

MASF Insight #6

ARP funds in 2020 Why so much pain ?

March 2021. For professional investors only

2020 performance overview

Making use of public information retrieved from Bloomberg, we have built an Alternative Risk Premia (“ARP”) composite index that supposedly reflects ARP strategies’ average behaviour. The composite performance is calculated as the average performance of all live ARP funds. Fund performances are considered in excess of cash and gross of management fees. As of the end of 2019, our composite universe consisted of 25 ARP funds; 1 was launched in the early days of 2020 and 4 were liquidated in the course of the year.

Return and risk indicators (daily data from 30/12/2019 to 30/12/2020)

| ARP Composite Index | |
|----------------------------|------------|
| Excess return (ann.) | -14.0% |
| Volatility (ann.) | 4.6% |
| Sharpe ratio | -3.0 |
| Skewness / Excess kurtosis | -2.4 / 9.7 |

Source: HSBC Asset Management. Returns expressed in excess of cash. Data from 30/12/2019 to 30/12/2020. Any differences are due to rounding.

In 2020, the ARP composite index posted a negative performance of -14% over cash with a volatility of 4.6%, translating into a Sharpe ratio of -3.

The performance of this composite index is consistent with that of the SG Multi Alternative Risk Premia index, that is based on the performance of the ten largest multi-asset multi-alternative risk premia funds managed by investment managers. In 2020, the SG ARP index posted a negative return of -15% over cash with an average daily volatility of 5.1%.

Unlike the last 4 years, investment bank-run multi-factor risk premia strategies outperformed their asset managers counterparts, on average. Based on the Eureka hedge Multi-Factor Risk Premia index, investment bank-run premia strategies delivered a negative return of -5% over cash in 2020, with a volatility of 9.5%, on average.

The performance figures displayed in the document relate to the past and past performance should not be seen as an indication of future returns.

Source: HSBC Asset Management. The commentary and analysis presented in this document reflect the opinion of HSBC Asset Management on the markets, according to the information available to date. They do not constitute any kind of commitment from HSBC Asset Management.

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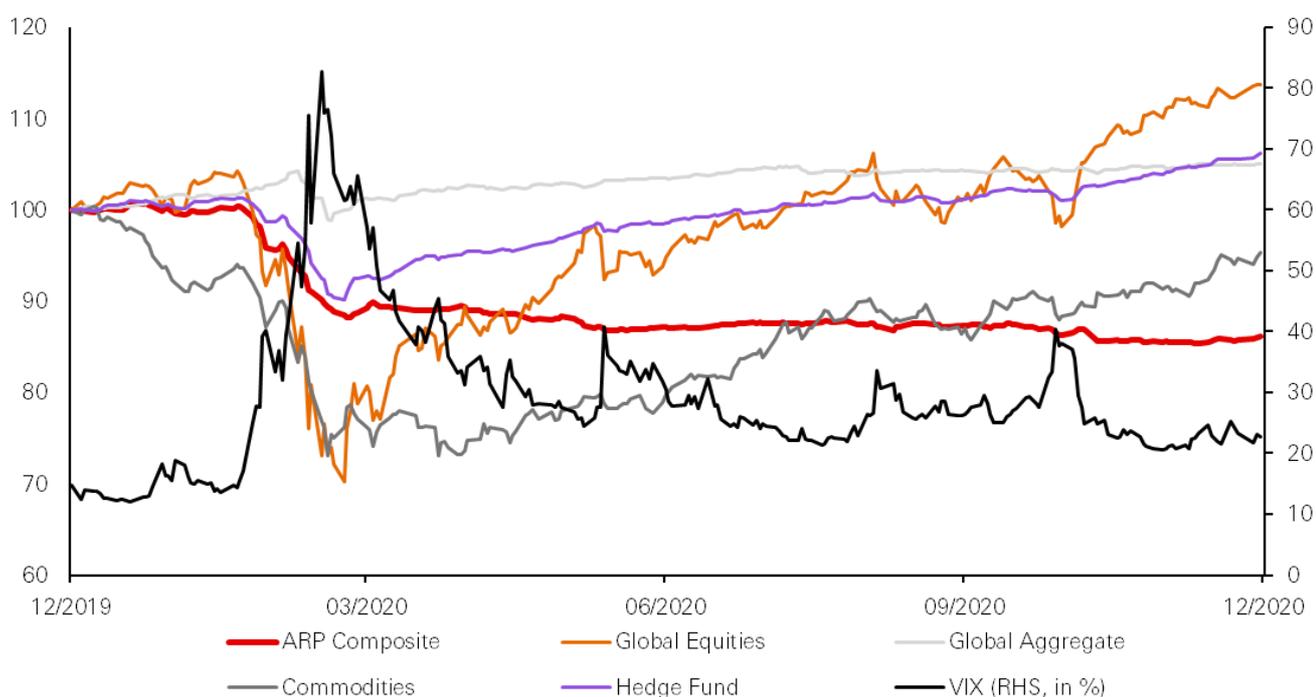
Head of Multi Asset Specialist strategies

2020 performance dynamics

Most of the yearly underperformance of the ARP composite index happened during the “COVID crisis” in Q1. Yet, while traditional risk asset classes and hedge funds delivered large positive returns during the following 3 quarters, ending the year well in positive territory, the ARP composite index continued to underperform throughout 2020.

ARP composite index 2020 performances versus other asset classes

| | Q1 | Q2 | Q3 | Q4 | Full year 2020 |
|-------------------|-------|-------|------|-------|----------------|
| ARP Composite | - 10% | - 3% | + 0% | - 1% | - 14% |
| Global Equities | - 20% | + 19% | + 7% | + 12% | + 14% |
| Global Hedge Fund | - 7% | + 6% | + 3% | + 5% | + 6% |



Source: HSBC Asset Management. Returns expressed in excess of cash. Data from 30/12/2019 to 30/12/2020. Any differences are due to rounding

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How does ARP funds' 2020 performance relate to underlying premia returns?

