

## Adverse Liquidity Effects of the EU Uncovered Sovereign CDS Ban

January 2014

### Summary

On November 1, 2012, the provisions of *Regulation (EU) No 236/2012 of the European Parliament and the Council of 14 March 2012 on short selling and certain aspects of credit default swaps* came into effect. The regulation bans uncovered short positions in European Union (EU) sovereign debt through credit default swaps (CDS) and requires that net short positions be privately notified to the relevant national regulator and, at higher levels, be publicly disclosed.<sup>1</sup>

An uncovered sovereign CDS (SCDS) position exists when a person holds a (short) position in a SCDS without either a corresponding (long) position in the sovereign issuer referenced in that CDS or another position with a value that is correlated to the value of the sovereign debt. In order to establish a permitted SCDS position, investors must now hold offsetting risk, such as the underlying sovereign bond or other exposures correlated to sovereign debt. This change raised concerns about the impact on portfolio hedging, the potential for a reduction in SCDS liquidity, and the implications of a reduction in the European Central Bank's (ECB) bond-buying program.

The International Monetary Fund (IMF), as part of its global stability report series, has criticized the regulation's ban on uncovered SCDS, asserting the move runs the risk of distorting financial markets. The IMF suggested such a prohibition would result in several unintended consequences, such as reduced SCDS liquidity and a loss of interest in the European Union (EU) government bond market as a whole, which could potentially lead to higher government borrowing costs, particularly for the bloc's smaller members.<sup>2</sup>

In this report, ISDA examines the liquidity impact of the regulation one year after implementation. Our findings reveal:

- The liquidity of the iTraxx SovX Western Europe index (Table 1), the main hedging vehicle for European sovereign risk, has substantially diminished in the period following the announcement of the political agreement on the SCDS ban, and, more acutely, when the regulation became effective.

<sup>1</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:086:0001:0024:en:PDF>

<sup>2</sup> <http://www.imf.org/external/pubs/ft/gfsr/2013/01/pdf/c2.pdf>

- Average weekly volumes and trade counts of iTraxx SovX Western Europe index constituent single-name CDS (Tables 2 and 3) have also declined in nearly all cases, with the largest declines observed in the most liquid sovereigns.
- Several other EU-regulated single-name sovereign CDS (non-constituents of the iTraxx SovX Western Europe index, Tables 4 and 5) have also declined in terms of average weekly volume and trade count during one or both periods under study.
- Nearly all non-EU single-name sovereign CDS (elsewhere in Europe, Asia, the Middle East and the Americas, Tables 6 and 7) showed *increases* in both average weekly volume and trade count during the post-regulation period.
- Declines in average weekly volume and trade count have also been observed in the iTraxx Europe Senior Financials index during the post-regulation period (Tables 8 and 9), supporting the IMF's concern about a possible loss of interest in EU-regulated credit.
- Finally, since the regulation became effective, we observe a breakdown of the average correlation between proxy hedges such as the iTraxx Europe Senior Financials index and EU-regulated single-name SCDS from 89% to 37% (Table 10).

