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Markets and Expectations in the Era of Dissonance

In these challenging times, one thing seems certain: the status quo is not sustainable. When a large number of market participants believe that statement and apply it to the prices of many different types of exposures there are going to be challenges. The expectations process that underlies market behavior is highly likely to exhibit abrupt changes in correlation structures and dynamically shifting levels of volatility in addition to some sharp movements in prices. This spells big trouble for financial risk management, argues for greater use of options to manage volatility risk, suggests more attention has to be paid to counterparty risk, and challenges some of the critical assumptions embedded deeply into quantitative methods for analyzing risks and constructing portfolios.

To develop appropriate strategies for risk management in these challenging times, it is incumbent on us to better understand the sources of the problems facing markets. Practitioners have a name for this market environment – "risk-on, risk-off" – yet that descriptive moniker tells us little about the underlying problem and nothing about possible approaches to risk management. Our argument, first, is that there is a severe confluence of sources of dissonance in the world today that produces a continuous stream of decision points in which there are very different potential outcomes. And second, we believe we need to examine deeply the expectations process to come to grips with why markets do not easily discount future outcomes when the potential scenarios are widely divergent and market participants only agree that the status quo cannot be sustained. By gaining a better appreciation of these two insights, we can start to improve our risk management processes to meet the challenges.

Sources of Dissonance and Divergent Scenarios

The sources of dissonance are well known. From population trends, to property rights, to policy constraints, countries around the world are being driven apart rather than pulled together by common objectives.

The mature industrial countries are much older than most of the emerging market countries, China excepted. Younger countries have a compelling need to create jobs and build a robust middle class. Politically they focus on exports, are likely to tolerate higher inflation levels, and desire to avoid currency strength even as they attract capital due to their exception growth potential. The mature industrial countries are facing a stagnant or even shrinking labor force as more people retire than young people seek jobs. The political agenda is all about wealth and health. The focus is on keeping the wealth these countries have accumulated, meaning a preference for low inflation and stable to stronger currencies. And, the social debate is about retirement safety nets and health care for an aging population.

We define property rights broadly to encompass the policies and political context that assists consumers and businesses to plan for the future. In absolute terms, the planning and property rights equation appears to favor the mature industrial countries. In finance and economics, however, everything is about relative prices and comparisons. That is, what matters for markets, and for the flow of capital, is that the pendulum of property rights is swinging backwards in most mature industrial countries and swinging forward in many emerging market countries. From the US, to Europe, to Japan, there is political uncertainty of proportions not experienced since the divisive first half of the 20th century with its two world wars and Great Depression in between. By contrast, in many of the robust economies of the emerging markets world, there is considerably more political stability than 15 or 20 years ago. Enforcement of contracts has improved, and economic policy-making is much more consistent and predictable than in the not too distant past.

And then there are the policy constraints. The mature countries are over-indebted, just as their growth prospects are slowing with their demographic trends. That is, they have way too much debt and less future income to pay the coupons. Mature economies have entered an extended period of market-enforced fiscal austerity. And since the Financial Panic of 2008, central banks have taken short-term interest rates to near zero and experimented with massive balance sheet expansion. While these emergency measures more than likely prevented a financially-induced crisis from becoming a global depression, they have not been effective in getting economic growth back on track. That is, in the mature economies, monetary policy is tapped out as a tool for economic expansion.

going away any time soon. One can no longer assume that over time market outcomes are drawn from distributions of possibilities with similar volatility and correlation structures. Correlation structures will not be stable and may even swing quite wildly. The ability to manage financial risks effectively over any time frame will be much more difficult. Market participants will need to re-assess many of the basic assumptions that guide their understanding of financial risks and form the basis for their decision making.

Our hope and challenge in this report is to provide an intellectual framework for understanding how to construct an effective risk management strategy in this Era of Dissonance as well as to highlight some practical guidelines for navigating through these difficult times.

