

April 28, 2017

Assessment Report for NYSE Arca Incentive Program

NYSE Arca, Inc. (“Exchange” or “NYSE Arca”) is issuing this Assessment Report (“Report”) in connection with the Exchange’s Exchange-Traded Product (“ETP”) Incentive Program (“Incentive Program”), which is operating on a pilot basis until July 31, 2017, unless extended.¹ In the 2016 Extension Notice, the Exchange committed to post an Assessment Report on the Exchange’s website five months before the end of the pilot period or at the time the Exchange files to terminate the pilot, whichever comes first.²

The ETP Incentive Program is a pilot program designed to incentivize quoting and trading in ETPs and to add competition among existing qualified market makers. In addition, the ETP Incentive Program is designed to enhance the market quality for ETPs by incentivizing market makers to take LMM assignments in certain lower-volume ETPs by offering an alternative fee structure for such LMMs. The Incentive Program is designed to improve the market and trading quality for lower-volume ETPs.

This Assessment Report, which spans data from 11/1/2015 – 2/28/2017, assesses whether the ETP Incentive Program has met its proposed goals to incentivize market makers to take LMM assignments in certain lower-volume ETPs. This updated Assessment Report will analyze the performance of the ETPs (and their comparable ETPs) during their time in the Incentive Program and after exiting the Incentive Program. While the results in certain cases show strong evidence of higher market quality in some ETPs based on participation in the Incentive Program, the data is less conclusive for other ETPs. Much of this inconclusiveness can be attributed

¹ The Commission approved the ETP Incentive Program on a pilot basis in Securities Exchange Act Release No. 69706 (June 6, 2013), 78 FR 35340 (June 12, 2013) (SR-NYSEArca-2013-34) (“Incentive Program Release”). The Exchange subsequently filed to extend the original pilot program for the ETP Incentive Program until September 4, 2015 (see Securities Exchange Act Release No. 72963 (September 3, 2014), 79 FR 53492 (September 9, 2014) (SR-NYSEArca-2014-99)); until September 4, 2016 (see Securities Exchange Act Release No. 75846 (September 4, 2015), 80 FR 54646 (September 10, 2015) (SR-NYSEArca-2015-78); and until July 31, 2017 (see Securities Exchange Act Release No. 78497 (August 8, 2016), 81 FR 53524 (August 12, 2016) (SR-NYSEArca-2016-110) (“2016 Extension Notice”).

² The 2016 Extension Notice stated the following: “The proposed Assessment Report would list the program objectives that are the focus of the pilot and, for each, provide (a) a statistical analysis that includes evidence that is sufficient to inform a reader about whether the program has met those objectives during the pilot period, along with (b) a narrative explanation of whether and how the evidence indicates the pilot has met the objective, including both strengths and weaknesses of the evidence in this regard. The Assessment Report also would include a discussion of (a) the procedures used in selecting any samples that are used in constructing tables or statistics for inclusion in the Assessment Report, (b) the definitions of any variables and statistics reported in the tables, including test statistics, (c) the statistical significance levels of any test statistics and (d) other statistical or qualitative information that may enhance the usefulness of the Assessment Report as a basis for evaluating the performance of the program. The Assessment Report would present statistics on product performance relative to the performance of comparable or other suitable benchmark products (including test statistics that permit the reader to evaluate the statistical significance of any differences reported or discussed in the report), along with information on the procedures that were used to identify those comparable or benchmark products, the characteristics of each comparable or benchmark products, the characteristics of each product that is the focus of the pilot, the procedures used in selecting the time horizon of the sample and the sensitivity of reported statistics to changes in the time horizon of the sample.” Id.

to the limited data available. In addition, a number of variables impact the ability to assess the limited data to date, including market conditions, participation costs, product variability, and product inception date. Therefore, it is difficult for the Exchange to state conclusively whether the Incentive Program has met its objectives. The Exchange believes that the Incentive Program should continue as a pilot program in order to provide more time for participation so that the Exchange, the Commission, and market participants can meaningfully assess whether the Incentive Program will meet its proposed goals.

To assist the Commission and market participants in assessing the Incentive Program, on a monthly basis beginning October 2014, the Exchange has provided the Commission with certain market quality reports, which also are posted on the Exchange's website as Incentive Program Reports (<https://www.nyse.com/products/etp-incentive-program>). Such reports have included market quality data such as the following:

- volume (consolidated average daily volume (“CADV”) and NYSE Arca average daily volume),
- national best bid and offer (“NBBO”) bid/ask spread differentials,
- Lead Market Maker (“LMM”) participation rates,
- NYSE Arca market share,
- LMM time spent at the inside,
- LMM time spent within \$0.03 of the inside,
- percentage of time NYSE Arca had the best price with the best size,
- LMM quoted spread, and
- LMM quoted depth.

