

## MEMORANDUM

**TO:** File

**FROM:** Division of Trading and Markets and Division of Economic and Risk Analysis<sup>1</sup>

**SUBJECT:** Analysis of post-trade transparency under the CFTC regime.

**DATE:** October 17, 2014

### **Introduction**

Staff from the Office of Analytics and Research (Division of Trading and Markets) and Division of Economic and Risk Analysis has completed an analysis of the effect of the adoption by the CFTC of post-trade transparency in the index CDS market. Our analysis focuses on market activity in the index CDS market as well as the single-name CDS market. We used data from the Depository Trust and Clearing Corporation – Trade Information Warehouse (DTCC-TIW) that are publicly available through its website.<sup>2</sup>

Title VII of the Dodd-Frank Act directs the Commission to, among other things, promulgate rules requiring public dissemination of transaction information in the security-based swap market (for which the single-name CDS market represents the majority of activity.<sup>3</sup>)<sup>4</sup> To implement this statutory provision, the Commission proposed Regulation SBSR to provide for both the reporting of security-based swap information to registered security-based swap repositories or the Commission, and the public dissemination of security-based swap transaction, volume, and pricing information.<sup>5</sup>

This analysis is intended to assist the Commission in the development of Regulation SBSR and inform the economic analysis of the final rules. In particular, we investigate the effect of post-trade transparency on total credit exposure, trading volume, and trade size in the index CDS market. While we acknowledge that there are significant differences between the index CDS market and the security-based swap market, the data analysis presented here may enhance the Commission’s understanding of the potential economic effects of mandated post-trade transparency in the security-based swap market.

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<sup>1</sup> This is a memo by the Staffs of the Division of Trading and Markets and the Division of Economic and Risk Analysis of the U.S. Securities and Exchange Commission. The Commission has expressed no view regarding the analysis, findings, or conclusions contained herein.

<sup>2</sup> The data and detailed information are available at: <http://www.dtcc.com/repository-otc-data.aspx>.

<sup>3</sup> See Securities Exchange Act Release No. 72472 (June 25, 2014), 75 FR at 47278 (August 12, 2014) (“Cross-Border Adopting Release”) note 135.

<sup>4</sup> Section 13(m)(1)(B) of the Exchange Act directs the Commission “to make security-based swap transaction and pricing data available to the public in such form and at such times as the Commission determines appropriate to enhance price discovery.” See 15 U.S.C. 78m(m)(1)(B).

<sup>5</sup> See Securities Exchange Act Release No. 63346 (November 19, 2010), 75 FR at 75207 (December 2, 2010) (“Regulation SBSR Proposing Release”)

As discussed in more detail below, we are limited in our ability to assess the effects of post-trade transparency along certain dimensions because we lack sufficient insight into pricing and participation. As a result, we are unable to draw robust conclusions regarding the overall impact of public dissemination of swap transactions information. However, based on our analysis of certain aspects of these markets for which data are available, we find little empirical evidence that the introduction of post-trade transparency in the index CDS market resulted in reduced trading activity, liquidity, or risk exposure in the index CDS market.

The memo is organized as follows. Section 1 briefly describes the introduction of post-trade transparency to the swap market by the CFTC. Section 2 describes the data we used in our analysis. Section 3 discusses our methodology and Section 4 presents and discusses our results.

## 1. Background

The CFTC implemented regulatory reporting and public dissemination requirements for swap transactions starting on December 31, 2012 (“post-trade transparency”). However, not all swap products and transactions were covered on that date. The CFTC pursued a phased implementation with several dates. Starting on July 1, 2013 all swap transactions subject to regulation by the CFTC were covered. For the purpose of this study, we use December 31, 2012 as our “event date.” Effective December 31, 2012, all transactions in CDS referencing broad-based indices, executed on, or pursuant to the rules of, a Designated Contract Market (DCM), as well as swaps executed “off-facility” involving a registered swap dealer were subject to regulatory reporting and public dissemination requirements.<sup>6</sup> While not all transactions in index CDS contracts were subject to the post-trade transparency requirements starting on December 31, 2012, the vast majority of transactions involved a swap dealer and were therefore subject to post-trade transparency.<sup>7</sup>

Our analysis examines certain effects of the implementation of mandatory post-trade transparency on market quality for the instruments covered by the CFTC’s rules. We focus on liquidity, as measured by trading activity and average transaction, and overall credit risk exposure, as measured by net notional outstanding, in our analysis. These metrics are readily available in the data provided by DTCC-TIW.

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<sup>6</sup> [http://www.cftc.gov/ucm/groups/public/@newsroom/documents/file/reportingswap\\_factsheet\\_final.pdf](http://www.cftc.gov/ucm/groups/public/@newsroom/documents/file/reportingswap_factsheet_final.pdf)  
Other dates of the phase-in: Reporting and public dissemination of transactions in CDS referencing broad-based indices began on February 28, 2013 for transactions involving a major swap participant (MSP), on April 10, 2013 for transactions involving any other financial entity, and on July 1, 2013 for all other swap transactions subject to regulation by the CFTC. Note, the CFTC required both swap dealers and MSPs to begin reporting to a registered SDR on December 31, 2012, but no MSP registered as such with the CFTC until February 28, 2013.

