



**AR
KUS**

RISK BASED
GOVERNANCE

MARKET VOLATILITY RISK NEWSLETTER – November 2020

Double-Dip

Member of the Profidata Group

Executive Summary

- All observed regions market volatilities decreased during the last month. Region volatility spanned a range that goes from 9.9% (Japan-Nikkei-) to 20.5% (US), with Asia excluding Japan changing from medium to low volatility regime (14.4% to 11.0%), and all other observed markets settling in the medium and low regimes.
- Realized volatility (of the Euro Stoxx 50 index over 30 days) decreased from 21.9% to 20.4%.
- All observed equity sector markets decreased in price during the last month. Sectors volatility spanned a range that goes from 12.5% (Consumer Staples) to 27.4% (Energy), with all sectors settling in the low and medium volatility regime.
- Sovereign bond price movements were mixed. Volatility moves were mixed and spanned a range between +1% for Japan and Italy 4.7% (which did not change), and all markets settling in the low regime.
- The EUR closed the month losing ground against all major currencies, within a range that goes from -0.8% against USD, and -1.6% against the Japanese Yen. FX volatility results were mixed and ended ranging between 2.1% (€/CHF) and 6.9% (€/£), with all pairs in the medium and low volatility regimes.
- Options' implied volatility increased in both observed markets, with the VIX changing from 26.4 to 38.02% and the VSTOXX increasing from 26.1 to 35.3, and both observed markets changed from medium to high volatility regime.
- With the exception of Cooper, all commodities' prices were downwards, with the Oil (Brent) losing -8.5%, Gold -1.5%, Copper +6.4%, and Iron Ore -2.5%. Volatility changes were mixed. It spanned a range between 13.5% (Gold) to 42.5% (Oil Brent), with Cooper being the commodity that experienced the biggest increase, moving from 22.3% to 28.4%.
- Real Estate (equity) prices dropped in all observed markets, with US losing -5.1%, Europe -5.0%, and Japan -5.0%. Volatility moves were mixed, ranging from 14.7% (Japan) to 23.1% (USA).
- The average PE Funds gained +0.4%, while the average Hedge Fund dropped -0.2%. Volatility for the average hedge fund decreased from 2.8% to 2.1%, while the average PE fund decreased from 14.9% to 10.5%, with both changing to low volatility regime.

The Arkus Risk Team



Table of contents

1. Summary volatility matrix	p. 4
2. Key News	p. 5
3. Kurtosis & correlation in the equity markets	p. 6-7
4. Equities	p. 8-9
5. Equity Implied Volatility	p. 10
6. Fixed Income	p. 11
7. Foreign Exchange	p. 12
8. (Equity) Options	p. 13
9. Commodities	p. 14
10. Real Estate (Real Estate Share Prices) & Alternatives	p. 15-16

Summary volatility matrix and outlook

Europe is back in lockdown mode as infections surged exponentially while the oldest democracy in the world has struggled to find a new president leaving the country more divided than ever. So more than enough fuel to spur volatilities up recently.

After some slight signs of economic recovery on the back of massive fiscal and monetary stimuli and the first relaxation of restrictive measures, it now looks like a double-dip is becoming more and more likely. Markets in the regions concerned reacted promptly and headed south. Now hopes are set on finding a vaccination. Pfizer/Biogen report promising results from trials shooting markets up again.

Under Christine Lagarde's ECB leadership spreads in Europe decline and money supply soars as she continues to blur the lines in the separation between fiscal and monetary policy now also intending to intervene directly in environmental policy in the EU.

Eventful times towards the end of the year – Enjoy the read of this month's report!

