

AERIAL VIEW

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**THE MONTH INVESTING
CHANGED FOREVER**

BY BNY MELLON MARKETS STRATEGY TEAM

BY THE NUMBERS

8.2%

March annualized volatility in Treasury futures

9.9%

Annualized returns achieved by risk-parity funds from 2003 to February 2020

31%

Share of US corporate bonds held by insurers and pension funds, versus 25% in 2007

35BP

Spread between two- and 10-year Treasuries, versus 280 basis points in 2009

36%

Share of US corporates operating at earnings before interest and taxes below their interest payment

SOURCES:

1. Bloomberg
2. S&P Risk Parity Index
3. International Monetary Fund
4. Bloomberg
5. International Monetary Fund

THE CORONAVIRUS PANDEMIC HAS UPENDED LONG-HELD CONVENTIONS IN MARKETS, FROM MODELS THAT BLEW UP AND VALUATIONS THAT PLUMMETED TO POLICY MOVES THAT WERE PREVIOUSLY DEEMED INCONCEIVABLE.

BY BNY MELLON MARKETS STRATEGY TEAM

Whatever investors thought would end the longest bull market on record, few could have predicted it would be a global pandemic. Previous outbreaks stretching across continents were contained before they forced large parts of the globe into lockdown. Such an unforeseen set of outcomes will also most likely result in an unforeseen recovery. The possible W-shaped recovery could be extraordinarily volatile by construct. Pain may overwhelm gain for a while, until healing begins.

Such events are also so rare that most investors do not consider them when mapping events in their portfolios. Until now that might even have seemed reasonable because heeding those risks would have led portfolio managers to significantly underperform their benchmarks – mostly because the market kept climbing. In the low-rate environment, we show through our proprietary iFlow® data that investors were aggressively seeking yield. The business of money management was

growing increasingly dependent on diversification tools, machine learning and artificial intelligence. Most of these are now quarantined, just like most of humankind these days.

The novel coronavirus and ensuing market crash are more than just a reckoning. They are yet another reminder that our investing frameworks are only as good as the data we can put into them. We believe central banks and governments have done well in quickly dusting off the fire hose. Nevertheless, pain has been exacerbated by the rise of computer-driven trading, the sudden dash for cash and the operational burden of financial professionals working from home.

US stocks have had their worst quarter since the global financial crisis of 2007-2009, European stocks their worst losses since 2002 and Japan since 2008.

Investing will be forever changed as a result. In this paper, we explain what the COVID-19 curveball will mean for a range of market stakeholders, using our own iFlow data. iFlow records daily flows in and out of the world's equity,

fixed income and currency markets. As the world's largest custodian, we search for insights from these iFlow data points and use them to inform our opinions.

HERE ARE OUR MAIN FINDINGS:

- Price behavior has reshaped risk allocation within and across asset classes. Value-at-risk models will require larger room for error. Across asset classes, correlations will be swinging, more often, in ways that will turn portfolio diversification on its head.
- Our proprietary iFlow tools have been demonstrating remarkable patterns. First, we observed the fastest flip in iFlow Carry from yield seeking behavior to yield ditching. Second, our indicators pointed to fast deleveraging in late February and into March. Third, we witnessed the outright liquidation of assets across

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countries, equities and bond markets as investors sought to raise cash allocations.

- Policy making will be challenged by a different kind of market fracture as a result, particularly in credit. In the most recent cyclical downturns, monetary policy responded to a slowing of activity driven by a negative wealth effect on household demand. This time, however, we show that insolvencies are inevitable. Policy makers' reaction function has been fast, but it will likely also require regulatory easing.
- Our last point is that activity and demand data are deteriorating in a never-seen-before pace. It will require significant work to fix traditional macroeconomic models. Frameworks will be rebuilt to accommodate such tail events and, as a result, shall welcome the W-shaped recovery as a viable outcome.

RETHINKING PRICE BEHAVIOR

Asset valuations have cratered, and in some cases prices have evaporated altogether. These dramatic price swings could have a meaningful effect on portfolio allocations moving forward, in particular for so-called "risk-parity" funds that have seen a dramatic fall from grace.

Broadly speaking, investment practitioners manage their exposures using a probabilistic approach. This approach takes into account typical price behavior observed over time, and uses it to allocate risk toward a single position and/or a portfolio of assets. Those traditional methods may now need to be rethought.