<sup>7</sup> For the week ending on December 28, 2012, the total gross notional outstanding for index CDS contracts is \$9.8 trillion of which \$51.5 billion are contracts not involving a swap dealer, which amounts to 0.52%. (<http://www.dtcc.com/repository-otc-data.aspx>, Table 1. We combined CDX – “Credit Default Index” and CDT – “Credit Default Tranche.”)

## 2. Data

The analysis in this memo uses data that are publicly available from the DTCC Trade Information Warehouse (DTCC-TIW)<sup>8</sup> and provided on a weekly basis. These data comprise open positions and trading activity for various swap and security-based swap products, including index CDS and single-name CDS products. Open positions data is provided for gross and net notional outstanding along with the respective number of contracts outstanding both for individual contracts and aggregated for product families. The DTCC-TIW provides the open positions at the end of each week as well as changes in the open positions from week to week. These data allow us to analyze risk exposures in the market.

Further, trading activity is provided for all transactions and is provided separately for market risk transactions. The DTCC-TIW provides all transaction activity data both for individual contracts and aggregated along various dimensions, and it provides market risk transactions activity for individual contracts. These data allow us to analyze trading volumes and average trade sizes. Section 3 describes in detail the metrics we are using in our analysis of risk exposures and trading activity.

The data provided by DTCC-TIW are limited in some respects. For example, the data may not contain all live positions in the DTCC-TIW as of a specified date because some transaction activity is subject to delayed reporting due to confidentiality arrangements.<sup>9</sup> In addition, during our sample periods, transactions that are cleared on the same day lead to “double-counting” because both contracts between the counterparties and the clearing house (“betas” and “gammas”) are included in the data.<sup>10</sup> Further, the data in the DTCC-TIW include trades irrespective of counterparty domicile. This means that some trades between two non-U.S. counterparties are included in our measures of activity, despite not being subject to post-trade transparency requirements. However, to the extent that delayed reporting, the prevalence of double-counting, and the number of transactions not subject to post-trade transparency were unaffected by the CFTC’s implementation of the post-trade transparency rules, these data limitations should not affect our results.

Even if they do not affect the results we present below, these data limitations and what data are provided in the weekly reports from DTCC-TIW restrict the set of questions we can answer and the analyses we can perform. For example, weekly reports from DTCC-TIW do not provide pricing data and do not permit us to analyze changes in the pricing of index CDS or single-name CDS contracts, including bid-ask spreads. Similarly, we cannot analyze changes in participants and participant domiciles. As a

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<sup>8</sup> The data and detailed information are available at <http://dtcc.com/en/repository-otc-data.aspx>.

<sup>9</sup> See Depository Trust and Clearing Corporation, Explanation of Trade Information Warehouse Data (24 May 2011), available at [http://dtcc.com/~media/Files/Downloads/Settlement-Asset-Services/DerivSERV/tiw\\_data\\_explanation.pdf](http://dtcc.com/~media/Files/Downloads/Settlement-Asset-Services/DerivSERV/tiw_data_explanation.pdf).

<sup>10</sup> Double-counting may affect certain elements of our analysis that are based on market risk transaction activity because the proportion of transactions that were same-day cleared was not constant during our sample periods. We note, however, that double-counting will not affect the measurement of net notional outstanding that results from same-day cleared transactions. Double-counting will also not affect the measurement of net notional outstanding or market risk transaction activity arising from backloaded cleared transactions since, for this activity, only the contracts between the original counterparties (“alphas”) are included in the weekly reports and the betas and gammas do not represent new market risk activity.

result, we cannot undertake the analysis for a sample of transactions involving at least one U.S. counterparty. We also cannot analyze whether there was a change in market share between the U.S. and non-U.S. markets in response to the implementation of mandatory post-trade transparency for index CDS, or whether there was a change in the composition of market participants. Nevertheless, we believe our analysis of weekly reports from the DTCC-TIW sheds light on the effects of post-trade transparency along the dimensions of market quality we discuss below.

### 3. Methodology

As discussed above, we define our event date to be December 31, 2012, the implementation date for mandatory reporting and public dissemination of transactions in CDS referencing broad-based indices began and being executed on or pursuant to the rules of a DCM or and involving a registered swap dealer. The analysis considers four time periods:

- “Event Period”
  - July 1, 2012 to December 30, 2012: the six-month period before the implementation of mandatory post-trade transparency
  - December 31, 2012 to June 30, 2013: the six-month period after the implementation of mandatory post-trade transparency
- “Control Period” - the equivalent time periods one year earlier to serve as control periods
  - July 1, 2011 to December 30, 2011<sup>11</sup>
  - December 31, 2011 to June 30, 2012

The event periods immediately preceding and immediately following the event date allow us to compare market behavior before and after the introduction of mandatory post-trade transparency. The control periods one year prior to the event periods allow us to control for seasonality, long-term trends, and other potentially confounding events in the market.