ASSET CLASS	AREA	LATEST VOLATILITY	LATEST Z-SCORE	REGIME
EQUITIES	North America	20.5%	-0.2	medium
	Asia ex-Japan	11.0%	-0.7	low
	Europe	16.6%	-0.3	medium
	Japan (Nikkei)	9.9%	-0.9	low
	Energy	27.4%	-0.3	medium
	Consumer Staples	12.5%	-0.2	medium
	Financials	17.1%	-0.4	low
	IT	25.7%	-0.1	medium
VOLATILITY OF VOLATILITY	Volatility of VIX	107%	-0.4	medium
	Volatility of VSTOXX	105%	-0.5	low
GOVERNMENT BONDS	Germany	2.5%	-1.9	low
	US	2.4%	-1.0	low
	Japan	1.0%	-1.1	low
	Italy	4.7%	-0.6	low
FX VS \$	€/\$	6.5%	0.0	medium
	€/Yen	6.8%	-0.1	medium
	€/CHF	2.1%	-1.6	low
	€/£	6.9%	-0.5	low
COMMODITIES	Oil (Brent)	42.5%	-0.2	medium
	Gold	13.5%	-0.5	low
	Copper	28.4%	1.0	high
	Iron Ore	14.4%	-0.7	low
PROPERTY	US	23.1%	-0.4	medium
	Europe	18.1%	-0.3	medium
	Japan	14.7%	-0.4	low
ALTERNATIVES	HFRX Global HF	2.1%	-0.5	low
	Avg PE Fund	10.5%	-0.7	low
KURTOSIS	ZCF 1% left (vs -2.33 for normal curve)	-2.93	0.0	medium
CORRELATION	Average market correlation with euro equities	30%	-0.1	medium

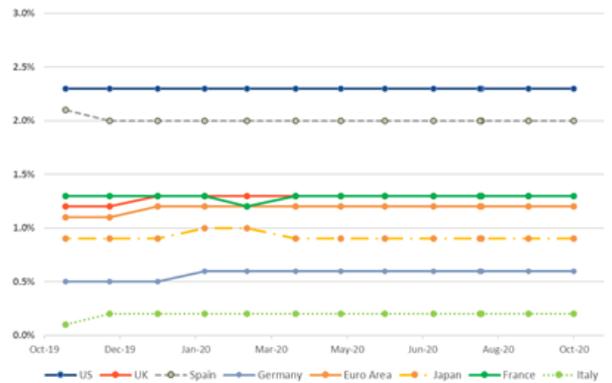
Note: Throughout the text we refer to volatilities as being "low", "medium" or "High". We define this by defining three equal "sized" regimes over the last 12 months. i.e. "High" volatility implies that volatility is in the upper third of its statistical range over the last 12 months. The table shows 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

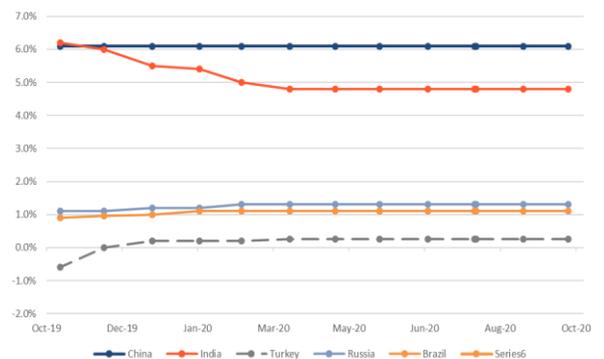
Major Volatility-Driving Events

- ▶ Chinese Fintech Ant's IPO plans suspended by Shanghai Stock Exchange who sees "major issues" with changes in the regulatory environment reported by the firm. Previously founder Jack Ma had received final approval to go public paving the way for the biggest IPO in history estimated to be worth around \$35bn.
- ▶ German based sports apparel company Adidas AG is planning to sell its brand Reebok in the near future. Reebok was acquired by Adidas in 2006 for \$3.8bn but is now expected to fair much less after the failed integration with Adidas AG.
- ▶ Roche Holding AG pays \$350m to form an alliance with Atea Pharmaceuticals Inc. to cooperate in the development of a potential treatment for COVID-19, ensuring distribution rights of Atea's AT-527 outside the US.
- ▶ Oil prices slide to five months low after second round of lockdowns and fears of a double dip recession.
- ▶ China is only reporting relatively small local COVID-19 outbreaks that were quickly contained and Twain has had no new infections since 200 days. In contrast to the rest of the world the virus seems to be under control in those regions, no further lockdowns anticipated so far.
- ▶ Turkish Aegean coast, including the city of Izmir, and Greek Islands hit by massive earthquake (7.0 Richter scale).
- ▶ Resurgence of Islamist terror in Europe as France and Austria got hit by a series of violent attacks with Islamist background.