Let's begin with an example of a 10-year US Treasury bond position. The annualized one- to six-month volatility of a US Treasury futures contract was around 5% until the end of February this year. A risk manager seeking to estimate the worst-case scenario on a US Treasury position equivalent to \$100mn would set aside \$10mn, or twice the standard deviation of the exposure.

Fast forward to March and annualized volatility in Treasury futures increased to 8.2%. That same risk manager was expected to set \$16.4mn aside to compensate for a two standard deviation event. Such events are extremely rare. Indeed, three-month realized volatility in US Treasury futures has not breached current levels in at least 10 years.

An additional twist to the extraordinary volatility observed in recent weeks has been correlation swings between asset classes. This is important because any portfolio allocation usually takes into account diversification benefits. For instance, risk parity funds take advantage of negative correlation between bonds and equities to cushion overall portfolio volatility.

Once an economic cycle turns, the easing of monetary policy would traditionally help bonds to cushion a potential dip in earnings and the ensuing equity market drawdown. These diversification benefits have allowed risk

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managers to allocate a larger exposure to risk-parity strategies over the years.

Their success has been largely attributed to a steady decline in the correlation between equities and bonds over the past two decades. In the early 2000s, the correlation stood at +0.4, compared to -0.4 earlier this year, for example.

In Chart 1, we show the total return of a risk-parity portfolio aiming to target 15% volatility. From 2003 to February of this year, this strategy achieved annualized returns of 9.9%. From the funds' peak performance in 2005 to the trough in March, this strategy withstood a 27.4% drawdown. During the global financial crisis the drawdown was 33%. (Chart 1.B shows the correlation between weekly changes of US Treasury total returns and S&P 500 total returns.)

Then the losses mounted. The weakness in risk-parity models took place for two reasons that will change risk-management forever. Firstly, the collapse in equity prices was not cushioned by gains in US Treasuries. Even though the Federal Reserve was very

quick in cutting reference rates close to zero, the bond rally was too muted to compensate for equity losses.

Secondly, and perhaps more importantly, rates are near zero but the term structure in the US government bond market failed to steepen. Back in the financial crisis in 2009, the spread between two- and 10-year Treasuries increased from 30bp to 280bp. This same spread is now only 35bp and it may only widen significantly once inflation expectations rise substantially, so long exposure to US Treasuries is unlikely to cushion the drawdown.

RETREATING FROM RISK

The current market conditions are severe and historic. We can observe this clearly through our iFlow data, in which we see extraordinarily high real-money outflow from equities, corporate bonds and fixed income as a whole. Our broadest measure of investor risk sentiment, iFlow Carry, is at record lows and it has been significantly negative for a record length of time.

iFlow is a set of proprietary indicators that are designed to track the

global flow of investment capital. Built from the real-money custodial flows observed by BNY Mellon, and aggregated from anonymized portfolio data, iFlow captures daily supply and demand pressures as exerted through the moves of roughly 20% of the world's assets. These flows have a measurable impact on price dynamics both within markets and across multiple asset classes.

Probably the best single iFlow indicator to illustrate the pace, depth and intensity of the retreat from risk assets is iFlow Carry, our measure of currency flows with currency risk. The intuition is that when the market is chasing high-yielding currencies, investors are risk-seeking, then when they are selling high yielders and buying funding currencies, they are risk-averse. Consequently, we have found that risky assets tend to underperform when iFlow Carry is significantly negative.

On January 14, iFlow Carry was significantly high and positive – strong evidence of the chase for yield. By February 14, a mere 23 days later, it fell to a significantly low reading. At day 29,

CHART 1

FALLING OUT OF FAVOR

Risk-parity funds relying on low equity-bond correlation outperformed, until the coronavirus crisis