We present results for three metrics provided by or based on data provided by the DTCC-TIW:

- net notional outstanding,<sup>12</sup>
- traded notional,<sup>13</sup> and
- average traded notional.<sup>14</sup>

Net notional outstanding is a measure of total credit risk exposure and generally represents the maximum possible net funds transfers between sellers of protection and buyers of protection that could

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<sup>11</sup> Because DTCC-TIW provides weekly reports, the data during the time periods do not perfectly coincide with the dates provided above. The four time periods are, as given by the dates of the weekly reports from DTCC-TIW: 1 July 2011 to 30 December 2011; 6 January 2012 to 29 June 2012; 6 July 2012 to 28 December 2012; 4 January 2013 to 28 June 2013. Data included in each report relate to the week prior to the date of the relevant report. As a result, the data cannot be used to identify changes on an exact date, e.g., exactly on December 31, 2012, or exactly on December 20, 2011.

<sup>12</sup> DTCC-TIW Section I, Table 7, Net Notional (USD EQ). The aggregate net notional data are calculated based on counterparty family. DTCC’s detailed explanation of these calculations is available at <http://dtcc.com/en/repository-otc-data.aspx>.

<sup>13</sup> DTCC-TIW Market Risk Transaction Activity, Section IVb, Gross Notional (USD EQ).

<sup>14</sup> DTCC-TIW Market Risk Transaction Activity, Section IVb, Gross Notional (USD EQ) divided by Contracts.

be required upon the occurrence of a credit event relating to a particular reference entity.<sup>15</sup> It is an important measure for the quality of the market since it is a measure for risk sharing, a primary function of the CDS market.

Traded notional and average traded notional are measures of trading activity and liquidity in the market. Traded notional is a measure of trading volume, which is one aspect of liquidity. Average traded notional gives us the average transaction size and helps characterize the trading activity in the market. For example, everything else equal, a smaller average transaction size may indicate that large trades are hard to execute.

#### 4. Samples

We conducted our analysis on three samples.<sup>16</sup>

- North American corporate index CDS contracts (CDX): We included all contracts based on indices for North American corporate CDS contracts, including both high-yield and investment grade contracts.<sup>17</sup>
- North American commercial mortgage-backed securities index CDS contracts (CMBX): We included all contracts based on indices for North American commercial mortgage-backed securities CDS contracts.<sup>18</sup>
- Single-name CDS contracts on entities that are CDX constituents: We identified index constituents from Markit's webpage for the CDX.NA.IG product.<sup>19</sup> Because the DTCC-TIW reports activity in the top 1,000 single names, we selected the index constituents that appeared in this list and obtained an average coverage of 95% of the CDX constituents.

Most transactions in index CDS contracts, including the ones for which we present results in this memo, became subject to the mandatory post-trade transparency rules beginning on December 31, 2012,<sup>20</sup> while the single-name CDS contracts were not subject to mandatory post-trade transparency during the study periods.

We chose the CDX contract family since these contracts are very liquid and comprise a sizeable fraction of the market. We chose the CMBX contract family since these contracts are less liquid and allow us to analyze whether the effects of mandatory post-trade transparency may be different for less liquid contracts. It is conceivable that post-trade transparency has a bigger effect on less liquid contracts. For example, if post-trade transparency makes it more difficult for market participants to hedge exposures and results in lower liquidity, these effects may be more pronounced in contracts that are already relatively illiquid. We use our sample of single-name CDS contracts on entities that are CDX constituents

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<sup>15</sup> Actual net funds transfers are dependent on the recovery rate for the underlying bonds or other debt instruments.

<sup>16</sup> We also analyzed other samples and the results are qualitatively similar to the results presented here. For brevity of exposition, we selected charts that allow us to highlight and summarize the empirical evidence we found for all samples. In doing so, we do not present results that do not add new insights beyond what is shown and discussed in this memo.

<sup>17</sup> All contracts with identifiers beginning with "CDX.NA" were included in this sample.

<sup>18</sup> All contracts with identifiers beginning with "CMBX.NA" were included in this sample.

<sup>19</sup> CDX.NA.IG is the CDS index for North American investment grade corporate bonds and has 125 constituents.

<sup>20</sup> See note 6 *supra*.

as a control. Trade in single-name CDS written on entities that are index constituents should be related to trade in the corresponding index CDS, but, as noted above, there was no mandatory post-trade transparency for single-name CDS contracts. Hence, comparing market quality measures for this control sample to the same measures for our treatment samples may allow us to control for changes in demand for credit risk exposure that are unrelated to changes in the level of post-trade transparency for index CDS transactions. We note, that since the payoffs between single-name CDS written on entities that are index constituents and index CDS are related, many participants in the index CDS market also transact in single-name CDS. Whether market quality measures for the single-name CDS market serve as a control for market quality measure in the index CDS market will depend on the extent to which liquidity in the single-name CDS market serves as a complement to, or substitute for, liquidity in the index CDS market.