Such monthly reports also include market quality data for NYSE Arca-listed ETPs that are comparable to ETPs in the Incentive Program but are not themselves participating in the Incentive Program (“Comparable ETPs”).³ As discussed in greater detail below, the Exchange's analysis for the Assessment Report, similar to the monthly reports, included market quality data for Comparable ETPs.

Products in Incentive Program

There are currently no products in the Incentive Program. Prior to 3/21/2016, there were four products in the Incentive Program, listed in Figure 1 below. No products entered the Incentive Program before 2/24/2014 and the last product exited the program on 7/1/2016.

As described below and in the Appendix to this Report, the Exchange conducted t-tests to assess the statistical significance of the data herein. For the purpose of the Report, the t-test analysis assumes a confidence interval of 95% ($\alpha = 0.05$). The null hypothesis for all the t-tests performed assumes no statistically significant difference among the monthly averages for the data points described below (products in Incentive Program versus comparable products) whereas the alternative hypothesis assumes that there is a statistically significant difference among the monthly averages. P-values for the analysis were extracted from the analysis. For p-values less than 0.05 (the α in this instance), the null hypothesis was rejected and the alternative hypothesis were accepted. For p-values greater than 0.05, the null hypothesis was not rejected and the alternative hypothesis was rejected. Equal number of monthly periods while the ETPs were out of and part of the Incentive Program were used for the analysis in this report.

Figure1: List of ETPs in the NYSE Arca Incentive Program as of March 31, 2017

³ Comparable ETPs are NYSE Arca-listed ETPs that have similar characteristics as the products in the Incentive Program. Comparable ETPs are determined by using a proprietary segmentation methodology created by the Exchange (based on specific factors related to an ETP's structure, investment objective and holdings).

Name	Ticker	Inception Date	Date Product Entered the Incentive Program	Date Product Exited the Incentive Program	Delisting Date
ProShares Managed Futures Strategy	FUTS	10/2/2014	10/2/2014	3/18/2016	3/21/2016
iShares MSCI ACWI Low Carbon Target ETF	CRBN	12/9/2014	12/9/2014	7/1/2016	N/A
iShares Interest Rate Hedged High Yield Bond ETF	HYGH	5/29/2014	1/2/2015	7/1/2016	N/A
iShares Asia/Pacific Dividend ETF	DVYA	2/24/2014	1/2/2015	7/1/2016	N/A

ProShares Managed Futures Strategy (FUTS):

The ProShares Managed Futures Strategy is listed on NYSE Arca under NYSE Arca Rule 8.200 (Trust Issued Receipts) and entered the Incentive Program on its initial listing date (10/2/2014). As such, no data exists for the Exchange to compare its performance prior to entering the Incentive Program. FUTS delisted from NYSE Arca on 3/18/2016, therefore no data exists for the Exchange to compare its performance after exiting the program.

iShares MSCI ACWI Low Carbon Target ETF (CRBN):

The iShares MSCI ACWI Low Carbon Target ETF, which is listed on the Exchange under NYSE Arca Equities Rule 5.2(j)(3) (Investment Company Units), entered the Incentive Program on the day of its listing (12/9/2014) and exited the Incentive Program on 7/1/2017. The product is still listed on NYSE Arca.

The Comparable ETP is similar to CRBN in that it is classified by the Exchange’s proprietary segmentation methodology as having a low carbon theme.

Figure 2 includes an average of the monthly data included in the market quality reports posted on the Exchange’s website for CRBN and Product C. The results show that, across the specified market quality parameters, CRBN had, on average, a lower spread or a higher market share as set forth in the following fields, while it was in the Incentive Program compared to after:

- Spread
- LMM Participation Rate
- NYSE Arca Market Share
- LMM % at Inside
- LMM% Inside \$0.03 Away
- % of Time NYSE Arca Sets the Best Price and Size
- LMM Average Quoted Spread

The Exchange also notes that CRBN had percentages greater than 90% for the below metrics before exiting the program and less than 90% after exiting the program:

- LMM % Inside \$0.03 Away
- % of time NYSE Arca Sets the Best Price and Size

Figure 2: Monthly Average of CRBN Pre and Post Exiting Incentive Program from 11/1/2015 – 2/28/2017:

Product Name	CADV	NYSE Arca ADV	Spread (%)	LMM Participation Rate	NYSE Arca Market Share	LMM % at Inside	LMM % Inside \$0.03 Away	% of Time NYSE Arca Sets the Best Price and Size (NBBO)	LMM Average Quoted Spread (in %)	LMM Quoted Depth (in Shares)
iShares MSCI ACWI Low Carbon Target ETF (CRBN) <u>Pre-Exit:</u> 11/1/2015 – 6/30/2016	6,898	3,620	0.14%	30.83%	52.92%	80.87%	90.92%	90.73%	0.15%	388
iShares MSCI ACWI Low Carbon Target ETF (CRBN) <u>Post-Exit:</u> 7/1/2016 – 2/28/2016	15,447	5,616	0.20%	20.17%	39.65%	69.36%	86.85%	84.07%	0.23%	398

*Highlighted cells represent product with highest volume or applicable percentage.

To determine the statistical significance of the differences in the averages for CRBN before and after it exited the Incentive Program, t-tests (for each of the fields above) were conducted (see Appendix). The p-values for the following fields were greater than the α of 0.05:

- NYSE Arca ADV
- Spread
- LMM Participation Rate
- LMM % At Inside \$0.03 Away
- LMM Quoted Depth

We therefore cannot reject the null hypothesis for these fields and we conclude that there is not enough evidence to suggest that the null hypothesis for these fields is false at the 95% confidence level.

The p-values for the below fields, however, were less than the α of 0.05. As such, we reject the null hypothesis and accept that there is a statistically significant difference between the averages for the following:

- CADV

- NYSE Arca Market Share
- LMM % at Inside
- % of Time NYSE Sets Best Price and Size
- LMM Average Quoted Spread

The Exchange has identified one Comparable ETP, and is listed below as Product C. Figure 3 shows the average of the monthly data for CRBN and Product C during the time frame when CRBN was still participating in the Incentive Program. Results show that, in the period prior to exiting the Incentive Program, CRBN had a higher number of shares or a lower spread for the following fields, compared to Product C, during the same period:

- CADV
- NYSE Arca ADV
- LMM Average Quoted Spread

Figure 3: Monthly Average of CRBN Pre Exiting Incentive Program (11/1/2015 – 6/30/2016) versus Product C During 11/1/2015 – 6/30/2016:

Product Name	CADV	NYSE Arca ADV	Spread (%)	LMM Participation Rate	NYSE Arca Market Share	LMM % at Inside	LMM % Inside \$0.03 Away	% of Time NYSE Arca Sets the Best Price and Size (NBBO)	LMM Average Quoted Spread (in %)	LMM Quoted Depth (in Shares)
iShares MSCI ACWI Low Carbon Target ETF (CRBN) Pre-Exit: 11/1/2015 – 6/30/2016	6,898	3,620	0.14%	30.83%	52.92%	80.87%	90.92%	90.73%	0.15%	388
Product C Pre-Exit of CRBN: 11/1/2015 – 6/30/2016	788	484	0.08%	33.59%	58.10%	99.90%	99.90%	99.31%	0.21%	512

To determine the statistical significance of the differences in the averages for CRBN and Product C, t-tests (for each of the fields above) were conducted (see Appendix).

The results showed that the p-values for the following were less than the α of 0.05, thus rejecting the null hypothesis and accepting the alternative hypothesis (that the differences were statistically significant):

- CADV

- NYSE Arca CADV
- Spread
- LMM % at Inside
- LMM % at Inside \$0.03 Away
- % of Time NYSE Sets Best Price and Size
- LMM Quoted Depth

An analysis was also conducted to assess the performance of CRBN and Product C during the period of 7/1/2016 – 2/28/2017, the period in which CRBN was not in the Incentive Program. In Figure 3, the results show that on average, CRBN had a higher number of shares or market share in the following fields:

- CADV
- NYSE Arca CADV
- NYSE Arca Market Share

Figure 4: Monthly Average of CRBN Post Exiting Incentive Program (7/1/2016 – 2/28/2017) versus Product C During 7/1/2016 – 2/28/2017:

Product Name	CADV	NYSE Arca ADV	Spread (%)	LMM Participation Rate	NYSE Arca Market Share	LMM % at Inside	LMM % Inside \$0.03 Away	% of Time NYSE Arca Sets the Best Price and Size (NBBO)	LMM Average Quoted Spread (in %)	LMM Quoted Depth (in Shares)
iShares MSCI ACWI Low Carbon Target ETF (CRBN) <u>Post-Exit:</u> 7/1/2016 – 2/28/2017	15,447	5,616	0.20%	20.17%	39.65%	69.36%	86.85%	84.07%	0.23%	398
Product C <u>Post-Exit</u> <u>of</u> <u>CRBN:</u> 7/1/2016 – 2/28/2017	1,033	227	0.10%	24.04%	35.58%	99.82%	99.82%	96.91%	0.11%	572

To determine the statistical significance of the differences in the averages for CRBN and Product C post-exiting the Incentive Program, the Exchange conducted t-tests for each of the fields above (see Appendix). The results show that the p-value for the following fields was less than the α of 0.05, thus rejecting the null hypothesis and accepting the alternative hypothesis (that the differences were statistically significant):

- CADV
- NYSE Arca CADV

- Spread
- LMM % at Inside
- LMM % at Inside at \$0.03 Away
- % of Time NYSE Sets Best Price and Size
- LMM Average Quoted Spread

iShares Interest Rate Hedged High Yield Bond ETF (“HYGH”)

Shares of iShares Interest Rate Hedged High Yield Bond ETF were initially listed and commenced trading on the Exchange on 5/29/2014 under NYSE Arca Equities Rule 8.600 (Managed Fund Shares). HYGH entered the Incentive Program on 1/2/2015.

Figure 5 includes an average of the monthly data included in the market quality reports posted on the Exchange’s website for HYGH for the time frame 1/1/2015 – 2/28/2017. To assess the performance of the product prior and after it exits the Incentive Program, data relating to its performance prior to and after exiting the program were also obtained. The results show that, across the specified market quality parameters, HYGH had, on average, a lower spread or a higher market share prior to the product exiting the Incentive Program in the following:

- LMM Participation Rate
- NYSE Arca Market Share

Figure 5: Monthly Average of HYGH Pre Exiting Incentive Program (11/1/2015 – 6/30/2016) versus HYGH Post Exiting Incentive Program (7/1/2016 – 2/28/2017):

Product Name	CADV	NYSE Arca ADV	Spread (%)	LMM Participation Rate	NYSE Arca Market Share	LMM % at Inside	LMM % Inside \$0.03 Away	% of Time NYSE Arca Sets the Best Price and Size (NBBO)	LMM Average Quoted Spread (in %)	LMM Quoted Depth (in Shares)
iShares Interest Rate Hedged High Yield Bond ETF (HYGH) <u>Pre-Exit:</u> 11/1/2015 – 6/30/2016	4,759	964	0.28%	37.34%	24.64%	61.60%	76.07%	84.20%	0.39%	2,135
iShares Interest Rate Hedged High Yield Bond ETF	18,104	2,932	0.15%	29.01%	22.15%	81.14%	89.82%	85.90%	0.21%	3,858

(HYGH) Post Exit: 7/1/2016 – 2/28/2017										
---	--	--	--	--	--	--	--	--	--	--

To determine the statistical significance of the differences in the averages for HYGH pre and post-exiting the Incentive Program, the Exchange conducted t-tests for each of the fields above (see Appendix). The results show that the p-value for the following fields was less than the α of 0.05, thus rejecting the null hypothesis and accepting the alternative hypothesis (that the differences were statistically significant):

- Spread
- LMM % at Inside
- LMM % at Inside at \$0.03 Away
- LMM Quoted Depth

Three comparable ETPs to HYGH were also identified. They are generically identified as Products D, E, and F.

The comparable products are similar to HYGH in that they are classified by the Exchange’s proprietary segmentation methodology as being an actively managed fixed income based product, with a focus on short-term global corporate debt.