By definition, ARP funds are expected to take advantage of systematic sources of alternative returns: the so-called alternative risk premia. Over the last decades, academic research has extensively studied such premia in many different asset classes and investment universes, offering theoretical backing and justification of their very existence. First, research findings led to the launch of equity factor-based indices, also known as "smart-beta" indices, that capture premia in an equity long-only framework. Then, hundreds – if not thousands - of premia strategies followed, managed by investment banks and asset managers, that are implemented in a long/short framework across various asset classes.

Unlike more traditional investment strategies or "macro" risk premia, most of alternative premia don't have any indisputable benchmark. Indeed, many different choices can be made when designing an investment strategy that aims to "capture" a given premium: investment universe, metric(s), how metrics translate into portfolio weights, rebalancing strategy, etc. Such choices may follow academic papers' definitions and specifications or, conversely, aim to add "alpha" compared to academic or well-admitted definitions¹. In this paper, we don't intend to evaluate ARP funds' performance in 2020 in light of a "theoretical" approach, supposedly "purer" from an academic standpoint. We rather aim to identify the main performance drivers of ARP funds in 2020, understand the performance patterns they exhibited and highlight any specific pattern relative to previous years, from an investor/practitioner point of view. To do so, in practical terms, we are considering the returns delivered by ARP solutions in light of the returns delivered by investment-bank run premia strategies.

Based on performance data of over 1,500 premia strategies, sourced from more than 15 investment banks, PremiaLab² constructs 8 proprietary Pure Factors (carry, low volatility, momentum, quality, size, trend, value and volatility) in 5 asset classes (equities, bonds, FX, commodities and credit). Thanks to the large number of strategies considered and the filtering and clustering procedures they derive from, PremiaLab Pure Factors can be seen as fair benchmarks of premia strategies for "practitioners". In other words, PremiaLab Pure Factors' returns can be seen as a realistic and unbiased estimate of alternative premia "theoretical" returns. All PremiaLab Pure Factors used in this note are Global factors i.e. implemented in a global investment universe.

PremiaLab Pure Factors performances, 30/12/19-30/12/20, scaled for a 10% volatility³

| | Equities | Bonds | FX | Commodities | Credit |
|------------|----------|-------|------|-------------|--------|
| Carry | -12% | -11% | -11% | 23% | -7% |
| Low Vol | -31% | - | - | - | - |
| Momentum | 11% | - | - | - | - |
| Quality | 0% | - | - | - | - |
| Size | -13% | - | - | - | - |
| Trend | -19% | 13% | 5% | 14% | -23% |
| Value | -38% | -6% | 13% | -5% | - |
| Volatility | 1% | 8% | -7% | -5% | -17% |



PremiaLab Pure Factors can be seen as fair benchmarks of premia strategies for "practitioners"

Sources: PremiaLab, HSBC Asset Management. Data from 30/12/2019 to 30/12/2020. Any differences are due to rounding

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1. For more details, please refer to Bertrand and Guillemet (2018) "Good practices in the evaluation of Alternative Risk Premia solutions"

2. www.premialab.com 3. PremiaLab Pure Factors' returns are scaled for a volatility of 10% based on their 5-year realized volatility

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Out of the 23 PremiaLab Pure Factors (hereafter pure factors), 9 posted positive returns in 2020 while 14 underperformed. The 40 to 60 ratio of positive versus negative performers shows that the large negative performance posted by ARP funds in 2020, on average, can hardly be justified by an overwhelmingly high number of underperforming premia.

In 2020, the outperforming pure factors posted a positive return of +10% while the underperforming ones underperformed by -15%, on average. Looking for outliers, Equity Low Vol (-31%) and Value (-38%) pure factors experienced 3 to 4-standard deviation events. Besides, all 3 credit pure factors posted negative returns with Trend and Volatility experiencing 2-standard deviation events. This illustrates the skewness risk structurally borne by some premia i.e. their tendency to suffer during equity “bad times”. While such skewness risk pays off in the long-run – the very existence of some premia is largely justified by such skewness risk anyway -, it should be considered when designing and structuring a multi-premia strategy.

If we focus on cross-asset premia i.e. premia that can be implemented hence diversified across several asset classes, pure-factors cross-asset average performances all are in negative territory. A naïve approach that equally allocates risk across carry, trend, value and volatility cross-asset premia would have delivered in 2020 a negative return of -10% with a volatility close to 5%. This is somewhat better than the composite index risk-adjusted return. Excluding Volatility premia – given their structurally higher correlation to equity markets -, the naïve approach would have delivered a similar return of -10%.

PremiaLab Pure Factors cross-asset average performances, 30/12/19-30/12/20, scaled for a 10% volatility⁴

| | Carry | Trend | Value | Volatility | 10%-vol scaled average |
|---------------------------------|-------|-------|-------|------------|------------------------|
| Cross-Asset Average pure factor | -8% | -4% | -18% | -9% | -10% |



The ARP funds’ underperformance in 2020, can’t be simply justified by a very high number of underperforming premia

We can also consider premia in the asset class dimension. Pure factors cross-premia average performances are calculated as the average performance of all 10%-volatility scaled pure factors within a given asset class (then scaled for a 10%-volatility assuming individual pure factors are independent). Cross-premia average performances are pretty diverse: significantly negative for equities and credit, flat to positive for bonds, FX and commodities.

A naïve approach that equally allocates risk across equity, bond, FX, commodity and credit cross-premia would have delivered in 2020 a negative return of -10% with a volatility close to 4.5%. Again, this is somewhat better than the composite index risk-adjusted return.

Excluding Credit premia – given their structurally higher correlation to equity markets and poorer liquidity -, the naïve approach would have delivered a substantially less negative return of -5%.

PremiaLab Pure Factors cross-premia average performances, 30/12/19-30/12/20, scaled for a 10% volatility⁴

| | Equities | Bonds | FX | Commodities | Credit | 10%-vol scaled average |
|----------------------------------|----------|-------|----|-------------|--------|------------------------|
| Cross-Premia Average pure factor | -36% | 2% | 0% | 13% | -26% | -10% |

Sources: PremiaLab, HSBC Asset Management. Data from 30/12/2019 to 30/12/2020. Any differences are due to rounding

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4. Pure factor cross-asset average performance is calculated as the average performance of all 10%-vol scaled individual pure factors associated to the considered premium and then scaled for a volatility of 10% assuming 0 correlation between individual pure factors

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What are the main performance drivers of the ARP composite index in 2020?