## Regulatory Impact on iTraxx SovX Western Europe Index Liquidity

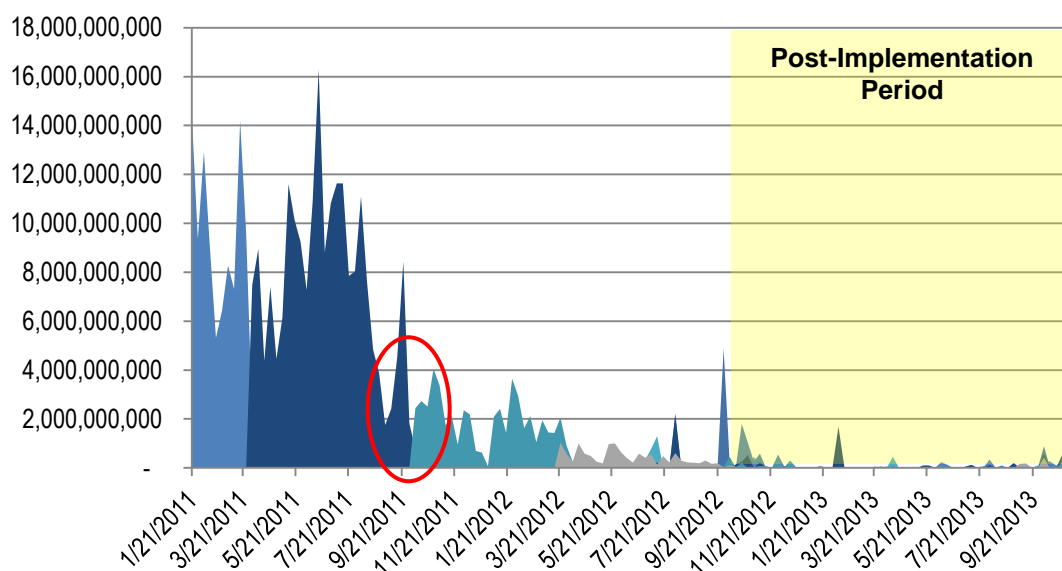
The ban on uncovered sovereign CDS has had a significant impact on key hedging vehicles of sovereign risk. The iTraxx SovX Western Europe index<sup>3</sup>, its constituents and other non-constituent EU-regulated SCDS have been negatively affected, resulting in reduced liquidity measured in terms of average weekly volume and trade count.<sup>4</sup>

iTraxx indices are utilized by several types of market participants. Investors such as asset managers utilize iTraxx indices for diversification into European credit and hedging risk exposures. Other participants, such as corporate treasury desks, commonly hedge new issue spreads, while insurers proxy hedge against their senior collateralized debt obligation portfolios with these indices.

Chart 1 aggregates iTraxx SovX Western Europe index weekly gross notional figures across series 2 through series 8. The chart highlights the post-implementation period commencing on November 1, 2012.

Interestingly, we observe a decrease in series volume beginning with series 6 (circled in red) at the start of the fourth quarter of 2011. This decrease corresponds to the October 18, 2011 agreement<sup>5</sup> by the European Parliament and the Council of the European Union announcing the final decision on the uncovered SCDS ban ahead of the implementation date. We refer to this period as the ‘post-announcement period’ throughout our analysis.

**Chart 1: Weekly iTraxx SovX Western Europe Index - Gross Notional Volume, 1/21/2011 – 11/8/2013**



Source: DTCC Trade Information Warehouse

<sup>3</sup> The iTraxx SovX Western Europe index comprises CDS of eurozone countries traded on western European documentation (Austria, Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal and Spain), as well as Denmark, Norway, Sweden and the UK.

<sup>4</sup> All index and sovereign CDS historical weekly gross notional volume and trade count data was obtained from the DTCC Trade Information Warehouse (Table IV). For more information, visit: [www.dtcc.com](http://www.dtcc.com)

<sup>5</sup> For more information: [http://europa.eu/rapid/press-release\\_MEMO-11-712\\_en.htm?locale=en](http://europa.eu/rapid/press-release_MEMO-11-712_en.htm?locale=en)

iTraxx SovX Western Europe index average weekly gross notional volume and trade count data is displayed in Table 1 and is organized by analysis period. The fourth quarter of 2011 was characterized by an 81% reduction in average weekly volume compared to the pre-announcement period. This drop-off worsened during the post-implementation period as liquidity faded by another 85%.

Trade count declined in lockstep with gross notional volume.<sup>6</sup> Following the November 1, 2012 implementation date, only one trade occurred per week on average, and several weeks showed no trade count across all series. It seems likely these declines were caused by the relatively higher costs associated with buying offsetting risk, such as the underlying bond of each constituent.

**Table 1: iTraxx SovX Western Europe Index Weekly Average Volume and Trade Count**

| Analysis Period                              | Average Weekly Gross Notional | Change | Average Weekly Trade Count | Change |
|--|-------------------------------|--------|----------------------------|--------|
| Pre-Announcement<br>1/21/2011 –10/14/2011    | 1,237,051,348                 | -      | 60                         | -      |
| Post-Announcement<br>10/28/2011 - 10/26/2012 | 233,540,788                   | -81%   | 27                         | -54%   |
| Post-Implementation<br>11/9/2012 - 11/8/2013 | 36,020,571                    | -85%   | 1                          | -97%   |

Source: DTCC Trade Information Warehouse

### Regulatory Impact on iTraxx SovX Western Europe Index Constituent Liquidity

Similarly striking effects were observed when we analyzed the iTraxx SovX Western Europe index constituents according to average weekly gross notional and trade count volume metrics. Tables 2 and 3 describe changes observed between the pre- and post-announcement periods and the post-announcement and post-implementation periods.