## 5. Results

Here we present statistics on the relative size of each market we examine and market quality measures.

Table 1 reports the average net notional outstanding for the various samples and for the event period during the six-month periods before and after the introduction of mandatory post-trade transparency for CDS referencing broad-based indices. The overall index CDS market as reported in the DTCC-TIW had an average net notional outstanding of approximately \$1.46 trillion before and approximately \$1.34 trillion after the event date.

For the CDX sample, the average net notional outstanding of these contracts decreased from approximately \$670 billion before to approximately \$580 billion after the event date. The CDX sample constituted about 46% (43%) of the overall index CDS market before (after) the event date.

For the CMBX sample, we observe an increase in the average net notional outstanding from approximately \$30 billion before to approximately \$33 billion after the event date. The CMBX sample constitutes about 2% (2.5%) of the overall index CDS market before (after) the event date. The CMBX contracts are less liquid than the CDX contracts and in terms of average net notional outstanding, the CMBX sample is about 1/20<sup>th</sup> the size of the CDX sample.

For the CDX constituents sample, we observe a decrease in average net notional outstanding from approximately \$156 billion before to approximately \$140 billion after the event date, which amounts to about 21% of the average net notional outstanding for all corporate single-name CDS contracts in the Top 1000 single-name CDS contracts as reported in the DTCC-TIW in both periods.

### *Net Notional Outstanding*

Figure 1 presents the results for net notional outstanding for CDX contracts. The 2011-2012 line depicts the control period, while the 2012-2013 line depicts the event period. The figure shows that, overall, the net notional outstanding was higher during the control period. It also shows a decline of approximately \$100 billion or 14% in mid-December 2012. However, this pronounced reduction in net notional outstanding precedes the event date by more than one week.

A potential explanation for this result is related to the maturity of CDX contracts. The decline we observe in December 2012 occurred around the maturity date on December 20, 2012.<sup>21</sup> On a maturity date, market participants with outstanding positions in a maturing contract have two options: (1) allow the contract to expire; and (2) replace the expiring contract with a new contract with a later maturity. Expiry with no replacement would lead to a reduction in net notional outstanding, while replacing a CDX contract would maintain a constant level of net notional outstanding.

While the weekly data from DTCC-TIW do not allow us to examine the behavior of counterparties with expiring contracts, we nevertheless believe it is important to interpret variation in market quality measures in the context of counterparties' choice over whether or not to roll. At an extreme, the reduction in net notional we observe prior to the event date may be solely due to counterparties' decision not to roll CDX contracts. It is also possible that market participants used the June 20, 2012 and December 20, 2012 maturity dates to passively reduce their risk exposures in anticipation of post-trade transparency.

Results from our control sample of single-name CDS (Figure 3) support an interpretation that the reductions in net notional outstanding observed around the June 2012 and December 2012 maturity dates were unrelated to the implementation of post-trade transparency. Namely, we observe a similar reduction in net notional outstanding for our control sample of single-name CDS contracts on entities that are CDX constituents, suggesting that factors other than the introduction of post-trade transparency were responsible for the sudden change in net notional outstanding. However, as we discussed in Section 4, trade in single-name CDS written on entities that are index constituents should be related to trade in the corresponding index CDS and, as a result, the reductions in net notional outstanding we observe for the single-name CDS contracts on entities that are CDX constituents could be related to the observed reductions for CDX contracts and the introduction of post-trade transparency for CDX contracts. Additionally, we observe declines in net notional outstanding around other maturity dates. A pronounced reduction of similar magnitude occurred in June 2012 and, to a lesser extent, in June 2013, while the reduction observed in December 2011 appears small by comparison. After the introduction of mandatory post-trade transparency, net notional outstanding was relatively stable and slightly higher than at the end of December 2012.

Figure 2 presents results for net notional outstanding in CMBX contracts. The figure shows that, overall, the net notional outstanding for CMBX contracts was higher during the event period relative to the control period for the same months. More importantly, there is a pronounced increase in net notional outstanding starting in January 2013, after the introduction of mandatory post-trade transparency. The increase is approximately \$3 to \$5 billion, which translates to between 10% and 17%. There is also an increase in the first half of 2012, but it is not as pronounced, suggesting that the increase in the first half of 2013 could be due to seasonal factors.

In contrast to CDS contracts, CMBX contracts do not mature on set dates. This is reflected in Figure 2, which does not show any patterns surrounding the maturity dates for CDS contracts, which are, depending on the contract, March 20, June 20, September 20, and December 20. This suggests that the declines around maturity dates in Figure 1 are related to contract maturity and factors other than the introduction of mandatory post-trade transparency.