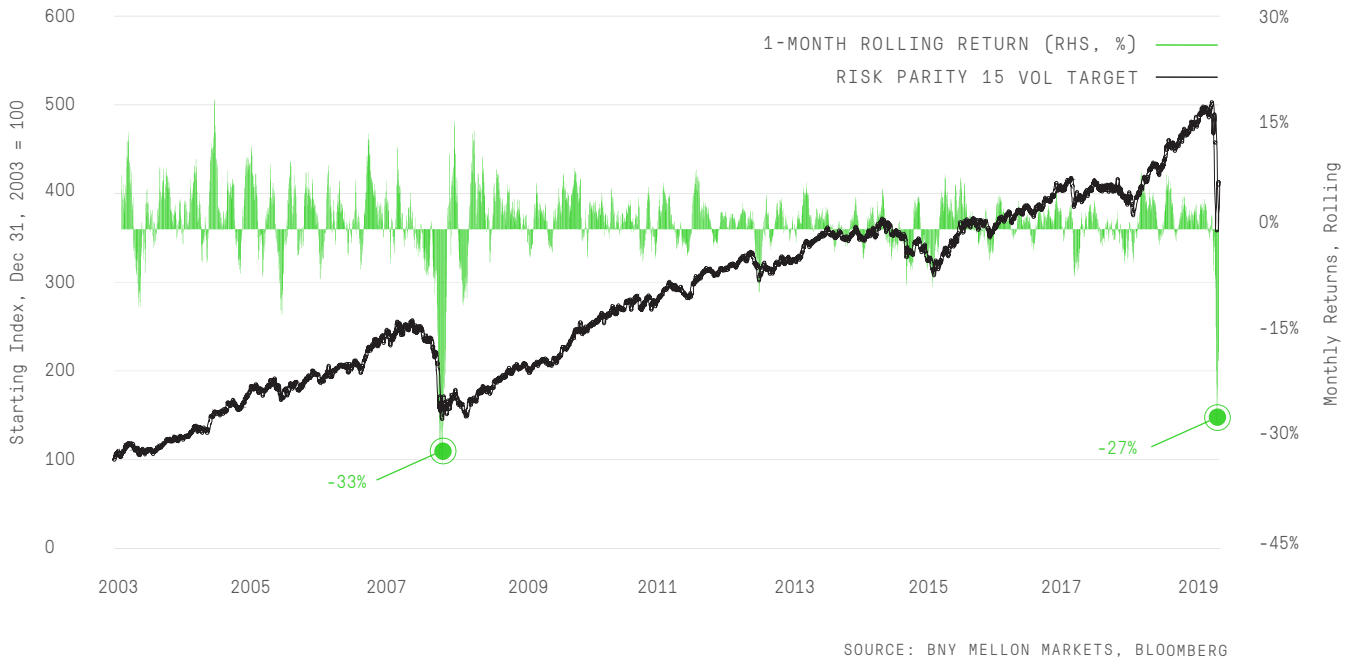
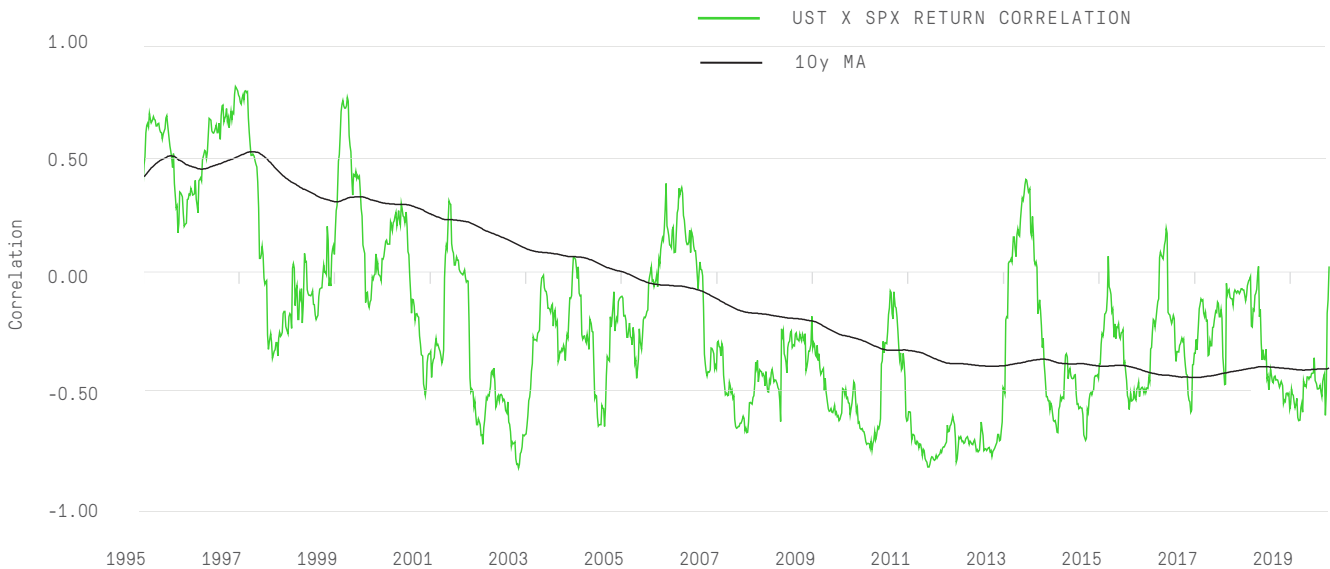