GDP ESTIMATES FOR 2020, DEVELOPED COUNTRIES



GDP ESTIMATES FOR 2020, DEVELOPING COUNTRIES



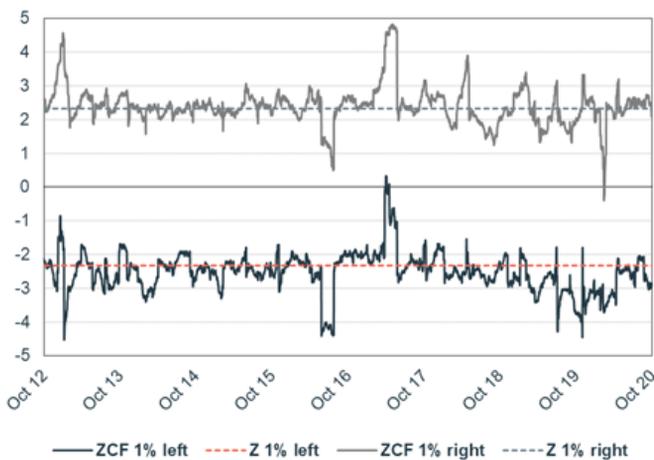
Kurtosis

Correlation in the equity markets

Kurtosis (against normal +/- 2.33)

The distribution of risks in European equity market displays denormalization with the ZCF 1% left at -2.93 and the right ZCF 1% at +2.07 (both as of 30th of October).

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



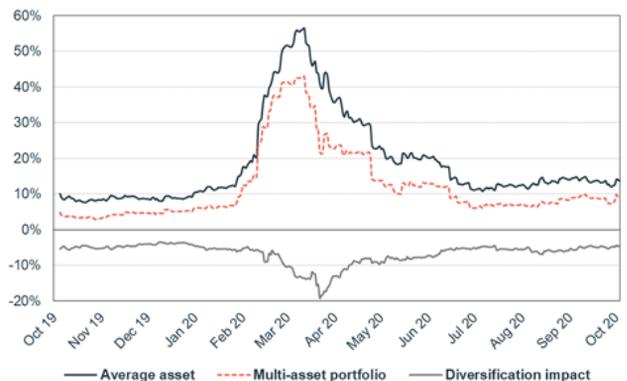
29.9% AVERAGE CORRELATION

Inter-market correlations (with EU equities)



Correlation increased during last month, leading our average correlation indicator to change from 24% to 29.9%.

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 14.5% to 13.7%, while the benefit of multi-asset diversification deteriorated, moving from 5.7% to 4.5%.

In combination, multi-asset portfolio volatility increased from 8.9% to 9.3%.



