we look at the two key drivers: volatility of implied volatility and major price movements of the underlying security.

Implied volatility (via an option's Vega) drives option prices, so a big indicator of option price volatility is the "volatility of implied volatility".

But usually the biggest driver of individual option prices is the movement of the underlying (via the option Delta): a move in either direction will cause the option to go more in or out of the money (and a corresponding change in the option's Delta and price volatility). As a proxy for this, we look at the 30-day price swing of equity market indices; options on bonds or FX could of course behave differently. The 30-day period is relatively close to the time to maturity of many options. Calls and Puts will respond in opposite fashions: calls becoming more volatile (relative to the size of the underlying notional) as prices rise.

**Note on Convertibles:** Convertibles are in effect a combination of a bond and a call option, with the bond portion usually making little contribution to the instrument volatility unless the option is significantly out of the money. As such, convertible portfolios' volatilities will tend to behave similarly to call option portfolios, and this commentary can be applied to convertibles as well as options.

# Commodities

## Prices

Commodities price movements were all upward during December. Oil (Brent) gained +10.2%, Gold gained +3.1%, Copper gained +4.3%, Iron Ore gained +20.9%.

+ 10.2% OIL

+ 3.1% GOLD

+ 4.3% COPPER

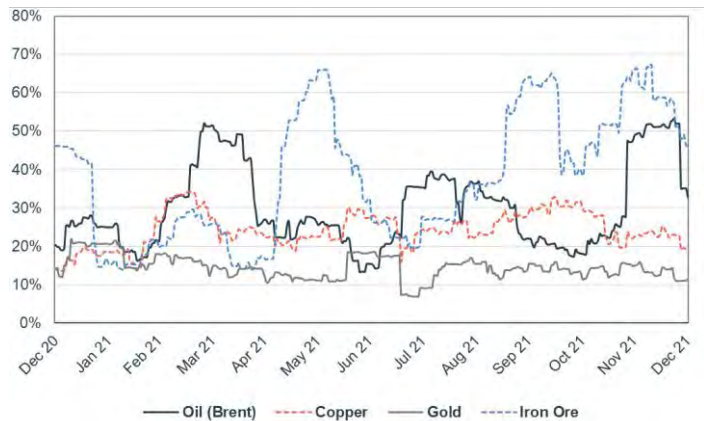
COMMODITIES PRICES, \$



## Volatility

Volatility movements for Commodities were all downwards. Oil (Brent) fell from 49.3% to 32.8% (medium), Gold fell from 15% to 11.2% (low), Copper fell from 22.5% to 19.2% (low), Iron Ore fell from 65.8% to 46.1% (high).

COMMODITIES VOLATILITY



**Note:** all prices refer to near futures rather than spot with the exception of iron ore which is a spot price.

# Real Estate and Alternatives

## (Real Estate Share Prices)

**REAL ESTATE (REIT) PRICES**




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**+ 1.8%** EUROPE

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**+ 8.1%** US

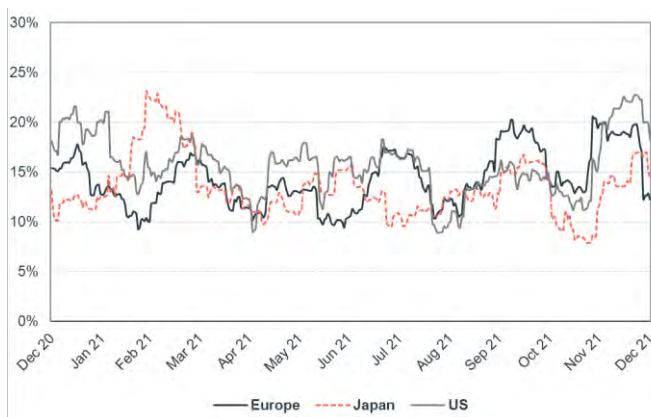
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**+ 2.1%** JAPAN

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Real Estate prices movements were all upwards. US gained +8.1%, Europe gained +1.8%, Japan gained +2.1%.

**REAL ESTATE (REIT) VOLATILITY**



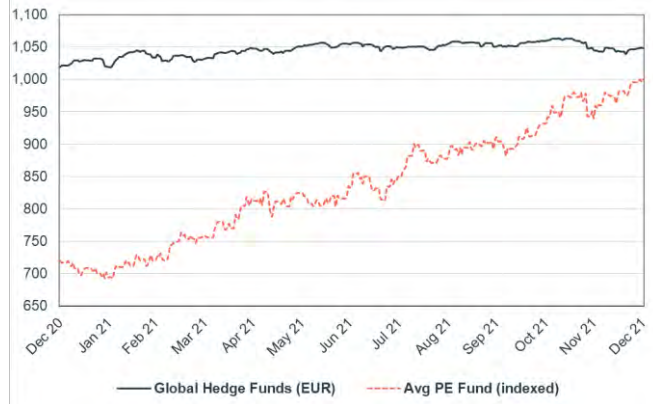
Volatility moves were mixed. US rose from 16.6% to 18.3% (high), Europe fell from 19.8% to 12.3% (low), Japan rose from 11.6% to 14.5% (medium).

*Note: Note that for property we look at indices of the share prices of REITs, and not the underlying property directly, for which little real-time data is available. This is usually consistent with funds which tend to invest in property indirectly, e.g. via REITs or property companies.*

*As REITs are usually focused on commercial property, residential property may also follow a slightly different pattern to that discussed in this article.*

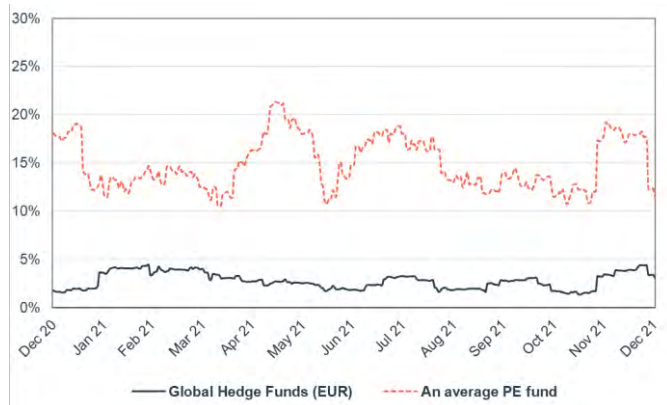
# Alternatives

**ALTERNATIVES PRICES**



the average hedge fund gained +0.3%, an average PE fund gained +4.2%.

**AI VOLATILITY**



Volatility results for Alternative Investments were all downwards. The average hedge fund fell from 3.5% to 3.1% (medium), An average PE fund fell from 18% to 11.5% (low).

↘
3.1%
HFRX  
Volatility

↘
11.5%
AVERAGE  
PE FUND



## Definitions

To avoid repetitions, the term volatility refers to annualised, 30-day average realised volatility in local currency unless otherwise specified. As such, it may be lower than, and lag, shorter-term market volatility in times of high market volatility.

Charts show data up to 31st December 2021, and news and events are included up to that date. The commentary was written on or before January 12th, 2022.

## Disclaimer

The commentary does not constitute, and is not intended to constitute, investment advice.

Any views expressed in this report are based on historical market data and as such cannot be interpreted as being forward-looking, or to constitute forecasts. Past movements are not necessarily indicative of future movements.

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