CHART 1.B

COMING APART

Equity-bond correlation had been steadily declining, helping risk-parity funds



We are seeing large-scale liquidation and cash-raising, a full-scale flight.

the indicator nearly matches its longest period in negative territory in our records, which go back to 2011. That tells us investors swiftly switched their attitudes, turning away from risk in foreign exchange markets and chasing safety because of the COVID-19 crisis in the markets.

In individual asset classes, our iFlow indicators for equities, corporate bonds and sovereign bonds are at record lows, below even those of the global financial crisis of 2007-2009 (see chart 3 and 3B). Again as can be seen from the chart, the rapidity of the declines for all three asset-class series is apparent. We are seeing large-scale liquidation and cash-raising, a full-scale flight.

iFlow indicators have informed our negative views on credit, equities and the macro outlook. They are also confirming what our traditional macro-strategy analysis tells us. We will be looking at the levels of risk-asset flows, how low they can go, but more importantly for how long they can stay there. Our work tells us that when flows start to form a pattern of daily low readings,

they stay that way for a while. This is a key metric to watch when trying to spot a market bottom or more worrisome times ahead.

ASSESSING CREDIT AND THE POLICY RESPONSE

In the past decade, a set of extraordinarily loose policies around the globe pushed corporations to operate with significantly more leverage. According to the International Monetary Fund's global financial stability report in October 2019, 36% of US corporations were operating at earnings before interest and taxes below their interest payment obligations. This same ratio in France and Spain stood at 25%. Sudden stops from widespread COVID-19 quarantines therefore have exacerbated an already precarious fundamental backdrop.

The policy response to a 10-20% activity drawdown, however, must differ from one region to the next. In the US, only 19% of non-financial corporate credit is provided through bank loans. In Europe, bank loans are 80% of corporate credit and in China they account for 72%. Policy response in the

US has been swift to provide liquidity to smooth capital markets while new information was incorporated into prices. Meanwhile, supervisors in the euro area and China will likely worry about the banking system's health as a result of asset impairment.

More broadly, across the main emerging markets (EM), most of corporate credit is sovereign controlled. The debt of state-owned enterprises as a share of total non-financial corporate debt is 80% in China, 57% in Brazil and 75% in India. In those regions, policy responses will likely be centrally planned through meaningful fiscal injections, pumping cash directly into state-controlled institutions.

In chart 2, we show the evolution of credit extension in the US over the past two decades. The dark line represents the ratio of non-financial debt to GDP. From 2000 to 2010, this ratio fluctuated between roughly 60% and 75%. Heading into the dot-com bust in 2001-02, US corporate leverage dropped from 65% to 60% of GDP. In the following cyclical upturn, this ratio increased from 60% to 74%.

The key concern in this cycle compared to 2002 and 2008 is the increasing presence of insurance companies and pension funds in the corporate bond market.

The green line in the chart represents the ratio of the market value of non-bank US corporates rated BBB/BBB+/BBB- to the total market value of all corporate investment-grade debt in the US. Between 2000 and 2010, the BBB share of corporate debt had an inverse relationship to that of overall corporate debt to GDP, so BBBs were deleveraging as the wider universe was borrowing more. This was a self-adjusting mechanism as economic cycles fluctuated, however.

Corporate leverage dynamics have changed since 2011. As the share of corporate debt to GDP has increased, investment-grade credit quality overall has deteriorated. Unlike pre-2008, when debt was rising in the overall economy but not among BBBs, now most of the new leverage added in the low-rate environment coincides with borrowing by the BBB segment. The share of BBB debt within investment-grade credit increased from 30% to 40%, while corporate debt to GDP increased from 64% to 75%. Both are

now near all-time highs.

A cyclical shock could therefore trigger a wave of downgrades of those BBB names into speculative-grade territory, making them so-called fallen angels, not to mention that some of them may file for bankruptcy.