We first calculate the sensitivities of the ARP composite index to usual macro factors such as equity and duration. We also consider the Fama-French size factor as a proxy of the liquidity factor. Based on simple regressions run on the 52 weekly returns of 2020, the ARP composite index exhibits positive sensitivities to equity (+0.15) - statistically significant at the 1% level - and to Fama-French size factor (+0.12) – significant at the 5% level - and no significant duration beta.

Results of univariate regressions of the composite index on equity, duration and Fama-French size factor

| | Beta | T-stat | Adj.R2 |
|----------|------|--------|--------|
| Equity | 0.15 | 5.7 ** | 37% |
| Duration | 0.21 | 1.0 | 2% |
| FF size | 0.12 | 2.2 * | 9% |

Weekly returns from 30/12/2019 to 30/12/2020*: 5%-significant. **: 1%-significant.

We now run simple regressions of the composite index on each of PremiaLab Global Pure Factors – making use of the 52 weekly returns of 2020. Focusing on the pure factors whose beta to the composite index is positive and statistically significant at the 1% level, we can draw a few observations:

- The composite index is highly related to Volatility pure factors - regardless of the asset class considered. Within Volatility factors, Credit Volatility has the largest « explanatory power », explaining about two thirds of the yearly variance of the composite index returns.
- Equity Low-Vol and Equity Trend pure factors also have large explanatory powers, close to 50%.

A combination of Credit Volatility, Equity Low Vol and Equity Trend pure factors explains 88% of the variance of the composite index returns in 2020. Replacing Credit Volatility with Equity Volatility lowers the explanatory power down to 79%.

T-stat and adjusted R-square of univariate regressions of the composite index on PremiaLab Pure Factors

| | 2020 | | 2020 w/o COVID crisis | | 2016-2019 | |
|-------------------------|---------|--------|-----------------------|--------|-----------|--------|
| | T-stat | Adj.R2 | T-stat | Adj.R2 | T-stat | Adj.R2 |
| Equity Carry | -3.7 ** | 18% | -4.7 ** | 30% | 0.9 | -1% |
| Equity Low Vol | 7.3 ** | 50% | 4.5 ** | 27% | 5.4 ** | 12% |
| Equity Momentum | 3.4 ** | 15% | 4.2 ** | 25% | 3.8 ** | 6% |
| Equity Quality | 1.3 | -1% | 4.8 ** | 30% | 4.9 ** | 9% |
| Equity Size | 2.6 * | 9% | -0.6 | -4% | 0.8 | -1% |
| Equity Trend | 6.9 ** | 47% | 3.9 ** | 22% | 8.5 ** | 25% |
| Equity Value | 0.5 | -4% | -1.5 | 0% | -0.9 | -1% |
| Equity Volatility | 7.1 ** | 48% | 4.5 ** | 28% | 7.4 ** | 20% |
| Fixed Income Carry | 5.8 ** | 37% | 1 | -2% | 5.5 ** | 12% |
| Fixed Income Trend | 0.4 | -4% | 1.3 | -1% | 5 ** | 10% |
| Fixed Income Value | -3.3 ** | 14% | -0.1 | -4% | 1.3 | 0% |
| Fixed Income Volatility | 6.1 ** | 40% | 4.5 ** | 28% | 4.6 ** | 9% |
| FX Carry | 4.6 ** | 27% | -0.8 | -3% | 4.9 ** | 10% |
| FX Trend | -1.2 | -1% | 3.7 ** | 20% | 4.9 ** | 10% |
| FX Value | 1.6 | 1% | -1.2 | -2% | 0.2 | -1% |
| FX Volatility | 7.4 ** | 50% | 2.5 * | 8% | 3.3 ** | 4% |
| Commodity Carry | -1.6 | 1% | 0.5 | -4% | 1.7 | 0% |
| Commodity Trend | -2.8 ** | 10% | 3 ** | 13% | 6.8 ** | 18% |
| Commodity Value | 3.9 ** | 20% | 0 | -4% | 2.8 ** | 3% |
| Commodity Volatility | 5.1 ** | 32% | 0.2 | -4% | 2.2 * | 1% |
| Credit Carry | 3.1 ** | 13% | -0.7 | -3% | 4.1 ** | 6% |
| Credit Trend | 2.7 * | 9% | 2.3 * | 7% | 5.9 ** | 14% |
| Credit Volatility | 10.2 ** | 66% | 2.8 ** | 11% | 3.1 ** | 3% |

Regressions run on 52 weekly returns from 30/12/19 to 30/12/20 and on 48 weekly returns excluding the 21/02 to 20/03 period.

*: 5%-significant. **: 1%-significant.

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In 2020, the composite index was extremely concentrated in a limited number of performance drivers

Given the magnitude of March 2020 market movements, usual statistical procedures will mainly aim to best « fit » the COVID-crisis data points. Hence, we are running similar regressions excluding the 4 weekly returns from Feb 21st to March 20th.

The statistically significant positive betas to equity and Fama-French size factors exhibited by the ARP composite index in 2020 turn statistically non-significant when excluding the 4 COVID-crisis data points. While the change in realized equity beta might be related to « natural » reversals in directional positioning of performance drivers such as trend-following strategies, these changes illustrate the massive skewness and liquidity events that happened in February/March of 2020.

Results of univariate regressions of the composite index on equity, duration and Fama-French size factor

| | Beta | T-stat | Adj.R2 |
|----------|-------|--------|--------|
| Equity | 0.01 | 0.3 | -4% |
| Duration | 0.10 | 0.7 | -3% |
| FF size | -0.04 | -1.3 | -1% |



The ARP composite index returns can be largely explained by exposures to Volatility factor, Equity Low Volatility and Equity Trend

2020 weekly returns excluding the 21/02 to 20/03 period. *: 5%-significant. **: 1%-significant.