Figure 3 presents the results for net notional outstanding for single-name CDS contracts on entities that are CDX constituents. Single-name CDS contracts mature four times each year on March 20, June 20,

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<sup>21</sup> CDX contracts mature either on June 20 or December 20, depending on the index series.

September 20, and December 20 and these maturity dates appear related to reductions in net notional outstanding. The largest decline of approximately \$17 billion or 11% occurs in December 2012. Importantly, as discussed before, the event date did not introduce post-trade transparency for single-name CDS contracts, so if this reduction is related to post-trade transparency the relation is indirect, as we discussed above.

### *Traded Notional*

Figure 4 presents the results for traded notional for CDX contracts. Traded notional is a direct measure of trading activity. Results for the event period and the control period look similar, both in terms of level of trading activity and its variability. Pronounced declines occurred in December 2011 and December 2012, with subsequent recoveries in January 2012 and January 2013, respectively. These declines may be due to the holiday period. Trading activity for the period following the introduction of mandatory post-trade transparency appears similar to that during the other time periods. While not presented, results for other contracts look qualitatively similar.

### *Average Trade Size*

Figure 5 presents the results for average transaction size for CDX contracts (measured in average notional amount in a transaction). The variability in average trade size is higher in the first quarter of 2012, otherwise, the level and variability of average trade size looks very similar between event and control periods. In particular, if anything, there is a slight increase in average trade size in the first quarter of 2013, after the introduction of mandatory post-trade transparency compared to the second half of 2012. In both periods, there is a dip in average trades size around the turn of the year, which mirrors those observed in traded notional (Figure 4), although, for average trade size the dip is not as pronounced. These reductions may reflect fewer large transactions during the holiday period. While not presented, results for other contracts look qualitatively similar.

### *Discussion*

Overall, the evidence presented in Figures 1 to 5 does not suggest that market activity in the index CDS market, in the dimensions we can measure, has changed significantly due to the introduction of mandatory post-trade transparency by the CFTC. Trading activity as measured by traded notional appears similar in periods without post-trade transparency. The same is true for average trade size.

While risk sharing in the market as measured by net notional outstanding appears to change, the evidence suggests that this may be due to other factors rather than post-trade transparency. The patterns for single-name CDS contracts on entities that are CDX constituents in Figure 3 are very similar to the ones for CDX contracts in Figure 1. While this supports the conclusion that the reduction in CDX net notional outstanding was unrelated to post-trade transparency, it is subject to the caveat that single-name CDS contracts on entities that are CDX constituents may be indirectly affected by the introduction of mandatory post-trade transparency for the CDX contracts. Evidence from the CMBX market (Figure 2), by contrast, appears not to be confounded by maturity dates or other factors.

Taken together, the evidence presented here does not suggest that the introduction of mandatory post-trade transparency had adverse effects on the risk exposures and aggregate trading activity in the index CDS market. Changes in these market quality measures for index CDS contracts may be the result of factors other than the introduction of mandatory post-trade transparency.



As we discussed above, this analysis is limited in certain respects. Data limitations such as delayed reporting, double-counting, and the number of transactions not subject to post-trade transparency in the data, may impact the results of our study and the reader should be aware of these. In addition, using weekly data reported by DTCC-TIW, we were not able to examine the relationship between post-trade transparency and pricing of index CDS and single-name CDS contracts, including bid-ask spreads. Moreover, using these data we were also not able to analyze whether there post-trade transparency was associated with changes in market participation or market shares.

**Table 1.** Average Net Notional Outstanding<sup>22</sup> during Event Period

Contract Family	Before introduction of mandatory post-trade transparency July 1, 2012 – December 30, 2012		After introduction of mandatory post-trade transparency December 31, 2012 – June 30, 2013	
	Average Net Notional Outstanding (\$B)	Fraction of Total	Average Net Notional Outstanding (\$B)	Fraction of Total
CDX	669.37	45.95%	577.59	43.00%
CMBX	30.24	2.08%	33.07	2.46%
All index CDS	1,456.71		1,343.15	
CDX Constituents	156.41	21.39%	140.02	20.91%
All corporate single-name CDS in Top 1000	731.33		669.68	

CDX: North American corporate index CDS contracts

CMBX: North American commercial mortgage-backed securities index CDS contracts

All index CDS: All index CDS contracts in DTCC-TIW

CDX Constituents: Single-Name CDS contracts on entities that are CDX Constituents

All corporate single-name CDS in Top 1000: All corporate single-name CDS contracts in Top 1000 single-name CDS contracts as reported in DTCC-TIW

<sup>22</sup> Average net notional outstanding represents the average of the weekly data reported by the DTCC-TIW.

Figure 1. Net Notional Outstanding for CDX contracts.