The key concern in this cycle compared to 2002 and 2008 is the increasing presence of insurance companies and pension funds in the corporate bond market. These two investor groups now hold 31% of US corporate bonds versus 25% in 2007. But they tend to have mandates requiring them to sell below-investment-grade debt, an all-too-present threat.

The solution to this conundrum in our opinion will likely be some sort of easing up on those mandates. Allowing managers more discretion over their holdings would enhance price discovery while fading concerns in relation to a wall of fallen angels.

GAPS IN MACROECONOMIC MODELS

It's hard to find superlatives to describe the nature of what's going on

in the world today. The personal and human toll exacted by COVID-19 defies description.

Macro-strategists and macroeconomists have been compelled to think differently, depend on data differently, and come up with new models – both formal mathematical ones and deductive ones.

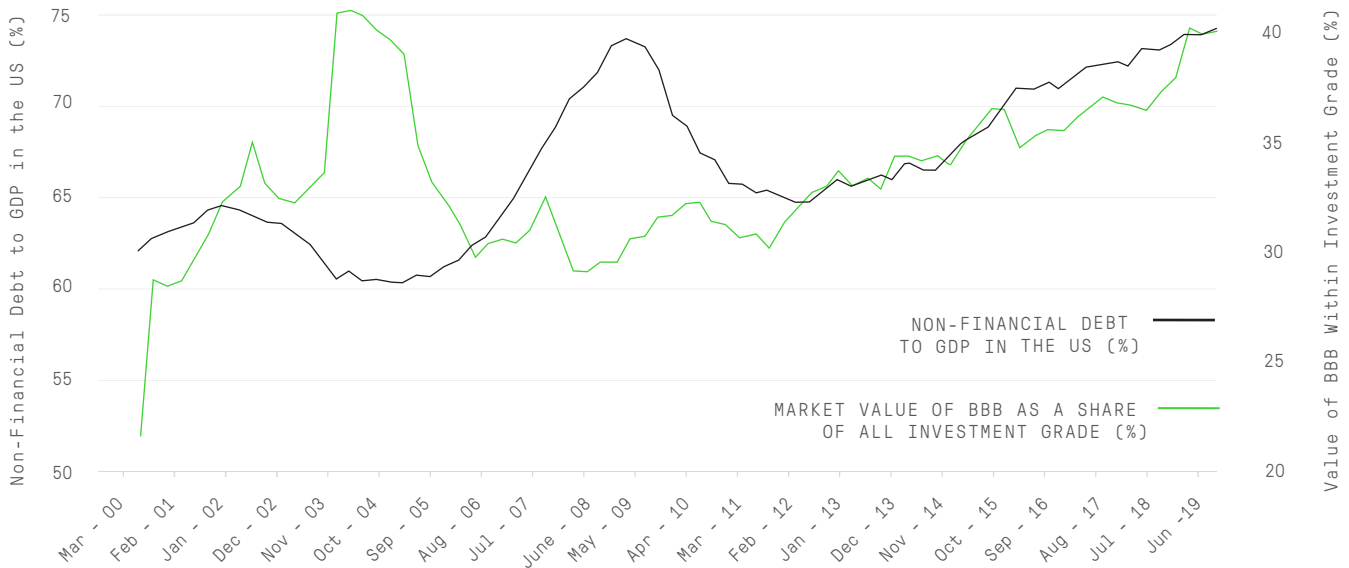
Take dynamic stochastic general equilibrium (DSGE) models, the workhorse model used by almost all policy makers and many private economists. They are built to model the individual actions of producers, consumers and policy makers, as well as markets and prices and their interactions with each other. This is the general equilibrium aspect.

They are dynamic, in that they consider agents who think ahead when deciding their actions today. This allows modelers to trace the evolution of the economy afterwards. The stochastic part comes from shocks that randomly occur. Once you have a model of how the economy works, you can gauge the impact of the shock on one part of the economy on all the rest, back to general equilibrium.

