POLICYSCOPE DATA

BACKTEST RESULTS

SEPTEMBER 2021

BCMstrategy, Inc.

ACKNOWLEDGEMENTS

Initiatives at the innovation frontier never occur in isolation.

BCMstrategy, Inc. is privileged to operate at the leading edge of alternative data. We generate data the world has never seen before -- numbers derived from the public policy process that measure momentum, not sentiment. We provide strategists and portfolio managers with more efficient ways to access actionable information and volatility-based signals drawn directly from the public policy process.

The first two years of data generation covered what is now considered the pre-pandemic and pandemic periods. It is a treasure trove of daily, global policy reaction function data. During summer 2021, we were ready to start backtesting against market aggregates. This report provides an analysis of those initial backtest results.

First, we need to acknowledge with deep gratitude the vision and steadfast support provided to our project from our investors. Without their advice, creativity, and determination, the PolicyScope™ data set would not exist.

Next, we acknowledge the forward-looking commitment of our strategic partners in providing early engagement. We are honored to partner with the legendary drivers of innovation in the capital markets: Bloomberg and Dow Jones. Daily engagement with their teams continues to expand our horizons with their good questions and excellent insights.

We are particularly grateful to InvisageAlpha and AltHub for providing resources during the busy summer of 2021 to structure and run a set of backtest activities using PolicyScope data. None of us knew what we would find when we tested the data. Their expert advice on how to conduct the correlations backtest is deeply appreciated. Finally, a small set of select individuals provided comments and critiques on various versions of this analysis. A fresh set of eyes helps hone perspective. Honest feedback from trusted colleagues helps ensure we do not overstate. Particular appreciation goes to Dr. Bob Mark, Dr. Irfan Ali, and Joseph Titlebaum. Their thoughtful comments made this report stronger and more precise in multiple ways.

ABOUT BCMSTRATEGY, INC.

BCMstrategy, Inc. quantifies public policy risks using 9+ layers of patented analytical automation without using sentiment analysis. PolicyScope™ data has been mapped to 300+ economic sectors and 9 asset class types.

PolicyScope™ data is available to institution investors in three formats.

- The complete dataset is available to institutional investors exclusively through the Bloomberg Enterprise Access Point (https://eap.bloomberg.com/catalogs/bbg/products/BCMStrategiesPolicyScopeEdition1).
- Customized single-issue dashboards and signals from BCMstrategy, Inc. can be accessed through APIs or on the web.
- Coming Soon: An app for the Bloomberg Terminal will be available during 4Q2021.

BCMstrategy, Inc. is the sole author of this report. BCMstrategy, Inc. contributed data and correlations interpretation, original research, and the content of this report as well as sample quantitative PolicyScope™ data generated by the patented process.

ABOUT INVISAGEALPHA

InvisageAlpha is a data analytics platform that helps investors use alternative data to generate performance. InvisageAlpha uses a proprietary machine learning engine that extracts investment signals and ideas from any form of data or narrative content. Their platform provides a set of tools to integrate signals into the investor process to drive performance and reduce risk.

InvisageAlpha is owned by AltHub, the leading provider of modelling, sales enablement tools, and business development solutions for the Alt Data Market.

InvisageAlpha contributed backtesting services and mathematical correlations analysis regarding PolicyScope™ data. They also contributed two specialized charts to this report.

EXECUTIVE SUMMARY

Public policy moves markets. What policymakers say and do directly impacts the cost of doing business, the cost of raising capital, and the demand for specific products and services.

To date, capital markets have viewed public policy as a random exogenous variable expressed predominantly through headline risks that generate market volatility. The patented BCMstrategy, Inc. process for generating objective data from the public policy process (PolicyScope™ data) means that capital markets can now start measuring and managing their exposure to public policy risks on a par with other market and credit risks. Public policy risk is no longer a random variable.

Measuring public policy risks daily and objectively enables capital markets to capture a range of efficiencies when measuring both systematic risk and specific risks along the efficient frontier. This first backtest of PolicyScope™ data documents how long it takes markets to notice that the official sector acted with respect to four issue areas: trade war, LIBOR, CBDC, and cryptocurrency. The current dataset, however encompasses over 1,000 curated lexicon terms tuned tightly by subject matter experts to the specific language of each policy area. Our key findings are:

- The backtests performed by InvisageAlpha prove that PolicyScope™ data is a leading indicator of market volatility, anticipating market volatility across multiple scenarios. PolicyScope™ data consistently anticipated VIX volatility, with public policy volatility spiking in advance of the VIX during both the pre-pandemic and pandemic periods tested.
- PolicyScope™ data also generated a forward indicator of volatility in U.S. equity markets (the S&P 500) during both periods, with particularly strong correlations when tested against economic sector mappings for PolicyScope™ data.
- In addition, the cryptocurrency lexicon consistently anticipates BitCoin price volatility. Average advance notice periods range between 10-22 days, providing portfolio managers with sufficient advance notice to structure strategic market positions.

Alpha capture and successful measurement of Beta with the Capital Asset Pricing Model (CAPM) depends critically on determining the contours of systematic risks in part by identifying the extent to which private assets are correlated with market volatility. Whether assessed in relation to a risk-free rate or in relation to economic sector baskets, public policy risks traditionally have been viewed as exogenous to the risk assessment process for private assets because public policy risks were assumed to be non-quantitative in nature.

PolicyScope™ data now makes it possible to approach risk analysis on a factor basis, with public policy risk as a core factor in the risk measurement process.

This paper is structured as follows:

Section I. The Policy/Market Volatility Nexus

Section II. PolicyScope™ Data Description

Section III. Backtest Methodology

Section IV. Correlations Against the S&P Total Markets Index + Days in Advance

- By lexicon term
- By economic sector
- By activity type

Section V. Correlations Against the VIX + Days in Advance

- By lexicon term
- By economic sector
- By activity type

Section VI Case Study: Cryptocurrency Policy

Section VII. Conclusion

This is the first of many backtests that BCMstrategy, Inc. will conduct as the PolicyScope™ data expands. We are at the leading edge of the innovation frontier, generating structured numerical data from the public policy process. Additional backtest opportunities may arise as the lexicon grows , particularly with respect to monetary policy and climate-related risk issues. Backtests against the Dow Jones Industrial Average, various sectoral indices, the FTSE, major reserve currencies, and possibly some FTSE sectoral baskets may be warranted to explore the extent of market correlations.

With three years of data for certain lexicon terms and with over 250,000 documents containing substantial amounts of verbal data, we additionally expect to use our combined quantitative and verbal data to begin training machine learning and artificial intelligence systems during 2022 for the purpose of generating robust signals about policy trajectories.

We look forward to exploring the contours and relationships between markets and quantified public policy to deliver the best possible data to portfolio managers so they can enhance their ability to deliver stronger returns based on a full assessment of risks and opportunities.

By increasing the efficiency of their ability to absorb information from the public policy process, we hope to advance the effectiveness and accuracy of risk asset pricing process in ways that help investors find and maximize previously hidden alpha opportunities.

SECTION I: THE POLICY/MARKETS VOLATILITY NEXUS

SYSTEMATIC RISK BASICS

Capital markets and securities issuers care about market volatility. Fluctuations in value for traded securities (both on the upside and on the downside) deliver opportunities to capture gains as well as deliver risk, particularly if the fluctuations are unexpected.

Investors minimize risk exposures and uncover value through thorough analysis of underlying issuer balance sheet fundamentals and industry sectoral trends. However, issuers are also subject to a range of systematic risks that impact all market participants, which means that asset values in both private and traded markets are based on more than just balance sheet fundamentals.[1]

The Corporate Finance Institute identifies four key systematic risks: market risk, interest rate risk, exchange rate risk, and inflation risk. Within bank trading books, market risks encompass a range of instruments held in the trading book (e.g., equities, foreign exchange, commodities instruments) as well as interest rate-related instruments (e.g., interest rate swaps).

Within capital markets, the dichotomy between general market risks and specific risks pioneered by Markowitz in the 1950s estimates maximum returns at different risk levels in order to identify the efficient frontier.[2] The estimation process starts from the proposition that although future performance may not be known in advance, a range of possible future outcomes can be estimated with some certainty if the factors that generate risk can be accurately measured and systematically analyzed.[3]

This analytical framework forms the foundation not only for asset valuation but also for risk assessment and detailed regulatory capital rules in the banking system.[4] Within the bank regulatory capital framework, the specific risk associated with a trading security is based on

(i) the individual security's volatility profile over a ten day trading period in relation to the overall

[1] Systematic Risk - Learn How to Identify and Calculate Systematic Risk (corporatefinanceinstitute.com)

[2] Expected returns are calculated as the combination of (i) a risk-free rate, (ii) the Beta of an asset defined as its risk or volatility in relation to the rest of the market, and (iii) the expected market return. Risk is defined as the standard deviation of return. The estimation process assumes an efficient market (equal access to information to which all investors have access) which optimizes for diversification without transaction costs.