13.7% AVERAGE VOLATILITIES



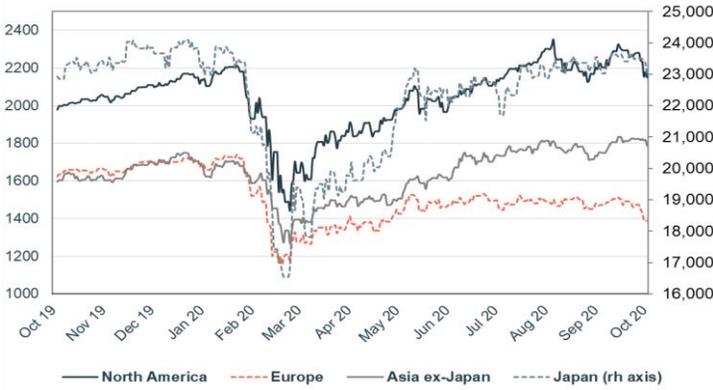
9.3% PORTFOLIO VOLATILITY

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

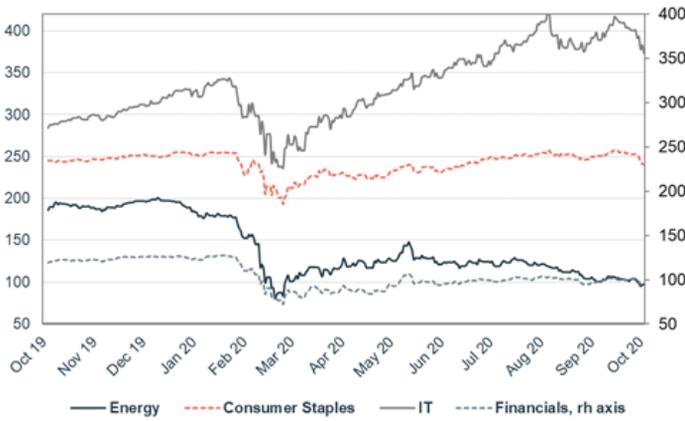
STOCK PRICE PERFORMANCE: REGIONS (LOG SCALES)



All equity regions, with the exception of Asia (Exc. Japan), decreased in price during October. North America lost -3.4%, Asia ex-Japan gained +1.9%, Europe lost -5.7%, and Japan (Nikkei) lost -0.9%.

-5.7%
Europe

STOCK PRICE PERFORMANCE: SECTORS (LOG SCALES)



All equity sectors closed the month continuing losing price momentum. We have that Energy lost -3.0%, Consumer Staples lost -4.4%, Financials lost -1.6%, and IT lost -6.2%

-1.6%
FINANCIALS

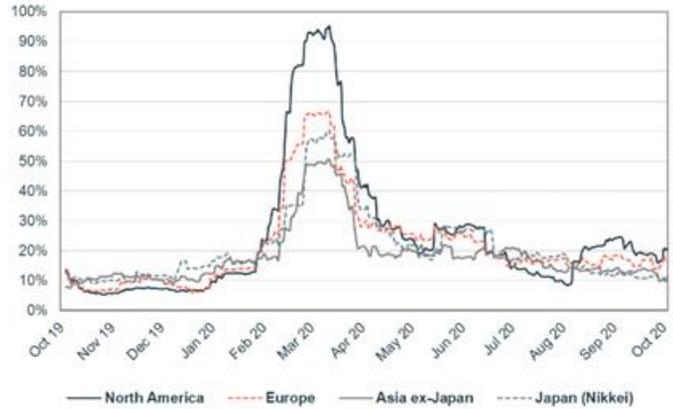
-6.2%
IT

-3.0%
ENERGY

-4.4%
CONSUMER
STAPLES

Equities Volatility

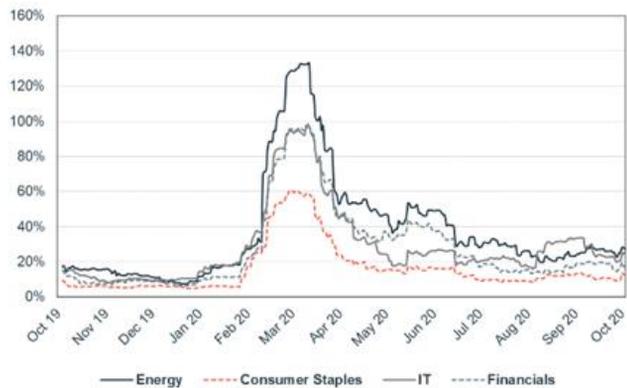
EQUITY VOLATILITY: REGIONS



16.6% EUROPE

Volatility in all observed market decreased. North America fell from 24.4% to 20.5% (medium), Asia ex-Japan fell from 14.4% to 11.0% (medium down to low), Europe fell from 18.5% to 16.6% (medium), and Japan (Nikkei) fell from 12.6% to 9.9% (low).

EQUITY VOLATILITY: SECTORS



Sectors volatility results were mixed.

