Study of Effects of VIX ETPs on Market Volatility

Type of Request: **Discretionary Project**

DERA Proposal

Objective

The Commission and the public have been interested in the causes and consequences of the February 5, 2018 market volatility event. After reviewing the hypotheses and views expressed by the media and other financial regulators, we propose to study whether the rebalancing needs of VIX ETPs have exacerbated price movements and market volatility.

Requestor:	Yu, Lei	Primary Customer:	Public
Submission Date:	6/22/2018	Proposed Completion Date:	10/31/2018

General Approach to Addressing the Objective of the Project

Approach

- Utilizing the order and transaction data obtained from CBOE with attribute activities to specific accounts, we test the hypotheses that advisors/issuers of VIX ETPs traded in the VIX futures markets between 4pm and 4:15pm to rebalance their holding in order to maintain their advertised leverage multiple. We also test the existence of other hedging trades or trades by other investors in anticipation of VIX ETPs' rebalancing activities. We use market impact measures to analyze how much of these trading activities had further contributed to the increase in VIX futures prices from 4pm to 4:15pm on February 5th.
- Use MIDAS and other market data, we test the potential spillover effects from VIX futures markets into other markets that are related to the VIX. Conduct a cross-market reconstruction analysis over related assets including VIX ETPs, VIX futures, S&P 500 futures, S&P 500 options, and S&P 500 ETFs. Use information share measure to determine potential lead-lag relationship across prices of assets.
- Work jointly with Su Li from ORDS and Jeannette Crawford from ORA.

Background

- A preliminary analysis has been conducted by the Bank for International Settlements BIS on the event of February 5th. The study showed that there was very large trading volume in VIX futures after the close, but cannot attribute it directly to VIX ETPs.
- DERA OLE and ENF are conducting investigations regarding behaviors of certain market participants during the February 5th event.

Alternatives

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Resource Requirements

- Code developing resources: SEC work computer, Data Science Workstations
- Data requirements: currently available account-level data from CBOE, MIDAS, MIDAS OPRA data (equity and options tick data), ETF daily creation and redemption data, Options open interest data.

Staffing Estimate

Resource Type Needed	Number of Resources Needed	Estimated % of time each resource will allocate to this request	Estimated # of weeks each resource will allocate to this request
Project Lead	1	**50-75%**	12
DBA	[Input number]	Choose an item.	[Input number]
Other Staff	2	**25-50%**	12
Contractor	[Input number]	Choose an item.	[Input number]
QRADS Support	[Input number]	Choose an item.	[Input number]

Consultation Only	[Input number]	Choose an item.	[Input number]
Choose an item.	[Input number]	Choose an item.	[Input number]

Results or Expectations

The study can be separated into two broad stages: 1) attributing VIX furutes market activity to VIX ETP rebalancing needs, which takes 6-8 weeks. 2) studying potential impact VIX ETP rebalancing on other markets, which takes 3-4 months.

No.	Milestone Name	Estimated Start	Estimated End
1.	Obtain list of all ETPs that are/were based on the VIX as of Feb 5	5/31/2018	6/15/2018
2.	Read the prospectus for each VIX ETP to determine how it defines its underlying index and achieves its advertised leverage exposure.	6/15/2018	6/30/2018
3.	Calculate the implied rebalancing demand in the markets used to implement the index exposure, adjusted for net creation / redemption activity.	6/15/2018	6/30/2018
4.	With CBOE data, analyze trading activities between 4-4:15pm attributable to VIX ETPs.	6/15/2018	6/30/2018
5.	With CBOE data, analyze order placed prior to the close that are attributable to rebalancing, or the anticipation of rebalancing trades.	6/22/2018	7/13/2018
6.	With MIDAS equity and options tick data, create time series of trading activities for each related asset. Construct VAR model to calculate information contribution (information shares) of the trading of each asset, in particular the rebalancing trades of VIX ETPs in VIX futures.	7/13/2018	9/14/2018
7.	Summarize and present findings of the study	9/14/2018	10/31/2018

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Critical Path items

Dependencies	• Identify any dependencies that may impact successful delivery.
Risks	• Identify potential resource and infrastructure constraints and risks that may threaten the completion of this request.
Mitigation Strategies	• Identify risk mitigation strategies for each identified risk.