Figure 6 includes an average of the monthly data included in the market quality reports posted on the Exchange’s website for HYGH, and for Products D, E, and F prior to HYGH exiting the Incentive Program. An average of the results show that across the specified market quality parameters, HYGH had a higher number of shares or a lower spread percentage compared to Products D, E, and F in the following categories:

- Spread
- LMM Participation Rate
- LMM % Inside \$0.03 Away
- LMM Average Quoted Spread
- LMM Quoted Depth

Figure 6: Monthly Average of HYGH Pre Exiting Incentive Program (11/1/2015 – 6/30/2016) versus Products D, E, and F (11/1/2015 – 6/30/2016):

Product Name	CADV	NYSE Arca ADV	Spread (%)	LMM Participation Rate	NYSE Arca Market Share	LMM % at Inside	LMM % Inside \$0.03 Away	% of Time NYSE Arca Sets the Best Price and Size (NBBO)	LMM Average Quoted Spread (in %)	LMM Quoted Depth (in Shares)
iShares Interest Rate Hedged High Yield Bond ETF (HYGH) Pre-Exit: 11/1/2015 – 6/30/2016	4,759	964	0.28%	37.34%	24.64%	61.60%	76.07%	84.20%	0.39%	2,135
Product D Pre-Exit of HYGH: 11/1/2015 – 6/30/2016	6929	548	0.34%	26.89%	11.80%	62.54%	75.68%	85.61%	0.50%	1246
Product E Pre-Exit of HYGH: 11/1/2015 – 6/30/2016	6,993	1,750	0.39%	5.57%	25.84%	18.52%	39.96%	75.36%	1.44%	669
Product F Pre-Exit of HYGH: 11/1/2015 – 6/30/2016	5686	167	0.71%	6.75%	65.74%	25.74%	42.37%	85.68%	5.46%	1357

*Highlighted cells represent time period with highest volume or applicable percentage.

To determine the statistical significance of the differences in the averages for HYGH pre-exiting the Incentive Program versus Products D, E, and F (during the same time frame), the Exchange conducted t-tests for each of the fields above (see Appendix). The results show that the p-value for the following fields was less than the α of 0.05, thus rejecting the null hypothesis and accepting the alternative hypothesis (that the differences were statistically significant):

HYGH (pre-exit) versus D

- NYSE Arca Market Share
- LMM Quoted Depth

HYGH (pre-exit) versus E

- Spread
- LMM Participation Rate
- LMM % at Inside
- LMM % at Inside \$0.03 Away
- LMM Quoted Depth

HYGH (pre-exit) versus F

- NYSE Arca CADV
- LMM Participation Rate
- LMM % at Inside
- LMM Average Quoted Spread

Figure 7 includes an average of the monthly data included in the market quality reports posted on the Exchange’s website for HYGH, and for Products D, E, and, F after HYGH exits the Incentive Program. An average of the results show that across the specified market quality parameters, HYGH had a higher number of shares or a lower spread percentage compared to Products D, E, and F in the following categories:

- CADV
- NYSE Arca ADV
- Spread
- LMM % at Inside
- LMM % Inside \$0.03 Away
- % of Time NYSE Arca Sets the Best Price and Size
- LMM Average Quoted Spread

Figure 7: Monthly Average of HYGH Post Exiting Incentive Program (7/1/2016 – 2/28/2017) versus Products D, E, and F (7/1/2016 – 2/28/2017):

Product Name	CADV	NYSE Arca ADV	Spread (%)	LMM Participation Rate	NYSE Arca Market Share	LMM % at Inside	LMM % Inside \$0.03 Away	% of Time NYSE Arca Sets the Best Price and Size (NBBO)	LMM Average Quoted Spread (in %)	LMM Quoted Depth (in Shares)
iShares Interest Rate Hedged High Yield Bond ETF (HYGH) Post-Exit: 7/1/2016 – 2/28/2017	18,104	2,932	0.15%	29.01%	22.15%	81.14%	89.82%	85.90%	0.21%	3,858

Product D Post-Exit of HYGH: 7/1/2016 – 2/28/2017	5713	1444	0.23%	30.02%	23.36%	75.01%	81.80%	84.07%	0.33%	3685
Product E Post-Exit of HYGH: 7/1/2016 – 2/28/2017	5,638	946	0.24%	0.45%	17.82%	22.23%	33.01%	61.81%	1.50%	157
Product F Post-Exit of HYGH: 7/1/2016 – 2/28/2017	3820	352	0.57%	16.16%	12.29%	68.33%	78.77%	68.62%	2.10%	4704

*Highlighted cells represent time period with highest volume or applicable percentage.

To determine the statistical significance of the differences in the averages for HYGH post-exiting the Incentive Program versus Products D, E, and F, the Exchange conducted t-tests for each of the fields above (see Appendix). The results show that the p-value for the following fields was less than the α of 0.05, thus rejecting the null hypothesis and accepting the alternative hypothesis (that the differences were statistically significant):

HYGH (post-exit) versus D

- None. It was found that there were no p-values less than the α of 0.05.