**Table 2: iTraxx SovX Western Europe Constituent Weekly Avg. Gross Notional Volume**

| Sovereign CDS    | Pre-Announcement | Post-Announcement | Change | Post-Implementation | Change |
|------------------|------------------|-------------------|--------|---------------------|--------|
| Austria          | 792,972,471      | 654,480,963       | -17%   | 416,458,090         | -36%   |
| Belgium          | 1,384,913,004    | 751,292,719       | -46%   | 478,030,296         | -36%   |
| Cyprus           | -                | 9,094,858         | -      | 15,434,282          | 70%    |
| Denmark          | 455,844,841      | 230,662,416       | -49%   | 179,372,832         | -22%   |
| Finland          | 184,973,333      | 149,881,902       | -19%   | 110,009,349         | -27%   |
| France           | 4,327,453,997    | 4,204,006,201     | -3%    | 2,094,885,897       | -50%   |
| Germany          | 2,558,027,247    | 2,829,123,746     | 11%    | 1,406,831,665       | -50%   |
| Greece           | 873,801,086      | 212,297,999       | -76%   | -                   | -      |
| Ireland          | 798,171,073      | 589,150,685       | -26%   | 451,170,048         | -23%   |
| Italy            | 5,463,192,997    | 5,697,459,525     | 4%     | 4,306,188,178       | -24%   |
| Norway           | 105,999,744      | 97,474,849        | -8%    | 67,644,619          | -31%   |
| Portugal         | 1,487,503,826    | 699,498,845       | -53%   | 814,777,209         | 16%    |
| Spain            | 5,593,620,066    | 3,906,043,815     | -30%   | 2,529,444,911       | -35%   |
| Sweden           | 324,843,424      | 253,877,868       | -22%   | 142,936,954         | -44%   |
| UK and N Ireland | 1,313,575,202    | 846,470,416       | -36%   | 606,670,957         | -28%   |

Source: DTCC Trade Information Warehouse

<sup>6</sup> On September 17, 2013, Markit announced iTraxx SovX Western Europe index series 8 would not roll into series 9 due to low trading activity. At the time of this writing, series 8 remains on-the-run and is fairly inactive.

Generally speaking, volume declined in almost every SCDS in both periods. However, some of the largest declines were observed in the most liquid SCDS. German and French volumes fell 50% in the post-implementation period. Spanish CDS volume declined over 65% since the October 2011 announcement.

**Table 3: iTraxx SovX Western Europe Constituent Weekly Average Trade Count**

| Sovereign CDS    | Pre-Announcement | Post-Announcement | Change | Post-Implementation | Change |
|------------------|------------------|-------------------|--------|---------------------|--------|
| Austria          | 45               | 44                | -2%    | 22                  | -50%   |
| Belgium          | 105              | 62                | -41%   | 30                  | -52%   |
| Cyprus           | -                | 3                 | -      | 4                   | 32%    |
| Denmark          | 54               | 32                | -41%   | 18                  | -44%   |
| Finland          | 9                | 9                 | 0%     | 7                   | -29%   |
| France           | 285              | 286               | 0%     | 104                 | -64%   |
| Germany          | 132              | 161               | 22%    | 61                  | -62%   |
| Greece           | 102              | 30                | -71%   | -                   | -      |
| Ireland          | 80               | 68                | -15%   | 34                  | -50%   |
| Italy            | 307              | 321               | 5%     | 219                 | -32%   |
| Norway           | 6                | 6                 | -7%    | 6                   | 2%     |
| Portugal         | 121              | 79                | -34%   | 90                  | 13%    |
| Spain            | 397              | 320               | -19%   | 153                 | -52%   |
| Sweden           | 23               | 21                | -13%   | 10                  | -53%   |
| UK and N Ireland | 107              | 70                | -35%   | 48                  | -31%   |

Source: DTCC Trade Information Warehouse

**Regulatory Impact on EU-Regulated (non-constituent) SCDS Liquidity**

Expanding the analysis beyond the constituents of the iTraxx SovX Western Europe revealed some additional trends. For example, the most liquid EU-regulated non-constituent SCDS also showed substantial volume declines. Polish and Hungarian volumes fell more than 40% since the post-announcement period. Tables 4 and 5 show that the majority of EU-regulated SCDS declined in terms of average weekly gross notional volume and trade count in one or both periods under study.