[3] "Since the future is not known with certainty, it must be 'expected' or 'anticipated' returns which we discount." *Portfolio Selection*, 7 Journal of Finance (No.1)(March 1952.

[4] *Calculation of RWA for market risk: Definition and application for market risk (MAR10)*, Basel Committee on Banking Supervision (effective as of 15 Dec 2019).

market's volatility during that same period and

(ii) the security's exposure to additional volatility associated with external event risks such as market shocks as well as internal event risks such as the risk of default.[5]

All systematic risk share two key characteristics. First, they contain considerable components that are driven by momentum. The 'wisdom of the crowd' can create accelerating dynamics that increase or decrease values beyond what dispassionate fundamental analysis might dictate. Second, public policy plays a particularly large role in defining the shape and dynamics of systematic risks. For example:

- **Market Risk**: Policies such as trading halts/circuit breakers and central bank asset purchases attempt to smooth out extreme movements in traded asset markets. This includes both normative policy formation activities as well as operational decisions to use (or cease using) these tools.
- **Interest Rate Risk, Inflation Risk**: Monetary policy attempts to maintain a relatively even amount of inflation in order to deliver steady economic growth, often paired with employment targets. Small technical shifts in language, priorities, and events can have a material, large impact on risks related to interest rates and inflation. Recent efforts to shift from interbank offer rates to market rates in order to articulate a benchmark interest rate generate a new kind of interest rate risk as financial instrument pricing shifts towards benchmarks more closely tied to national trading markets.[6]
- **Exchange Rate Risk**: Trade policy and geopolitical positioning play an outsized role in triggering exchange rate volatility.

Firms and investors cannot diversify away their exposure to these risks. They incur these risks merely by being active in the relevant market. However, the quality of management and the structure of a firm's financial obligations (particularly its fixed income securities) determine the extent of a firm is exposure to specific types of systematic risks.[7]

Skilled risk managers and strategists thus assess how individual firms may be exposed to selected systematic risks (e.g., regulatory change, supply chain disruptions, interest rate increases, geopolitical event risks) so they can devise mitigation and hedging strategies beyond diversification mechanisms. Assessing exposure to systematic risks even today remains a profoundly subjective activity.

[5] Id., Para. 10.13, footnote 3.

[6] The public policy decision to shift away from LIBOR to benchmark rates based on market rates following the Great Financial Crisis thus holds particular implications for all pricing models premised on a "risk-free rate." The full articulation of new benchmark rates has not yet been completed in many jurisdictions and the process remains subject to intensive normative policymaking both at the legislative and regulatory levels. For this reason, the PolicyScope™ data set continues to track LIBOR policy even though the main decision to move away from inter-bank offer rates was taken years ago. The next round of technical decision-making will have a material impact on risk measurement. Depending on how it is implemented, it may also create basis risks for issuers and lenders.

[7] *The Essentials of Risk Management, Second Edition, By Michel Crouhy, Dan Galai, Robert Mark (2013)* The Essentials of Risk Management - The Essentials of Risk Management Digital Handbook (prmia.org)

The operating assumption seems to be that human intelligence and expert opinion can provide perspective on potential future exposures but not quantitative measures of public policy risks. Capital markets may appreciate that public policy risk and market risks are volatile and even linked (see below), but to date they have not had the capacity to measure public policy risks quantitatively on a par with market volatility. PolicyScope™ data has only been available to capital market participants for less than two years as of this writing.

Measuring risk does not always mean avoiding it. Measurement merely makes it possible to make fact-based decisions about how much (or how little) of the risk an investor may seek to hold in a portfolio for a defined period of time or a defined alpha realization. For example, tradeable index products and investing baskets have been structured to deliver controlled, targeted exposures to specific factors in the asset pricing methodology. Leading examples include the FTRussell factor indices[8] and the MSCI factor indices.[9] Experimentation has also begun to redefine the efficient frontier by incorporating ESG (environmental, social, governance) considerations.[10]

Systematic Risk and Inefficiencies – Public Policy Risks

Automated processing increases operational efficiencies in general. But the application of process automation techniques to verbal and analytical arenas has been slower than in the physical world due in part to technological constraints. The application of Natural Language Processing at scale ushers in opportunities for increased automation within disciplines dominated by words.

Capital markets seeking to manage exposure to policy-related systematic risks traditionally rely on expert opinion and human intelligence to interpret public policy signals. This is inefficient at a temporal level. Consider the typical sequence of events:

- **Action**: Policymakers act (the action need not be a final decision)
- **Observation**: Insiders/experts learn of the action | Journalists report on the action
- **Analysis**: Subject matter experts read the action and/or the observation reports
- **Risk Assessment**: Subject matter experts notify portfolio managers

[8] *Factor exposure indexes: Index construction methodology*, FTRussell.com (August 2014).

[9] *MSCI Diversified Multi-Factor Indexes Methodology*, MSCI (February 2015).

[10] *Responsible Investing: The ESG-Efficient Frontier,* Lasse Heje Pedersen, Shaun Fitzgibbons, and Lukasz Pomorski, Mayo Center for Asset Management Virtual Seminar Series, University of Virginia (May 1, 2020).

and risk managers, who then assess the risk through shifts in assumptions and parameters within asset pricing and scenario analysis models.

- **Transaction Execution**: New buy/sell/hedge positions are taken in the market.

Each of these processes takes time to implement. The process starts with verbal inputs and gradually migrates into quantitative elements.

Capital markets participants seeking to push to the edge of the efficient frontier invest billions in acquiring the best and fastest communications mechanisms as well as the best and fastest analysts in a race against the clock to generate actionable trading decisions regarding policy-related systematic risks.

From the tickertape to the telegraph to the telex to the Bloomberg Terminal to the Blackberry, capital markets have consistently pushed the technological boundary to help information and analysis move ultimately at the speed of light. The innovation frontier delivers efficiency gains not by accelerating the velocity of communications but by intensifying the automation of the analytical process.

But the problem still remains that public policy risks are expressed in terms of words whereas financial risks are expressed in terms of numbers. Portfolio managers experience difficulty incorporating verbal public policy risks into their quantitative workflow processes. The resulting process misalignment complicates considerably the ability to integrate policy risks within structured financial analysis. As a result, investors face downside risks and missed investment opportunities from shifts in policy. Efficiency gains that facilitate better estimation of systematic risks require a repeatable process for generating consistent data that converts the words into numbers analytically, without bias.

BCMstrategy, Inc.'s patented process incorporates 9+ layers of patented analytical automation in a manner that converts the words of the public policy process into numbers suitable for use in asset valuation and risk analysis. We assign scores to global public policy activity in relation to commitment levels objectively, without a normative or sentiment-based overlay. This PolicyScope™ data measures the path towards a decision, delivering daily, time-stamped weighted scores that provide advance notice of public policy volatility often well before proposals and decisions are announced. This is entirely new data which has only just become available to capital markets in the last nine months.

Systematic risks related to public policy may still not be subject to diversification, but at least they can now be measured and reduced to a factor in a broader risk or asset valuation equation.

However, measurement by itself is not a risk metric. Risk requires an understanding of how much (or how little) a given value can fluctuate over a defined period of time. When evaluating two different items, it further requires understanding how their respective volatility rates may or may not be correlated with each other. It also requires normalizing the time periods for observation.

Capital markets move with each trade just as public policy moves with each word. The velocity of change tends to be faster in capital markets. But a new agreed market value always exists with a closing price. PolicyScope™ also registers new values every 24 hours, but for a different reason. PolicyScope™ data captures and measures the global public policy reaction function. Policymakers around the world react to each others' words and actions. Activity for every issue may not occur daily, but activity on some issues occurs daily. Whenever the activity occurs, the patented process that generates PolicyScope™ data captures it.

The process of creating daily PolicyScope™ data for the purpose of decreasing the inefficiencies in policy-related risk measurement provides the foundation for comparing public policy volatility for specific issues against market volatility. We will ultimately use the quantitative and verbal data to conduct algorithmic policy trend projection. But with two years of data, we have enough information to start assessing the potential efficiency gains and alpha generation opportunities associated with the relationship between public policy volatility and market volatility.