As expected, since the total variance of the composite index returns is better diversified throughout the year, pure factors' total explanatory power is lowered when the COVID crisis is excluded.

Compared to the full year 2020 results:

- Equity, Bond and Credit Volatility pure factors still are statistically significant explanatory factors of the composite index, Credit now having the lowest explanatory power of the 3. FX and Commodity Volatility factors are no more statistically significant.
- Within Equity pure factors, Quality now has the highest explanatory power, explaining 30% of the variance of the composite returns. Quality being highly correlated to Low-Volatility and less diversifying versus other Equity factors, it is not retained in multi-factor regressions.
- A combination of Equity Volatility, Low Vol and Trend pure factors explains 67% of the variance of the composite index returns in 2020 ex-COVID crisis. Credit Volatility is no more significant when combined with Equity Low-Vol and Trend factors.

Considering regressions outcomes with and without the COVID crisis, we can observe that the composite index returns can be largely explained by exposures to 3 factors: one Volatility factor (equity, bond or credit), Equity Low Volatility and Equity Trend. It is worth highlighting that neither Value nor Carry meaningfully explain the composite index returns in 2020, which may raise the question of the composite index actual diversification in terms of factor exposures. Besides, the explanatory power of non-equity factors seems to be quite limited, which may raise the question of the composite index actual diversification in terms of asset classes.

On a separate note, the fact that Equity Value does not stand out as one of the key drivers of ARP funds' performance in 2020 does not sound particularly intuitive to us. Indeed, Equity Value certainly is one of the most widespread premia in the industry and it happens to be the worst performer of all PremiaLab Pure factors in 2020 (-38% for a volatility of 10%). While Equity Value does not seem to statistically explain the variance of the returns of our ARP composite index in 2020, still, it most likely acted as a drag on ARP funds' performances.

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Was 2020 significantly different from the previous years?

Are the pure factors that explain the composite index performance in 2020 the same ones as over the previous 4 years?

We are running similar regression analysis over 4 years of weekly returns spanning from January 2016 to the end of 2019.

Over the 2016-2019 period, the ARP composite index exhibits positive betas to equity (+0.12) and duration (+0.27) factors – both statistically significant at the 1% level - that are similar to those realized in 2020 (+0.15 and +0.21, respectively). No significant sensitivity to the Fama-French size factor (-0.02) is exhibited over 2016-2019, similar to 2020 when excluding the COVID crisis. This illustrates again the specificity of the liquidity stress of February/March 2020.

Results of univariate regressions of the composite index on equity, duration and Fama-French size factor

| | Beta | T-stat | Adj.R2 |
|----------|-------|--------|--------|
| Equity | 0.12 | 6.6 ** | 17% |
| Duration | 0.27 | 3.7** | 5% |
| FF size | -0.02 | -0.6 | -1% |



Although 2020 clearly bears specificities, it does not look entirely different from the previous 4 years

Weekly returns from 01/01/2016 to 30/12/2019. *: 5%-significant. **: 1%-significant

Regarding sensitivities to PremiaLab pure factors, a combination of Equity Volatility, Equity Low Vol and Equity Trend pure factors explains 44% of the total variance of the composite index returns over the 2016-2019 period. While the explanatory power of these 3 factors over this period is clearly lower than in 2020, each of the 3 factors still is statistically significant at the 1% level and explains more than 10% of the total variance of the composite index returns. Adding Bond and FX Carry factors as well as Commodity Trend and Value to the 3 Equity factors (adding up to 7 explanatory factors) increases the explanatory power up to 67%. This shows that the composite index was better diversified during 2016-2019 than in 2020, both in terms of factor and asset classes. It is worth highlighting that among the Value factors, only the Commodity one is statistically significant.

T-stat and adjusted R-square of the regressions of the composite index on PremiaLab Pure Factors

| | T-stat | Adj.R2 |
|-------------------------|--------|--------|
| Equity Carry | 0.9 | -1% |
| Equity Low Vol | 5.4 ** | 12% |
| Equity Momentum | 3.8 ** | 6% |
| Equity Quality | 4.9 ** | 9% |
| Equity Size | 0.8 | -1% |
| Equity Trend | 8.5 ** | 25% |
| Equity Value | -0.9 | -1% |
| Equity Volatility | 7.4 ** | 20% |
| Fixed Income Carry | 5.5 ** | 12% |
| Fixed Income Trend | 5 ** | 10% |
| Fixed Income Value | 1.3 | 0% |
| Fixed Income Volatility | 4.6 ** | 9% |
| FX Carry | 4.9 ** | 10% |
| FX Trend | 4.9 ** | 10% |
| FX Value | 0.2 | -1% |
| FX Volatility | 3.3 ** | 4% |
| Commodity Carry | 1.7 | 0% |
| Commodity Trend | 6.8 ** | 18% |
| Commodity Value | 2.8 ** | 3% |
| Commodity Volatility | 2.2 * | 1% |
| Credit Carry | 4.1 ** | 6% |
| Credit Trend | 5.9 ** | 14% |
| Credit Volatility | 3.1 ** | 3% |

Results of multivariate regressions of the composite index on selected PremiaLab Pure Factors

| | Beta | T-stat | Adj.R2 |
|-------------------|------|--------|--------|
| Equity Low Vol | 0.33 | 6.8 ** | 12% |
| Equity Trend | 0.26 | 6.1 ** | 18% |
| Equity Volatility | 0.22 | 5.1 ** | 13% |
| Total | | | 44% |

| | Beta | T-stat | Adj.R2 |
|--------------------|------|--------|--------|
| Equity Low Vol | 0.24 | 5.6 ** | 9% |
| Equity Trend | 0.22 | 6.2 ** | 15% |
| Equity Volatility | 0.13 | 3.9 ** | 8% |
| Fixed Income Carry | 0.28 | 5.1 ** | 8% |
| FX Carry | 0.25 | 6.7 ** | 9% |
| Commodity Trend | 0.31 | 6.3 ** | 12% |
| Commodity Value | 0.27 | 6.0 ** | 5% |
| Total | | | 67% |

Source: HSBC Asset Management. Weekly returns from 01/01/2016 to 30/12/2019. *: 5%-significant. **: 1%-significant. Any differences are due to rounding.