Energy rose from 24.5% to 27.4% (medium), Consumer Staples fell from 13.4% to 12.5% (medium), Financials fell from 19.0% to 17.1% (medium down to low), and IT fell from 33.5% to 25.7% (medium).

Equity volatility: sectors

Equity Implied Volatility

Market-Implied Near Term Outlook

Implied Volatility

Implied volatility in both, US and Europe, increased. VIX rose from 26.4 to 38.0 (medium up to high), VSTOXX rose from 26.1 to 35.3 (medium up to high)

IMPLIED VOLATILITY



38.0% VIX

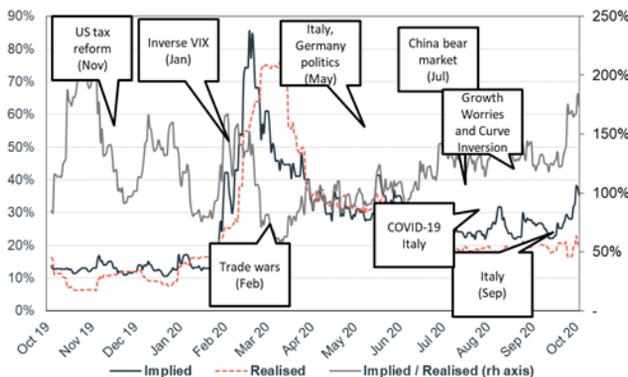
35.3% VSTOXX

Implied vs Realised Volatility

(European equity) implied volatility increased. The realised volatility decreased (of the Euro Stoxx 50 index over 30 days) to 20.4% (medium up to high) bringing the ratio of implied/realised volatility to move up from 119% to 173%.

This ratio is suggesting that the market is currently anticipating future volatility to still be higher than current and is also higher than what it was anticipating in the previous month.

IMPLIED VS. REALISED VOLATILITY



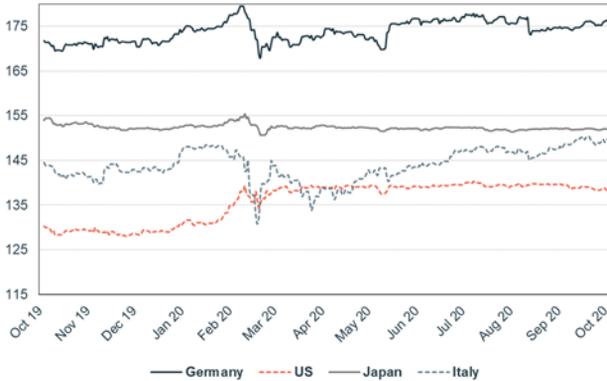
173% IMPLIED/REALISED VOLATILITY

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

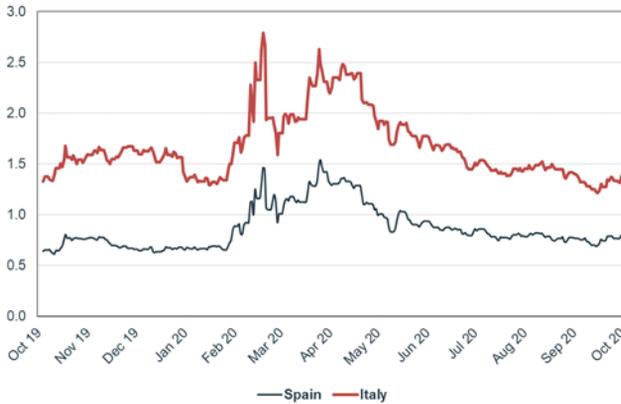
PRICES OF 10Y BOND FUTURES



Prices

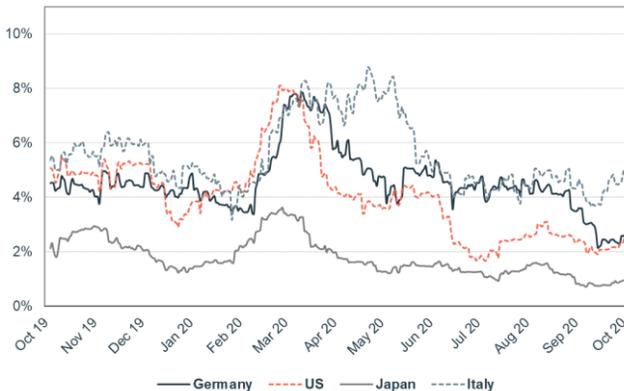
Government bond prices movements were mixed. Germany gained +0.9%, US lost -1.0%, Japan lost -0.1%, and finally we have that Italy gained +1.0%.