CHART 2

A CLIFFHANGER IN CREDIT

Pre-2008, BBB debt was anchored while overall leverage in the economy was rising. After 2011, BBB borrowing ramped up, posing a risk of “fallen angels”

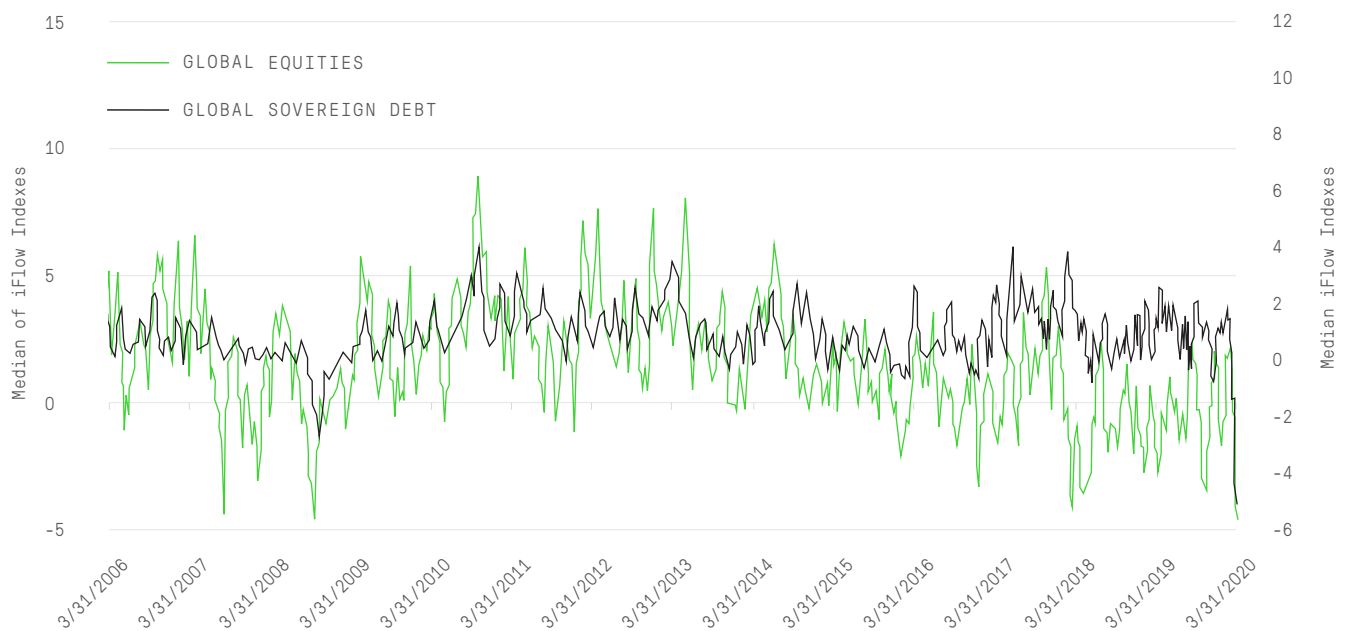


SOURCE: BNY MELLON MARKETS, BLOOMBERG

CHART 3

EBB AND FLOW

Our iFlow data indicate record-setting liquidations for equities, corporate and sovereign debt



*Median of iFlow Indexes Across 30+ Countries

SOURCE: BNY MELLON, IFLOW®

We believe – with relatively high conviction – that all this fiscal spending and monetary stimulus, combined with such a massive supply shock, will eventually result in inflation.

The problem in using today's DSGEs as a model of "how the world works" is that markets are broken, and the shock is massive – it's beyond the scope of a DSGE to contemplate. In addition, it is hitting all sectors and markets globally. The data used to run these models are assumed to be stationary; they come from well-understood probability distributions. That's certainly not the case now.

Ten million jobless claims in two weeks proves the point. Claims in the four years prior to March 13 were between 200,000 and 300,000. In the last two years they were between 200,000 and 240,000. Now we have ten million!

Similarly, a high frequency activity indicator built from daily (and a few weekly) series shows the same "off-cliff" behavior recently, much like the jobless claims data (see chart 4) show a "straight-up-to-the-sky" pattern. How can models deal with data like that?

As we think our way through the crisis, the answer is that we all are trying to rebuild DSGEs, either with or without the math, and with or without

the ability (or is it the imagination?) to handle data like we're seeing now. The old model is broken, and the data are messy, but thinking in general equilibrium about dynamics is still a useful exercise.

Up to a point, we can use analogs like the 1918 pandemic, both to know that social distancing helps flatten the curve and to conclude that we are still far from a market bottom. Between 1917 and 1922, dividends fell 33%. A simple valuation model translates that to additional significant downside ahead.