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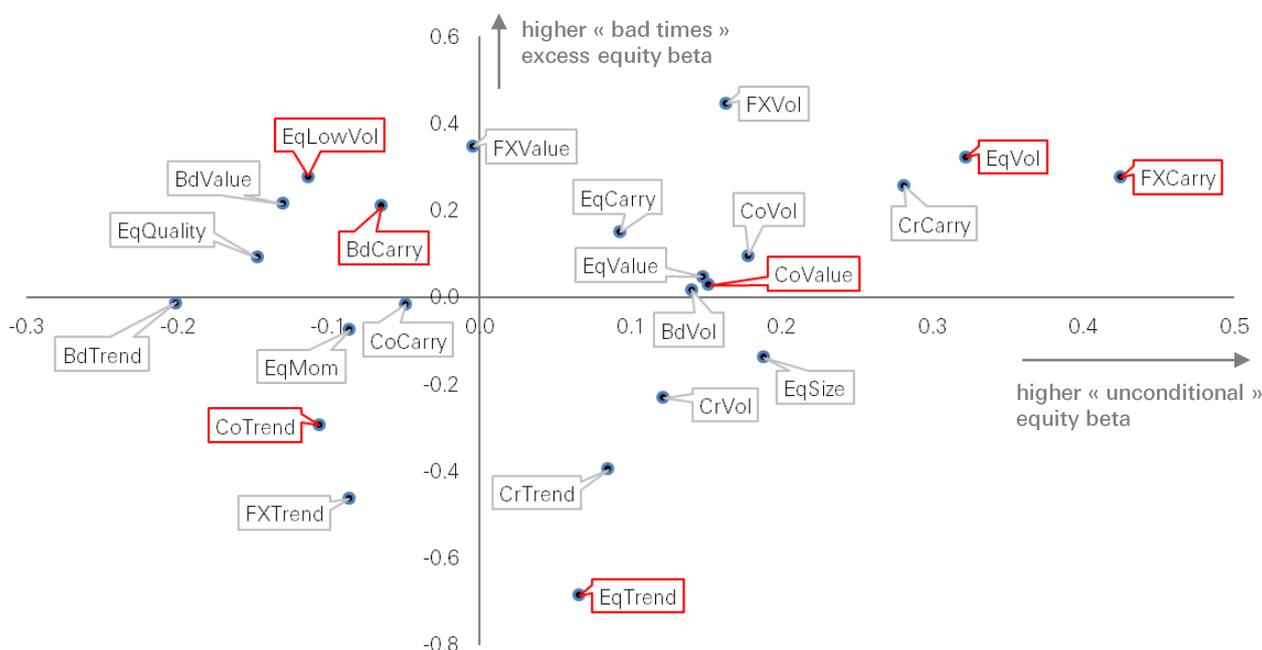
Was 2020 significantly different from the previous years?

Did the pure factors that explain the composite index performance in 2020 behave in line with their long-term average performance patterns?

PremiaLab Pure Factors historical performances go back to August 2007. Hence, we can evaluate their 2020 returns in light of their long-term average performance patterns.

We first consider pure factors average sensitivities to equity markets (i.e. “unconditional” betas) as well as their “bad times” equity betas (betas conditional on equity markets posting large negative returns, the threshold being set as the 5%-percentile of equity returns’ historical distribution). “Bad times” excess equity betas are then simply calculated as the difference between “bad times” and “unconditional” betas. Doing so, we can visualize the pure factors that are structurally positively (resp. negatively) correlated to equity markets and/or that tend to exhibit higher (resp. lower) correlations to equity markets during equity “bad times”.

PremiaLab Pure Factors “bad times” excess equity betas (Y-axis) versus “unconditional” equity betas (X-axis).



All betas are calculated to the MSCI World currency hedged index on weekly returns from August 2007 to the end of 2019. “Bad times” excess equity beta is defined as “bad times” equity beta minus “unconditional” equity beta. “Bad times” (resp. “unconditional”) equity betas are calculated on the 5% lowest (resp. on all) equity weekly returns. PremiaLab Pure Factors are scaled for a 10% volatility.

Focusing on the 7 pure factors (red-boxed in the graph) identified as drivers of the performance of the composite index over the 2016-2019 period:

- ◆ 4 are in the right side of the graph i.e. show positive average correlations to equity markets while 3 are in the left side, with a negative average equity beta. Equity Volatility and FX Carry show “unconditional” equity betas of 0.3 and 0.4, respectively. The average “unconditional” beta of the 7 considered pure factors is +0.10.
- ◆ 4 are in the upper side of the graph i.e. show higher correlations to equity markets during equity “bad times”, 1 is rather neutral and 2 are in the lower side of the graph i.e. show lower correlations to equity markets during equity turmoil.
 - Equity Volatility, Equity Low Vol and FX Carry show similar “bad times” excess equity betas of 0.3. Conversely, Equity Trend shows a large negative “bad times” excess equity beta of -0.7. With an “unconditional” equity beta of +0.1, Equity Trend exhibits strong defensive properties during equity turmoil, on average.
 - Although they exhibit negative “unconditional” equity betas, Bond Carry and Equity Low Vol equity betas turn positive during equity “bad times”. The average “bad times” excess equity beta of the 7 pure factors is +0.02 (+0.14 without Equity Trend).

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- ◆ 2, namely Equity Volatility and FX Carry, are in the top right side of the top right quadrant of the graph i.e. in the “toxic” area, showing significant positive “unconditional” betas and “bad times” excess equity betas.
- ◆ 1, namely Commodity Trend, is in the bottom left quadrant of the graph i.e. in the “defensive” area, showing both negative “unconditional” and “bad times” excess equity beta.