VOLATILITY BASICS

Markets measure aggregate volatility by quantifying the daily changes in asset prices for specific equity indices. Volatility can be estimated on a forward-looking basis. For example, the VIX anticipates volatility on a 30-day advance basis by extrapolating market expectations from option prices on the S&P. Investors can take positions and attempt to acquire alpha by making investments regarding that volatility directly through positions in the VIX as well as through derivative VIX-related products.[11]

The nexus where public policy and markets meet is well established: the media cycle. Capital markets and public policy share a common currency: information. Steady increases in the velocity of information flows through advanced technology in the last 120 years in particular have intensified the feedback loop between markets and policy arenas.[12]

The feedback loop between the media cycle and market volatility over the years has acquired a name: headline risk.[13] It

[11] *THE VIX INDEX AND VOLATILITY-BASED GLOBAL INDEXES AND TRADING INSTRUMENTS: A Guide to Investment and Trading Features*, CFA Research Foundation (2020) https://www.cfainstitute.org/-/media/documents/article/rf-brief/rfbr-moran-vix-volatility.ashx

[12] Notable accelerants over the last century have included: the telegraph, the tickertape, the teletype, the telephone, the Bloomberg Terminal, Blackberries, cable news, program/algorithmic trading, server co-location, automated headline-reading bots that accelerate trading signal extraction from the news cycle, machine-readable institutional news feeds, and social media.

[13] Headline risk is formally defined as: "the possibility that a news story will adversely affect the price of an investment, such as a

encompasses a broad range of media coverage, including corporate announcements and litigation announcements. For purposes of this White Paper, we are only concerned with headline risk generated by shifts in public policy.

Initial efforts to quantify the relationship between markets and public policy volatility understandably have focused on measuring the correlation between the news cycle and market volatility because most market participants intersect with the policy cycle through media coverage. Considerable research recently has quantified conclusively that public policy news (particularly around geopolitical topics) correlates strongly and immediately with market volatility.[14]

But the news cycle is not the sole or sometimes even the best source of information regarding public policy decisions that can move markets. Public policy professionals know that leading indicators for decisions in the official sector occur long before a formal announcement or proposal generates headlines. The vast majority of this activity occurs in the public domain even when it does not generate headlines. Much of this activity may be highly technical or obscure. The pace of information flows make it easy for investors to miss material developments.

For this reason, sophisticated capital market participants have long employed a range of technical policy experts. They rely on these experts to help identify macro trends faster and better than other firms in order to generate alpha and manage risk exposures. However, relying on human intelligence and expert judgement creates inefficiencies in the process for identifying policy-related systematic risks. These human experts still need to read. They rely on the media cycle and specialized feeds to alert them to developments. They can be prone to substantial personal bias as well as incomplete information.

More recent efforts to automate the assessment or systematic risks arising from the public policy process mistake political risk for policy risk.[15] They deploy sophisticated sentiment analysis to detect normative signaling from the news cycle or public statements, or both. Sentiment-based scores (and their close cousins, word counts) take in data from a range of sources that have no authority to make a binding policy decision. Automated algorithm-based processes to read media reports ironically accelerate the intensity of the

---

stock or commodity. Headline risk can also impact the performance of a specific sector or the entire stock market." Headline Risk (investopedia.com).

[14] *Policy News and Stock Market Volatility*, by Scott R. Baker, Nicholas Bloom, Steven J. Davis and Kyle Kost (25 March 2019), available at: https://www.policyuncertainty.com/media/Policy%20News%20and%20Stock%20Market%20Volatility.pdf

[15] *Political Risk vs. Policy Risk*, BCMstrategy, Inc. (21 January 2021) available at: Political Risk vs. Policy Risk (policyscope.io) The distinction between political and policy risks is well established across a range of disciplines. Representative analysis includes: *Political risk vs. risk to force: How policy decisions impact risk and capability in partner operations,* By Mick Mulroy, Eric Oehlerich, Walton Mulroy Middle East Institute (29 March 2021) Political risk vs. risk to force: How policy decisions impact risk and capability in partner operations | Middle East Institute (mei.edu) See also: *Political Risk vs. Economic Policy Risk: Which One Really Matters?* By Giovanni Pagliardi*, PhD student at ESSEC Business School, and Prof.* François Longin*, Prof. of Finance, ESSEC Business School (*12 April 2017)(**"**One essential lesson: ignoring variances in political risk and economic policy risk would lead to completely wrong conclusions about the relationship between politics and finance and the impact of the former on the latter. Rather than assume that "when risk is high, aim for low", wiser to ask yourself *what* risk before letting go of your ten billion.)

market reaction function to headline risk without materially providing insight into actual public policy trends.

Traditional methods of assessing policy-related systematic risks predominantly intersect with the policy process through the media cycle. This approach intensifies the perception that public policy risk is a random exogenous variable which can neither be measured nor managed because media attention to public policy developments can be discontinuous over time. Media coverage tends to arise during key policy inflection points at seemingly random intervals which do not line up with key market timelines like the opening of trading, options expiration dates, or quarterly report filing deadlines for securities issuers.

Finally, a fundamental mismatch exists between the how public policy volatility is expressed (in words) and how market volatility is expressed (in numbers). Scoring public policy language in relation to sentiment or word counts inadvertently intensifies the mismatch by delivering quantitative data that provides little to no insight into the volume or direction of decision-making within the official sector.

A better way exists to measure public policy risk. Rather than measure sentiment, advanced natural language technology makes it possible to convert the action levels implied by the use of specific words and phrases directly from the public policy process. Measuring the action delivers a more objective measurement of activity. Weighting the measurement based on how close the activity might be to a decision delivers a forward-looking measure of public policy volatility. This is the process used by BCMstrategy, Inc. to generate PolicyScope™ data.[16]

We would expect that activities generating headlines (e.g., proposal) would deliver high correlations to market volatility since the nexus between headlines and market volatility has already been established conclusively. But can measurements of public policy volatility provide a *leading* indicator of market volatility?

To answer this question, BCMstrategy, Inc. partnered with InvisageAlpha during Summer 2021 to backtest two years of historical PolicyScope™ data against the VIX, the S&P500, and BitCoin prices. Because PolicyScope™ data has been mapped to economic sectors, we also backtested correlations of the economic sectoral mappings against the VIX and the S&P500.

[16] *System, Method and Computer Program Product for Behavioral Database Providing Quantitative Analysis of Cross Border Policy Process and Related Search Capabilities*, by Barbara C. Matthews U.S. Patent Number US 9,436,726 B2 (6 September 2016).

SECTION II. POLICYSCOPE™ DATA

BCMstrategy, Inc. generates quantitative data daily and automatically from the global public policy process. The patented system automatically finds specific lexicon terms when they are used and then analyzes automatically what kind of activity was involved when those terms were used. The current proprietary lexicon encompasses 1000+ technical terms grouped thematically (e.g., Monetary Policy, Trade Policy, Digital Currency Policy, Climate-related Disclosures, Banking Regulation).

Relevant activity is weighted objectively in relation to proximity to a decision. For example, a speech receives a lower score than a formal proposal. Numerical values are grouped in relation to the five drivers of public policy risk:

- Action taken by government officials
- Data Releases
- Judicial Activity
- Rhetoric (what government officials say in the media)
- Leaks (what government officials leak on an unattributed basis to the media)

The resulting daily data delivers an analytical assessment of the composition of public policy activity for any given issue. Because all items are time-stamped, it is also possible to generate time-series charts that show the shape of the public policy reaction function for any given lexicon term at any level of specificity.

The process is extensible to any public policy issue. It can be hyper-targeted to any level of government. The current quantification process operates at the global level in order to help investors address global macro risks from the start. But specialized subject-matter focus areas (e.g., insurance regulation, environmental regulation) could extend the quantification process to state, regional, and/or municipal level governments.

The PolicyScope™ dataset thus makes it possible for financial analysts and risk managers for the first time to measure explicitly their exposure to the risk of an unanticipated policy shift using a quantitative model that measures daily aggregate activity for each lexicon term:

$$POL^{risk} = \sum (Rh + Ac + Dt + Lk + Ju)$$

Rhetoric (Rh) | Action (Ac) | Leaks (Lk) |
Economic data releases (Dt) | Judicial Activity (Ju)

The patented process does not use sentiment analysis for three reasons. First, normative assessments about specific words would inject bias into the data. Second, a policymaker's personal sentiment is not always a reliable indicator of policy outcomes. Third, technical policymakers like regulators and trade officials are expected to articulate their policy preferences in value-neutral terms.