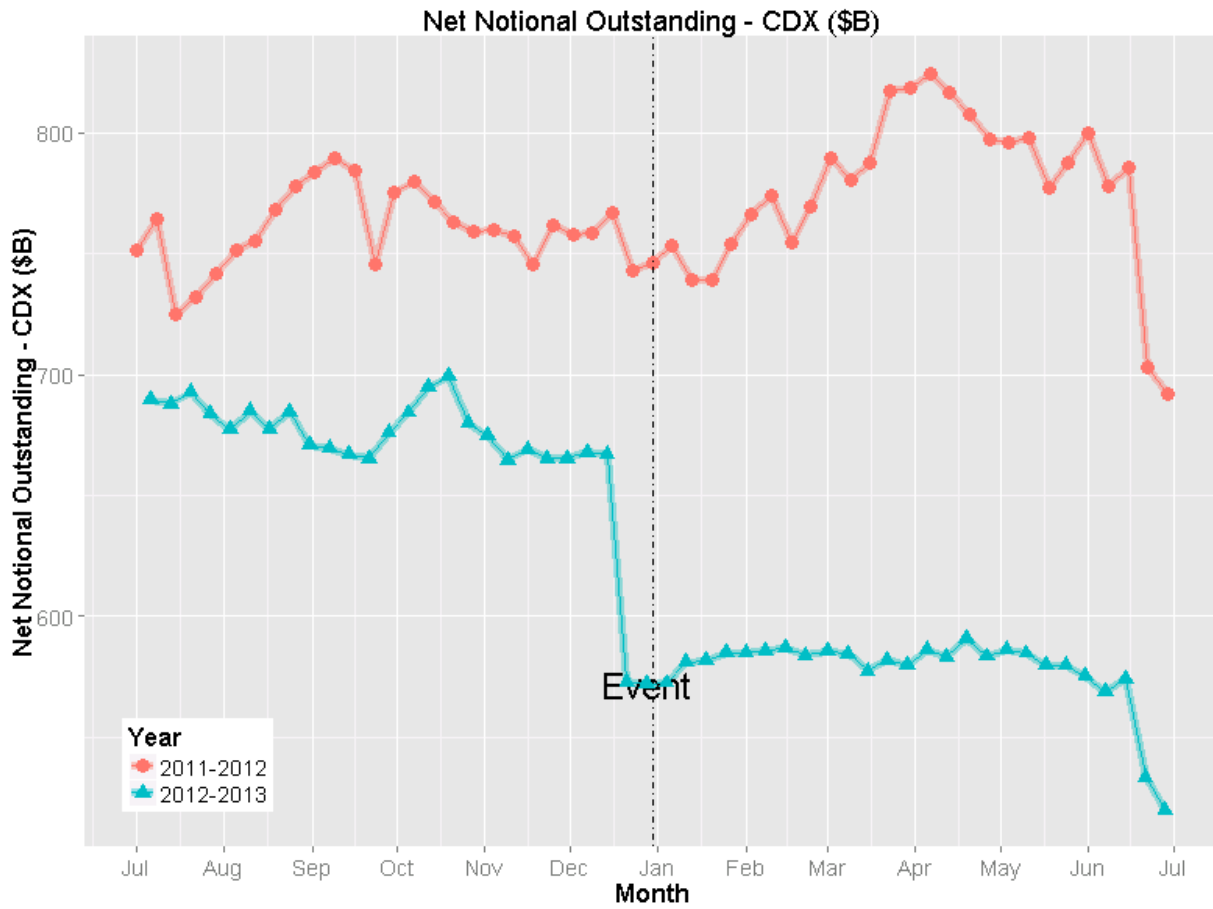


Figure 2. Net Notional Outstanding for CMBX contracts.