We are now considering the 2020 performance pattern of the 7 “leading” pure factors in light of their previously described historical sensitivities to equity markets, both “unconditional” and during equity “bad times”.

Starting with general observations, out of the 7 “leading” pure factors, all but Commodity Trend experienced large drawdowns during the COVID crisis of February-March 2020. Besides, the 6 negatively performing pure factors experienced drawdowns of similar magnitude. Both observations don’t seem fully consistent with the diversity of the 7 pure factors’ historical equity betas previously described.

PremiaLab Pure Factors returns, equity beta implied returns and specific returns from 21/02/2020 to 20/03/2020

| | Covid-crisis return | 2007-2019 "bad times" equity betas | Beta implied return | "Specific" return |
|--------------------|---------------------|------------------------------------|---------------------|-------------------|
| Equity Volatility | -12% | 0.6 | -13% | 1% |
| Equity Low Vol | -16% | 0.2 | -3% | -13% |
| Equity Trend | -13% | -0.6 | 12% | -25% |
| FX Carry | -13% | 0.7 | -14% | 0% |
| Fixed Income Carry | -11% | 0.1 | -3% | -8% |
| Commodity Trend | 14% | -0.4 | 8% | 6% |
| Commodity Value | -12% | 0.2 | -4% | -8% |
| Global Equities | -20% | | | |



Only Equity Trend significantly diverges from its “expected” performance path

Beta implied returns are calculated as equity markets returns times “bad times” equity betas
 “Specific” returns are defined as the difference between actual returns and beta implied returns
 PremiaLab Pure Factors are scaled for a volatility of 10%

Commodity Trend resilience during the COVID crisis is consistent with its “defensive” pattern exhibited over the 2007-2019 period, with both negative “unconditional” beta and “bad times” excess equity beta.

As expected, FX Carry and Equity Volatility suffered during the equity turmoil. Interestingly, the magnitude of the drawdown they both experienced is very consistent with their “bad times” equity beta (“unconditional” equity beta + “bad times” excess equity beta) of +0.6 for Equity Volatility and +0.7 for FX Carry. Over the period considered, global equity markets delivered a return over cash of -19.7%, which gives an “expected” performance of -13% for Equity Volatility (vs -12% realized) and -14% for FX Carry (vs -13% realized).

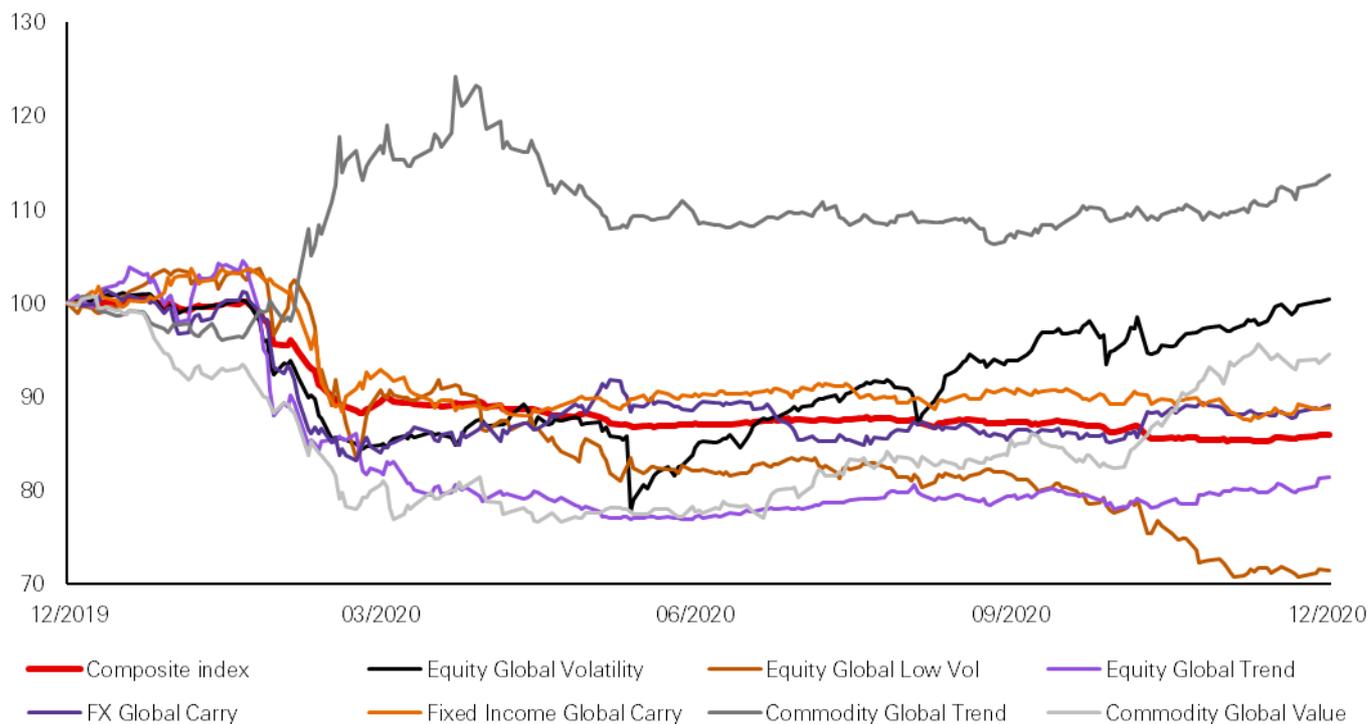
The underperformance during the COVID crisis of Commodity Value, Bond Carry and Equity Low Vol is consistent with their positive “unconditional” equity betas (Commodity Value) or their positive “bad times” excess equity betas (Bond Carry and Equity Low Vol). Yet, the magnitude of the drawdowns they experienced is significantly larger than that implied by their “bad times” equity betas.

Based on its equity betas calculated over the 2007-2019 period, Equity Trend was expected to be the most defensive factor of all. Its “bad times” equity beta of -0.6 translates into an “expected” performance over the COVID crisis of +12% against a realized performance of -13%. This illustrates again the fact that, while Equity Trend can exhibit compelling defensive properties during equity markets “slow crashes” such as the 2008 Global Financial Crisis, it can be caught out during “fast crashes” such as the February 2018 “volatility crash” or the COVID crisis.