HYGH (post-exit) versus E

- Spread
- LMM Participation Rate
- LMM % at Inside
- LMM % at Inside \$0.03 Away
- % of Time NYSE Sets Best Price and Size
- LMM Average Quoted Spread
- LMM Quoted Depth

HYGH (post-exit) versus F

- Spread

iShares Asia/Pacific Dividend ETF (“DVYA”)

Shares of iShares Asia/Pacific Dividend ETF (DVYA) initially listed and commenced trading on the Exchange on 2/24/2012 under NYSE Arca Equities Rule 5.2(j)(3) (Investment Company Units). DVYA entered the Incentive Program on 1/2/2015.

Figure 7 includes an average of the monthly data contained in the market quality reports posted on the Exchange’s website for the time frame DVYA was in the Incentive Program (1/2/2015 – 7/1/2016). However,

to assess the performance of DVYA prior and after exiting the Incentive Program, its performance during this period was obtained. The figures are divided between “pre” and “post” exiting the program, such that the number of months used for analysis during both periods was equal. Thus the analysis covers the period from 11/1/2015 – 6/30/2016 for pre-exiting the Incentive Program and 7/1/2016 - 2/28/2017 for post-exiting the Incentive Program.

A comparable product, Product G, was initially identified for DVYA. However, the product delisted from NYSE Arca in February 2016.

The monthly averages across the specified market quality parameters demonstrate that DVYA had a higher number of shares and a lower spread percentage before it exited the Incentive Program compared to after it exited the Incentive Program, for the following fields:

- Spread
- LMM Participation Rate
- NYSE Arca Market Share
- LMM % at Inside
- LMM % at Inside \$0.03 Away
- % of Time NYSE Arca Sets the Best Price and Size
- LMM Average Quoted Spread

Figure 7: Monthly Average of DVYA Pre Exiting Incentive Program (11/1/2015 – 6/30/2016) versus DVYA Post Exiting Incentive Program (7/1/2016 – 2/28/2017):

Product Name	CADV	NYSE Arca ADV	Spread (%)	LMM Participation Rate	NYSE Arca Market Share	LMM % at Inside	LMM % Inside \$0.03 Away	% of Time NYSE Arca Sets the Best Price and Size (NBBO)	LMM Average Quoted Spread (in %)	LMM Quoted Depth (in Shares)
iShares Asia/Pacific Dividend ETF (DVYA) – <u>Pre Exit:</u> 11/1/2015 – 6/30/2016	7,229	2,006	0.287%	10.65%	31.80%	22.65%	58.28%	74.62%	0.60%	1,863
iShares Asia/Pacific Dividend ETF (DVYA) <u>Post Exit:</u> 7/1/2016 – 2/28/2017	36,865	6,228	0.293%	1.71%	21.26%	2.05%	6.89%	60.66%	1.78%	2,167

*Highlighted cells represent time period with highest volume or applicable percentage.

To determine the statistical significance of the differences in the averages for DVYA pre-exiting the Incentive Program versus its performance post-exiting the program, t-tests (for each of the fields above) were conducted (see Appendix). The results show that the p-values for the following fields were less than the α of 0.05, thus rejecting the null hypothesis and accepting the alternative hypothesis, indicating that the differences were statistically significant:

- CADV
- NYSE Arca ADV
- LMM Participation
- LMM % at Inside
- LMM % at Inside \$0.03 Away
- % of Time NYSE Sets Best Price and Size
- LMM Average Quoted Spread

Conclusion:

The Incentive Program was designed to support newly issued ETPs with low volumes by incentivizing market makers to make better markets. The analysis above was conducted by the Exchange to assess whether the program has met its goals. The Assessment Report looks at the performance of the products in the Incentive Program during the entire period in which the products were in the program. However, given the limited number of products in the program and, thus, the limited amount of data on which the analysis is based, the Exchange is not able to provide conclusive evidence that the Incentive Program has met its objectives during the pilot period. In some instances, such as DVYA and CRBN, we see that there was a statistically significant change for the better in the market quality of the product after entering the Incentive Program. However, for other products, such as HYGH, it is unclear whether the performance of the product improved after entering the Incentive Program.