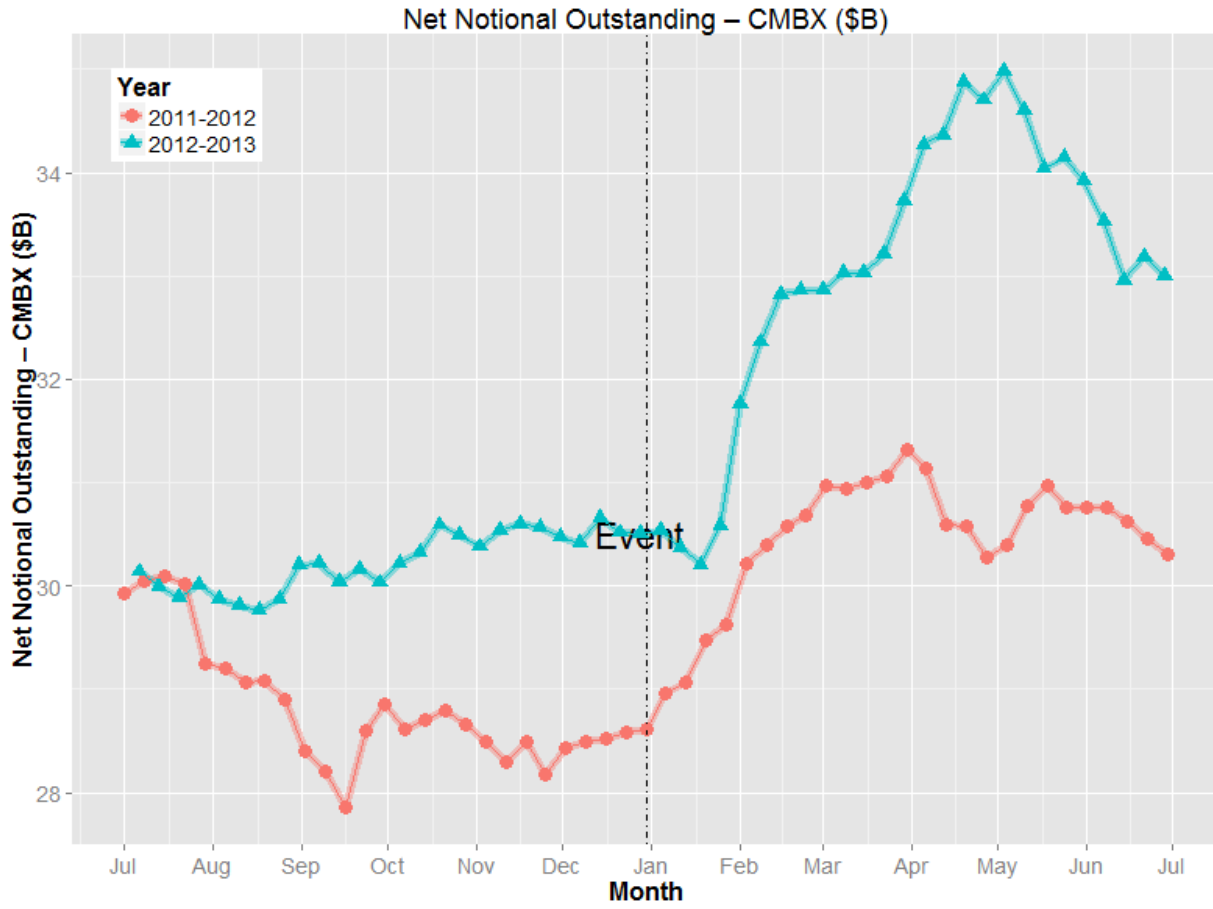


Figure 3. Net Notional Outstanding for single-name CDS contracts on entities that are CDX constituents.