10 YEAR BOND SPREADS OVER GERMANY, %



Italian spreads over Germany remained unchanged at 1.39%, while the Spanish spreads against Germany decreased to 0.76%.

VOLATILITY OF 10Y BOND FUTURES

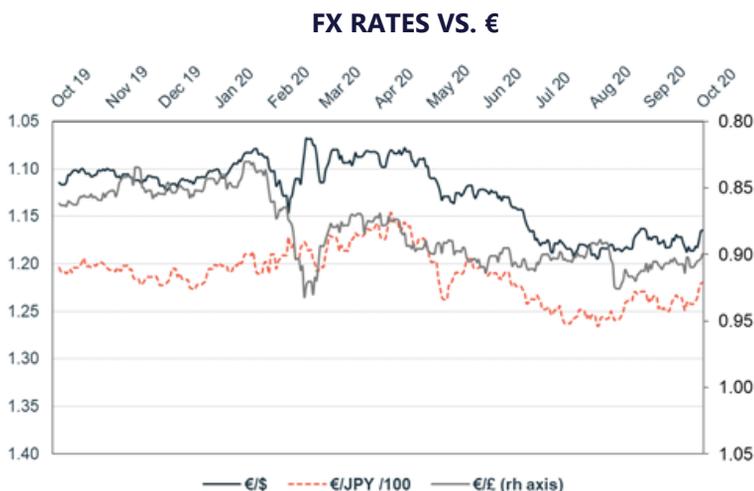


Volatility moves were mixed, and all observed market settled in the low volatility regime. Germany fell from 3.6% to 2.5% (low), US remained at 2.4% (low), Japan rose from 0.8% to 1.0% (low), and Italy did not change with 4.7% (low).

Foreign Exchange

Prices

Euro lost price momentum against all major currencies. We have that the Euro lost 0.8% against the US Dollar, Euro lost 1.6% against the Japanese Yen, Euro lost 1.0% against the Swiss Franc, and finally Euro lost 1.2% against the British Pound.



Volatility

FX volatility moves were mixed. €/USD rose from 5.4% to 6.5% (medium), €/Yen rose from 6.5% to 6.8% (medium), €/CHF fell from 3.9% to 2.1% (medium down to low), €/£ fell from 9.5% to 6.9% (medium down to low).

VOLATILITY OF FX RATES VS. €



↗ 6.5% € vs. \$

↘ 6.9% € vs. £

↗ 6.8% € vs. ¥

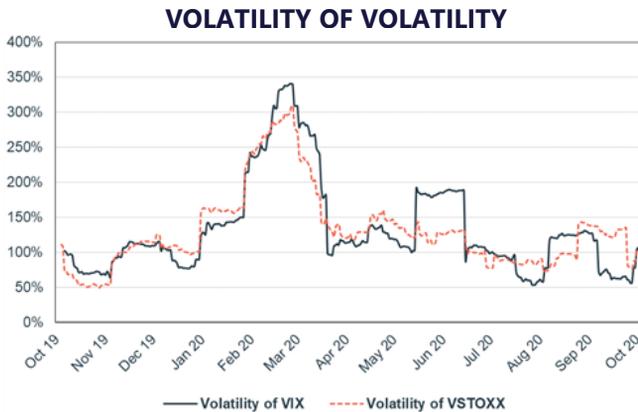
Note: The charts show currencies vs. the €. Axes on the first chart are inverted to show conventional currency quotations, but with higher on the chart representing a stronger currency vs. the euro.