The inclusion of a t-test strengthened the analysis, thereby allowing the Exchange to determine the statistical significance of any differences in the data that were analyzed. However, as indicated, the small number of products in the program, and thus, the limited amount of data underlying the analysis, narrows the effectiveness of the analysis. In addition, several products entered the Incentive Program upon inception. As such, the Exchange is only able to compare those products' performance after entrance to the Incentive Program with Comparable ETPs. Furthermore, it is important to note that it is difficult to create a perfect control group for all situations (e.g., - differences in inception dates, market conditions, market makers, etc.).

The Exchange is optimistic that an extension of the pilot (scheduled to end July 28, 2017), for which the Exchange would be required to file a proposed rule change pursuant to Rule 19b-4 under the Securities and Exchange Act of 1934, will provide time for other issuers to participate in the Incentive Program so that the Commission, the Exchange, LMMs, and issuers may meaningfully assess the impact of the program.

Appendix (p-values of t-tests):

CRBN Pre-Exit Incentive Program (11/1/2015 – 6/30/2016) vs. CRBN Post-Exit Incentive Program (7/1/2016 – 2/28/2017)

CADV	0.024058081
NYSE Arca CADV	0.066151344
Spread	0.105013194
LMM Participation Rate	0.068763336
NYSE Arca Market Share	0.047576442
LMM % at Inside	0.033147029
LMM % Inside \$0.03 Away	0.307691684
% of Time NYSE Sets the Best Price and Size	0.028124633
LMM Average Quoted Spread	0.040061371
LMM Quoted Depth (in Shares)	0.875585608

CRBN Pre-Exit Incentive Program (11/1/2015 – 6/30/2016) vs. Product C (11/1/2015 – 6/30/2016)

CADV	0.000221643
NYSE Arca CADV	0.000484087
Spread	0.034561957
LMM Participation Rate	0.6792782
NYSE Arca Market Share	0.419436269
LMM % at Inside	0.000584525
LMM % Inside \$0.03 Away	0.00290644
% of Time NYSE Sets the Best Price and Size	0.000486458
LMM Average Quoted Spread	0.187770482
LMM Quoted Depth (in Shares)	0.00359133

CRBN Post-Exit Incentive Program (7/1/2016 – 2/28/2017) vs. Product C (7/1/2016 – 2/28/2017)

CADV	0.001885722
NYSE Arca CADV	0.000320694
Spread	0.019966161
LMM Participation Rate	0.25550375
NYSE Arca Market Share	0.581558096
LMM % at Inside	7.14867E-05
LMM % Inside \$0.03 Away	0.005272225
% of Time NYSE Sets the Best Price and Size	0.000455701
LMM Average Quoted Spread	0.007514006
LMM Quoted Depth (in Shares)	0.051459562

HYGH Pre-Exit Incentive Program (11/1/2015 – 6/30/2016) vs. HYGH Post-Exit Incentive Program (7/1/2016 – 2/28/2017)

CADV	0.270018353
NYSE Arca CADV	0.174816086
Spread	0.006151996
LMM Participation Rate	0.067083493
NYSE Arca Market Share	0.72444854
LMM % at Inside	0.000591762
LMM % Inside \$0.03 Away	0.007473409
% of Time NYSE Sets the Best Price and Size	0.724165377
LMM Average Quoted Spread	0.128008795
LMM Quoted Depth (in Shares)	3.052E-09

HYGH Pre-Exit Incentive Program (11/1/2015 – 6/30/2016) vs. Product D (11/1/2015 – 6/30/2016)

CADV	0.408385482
NYSE Arca CADV	0.06967272
Spread	0.09615448
LMM Participation Rate	0.31346841
NYSE Arca Market Share	0.02213723
LMM % at Inside	0.896327901
LMM % Inside \$0.03 Away	0.94963016
% of Time NYSE Sets the Best Price and Size	0.774347522
LMM Average Quoted Spread	0.371442667
LMM Quoted Depth (in Shares)	0.011521472

HYGH Pre-Exit Incentive Program (11/1/2015 – 6/30/2016) vs. Product E (11/1/2015 – 6/30/2016)

CADV	0.217372248
NYSE Arca CADV	0.08522436
Spread	0.0475544
LMM Participation Rate	1.68124E-05
NYSE Arca Market Share	0.864736614
LMM % at Inside	1.18297E-06
LMM % Inside \$0.03 Away	0.000485981
% of Time NYSE Sets the Best Price and Size	0.153336467
LMM Average Quoted Spread	0.069908566
LMM Quoted Depth (in Shares)	0.005336101