**Table 4: EU-Regulated Single-Name Sovereign CDS Weekly Average Gross Notional Volume**

| Sovereign CDS  | Pre-Announcement | Post-Announcement | Change | Post-Implementation | Change |
|----------------|------------------|-------------------|--------|---------------------|--------|
| Bulgaria       | 175,003,098      | 62,606,152        | -64%   | 119,991,308         | 92%    |
| Croatia        | 100,285,615      | 92,122,937        | -8%    | 104,973,182         | 14%    |
| Czech Republic | 41,536,667       | 116,109,595       | 180%   | 90,305,859          | -22%   |
| Estonia        | 8,171,939        | 8,755,223         | 7%     | 16,372,614          | 87%    |
| Latvia         | 41,517,562       | 61,385,943        | 48%    | 58,652,542          | -4%    |
| Lithuania      | 30,465,200       | 52,543,705        | 72%    | 56,102,981          | 7%     |
| Poland         | 580,490,750      | 473,167,907       | -18%   | 359,909,732         | -24%   |
| Slovakia       | 36,259,572       | 71,534,776        | 97%    | 55,115,287.68       | -23%   |
| Slovenia       | 30,890,772       | 57,181,252        | 85%    | 88,171,019          | 54%    |
| Hungary        | 865,249,707      | 638,419,712       | -26%   | 522,565,150         | -18%   |

Source: DTCC Trade Information Warehouse

Table 5: EU-Regulated Sovereign Single-Name CDS Weekly Average Trade Count

| Sovereign CDS  | Pre-Announcement | Post-Announcement | Change | Post-Implementation | Change |
|----------------|------------------|-------------------|--------|---------------------|--------|
| Bulgaria       | 28               | 9                 | -68%   | 15                  | 71%    |
| Croatia        | 15               | 10                | -32%   | 15                  | 46%    |
| Czech Republic | 6                | 13                | 125%   | 9                   | -32%   |
| Estonia        | 1                | 1                 | -6%    | 2                   | 66%    |
| Latvia         | 5                | 9                 | 61%    | 7                   | -25%   |
| Lithuania      | 4                | 8                 | 79%    | 8                   | 9%     |
| Poland         | 57               | 54                | -5%    | 33                  | -39%   |
| Slovakia       | 4                | 7                 | 70%    | 6                   | -20%   |
| Slovenia       | 4                | 7                 | 93%    | 13                  | 82%    |
| Hungary        | 91               | 80                | -12%   | 56                  | -30%   |

Source: DTCC Trade Information Warehouse

### Non-EU Single Name SCDS Liquidity

Comparing EU-regulated single-name SCDS volume metrics to other regional non-regulated single-name SCDS exposes some remarkable differences. Tables 6 and 7 provide average weekly gross notional and trade count statistics of non-EU European, Asian, Middle Eastern, African and Americas SCDS. Several countries experienced volume declines following the October 2011 announcement. However, almost all of them recovered during the post-implementation period. Several sovereigns also exceeded their pre-announcement average weekly volumes. The most liquid SCDS, referenced to Turkey and Brazil, experienced large volume increases of 54% and 48%, respectively.