(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 markets. Volatility of VSTOXX fell from 138.8% to 105.1% (medium down to low), while the Volatility of VIX fell from 127.2% to 106.8% (medium).



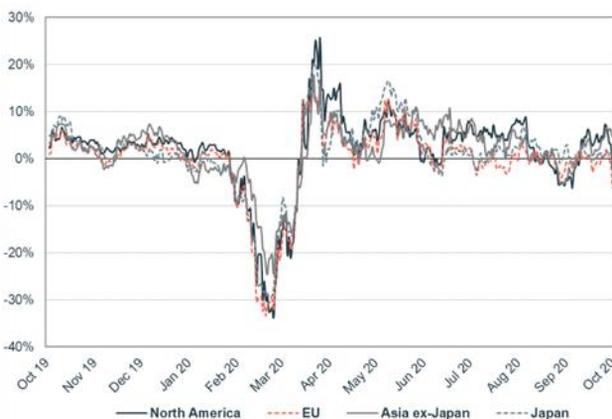
106.8% US

105.1% EUROPE

Major (Regional Equity) price moves

Price movements were mixed, with Europe losing the most, and only Asia (Ex-Japan) increasing in price. We have that North America lost -3.4%, Asia ex-Japan gained +1.9%, Europe lost -5.7%, and Japan (Nikkei) lost -0.9%

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

With the exception of Cooper, commodity prices suffered again another draw back during the last month, with Oil Brent being the most punished. We have that Oil (Brent) lost -8.5%, Gold lost -1.5%, Copper gained +6.4%, Iron Ore lost -2.5%.

-8.5% OIL

-1.5% GOLD

+6.4% COPPER

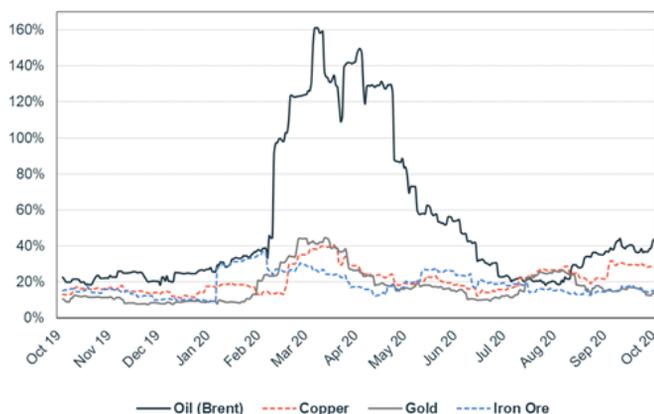
COMMODITIES PRICES, \$



Volatility

Volatility movements were mixed during October. With Oil (Brent) increasing from 36.9% to 42.5% (medium), Gold falling from 15.4% to 13.5% (medium down to low), Copper moving up from 22.3% to 28.4% (medium up to high), and finally Iron Ore with no changes at 14.4% (low).

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



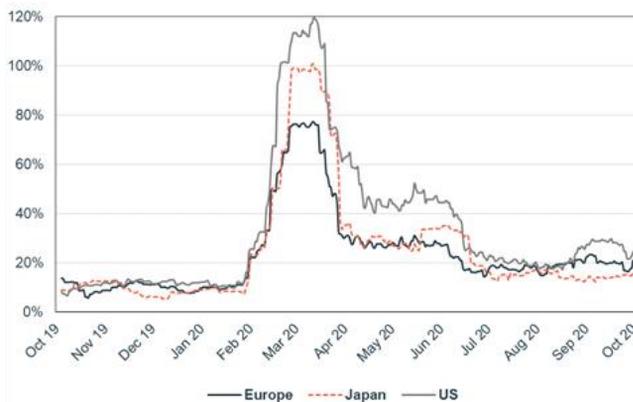
Real estate regional prices movements were all downwards. We have that US lost -5.1%, Europe lost -5.0%, and finally Japan lost -5.0%.