Nor does the process rely on word counting because counting words rarely generates meaningful insight into the policy process. For example, a word cloud for a speech or document generated by a central bank will

nearly always be dominated by terms such as "monetary policy" or "interest rates" or "financial stability."

Portfolio managers intersect with the public policy process thematically by industry sector. Official decisions and rhetoric have a horizontal impact on all firms in a sector, although individual firms within that sector may be impacted differently. Consequently, ***BCMstrategy, Inc. has mapped its 1,000+ individual lexicon terms to over 300 industry sectors.***

The mapping makes it easier for portfolio managers to spot when a sometimes obscure shift in policy may impact an investment or a sectoral portfolio. For example, a shift in cryptocurrency policy will impact demand for electricity and a shift in trade policy regarding rare earth minerals or loose talk of trade wars will impact the automobile components sector. Regulatory requirements to increase the disclosure of climate-related risks and shifts in central bank asset purchase programs will impact all securities issuers, particularly those that issue fixed income instruments.

The PolicyScope™ dataset has now amassed over two years of quantitative data for certain lexicon terms. This is a sufficient amount to begin backtesting the public policy data against market data.

SECTION III. BACKTEST METHODOLOGY

During summer 2021, BCMstrategy, Inc. partnered with InvisageAlpha to conduct the first backtest of the PolicyScope™ dataset.

LEXICON TERMS

Four individual lexicon terms were chosen from the hundreds in the database. These were:

- Trade War
- LIBOR
- Central Bank Digital Currencies (CBDC)
- Cryptocurrency.

The terms were chosen to test the breadth and depth of the lexicon.

We chose two general terms that had attracted a fair amount of media attention: "trade war" and "cryptocurrency"). We also chose two highly technical terms that had attracted relatively little media attention but were important for global macro analysis: "LIBOR" and "CBDC".

Heterogeneity also existed in relation to the economic mapping. Due to their broader impact on the economy, the LIBOR and trade war terms are mapped to more economic sectors than CBDC and cryptocurrency. Shifts in benchmark interest rates impact nearly all fixed income issuers. Trade war tensions disproportionately impact manufacturers. Digital currency policy disproportionately impacts banks and payment services providers but it can also impact electricity demand so utilities and the electricity sector are included in the economic sector map for digital currency policy issues.

We chose not to include the lexicon term which has generated the single largest cache of data in the PolicyScope™ dataset: COVID-19. While we have large amount of data for this term, the available history only began in February 2020. We believe we may have the ONLY dataset that captures the full scope of economic policy decisions globally in response to the pandemic, particularly from globally significant central banks. But we concluded that a two-year backtest for all terms would be more valuable than a one-year backtest. We addressed the obvious breaks and skews in the data arising from the pandemic by segmenting the correlations analysis over time.

TIME HORIZONS

Data for the four lexicon terms covered the period from 1st January 2019 to 31st December 2020. We further split the period of analysis into two separate periods in order to account for the possibility that pandemic-related shifts in financial markets as well as the policy process might generate different outcomes. Our definitions for those periods were as follows:

- **Pre-Covid**: 1st January 2019 to 20th February 2020
- **Since-Covid/"Pandemic period"**: 21st February 2020 to 31st December 2020

Indeed, we saw shifts in correlations and distributions using these two time periods.

Data Transformations – Rolling Averages

Markets price in relation to all available data. However, this does not mean that all publicly available official sector actions are seen by investors instantly, despite modern technology. *A time lag exists between when policymakers and when investors notice the action.* In other words: markets are efficient, but they are not immediately efficient.

Whether they rely on headline-reading algorithms, expert opinion, or a daily news feed, investors and their experts predominantly depend on publishers and analysts to notify them that activity has occurred. The more that investors rely on media reports for their information, the more they are at risk for missing key technical policy moves that are so technical that they do not generate headlines. Humans are still reading the news cycle as their main source for information about government activity.

We therefore tested tree specific time lags for PolicyScope™ data against market volatility data:

- 3 days rolling average
- 7 days rolling average
- Daily incremental change.

Correlations analysis against the S&P and the VIX were performed against all three time lags as well as the original data point for twenty two (22) periods in the future.

This backtest served two purposes. First, it sought to identify whether PolicyScope™ data might be generating advance notice of market volatility. Second, it sought to identify whether – and, if so, how much – in advance PolicyScope™ data might provide market participants with clear signals of impending market volatility.[17]

Market Data

The sole purpose of this first backtest was to assess whether, and to what extent, PolicyScope™ data might correlate with market volatility data. We chose three indicators of market volatility:

- The **S&P Total Market Index**: We calculated realized volatility on 22 forward-looking days using the standard deviation of the last 22 trading day prices, with a minimum of 10 observations. The outcome was then converted into the percentage change between current realized volatility against future date realized volatility.
- The **VIX Volatility Index**
- **BitCoin Prices**: We backtested only the cryptocurrency lexicon term against BitCoin prices.

While the VIX of course is based on the S&P[18], we tested against both sets of market data for a specific reason. The U.S.

[17] Public policy, like capital markets, follows a profoundly momentum-based rhythm. Understanding the contour of volatility also requires understanding the shape of the curve for day-to-day normal activity levels. Because the PolicyScope™ data is entirely new, it is possible that different patterns could emerge for different issues as well as for different time periods.

[18] Specifically, the VIX is based on SPX options market prices in order to estimate "the conditional risk-neutral expectation of the annualized return variance over the next 30 calendar days." *A Tale of Two Indices*, Peter Carr and Liuren Wu,The Journal of Derivatives (Spring 2006).

stock markets are the most liquid, large, and active equity markets on the planet. The S&P Total Market Index is a direct measure of U.S. equity market volatility. We consider this an acceptable proxy for overall equity market volatility, subject to the proviso that its own volatility is driven by the economic sectors represented in the index.

While many measures of U.S. equity market volatility exist, we chose the S&P because we also sought a backtest against market expectations regarding potential future volatility. The premier measure of forward-looking market volatility is the VIX Volatility Index. The VIX is based on S&P market prices. Consequently, backtesting against both the VIX and the S&P 500 would provide us with an apples to apples comparison of volatility expectations as well as realized volatility using well-established related market data.

We note that our data is global but we backtested only against U.S. equity markets. As noted, these are highly liquid and deep markets with a long history of being responsive to global macro pressures. Because our data is generated from the global public policy process, we capture public policy signals that likely impact other global trading markets (particularly London, Frankfurt, Paris, Hong Kong, Tokyo and Singapore).

Subsequent backtests could assess correlations against these and other market indices. Backtests against sectoral indices could generate additional insights on how to measure policy-related systematic risks for those sectors specifically.

Finally, a note on correlations. Throughout this paper we reference observed correlations against realized volatility. Much of the discussion understandably focused on positive correlations. But in many instances strong negative correlations and covariances also exist.

Knowing when markets move in the opposite direction from a reference point can be just as valuable as knowing when markets move in tandem with a reference point. Alpha capture can occur regardless of whether the quantitative values and direction are positive or negative. We understand this.

Covariances in relation to PolicyScope™ data require more research. In many instances, they may signal that markets have already priced in the public policy information. But they may also instead signal the sizes of potential alpha available to contrarian investors as they start measuring and managing policy risk exposures quantitatively using PolicyScope™ data.

The backtest data in this report suggest strongly that a handful of market participants are already pricing in some public policy data, mostly likely using traditional human intelligence supplemented by some technology. We save for another day an assessment of whether and how covariances may decrease or shift as quantitative policy risk management becomes more prevalent.

Economic Sector Mapping

During Spring 2021, BCMstrategy, Inc. mapped its lexicon terms against the publicly available 4-digit NAICS codes. Daily data feeds incorporating this mapping against 1000+ lexicon terms are available commercially and exclusively through the Bloomberg Enterprise Access Point. However, the S&P does not use the same economic sectors as NAICS.

In order to assess potential volatility correlations within the S&P Total Market Index, we instead mapped the lexicon terms to broader economic sector designations that correspond to just over 50 Generalized Industry Codes industries. We then compared the realized volatility of individual S&P sectoral indices against the aggregate daily PolicyScope™ data mapped to that industry.