The Market predicts a massive GDP hit is coming, and based on some admittedly imprecise assumptions due to the lack of timely data, we think it could be as severe as minus-20% in the second quarter. This implies a similar downside to corporate earnings. Assigning typical bear-market multiples to earnings-per-share (EPS) from the past suggests a similar market conclusion as above.

We believe – with relatively high conviction – that all this fiscal spending and monetary stimulus, combined with such a massive supply shock, will eventually result in inflation when demand

recovers. That conviction is based on a non-mathematical model, while still relying on DSGE intuition.

But what happens to foreign exchange, bond and equity markets with most of the world experiencing high inflation? Here is where analogs can be useful. Think back to the 1970s. We will have higher yields, lower real growth and very likely a new "nifty fifty" in the stock market as winners and losers emerge from the coronavirus crisis.

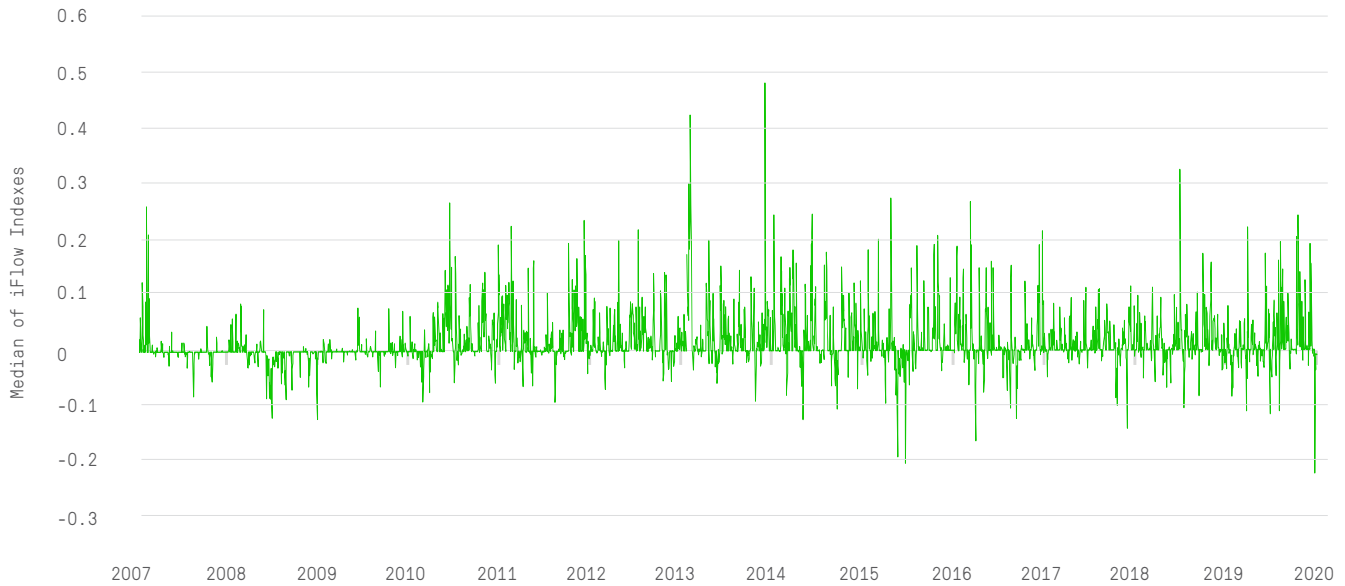
While the data are troublesome and the formal models inadequate, the underlying intuition of the DSGE is still at work as we think our way through the crisis. ●

The BNY Mellon Markets Strategy Team comprises John Arabadjis, Head of Macro Strategy Products and Analytics; Juliette Eastwood, Data Scientist in Analytics; Daniel Tenengauzer, Head of Strategy; and John Velis, FX and Macro Strategist, Americas. Questions or Comments? Write to Daniel.Tenengauzer@bnymellon.com, John.Velis@bnymellon.com or reach out to your usual relationship manager.

CHART 3B

LEAVING A MARK

Corporate bond outflows are larger now than they were in the 2007-2009 financial crisis



SOURCE: BNY MELLON MARKETS, IFLOW®

CHART 4

DATA DISCONTINUITY

High frequency activity indicators have been showing “off-a-cliff” behavior, much like jobless claims data



SOURCE: BNY MELLON MARKETS, BLOOMBERG

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