The performance figures displayed in the document relate to the past and past performance should not be seen as an indication of future returns.

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ARP composite index and PremiaLab Pure Factors indices, 31/12/2019 to 31/12/2020



PremiaLab Pure Factors are scaled for a volatility of 10%

To sum up, out of the 7 pure factors identified as “drivers” of the ARP composite index over the 2016-2019 period:

- 3 exhibited during the COVID crisis (20/02/2020 to 21/03/2020) performance patterns consistent with their “bad times” equity betas calculated over the 2007-2019 period: FX Carry and Equity Volatility on the downside and Commodity Trend on the upside.
- 3 delivered negative returns, as expected, though the magnitude of the drawdowns was significantly larger than that implied by their 2007-2019 “bad times” equity betas, especially for Equity Low Vol.
- The pure factor that exhibited the most negative 2007-2019 “bad times” excess equity beta, namely Equity Trend, delivered a large negative return, hence of opposite sign to its equity beta implied performance.

Out of the 7 pure factors considered, Equity Trend therefore is the only one that significantly diverged from its “expected” performance pattern.

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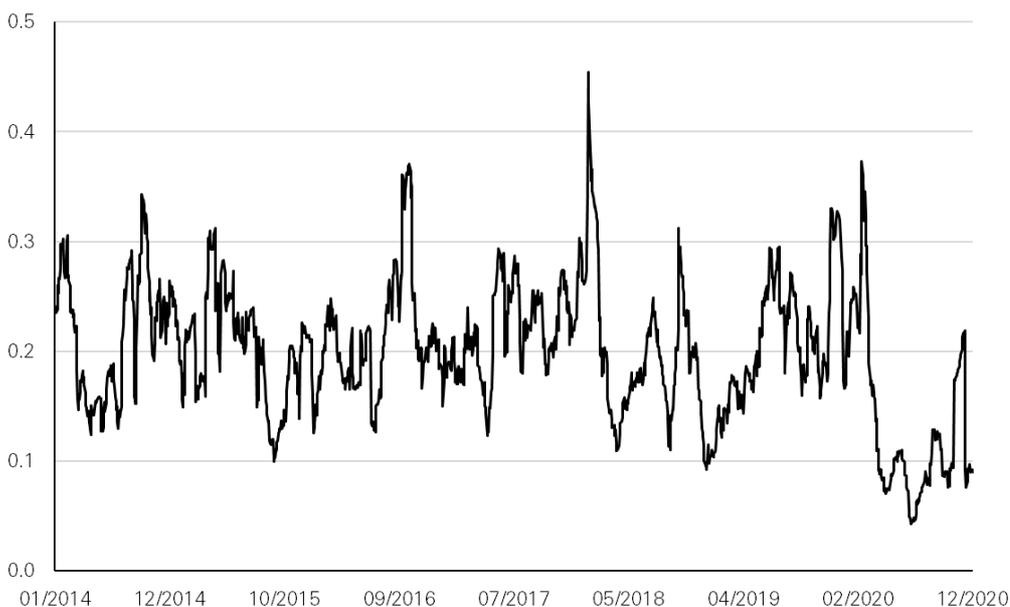
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Why did the ARP composite index not rebound after the February/March COVID crisis?

Looking at the graph showing the 2020 performances of the ARP composite index and of the 7 selected pure factors, one may be puzzled by the fact that the ARP composite index did not benefit from the rebound of Equity Volatility, FX Carry or Commodity Value pure factors from the end of March onward. Indeed, while Equity Low Volatility kept its downward trend throughout 2020, the average performance of the 7 selected pure factors (all scaled for a 10% volatility) from March the 20th to the year-end is a positive +2% versus -3.5% for the ARP Composite index.

Many reasons may explain such a divergence. Risk budgeting programs (e.g. volatility scaling) may have triggered a significant deleveraging of the factors that saw their risk parameters skyrocket during the COVID crisis (usually those that suffered the most during the crisis and rebounded afterwards...). Such a deleveraging may also come from strategic decisions (e.g. reallocation of risk budget from pro-cyclical / negative skewness drivers to more defensive factors such as intra-day momentum) or from simple stop-loss rules. The severe liquidity crisis that took place in March 2020 may also have led to forced changes in strategic risk-budgets and/or in implementation techniques. To illustrate this point, we consider the ratio of the ARP composite index 20-day volatility to equity markets short-term volatility as represented by the 20-day average level of the VIX index. We can see that the ratio fell below its long-term average level of 0.2 following the COVID crisis and seems to be stabilizing at levels closer to 0.1 ever since. The short-lived spike of November 2020 is triggered by one daily return: November 9th 2020 "momentum" crash, that saw the ARP composite index drop by 1.3%.

Ratio of the 20-day volatility of the ARP composite index to the 20-day average level of the VIX index



Different explanations can be proposed including deleveraging and reallocation of risk budget to more defensive / more liquid factors

Besides, we may reasonably assume that such changes led, on average, to lower risk exposures to factors implemented with less liquid instruments and/or in less liquid asset classes and to higher risk exposures to more traditional factors implemented with more simple instruments. Given the negative returns delivered, on average, by "academic" equity factors (value, carry, low-vol,...) from March 2020 to the year-end, a higher risk budget allocated to such factors following the COVID crisis would have been detrimental to the performance delivered by ARP funds.

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Conclusion

2020 was a challenging year for Alternative Risk Premia strategies. Considering the performance numbers of more than 20 funds combined in an ARP composite index, ARP funds posted large negative returns during the COVID crisis of February-March 2020 and, unlike most other risk asset classes, did not recover afterward.