Section IV. Correlations Against the S&P Total Markets Index + Days in Advance

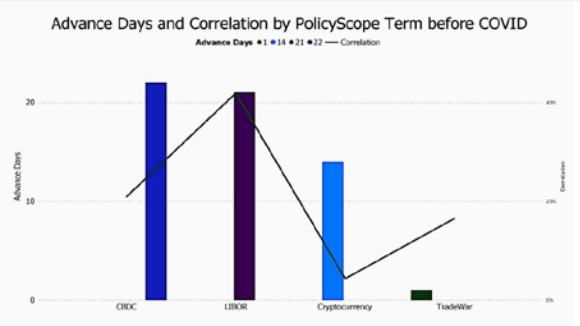
Correlations and Days in Advance: Lexicon Terms

The backtest revealed an overwhelmingly strong set of correlations across lexicon terms in relation to the S&P, often nearly a month in advance. The correlations illustrate not only a solid market signal but a sufficiently advanced signal to permit portfolio managers to establish strategic positions. This was true both before and during the pandemic period, but the composition of the signal shifted after the pandemic.

Pre-Pandemic Period

(2019-Feb. 2020)

Before the pandemic, the lexicon terms that generated the least amount of media coverage (CBDC, LIBOR, Cryptocurrency) generated the most powerful advance signals of market volatility.



The outcome is intuitively correct. During 2019, media coverage and market volatility reacted strongly to trade war tensions as the United States took an increasingly aggressive stance against both traditional trading partners (the European Union) and China. Even with significant media coverage, the PolicyScope™ dataset delivered a few days advance warning of market volatility.

Why would PolicyScope™ data deliver advance notice of market volatility in relation to a high profile issue? *Because the patented process that produces the data does not rely solely on media coverage to generate quantitative data.* The process captures technical and sometimes obscure policy shifts which investment professionals only see with a time lag. *The correlations data reflects the informational advantage of accessing this information immediately.*

2019 was also the year that Facebook's Libra proposal catapulted cryptocurrency into the public policy spotlight. Correlations against BitCoin price volatility would be low because, at that time, the prevailing sentiment in cryptocurrency markets was that the official sector could do little to regulate non-sovereign currencies. The

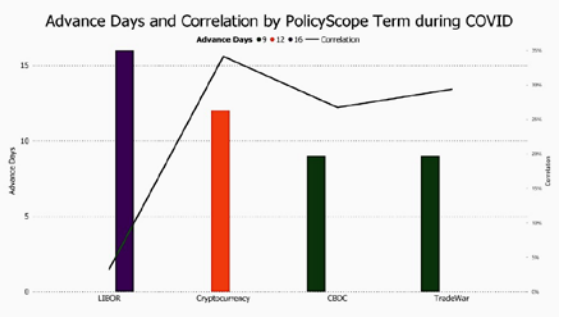
backtest results indicate that technical regulatory policy moves took a little over ten days before markets reacted. Again, this is intuitively correct. Technical regulatory policy moves might not have been noticed by markets unfamiliar with and disdainful of official sector regulation; but once the details were absorbed the price adjusted.

The most advance warning and the highest correlations with market volatility during the pre-pandemic period arose in connection with two highly technical policy issues (CBDC and LIBOR). During 2019, policymakers began in earnest to urge financial institutions to implement agreed shifts away from the predominant benchmark interest rate used in financing contracts (LIBOR). The shift towards national benchmark rates would particularly impact credit underwriters as well as corporate bond issuers.

PANDEMIC PERIOD

(FEB. 2020-DEC. 2020)

Everything shifted after the pandemic hit, of course. The average number of days for which volatility correlations were available in advance shifted.



Again, these outcomes are intuitive. The advance signal increased for trade war, largely due to decreased media coverage of this policy term during the pandemic. Rapid shifts towards electronic issuance of pandemic-related emergency payments and accelerating public policy activity regarding both CBDC and cryptocurrency issues (particularly during the second half of 2020) tightened up timelines but still provided at least one week's advance notice of market volatility, which is sufficient to establish a strategic position to capture alpha.

These advance signals operated in relation to U.S. equity markets ***without tickerization.***[19]

However, we have mapped the data to economic sectors as noted above. Different policy issues were associated with different economic sectors. The backtest thus sought to determine whether the economic sectoral mapping delivered advance notice of equity market volatility. The answer is YES, although of course variations in the data occurred after the onset of the pandemic.

[19] Alternative data providers increasingly create automated linkages between their data points and specific securities. This step has not yet been undertaken for the PolicyScope™ dataset.

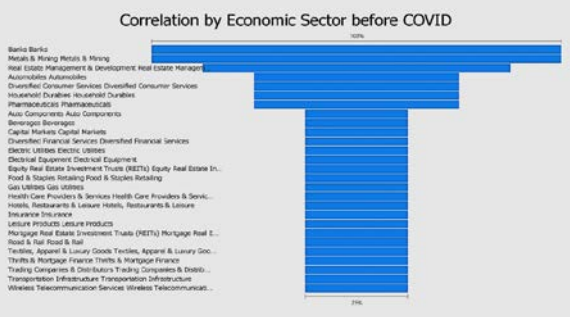
Correlations and Days in Advance

Lexicon Terms Mapped to Economic Sector

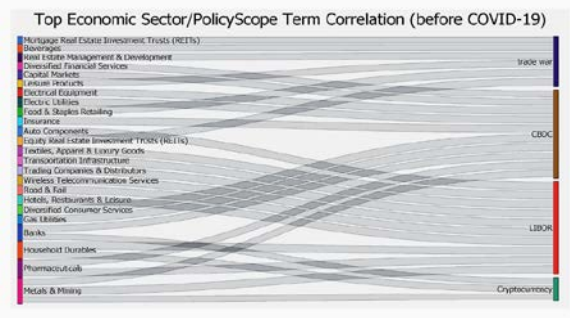
Pre-Pandemic Period

(2019-Feb. 2020)

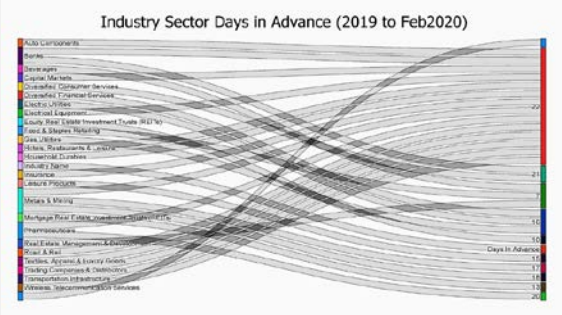
Before COVID-19 hit, a broad set of economic sectors experienced correlated market volatility, led by banks:



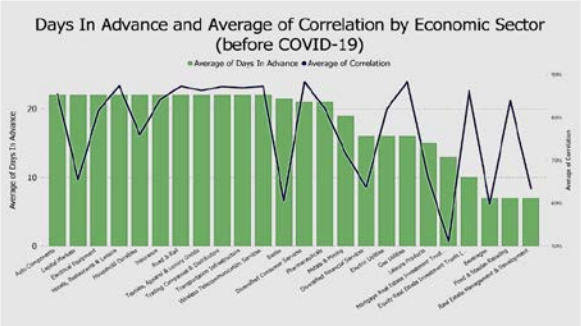
What drove these correlations? When we map the top economic sector correlations against our four tested lexicon terms, "trade war" unsurprisingly emerges as the at the top driver:



The economic correlations were not just high…..they were early. The top economic sectors seeing high advance notice of market volatility typically saw early warnings two to three weeks in advance of realized volatility in the equity markets.



Moreover, the average number of days in advance were robust and sufficient to generate advance market positioning, particularly for high correlation economic sectors:



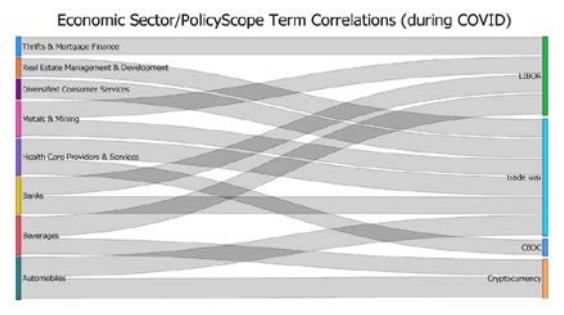
Mapping our lexicon terms to economic sectors means investors can see when public policy activity relevant to that economic sector is spiking. Policymakers may not act every day specific with respect to, say pharmaceuticals or mining. They may not mention individual economic sectors by name. But if one knows which public policies are important to which economic sectors, then mapping to those sectors generates valuable alerts….before the rest of the market has had the opportunity to price in the development.

Investors choosing to visualize PolicyScope™ data through the prism of economic sector would therefore see activity and volatility whenever a diverse set of public policy activity occurs. In the context above, high activity levels regarding cryptocurrency policy delivered nearly 20 days advance notice of market volatility with a high degree of correlation.