Table 6: Non-EU Sovereign Single-Name CDS Weekly Average Gross Notional Volume

| Sovereign CDS                  | Pre-Announcement | Post-Announcement | Change | Post-Implementation | Change |
|--------------------------------|------------------|-------------------|--------|---------------------|--------|
| <b>Non-Regulated Europe</b>    |                  |                   |        |                     |        |
| Iceland                        | 17,330,542       | 16,257,099        | -6%    | 17,582,710          | 8%     |
| Kazakhstan                     | 59,526,492       | 88,115,324        | 48%    | 72,003,159          | -18%   |
| Turkey                         | 1,287,068,806    | 1,490,290,006     | 16%    | 2,301,092,126       | 54%    |
| <b>Asia/Africa/Middle East</b> |                  |                   |        |                     |        |
| China                          | 1,159,491,466    | 1,261,811,743     | 9%     | 1,494,411,863       | 18%    |
| Egypt                          | 135,519,804      | 47,050,818        | -65%   | 26,300,711          | -44%   |
| Indonesia                      | 534,727,819      | 491,104,208       | -8%    | 713,033,695         | 45%    |
| Korea                          | 875,583,763      | 1,139,750,263     | 30%    | 1,433,637,313       | 26%    |
| Lebanon                        | 14,793,590       | 12,946,500        | -12%   | 18,454,289          | 43%    |
| Philippines                    | 509,981,180      | 403,849,331       | -21%   | 546,437,989         | 35%    |
| South Africa                   | 492,199,143      | 513,722,489       | 4%     | 794,834,800         | 55%    |
| Vietnam                        | 100,152,692      | 53,534,275        | -47%   | 69,341,759          | 30%    |
| <b>Americas</b>                |                  |                   |        |                     |        |
| Argentina                      | 682,592,696      | 649,290,040       | -5%    | 524,413,264         | -19%   |
| Brazil                         | 2,650,066,047    | 2,688,425,419     | 1%     | 3,986,936,086       | 48%    |
| Chile                          | 42,352,635       | 79,738,426        | 88%    | 112,974,359         | 42%    |
| Colombia                       | 260,080,505      | 180,409,462       | -31%   | 345,474,053         | 91%    |
| Panama                         | 50,750,206       | 48,469,875        | -4%    | 72,370,020          | 49%    |
| Peru                           | 534,042,029      | 178,436,348       | -67%   | 254,964,390         | 43%    |
| Venezuela                      | 597,351,374      | 541,130,418       | -9%    | 555,466,947         | 3%     |

Source: DTCC Trade Information Warehouse

One possible explanation is that the post-announcement volume changes were the result of portfolio rebalancing given decreases in exposures to EU credit obtained through the CDS market. Once this rebalancing had taken place, other regional SCDS continued to trade normally and, in many cases, more heavily as market participants presumably diversified away from European SCDS.

**Table 7: Non-EU Sovereign Single-Name CDS Weekly Average Trade Count**

| Sovereign CDS                  | Pre-Announcement | Post-Announcement | Change | Post-Implementation | Change |
|--------------------------------|------------------|-------------------|--------|---------------------|--------|
| <b>Non-Regulated Europe</b>    |                  |                   |        |                     |        |
| Iceland                        | 4                | 2                 | -50%   | 2                   | 12%    |
| Kazakhstan                     | 11               | 12                | 7%     | 9                   | -20%   |
| Turkey                         | 114              | 126               | 11%    | 191                 | 52%    |
| <b>Asia/Africa/Middle East</b> |                  |                   |        |                     |        |
| China                          | 122              | 142               | 16%    | 157                 | 11%    |
| Egypt                          | 32               | 20                | -37%   | 8                   | -61%   |
| Indonesia                      | 70               | 68                | -3%    | 93                  | 37%    |
| Korea                          | 114              | 127               | 11%    | 141                 | 11%    |
| Lebanon                        | 3                | 4                 | 22%    | 4                   | 17%    |
| Philippines                    | 56               | 49                | -13%   | 67                  | 38%    |
| South Africa                   | 51               | 62                | 21%    | 94                  | 51%    |
| Vietnam                        | 16               | 8                 | -46%   | 10                  | 12%    |
| <b>Americas</b>                |                  |                   |        |                     |        |
| Argentina                      | 79               | 90                | 14%    | 98                  | 9%     |
| Brazil                         | 176              | 226               | 28%    | 360                 | 59%    |
| Chile                          | 5                | 9                 | 66%    | 13                  | 47%    |
| Colombia                       | 25               | 19                | -24%   | 35                  | 85%    |
| Panama                         | 7                | 8                 | 5%     | 11                  | 50%    |
| Peru                           | 61               | 23                | -63%   | 29                  | 27%    |
| Venezuela                      | 65               | 70                | 7%     | 81                  | 15%    |

Source: DTCC Trade Information Warehouse

### Regulatory Impact on European Credit Proxy Hedging

In the previous section, this analysis brought to light substantial volume decreases in the iTraxx SovX Western Europe index and its constituent (single-name) SCDS occurring over the post-announcement and post-implementation periods. Since the index and underlying CDS commonly serve as hedging and diversification vehicles for exposure to European credit, we investigated the impact on and suitability of proxy vehicles used as a consequence of the regulation.