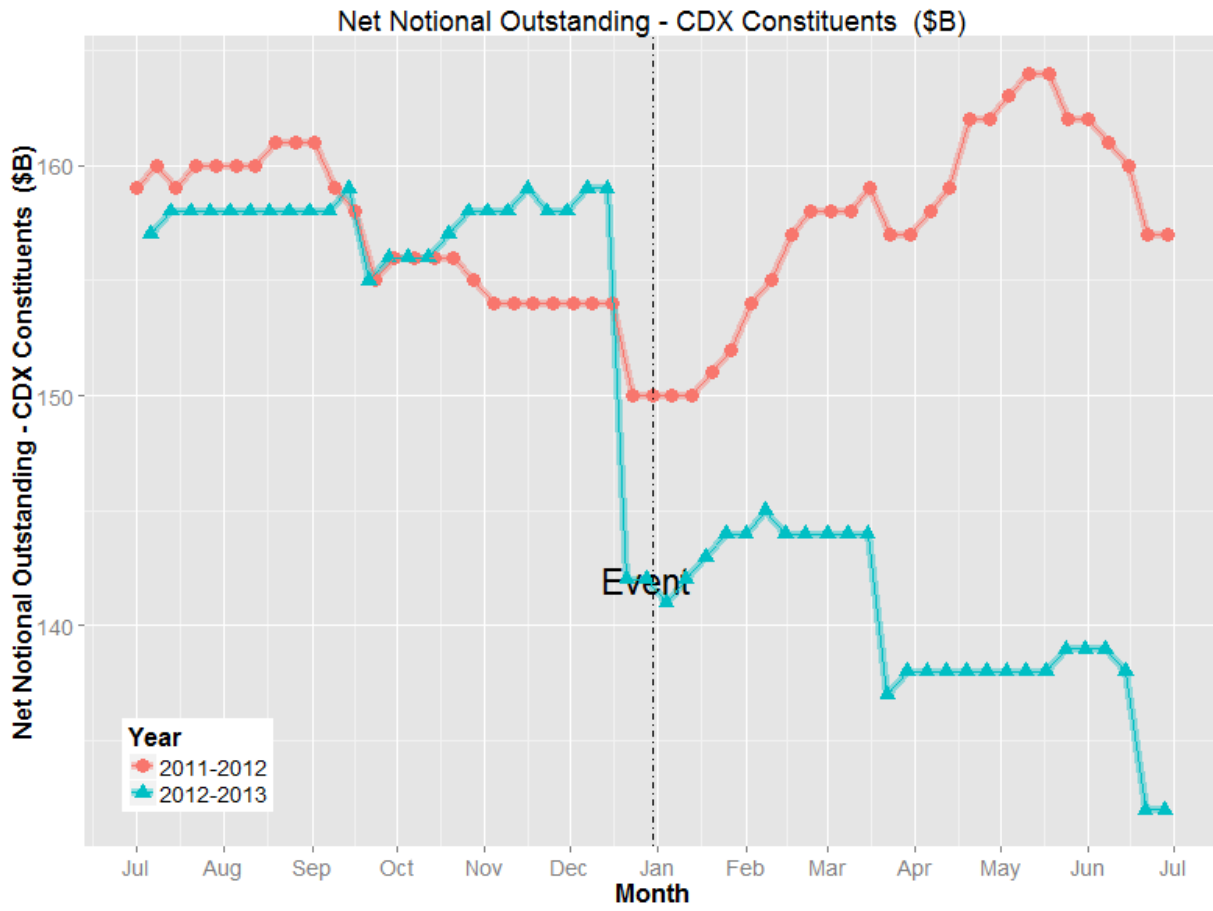


Figure 4. Traded Notional for CDX contracts.

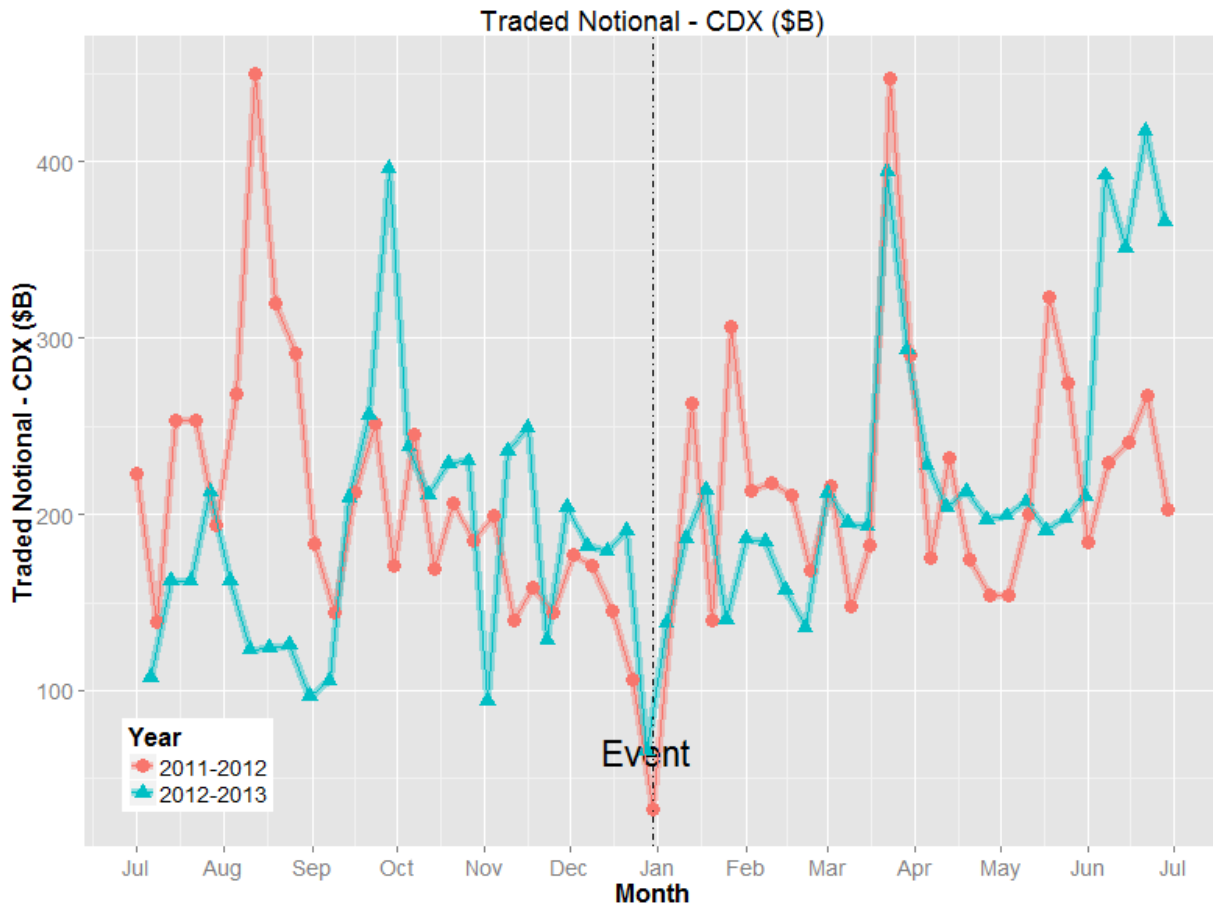


Figure 5. Average Transaction Size for CDX contracts.