Pandemic Period

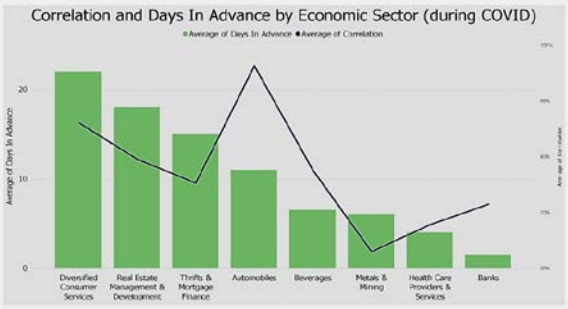
(Feb. 2020-Dec. 2020)

Did the onset of the pandemic impact observed correlations? Yes, and no. The distribution of activity shifted but the overall advance notice of market volatility remained in place.



Again, the results are intuitive. The economic sectors most impacted during the pandemic in the overall market delivered high correlations with lexicon terms that were core to their business models (particularly LIBOR and trade war). The overlap between trade war and COVID-19 during the period is striking as well as intuitive given the intense public policy debate globally regarding the manufacture and supply chain issues associated with crucial medical equipment and core raw materials necessary for powering modern technology (including automobiles).

Intense media coverage of the risks to the economy and the health system helped drive down the average days in advance in which PolicyScope™ policy volatility preceded volatility in the S&P for banks and health care providers, but mapping policy terms like trade war to economic sectors like automobiles helped generate solid advance notice for important economic sectors:



We are well aware that correlation does not necessarily and always denote causation. It is important to interpret the powerful signals from this backtest precisely and carefully.

It is crucial to recognize that our backtest operated in a highly constrained environment. We included mappings for only four lexicon terms against all industry sectors, not all available lexicon terms. The full PolicyScope™ dataset incorporates 1,000+ lexicon terms. Consequently, the full dataset provides a more comprehensive assessment of public policy exposures for any given industry sector. This is especially the case starting in September 2021 because we have recently added 100+ monetary policy lexicon terms to the dataset. The more comprehensive core data may generate more robust results.

It is also crucial to underscore that the backtest did not attempt to determine

whether – or not – markets were pricing assets in the economic sectors above in relation to trade war or any of the other lexicon terms. In fact, since capital markets were not using PolicyScope™ data to price assets during the testing period in question, we would expect that the public policy risks priced into the market data above were largely driven from headline risk at the short end and the trickling through of analysis at the high end of the advance notice period.

Consequently, we believe that the correlations data discovered during this first backtest of PolicyScope™ data identifies the increased efficiencies available to investors as measured by the number of days in advance that PolicyScope™ data showed volatility relative to the market. We also believe that since the majority of market participants are not yet pricing in relation to PolicyScope™ data, many public policy risks were not likely priced into the market at the time, which means alpha opportunities and risk mitigation opportunities were missed.

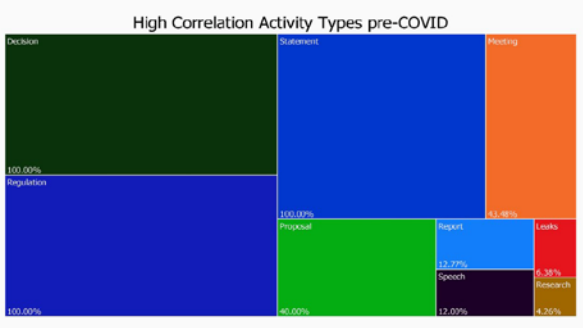
The backtest data seems to confirm this hypothesis when we isolate the market correlations associated with specific types of policy activity.

Correlations and Days in Advance (Activity Types)

Given that the market already prices in relation to headlines, it is not surprising to see a 100% correlation for activity types that generate headlines. But the distribution of other correlations and the shift between the pre-pandemic and pandemic periods was intriguing.

Pre-Pandemic Period

(2019-Feb. 2020)



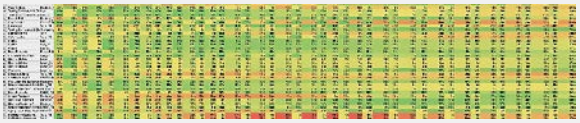
The interesting developments were to see *any* correlations with items that rarely generate major media coverage (research, speech, meeting) and to see that meetings and proposals generated nearly equivalent high correlations.

These correlations were recorded across lexicon types. In other words, the activities were highly correlated against market volatility in advance regardless of the issue in play.

We interpret this data as confirmation that markets respond to official sector activity even when the activity does not generate headlines. Lower correlations indicate that only a minority of the market with access to superior public policy information (e.g., large firms with chief economists) are able to price in the risks related to public policy

at present. *The correlations are striking not for their size but for the fact that they exist at all because the market is not yet systematically pricing against these early indicators of policy action. Seeing any correlations for non-final activity (e.g., speeches, meetings, proposals, etc.) provides a window into the alpha capture some market participants are achieving through old-fashioned human intelligence and expert opinion.*

We view the 30% to 60% observed correlations as pure alpha waiting to be found across a broad range of sectors. Consider the snippet below of observed industry/activity type correlations calculated against the S&P:

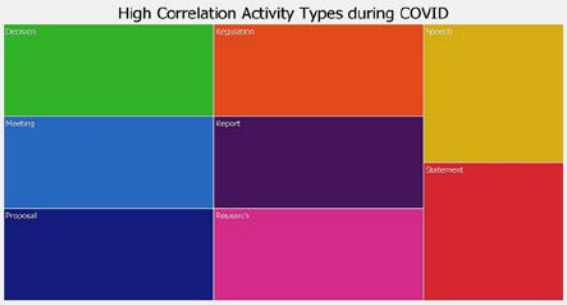


PolicyScopeTM data makes that alpha capture available to a wider universe of portfolio managers. Our patented data generation mechanism automatically finds, surfaces, and quantifies the early activity…and makes it accessible to portfolio managers through the prism that matters to them: economic sector.

Pandemic Period

(Feb. 2020-Dec. 2020)

The distribution of high correlation activity types shifted dramatically during the pandemic period, with increased diversification and distribution on display



The nearly even distribution suggests strongly the extent to which markets shifted towards an increased focused on public policy as a driver of asset prices during the pandemic period.

In other words: PolicyScope™ data delivers reliable advance notice of equity market volatility whether viewed through the prism of a lexicon term, an economic sector, or a specific type of public policy activity (and related combinations thereof). The next step was to see whether PolicyScope™ data would outperform the industry standard for predictive measures of market volatility: the VIX.

SECTION V. CORRELATIONS AGAINST THE VIX + DAYS IN ADVANCE

Because the VIX represents market expectations of S&P market volatility, we would expect to see slightly lower correlations between the VIX and PolicyScope™ data. Strategic investors that take positions in the VIX are highly responsive to the news cycle. This segment of the capital market is one of the most forward-looking, tracking public policy developments and major events intensively in order to generate returns by anticipating equity market volatility.

Not only did PolicyScope™ data out-perform the VIX as a forward indicator of market volatility, it did so often with a two- to three-week lead time. As with the S&P data, however, the distribution of lexicon terms and activity types shifted.

But these early results are encouraging. It is important in this context to underscore how PolicyScope™ data outperformed the VIX and what kinds of additional questions this raises. First, as noted, PolicyScope™ data generated consistent advance notice of VIX volatility. Second, the backtest results also show that PolicyScope™ data generated advance notice of S&P volatility (upon which the VIX is based). *The backtest results thus show that strategic investors seeking superior alpha capture from investments in the VIX will increase their ability to move closer to the efficient frontier using PolicyScope™ data when trading volatility.*

Yet when we look at the full time series across both the pre-pandemic and pandemic periods, we see multiple instances in which PolicyScope™ data accurately signaled VIX volatility.

Using the same four lexicon terms (trade war, LIBOR, CBDC, Cryptocurrency), *PolicyScope™ data outperformed the VIX across both activity types (for all lexicon terms) and even CBDC, both before and during the pandemic:*

Additional research will be needed, of course. This initial backtest did not attempt to determine whether the anticipatory volatility signals regarding the VIX also served as advance indicators of realized volatility in the S&P. The chart on the previous page depicts only the top ten outcomes. A more comprehensive assessment using a broader range of lexicon terms would be warranted. We expect at least some market participants may find this data of interest because they already use underlying options market data and VIX futures for purposes of pricing VIX options.[20]

[20] *A Tale of Two Indices*, Peter Carr and Liuren Wu,The Journal of Derivatives (Spring 2006).