Based on PremiaLab “Pure Factors”, we have identified the key drivers of ARP funds’ returns in 2020: Equity Volatility, Equity Trend and Equity Low-Vol explain close to 80% of the variance of the ARP composite index in 2020, 67% when excluding the 4 weekly returns from February 20th to March 21st. In 2020, overall, pure factors that showed higher correlations to the ARP composite index were either Volatility pure factors or Equity pure factors, which may point to a lack of diversification in ARP funds, on average, in terms of factor exposures and in terms of risk exposures by asset class.

Then, we assessed that 2020 was no “outlier” in terms of premia exposures nor in terms of individual premia performance patterns. Indeed, while 2020 clearly bears specificities, it is not entirely different from the previous 4 years.

Over the 2016-2019 period, Equity Low Vol, Equity Trend and Equity Volatility still are significant drivers, explaining 44% of the variance of the ARP composite index returns. 4 other pure factors, namely Bond Carry, FX Carry, Commodity Trend and Commodity Value also are significant drivers over the period. A 7-factor regression model explains 67% of the variance of the ARP composite index returns over the 2016-2019 period.

Considering the 2020 returns of the 7 selected pure factors in light of their long-term average performance patterns, we see that only Equity Trend significantly diverged from its “expected” performance path. Indeed, it delivered a large negative return during the COVID crisis while it was supposed to be the most defensive pure factor of all – based on its historical large negative “bad times” equity beta. The 6 other “leading” pure factors largely behaved as expected, although some, such as Equity Low Vol, experienced drawdowns of significantly larger magnitude than expected. This illustrates again – as in 2018 - that Equity Trend defensive properties are mainly valid during equity markets “slow crashes”, not always during “fast crashes”.

Finally, the ARP composite index posted a negative “post COVID crisis” performance, from March 21st to the year-end, hence diverging from its “expected” performance derived from the 2016-2019 pure factors’ exposures and from pure factors’ “post COVID crisis” returns. While a thorough analysis would require to access the time-varying premia exposures of each ARP fund composing the ARP composite index, we believe that volatility scaling, changes in strategic premia allocations or deteriorated liquidity conditions led to an overall reduction in nominal exposures to equity-sensitive premia such as Equity Volatility and to relatively higher exposures to more liquid and academic equity premia, which proved detrimental performance-wise.

Appendix

Constituents of the Composite index

| ARP provider | ARP strategy | Inclusion date | Bloomberg code | Notes |
|-------------------|---|----------------|----------------|-----------------------------|
| Aberdeen | Aberdeen Alternative Risk Premia Enhanced | 27/07/2017 | SPRP2XE LX | |
| AllianceBernstein | AB Alternative Risk Premia | 11/12/2017 | ABARIEH LX | |
| AQR | AQR Style Premia | 30/10/2013 | AQRSPBE LX | before 15/10/14: QSPIX US |
| AXA | AXA Chorus Multi Premia | 18/07/2017 | CHMPIEH LX | |
| Blackrock | Blackrock Style Advantage | 29/02/2016 | BSSAI2E LX | |
| CFM | R CFM Diversified | 23/12/2014 | RCFMIE1 ID | |
| ERAAM | ERAAM Premia | 21/12/2015 | ERPREMI FP | |
| Fulcrum | Fulcrum Risk Premia | 08/01/2020 | FULPEUA LX | |
| GAM | GAM Systematic Alternative Risk Premia | 04/04/2012 | GSBDMEA ID | |
| Goldman | GS Alternative Risk Premia | 30/12/2015 | GSARPIU LX | |
| HSBC | HSBC Multi Asset Style Factors | 28/04/2015 | HSBMAIC LX | before 28/04/15: HSBCMAS FP |
| Janus | Janus Global Diversified Alternatives | 31/07/2013 | JANDAIE ID | liquidated on 16/04/2020 |
| JPM | JPM Diversified Risk | 11/04/2013 | JPDREAH LX | |
| LFIS | LFIS Vision Premia | 27/12/2013 | LFVRPIS LX | before 31/12/14: LFAISEU LX |
| Lombard | LO Alternative Risk Premia | 06/08/2014 | LORPEMA LX | |
| MAN | Man Alternative Style Risk Premia | 17/10/2017 | GMASIEH ID | |
| Neuberger | NB Multi Style Premia | 18/05/2018 | NBMPEIA ID | before 03/01/19: NMLIX US |
| NN | NN Multi Asset Factor Opportunities | 29/03/2016 | NNMAZCE LX | |
| Parametric | Parametric Syst. Alternative Risk Premia | 08/01/2018 | ESATX US | liquidated on 30/07/20 |
| Quoniam | Quoniam Alternative Risk Premia | 04/10/2016 | QFARPEI LX | |
| SwissLife | Swiss Life Multi Asset Risk Premia | 29/09/2017 | SLMARPI LX | liquidated on 17/08/20 |
| Systematica | Systematica Alternative Risk Premia | 09/11/2017 | SARPCUN ID | |
| TwoSigma | Schroder GAIA Two Sigma Diversified | 24/08/2016 | SCHTSCE LX | |
| Unigestion | Uniglobal Alternative Risk Premia | 12/12/2016 | UGARPRE LX | |
| Wellington | Wellington Alternative Risk Premia | 31/07/2018 | WEARPSE LX | liquidated on 27/03/20 |
| Wells Fargo | Wells Fargo Alternative Risk Premia | 05/02/2019 | WRPIX US | |

Data sources

Traditional betas excess returns are based on the performance of the following reference indices:

- Global Equities and “equity” factor: MSCI World TR Net Index USD hedged (WHANWHID)
- “duration” factor: JP Morgan GBI Broad Index USD hedged (JHDCGBIB)
- Global Aggregate: Bloomberg Barclays Global Agg. TR USD hedged (LEGATRUH)
- Commodities: Bloomberg Commodity Index USD (BCOM)
- Global Hedge Fund: HFRX Global Hedge Fund Index (HFRXGL)
- Fama-French size factor: North-America “SMB” factor of Fama-French 5-factor model (Kenneth R. French data library, mba.tuck.dartmouth.edu)

ARP representative indices:

- SG Mutli Alternative Risk Premia (NEIXMARP)
- EurekaHedge Multi-Factor Risk Premia (EHFI900)

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