HYGH Pre-Exit Incentive Program (11/1/2015 – 6/30/2016) vs. Product F (11/1/2015 – 6/30/2016)

CADV	0.850843
NYSE Arca CADV	0.001805
Spread	0.116685
LMM Participation Rate	0.001339
NYSE Arca Market Share	0.252559
LMM % at Inside	0.009308
LMM % Inside \$0.03 Away	0.060579
% of Time NYSE Sets the Best Price and Size	0.832954
LMM Average Quoted Spread	0.015088
LMM Quoted Depth (in Shares)	0.193118

HYGH Post-Exit Incentive Program (7/1/2016 – 2/28/2017) vs. Product D (7/1/2016 – 2/28/2017)

CADV	0.302513505
NYSE Arca CADV	0.312309706
Spread	0.050716495
LMM Participation Rate	0.861679417
NYSE Arca Market Share	0.889284993
LMM % at Inside	0.275886437
LMM % Inside \$0.03 Away	0.067649915
% of Time NYSE Sets the Best Price and Size	0.624909062
LMM Average Quoted Spread	0.062185184
LMM Quoted Depth (in Shares)	0.334862566

HYGH Post-Exit Incentive Program (7/1/2016 – 2/28/2017) vs. Product E (7/1/2016 – 2/28/2017)

CADV	0.298272176
NYSE Arca CADV	0.170148827
Spread	0.032308225
LMM Participation Rate	5.71772E-05
NYSE Arca Market Share	0.502247116
LMM % at Inside	6.52179E-09
LMM % Inside \$0.03 Away	9.60096E-09
% of Time NYSE Sets the Best Price and Size	2.02086E-05
LMM Average Quoted Spread	0.005143842
LMM Quoted Depth (in Shares)	6.67885E-15

HYGH Post-Exit Incentive Program (7/1/2016 – 2/28/2017) vs. Product F (7/1/2016 – 2/28/2017)

CADV	0.242886
NYSE Arca CADV	0.088696
Spread	0.007976
LMM Participation Rate	0.064394
NYSE Arca Market Share	0.17396
LMM % at Inside	0.285325
LMM % Inside \$0.03 Away	0.369546
% of Time NYSE Sets the Best Price and Size	0.106798
LMM Average Quoted Spread	0.134995
LMM Quoted Depth (in Shares)	0.523726

DVYA Pre-Exit Incentive Program (11/1/2015 – 6/30/2016) vs. HYGH Post-Exit Incentive Program (7/1/2016 – 2/28/2017)

CADV	0.028370581
NYSE Arca CADV	0.012878747
Spread	0.758263082
LMM Participation Rate	0.029223101
NYSE Arca Market Share	0.2544453
LMM % at Inside	1.52388E-06
LMM % Inside \$0.03 Away	2.36284E-06
% of Time NYSE Sets the Best Price and Size	0.016533052
LMM Average Quoted Spread	6.65008E-05
LMM Quoted Depth (in Shares)	0.448530266

Definition of Fields:

- **LMM Participation Rate:** Percentage of time LMM trades in the security on NYSE Arca.
- **NYSE Arca Market Share:** NYSE Arca's trading market share in the specified product (during core trading session)
- **LMM % at Inside:** Average percentage of time that the LMM is displayed at or better than the NBBO, where by LMM's top of book is computed and compared against the NBBO
- **LMM % Inside, \$0.03 away:** The average % of time the LMM's displayed limit orders are within \$.03 of the NBBO
- **% of time NYSE Arca sets the NBBO:** The percentage of time NYSE Arca sets the NBBO during the core trading hours
- **LMM Quoted Depth (in shares):** The average time weighted size for the security during the core session
- **T-test:** A t-test is commonly used to determine whether the mean of a population significantly differs from a specific value or from the mean of another population.
- **α (alpha):** The alpha is the significance level of a statistical test. It is the probability of rejecting the null hypothesis when the null hypothesis is true. In this analysis, an alpha of 5% (0.05) was used.
- **P-values:** Used to determine the significance of ones results. It is the probability of finding the observed results when the null hypothesis of the study is true. In cases where the p-value is less than the alpha, one would reject the null hypothesis. Whereas in cases where the p-value is greater than alpha, we cannot reject the null hypothesis.
- **Null Hypothesis:** Typically a hypothesis that one is trying to disprove or reject
- **Alternative Hypothesis:** The hypothesis one believes to be true should the null hypothesis be false. This is often the hypothesis that one hopes to be true.