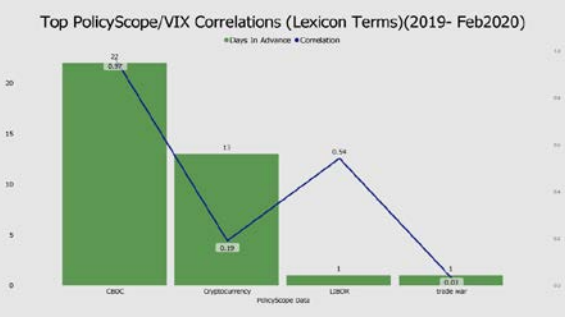
For example, a close assessment of the top performing activity types in the chart above reveals that the activity types are those most correlated with headline-generating activity. Additional alpha capture could thus be achieved by tracking with a high level of precision additional activity types (e.g., speeches) for specific high-value lexicon terms (e.g., supply chain diversification).

CORRELATIONS AND DAYS IN ADVANCE (LEXICON TERMS)

PRE-PANDEMIC PERIOD

(2019-FEB. 2020)

Unsurprisingly, the lowest number of days in advance and the lowest correlations between our tested lexicon terms and the VIX was with respect to trade war. During 2019, markets were reacting strongly to headlines and actions related to trade war especially in the United States. Relatively low advance notice but relatively high (54%) correlations regarding LIBOR make sense for a different reason. VIX traders watch interest rate and risk-free benchmark shifts with a high degree of attention because many derivative contracts are priced in relation to a risk-free rate. This is a technical market where technical moves in benchmark rates would be noticed quickly and acted upon.



Relatively high advance warning of volatility regarding both digital currency issues (CBDC and cryptocurrency) during 2019 is also intuitively correct.

The VIX is often seen as a forward indicator of global macro risks that can impact markets. Few issues are more global in their impact that the potential issuance of a sovereign digital currency, particularly if the issuer is a reserve currency central bank. *The broader public and mainstream media may not care much about CBDCs, but the PolicyScope™/VIX correlations during 2019 indicate that hyper vigilant VIX traders notice every technical move central banks make in this space….with a 22 day lag relative to PolicyScope™ data.*

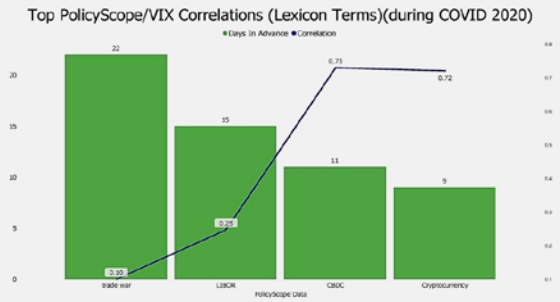
PANDEMIC PERIOD

(FEB. 2020-DEC. 2020)

Relative correlations and advance notice periods changed during the pandemic. LIBOR remained a top performer, anticipating market volatility 15 days in advance with a 25% correlation. But the trade war term moved to the most advance signal (22 days), albeit with a low correlation (10%). This is also intuitive.

When markets are pricing in pandemic-related activity and policymakers stop talking about trade wars except with respect to very targeted supply chain issues (e.g., health care, rare earths, automobiles), a broad market aggregate like the VIX that anticipates general market volatility will not be highly correlated with trade war issues.

Pandemic era correlations regarding both CBDC and cryptocurrency jumped to just north of 70% as governments accelerated their efforts to deliver competitive payments for an increasingly digital and quarantined planet.



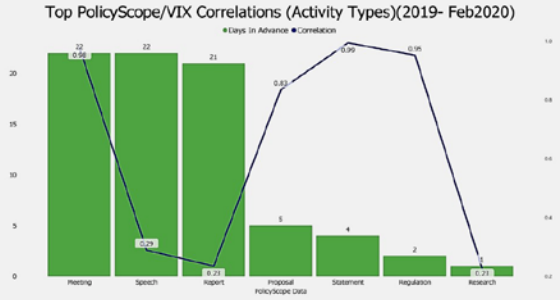
CORRELATIONS AND DAYS IN ADVANCE: ACTIVITY TYPES

The VIX correlations showed a similar reaction function as the equity markets with respect to activity types during both the pre-pandemic and pandemic periods. The distribution of correlations and advance notice again shifted across the two periods. The backtest results point to significant informational advantages and alpha capture opportunities for VI traders specifically in relation to the public policy cycle, particularly for activity types with long (e.g., 22 days) notice periods.

PRE-PANDEMIC PERIOD

(2019-FEB. 2020)

Low single digit advance notice days and high (83%-99%) correlations indicate unsurprisingly that VIX traders operate on a par with equity traders to absorb within a week the kinds of activities that generate headlines (proposal, statement, regulation):



VIX traders are also far more sensitive to meetings, registering a 98% correlation relative to the equity market's 43% reading. But the time lag to price in the informational content from a meeting is long: 22 days. We see this as another significant alpha capture opportunity made available through PolicyScope™ data.

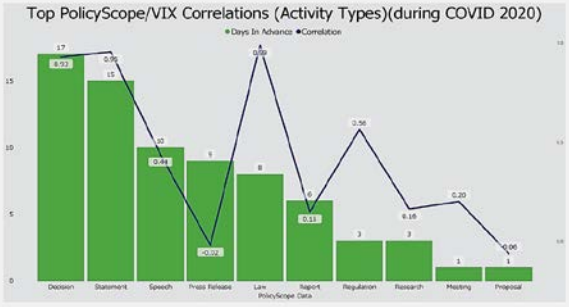
Correlations for the activity types that are less final (speech, report, research) were unsurprisingly low, which again signals opportunities for alpha capture given the

long lead times. Interestingly, however, the lag from research releases was considerably less than for speeches and reports. The outcome is consistent with behavior patterns in VIX and futures/options trading in which expert investors scour new research releases for hints about monetary policy shifts.

PANDEMIC PERIOD

(FEB. 2020-DEC. 2020)

Public policy reaction functions shifted significantly during the pandemic. During a crisis period, government officials generally issue more statements and those statements provide meaningful indicators for future policy action. Correlations regarding statements dropped slightly during the pandemic period (down to 95%) but the time period for reaction jumped from four days to 15 days.



The advance notice of market volatility regarding meetings plummeted to 1 day, with correlations also dropping from 99% to 20%.

These data deliver a striking picture of crisis decision-making during 2020. Strong reaction functions to final decisions (laws regulations, statements, decisions) are to be expected particularly the often hair-trigger responses capital markets deliver in relation to headlines. But the time periods involved even for the VIX (which is more sensitive to new developments) suggests strongly that the market is slow to react to public policy.

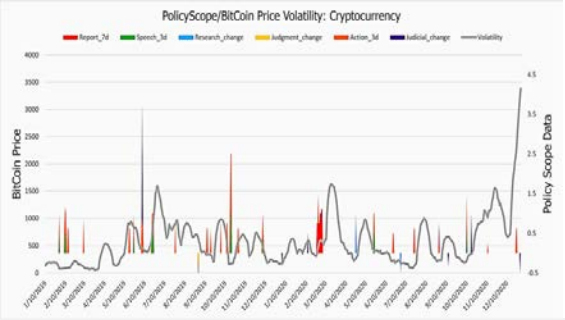
Reaction functions of 3-10 days for laws and regulations could be explained away by the possibility that markets would already have priced in related volatility in prior periods in response to headlines about pending legislation. *Long lead times regarding decisions, statements, and speeches indicate that amid a pandemic it took the VIX market two to three weeks to absorb technical public policy shifts regarding non-pandemic policy matters*.

We view these data as illustrating concretely the scale of the informational advantages that accrue to capital market participants that use PolicyScope™ data to measure and manage their exposure to technical shifts in public policy. Even when massive distractions (like a pandemic) exist for humans, the automated patented process that generates and delivers PolicyScope™ data is not distracted or overwhelmed. It can deliver alerts and insights even amid significant disruptions.

SECTION VI. CASE STUDY: CRYPTOCURRENCY POLICY

PolicyScope™ data provides more than just advance notice of generalized market volatility. ***Our backtest shows that a targeted lexicon term can provide advance notice of market volatility against a specific paired asset.*** Our case study demonstrates the relationship between public policy activity regarding cryptocurrency policy and BitCoin prices.