The three P's of dissonance – population, property rights, and policy constraints – have the simultaneous impact, acting together, to force a stream of truly difficult political choices with widely divergent potential economic outcomes. This forces economic and financial analysts to spend considerable attention on the political agenda. From the political analysis comes the conclusion that we are going to be living over the next decade with a seemingly never-ending series of difficult choices. This means that market expectations will be formed with multiple scenarios, some very far apart from each other. There will typically be a low, but significant, probability of a very dire outcome set against a somewhat higher probability of a more benign economic and financial outcome. Does the US pass the debt ceiling or default causing severe market disruptions? Does the euro fall apart or muddle through? Will China allow the RMB to float freely sooner or much later? Will Russia shutdown wheat exports again? Will upstream countries build so many dams for hydro-electric power that downstream countries see their supply of water irrevocably altered, impacting their agriculture and industrial sectors? From commodities, to currencies, to equities, to bonds, all asset classes are impacted.

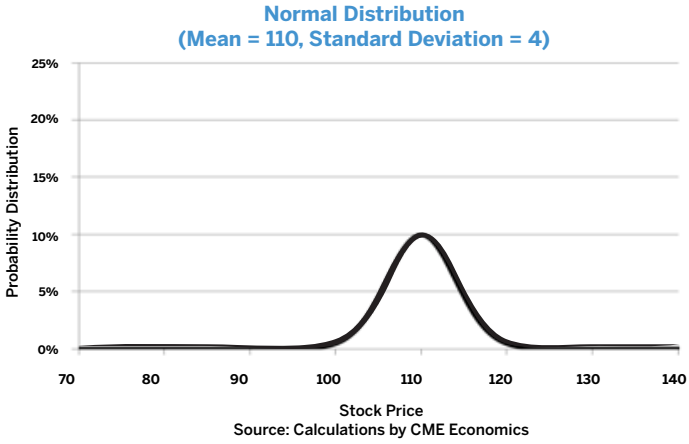
How Markets Rationalize Widely Divergent Scenarios

In terms of market expectations, the existence of plausible scenarios that are far apart along with the presumption that the status quo is not sustainable builds additional volatility into the market with the level of volatility and the correlation structure also subject to abrupt changes. In terms of probability theory, we are looking at a bi-model distribution of potential returns that appears nothing like a bell-shape or even a highly skewed single-mode distribution.

In more calm times, such as the very special period from 1950-2000, the major industrial countries largely shared a common context. With new information about the economy, market participants shifted their price and return expectations, yet for the most part the degree of confidence (i.e., expected volatility) and the structure of correlations between pairs of exposures were considered manageably stable. This type of expectations environment is characteristic of markets when the potential outcomes are different, but not so different as to result in bi-model probability distributions. This allows risk management systems to be built with embedded assumptions of single-mode distributions of potential outcomes.

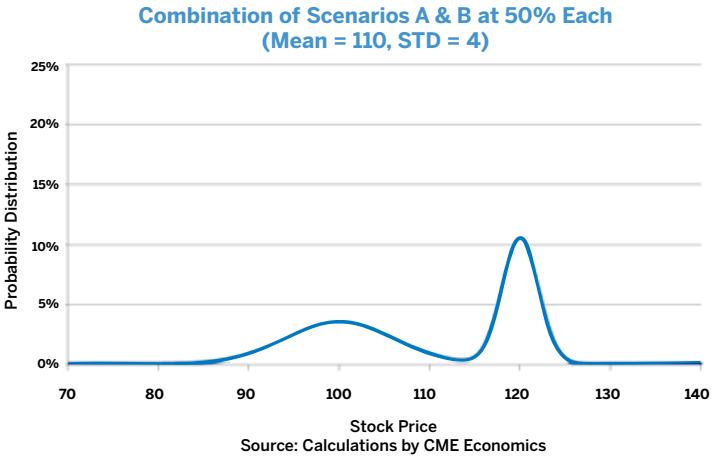
With the profound and powerful sources of dissonance causing a steady stream of widely divergent potential outcomes, along with the presumption that the status quo is not sustainable, we have a much more complex expectations process. Take an example from the world of mergers and acquisitions. Suppose one company is trading at a stock price of $100 per share, and a bid is received for $120. Further suppose that the merger of the two companies potentially disrupts competition in that industry, and the regulatory authorities may disallow the merger (50% chance) or allow it (50% chance). What is clear is that there is 50% chance of the price of the company being acquired going to $120 (merger allowed) with a relatively narrow variance, and a 50% chance of the price going back to $100 with a rather wide variance due to uncertainties about whether the disallowed merger damaged the company's future prospects or not.