- 5.0% EUROPE

- 5.1% US

- 5.0% JAPAN

REAL ESTATE (REIT) VOLATILITY



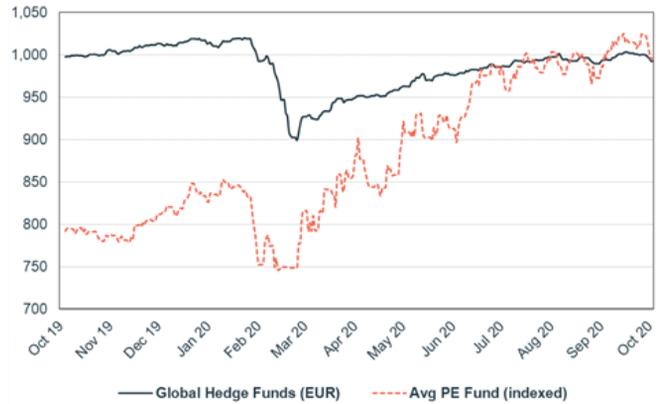
Volatility moves were mixed, and the volatility spanned a range that goes from 14.7% to 23.1%. We have that US fell from 27.5% to 23.1% (medium), Europe fell from 23.2% to 18.1% (medium), and Japan rose from 14.4% to 14.7% (medium down to low).

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.

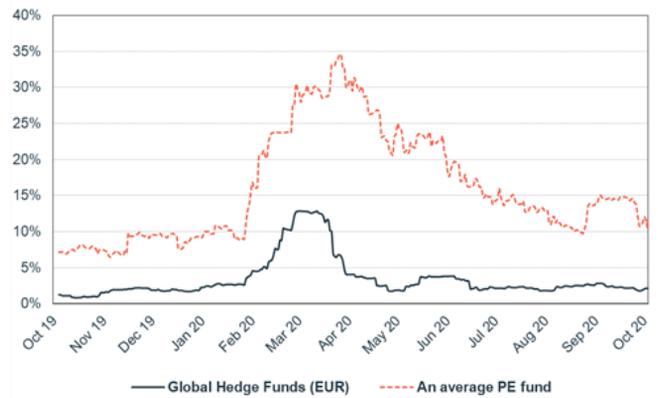
Alternatives

ALTERNATIVES PRICES



The average hedge fund lost -0.2%, and the average PE fund gained +0.4%.

AI VOLATILITY



Volatility movements for Alternative Investments were downward. The results show that the average hedge fund fell from 2.8% to 2.1% (medium down to low), while the average PE fund fell from 14.9% to 10.5% (medium down to low).



2.1% HFRX
Volatility



10.5% 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 30th October 2020, and news and events are included up to that date. The commentary was written on or before November 7th, 2020.

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.

Employees of Arkus FS may hold positions in securities mentioned.

All expressions of opinion reflect the judgment of ARKUS FS at this date and are subject to change. Information has been obtained from sources considered reliable, but we do not guarantee that the report is accurate or complete.

This document is not for US clients or distribution to the US.

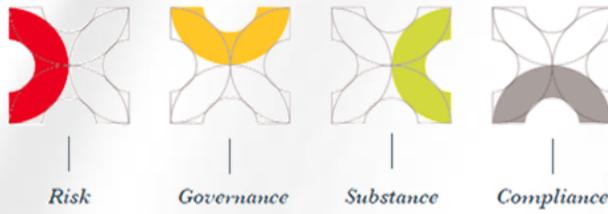
© Arkus - 2020

This document is the property of Arkus FS and should not be copied or distributed to any third party without the prior consent of Arkus FS – please contact us regarding distribution rights.

© Arkus Financial Services - 2020

Arkus is the brand under which IRML S.A. operates and provides services.

This document is the property of IRML/Arkus FS and should not be copied or distributed to any third party without the prior consent of IRML/Arkus FS – please contact us regarding distribution rights.



Societe Anonyme
6B Route de Treves L-2633
Senningerberg
Luxembourg
T +352 42 26 11 111 F +352 42 26 399
info@arkus-fs.com

150 Minories
London
EC3N 1LS
T +44 (0) 207 264 2027
www.arkus-fs.com