A range of PolicyScope™ activity types regarding specifically cryptocurrency policy consistently registered volatility ad increased activity levels in advance of BitCoin price moves from January 2019 to December 2020:



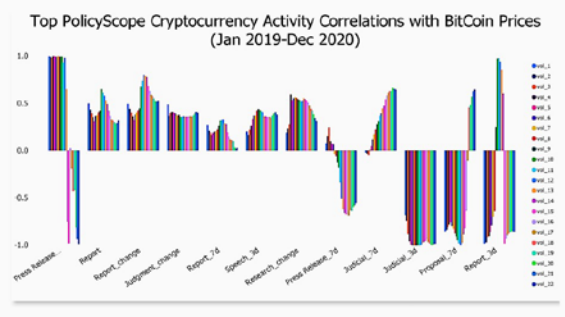
The cryptocurrency backtest results provide a particularly clear picture of the reaction function related to specific activity types. It is true that BitCoin prices may be more sensitive to public policy shifts since all cryptocurrency and BitCoin market participants are uniquely exposed to the risk of massive increases in regulatory oversight in the near future.

But BitCoin is not the only asset in capital markets sensitive to macro-policy risks.

- Equity and fixed income instruments issued by companies in highly regulated industries operate with cost structures that are highly sensitive to small shifts in public policy.
- Equity and fixed income issuers in the manufacturing and farming sectors (and their underwriters in the financial sector) will be highly impacted by shifts in disclosure standards with respect to climate-related risks.
- Currencies and fixed income instruments issued by sovereigns will also be highly impacted by shifts in climate-related disclosure standards as well as monetary policy and digital currency policy.

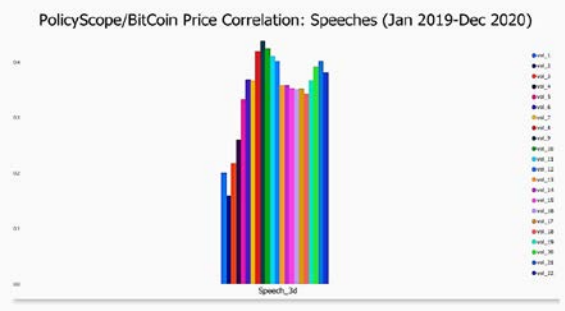
PolicyScopeTM data currently covers all these issues, and more. Our two years of data regarding cryptocurrency policy provides a starting point for the kind of correlations and analysis that are now possible for strategists and portfolio managers seeking a more objective, reliable, and consistent mechanism for measuring exposure to public policy shifts at precisely the moment when rules are changing.

Twelve distinct types of official sector activity generated strong correlations against BitCoin prices between January 2019 and December 2020. These included activity at the 3-day rolling average and the 7-day rolling average as well as the daily change values:

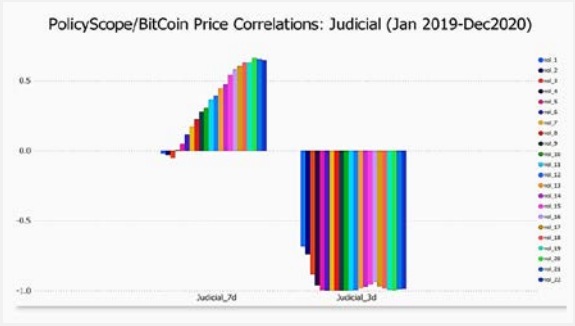


Let's start with press releases. Unsurprisingly, press releases show a high and immediate correlation which drops off quickly as new information is absorbed:

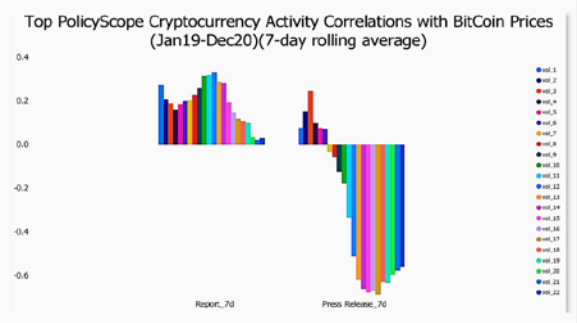
Speeches seem to have a longer impact, but they take marginally longer to correlate with volatility. Consider the 3-day moving average which shows moderate to low activity initially. The steady near-doubling of correlations over a handful of periods illustrates visually the process by which industry analysts and media outlets start discussing the implications of an official sector speech and markets start to reprice accordingly.



The converse is true for judicial activity in the cryptocurrency context. The U.S. Securities and Exchange Commission was been particularly active in generating enforcement actions against cryptocurrency issues during 2019-2020. As the correlations analysis below illustrates, relative lack of media coverage for these activities (the 3-day rolling average) does not register in the markets. But as information about enforcement actions trickles into the market and the full implications of the latest move are understood, market prices adjust accordingly:



Report issuance has its own, separate dynamic in the cryptocurrency context. Reports tend to be highly technical and conceptual in nature. They do not generate much media coverage. They also do not represent imminent shifts in regulatory requirements. But they can generate passing attention. The correlation analysis for the 3-day moving average illustrates this dynamic well:



The 7-day moving average, while less dramatic, illustrates the parallel longer term impact of the policy reaction function in which report issuance literally changes the conversation about public policy priorities, permitting markets to adjust.

The correlations are striking not for their size but for the fact that they exist at all because the market is not yet systematically pricing against these early indicators of policy action. Seeing any correlations at the 30% to 60%% level for non-final activity (e.g., speeches, meetings, proposals, etc.) provides a window into the alpha capture some market participants are achieving through old-fashioned human intelligence and expert opinion.

PolicyScopeTM data makes that alpha capture available to a wider universe of portfolio managers. Our patented data generation mechanism automatically finds, surfaces, and quantifies the early activity…and makes it accessible to portfolio managers through the prism that matters to them: economic sector.

The detailed analysis of the cryptocurrency/BitCoin correlations illustrates the kind of analysis that can be conducted using PolicyScope™ data across asset classes and economic sectors. The strong correlations discovered in this first backtest against large market aggregates like the S&P and the VIX suggests strongly that additional single-issue correlations may exist

.

SECTION VII. CONCLUSION -- MEASURING THE FUTURE

Officials that make public policy decisions change the future with every word. These activities move markets…..when markets notice.

This first backtest of PolicyScope™ data documents how long it takes markets to notice that the official sector acted with respect to four issue areas: trade war, LIBOR, CBDC, and cryptocurrency. The current dataset, however encompasses over 1,000 curated lexicon terms tuned tightly by subject matter experts to the specific language of each policy area.

The backtest suggests strongly that it can take up to 22 days for some activity to be priced in to the capital markets and, when the activity is priced, there is a high degree of correlation with market volatility. That public policy volatility generated market volatility is already well appreciated. Less well appreciated is how long that volatility can take to materialize.

By partnering with InvisageAlpha to run some initial backtests, the data show conclusively that informational advantages and alpha generation opportunities exist for portfolio managers and strategists merely by using the daily, objective PolicyScope™ measurements of public policy activity generated by the patented BCMstrategy, Inc. process.

The PolicyScope™ dataset literally measures the path policymakers are building towards the future, word-by-word. The measurement weightings in relation to activity type hard-wire assessments of how final or tentative the action may be.

We know that correlation is not causation. The current PolicyScopeTM measures deliver insight into public policy volatility which is highly correlated with market volatility and at an earlier point in the cycle than headline-driven market volatility. Portfolio managers and other investors that trade volatility can thus capture gains and informational advantages even without knowing the likely outcome of the policy process for any issue.

This is only the beginning.

With a solid three years of curated, tagged, and quantified language in our database, BCMstrategy, Inc. in 2022 will have sufficient training data to start working in earnest with machine learning and artificial intelligence systems to begin experimenting with policy trend projection.

Importantly, the PolicyScope™ dataset straddles a significant event that likely generates a major disruptive break not only in capital markets but also in public policy formation: the pandemic. Massive central bank asset purchase programs and low interest rates[21] exert a powerful stabilizing force in capital markets. Policy priorities during the pandemic period extended not only to health policy but also to massive economic support, infrastructure, digital currency, and

[21] The scale and scope of global quantitative easing programs are tracked and shared publicly by the Atlantic Council HERE: https://www.atlanticcouncil.org/global-qe-tracker/

climate-related risk policies. Capital markets know that pricing in many sectors has been skewed by these activities. They know that asset prices increasingly reflect more than "the fundamentals;" those prices also increasingly reflect the impact of public policy activities.

Markets increasingly require near-term data and nowcasting-based analysis in recognition that the pandemic created a break in the time series for market data. A comparable break or shift has occurred within the public policy process. Pricing in climate-related risks, shifting towards electronic currencies, and conducting monetary policy amid an ongoing pandemic that coincides with a shift towards a digital economy means the conversation is changing about which issues and which priorities will drive public policy choices. Nowcasting is more important than ever. The PolicyScope™ dataset is uniquely suited to support strategic investment decisions in this context.