A lot of risk management systems would be given the information that the average expected price was $110 (the midpoint of the two scenarios) and the expected volatility was also an average of the two.



Unfortunately, the reality would be a far more complex, bi-modal (with local peaks at $100 and $120) distribution, with a non-trivial probability of outcomes far below the original $100 stock price. Moreover, once the regulatory authorities make their decision, the status quo will be changed for certain and for the future. This means that the past history of the volatility of the price of the company being acquired is not particularly useful in forecasting the future volatility. Indeed, the expected volatility that the market must process is dependent on how the probabilities shift between "merger allowed" and "merger denied", which is an entirely different question. To complicate things further, since the different scenarios have different expected volatilities, the market's average expected volatility shifts every time new information is received that changes the probabilities of the ruling by the competition authorities.

Well, this example is exactly what markets are facing quite regularly in these challenging times. And as probabilities shift for the dire outcome versus the more benign outcome, we see the result as a "risk-on, risk-off" world, with shifting volatility patterns and correlation structures that are decidedly unstable. What does all this mean for risk management?



Source: Calculations by CME Economics

Risk Management in a Risk-On, Risk-Off World

First, quantitative models and risk systems with embedded assumptions of single-mode distributions, even fat-tailed ones, may produce less useful forecasts and lead the user to misplaced over-confidence. The instability of the correlation structure leads to rising correlations within an asset class at the exact time that market risk is abruptly shifting higher, making diversification a less effective antidote to market volatility. This does not mean we should throw away our quantitative systems. They are still very useful. What it means is that we need to check each and every embedded assumption in how these quantitative models and risk measurement systems were built, so that we can reasonably evaluate the robustness of the results and adjust our confidence in the results accordingly.

Risk managers are being forced into a situation in which they must be much more forward-looking and less confident in the risk assessments based primarily on historical data. Historical data still can be used effectively. The issue is that time series methods typically have trouble when volatility and correlation structures are not stable (i.e., heteroscedasticity, for the quants). Historical data becomes more useful in case studies and worst-case scenario tests, and less useful in methods like regression analysis. Methods that are built to seamlessly integrate expert information and forward-looking perspectives, such as Bayesian inference methods, are one of several possible approaches to the "risk-on, risk-off" world.

Second, the instability of volatility leads to more active use of options. Options directly price volatility. In the simplest of option pricing models, the inputs that are known are the current price of the underlying exposure, the strike price, the time to maturity, and the borrowing rate, while the expected volatility of the return pattern of the underlying exposure is the unknown, which must be estimated. This focus on volatility makes dynamic option strategies a potential way to mitigate the increasing level of "vega" risk, as shifting volatility is called. Not surprisingly, the trading of options has increased significantly in the current environment.

Third, counterparty risk management has become more critical. Counterparty risk tends to rise sharply in a "risk-on, risk-off" world, simply because some financial institutions are considerably more advanced than others in adapting their risk management processes to an environment in which volatility and correlation structures are not stable. Couple this observation with the reality that the price of risk management mistakes is now much higher than it once was and it is easy to see why counterparty risk is a focus of market participants, not just regulators. Indeed, we are seeing end-user institutions, such as asset management firms, now pushing for greater use of clearing houses for swap transactions rather than waiting on regulatory actions.

Our conclusion is that financial markets have entered an **"Era of Dissonance"** that will stand in sharp contrast to the relative harmony and economic expansion of the last half of the 20th century. Financial markets will remain challenged, with bouts of uncertainty concerning strikingly different potential outcomes. The dissonance will profoundly disturb the dynamic evolution of market returns, volatilities, correlations, and risk-taking.

The CME Group is focused on helping our clients manage risks in this difficult environment. A variety of tools for implementing exposures and understanding market depth and liquidity are now available on the CME web site. For a demonstration of these tools see http://progressive.powerstream.net/008/00102/edu/interactive/order-execution/index.html. Across the board, from research to trading tools, the CME Group is committed to assisting its clients achieve effective risk management.

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