The ban on uncovered CDS appears to have led market participants to utilize other indices such as the iTraxx Europe Senior Financials index as a substitute for the iTraxx SovX Western Europe index and other EU-regulated SCDS. The index consists of 25 financial entities and offers an alternative way to hedge against sovereign credit risk by exploiting the correlation between banks and sovereigns<sup>7</sup>.

The ban also appears to have caused a shift into some exchange-traded government bond futures. The average daily volume of Eurex-listed long-term Italian BTP futures, for example, increased by 88% in the post-announcement period and 101% during the post-implementation period<sup>8</sup>. Similar surges were observed in short-term Italian BTP contracts. A deeper cross-product impact study of the ban

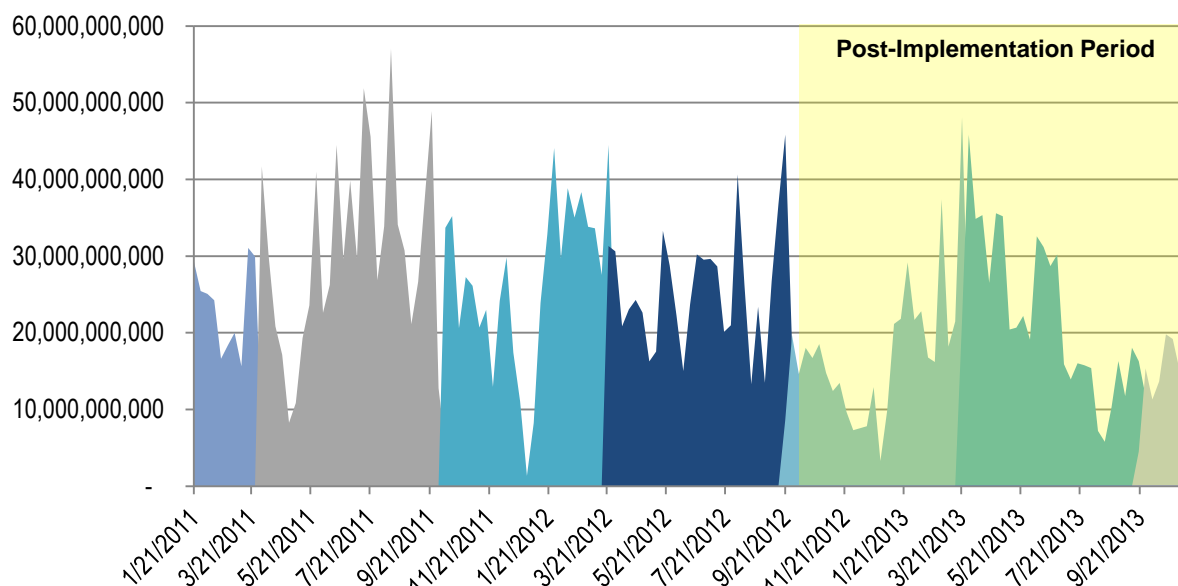
<sup>7</sup> Unlike the iTraxx SovX Western Europe Index, market participants are not required to own the underlying constituent bonds of the iTraxx Europe Senior Financial Index as a consequence of the Regulation, so this may offer a more economically sound way to hedge European credit exposures or obtain regional diversification benefits.

<sup>8</sup> All government bond futures historical daily volume metrics were obtained from Bloomberg.

falls outside this analysis, as we focus on the use of alternative CDS indices in the remainder of this paper.

Chart 2 aggregates iTraxx Europe Senior Financial index weekly gross notional totals across series 2 through 20. The chart highlights the post-regulation period commencing on November 1, 2012.

**Chart 2: Weekly iTraxx Europe Senior Financial Index  
Gross Notional Volume, 1/21/2011 - 11/8/2013**



Tables 8 and 9 compare notional volumes and trade count of the iTraxx Europe Senior Financial index to the iTraxx SovX Western Europe index (presented in Table 1), as well as other global indices<sup>9</sup> with sovereign or corporate constituent CDS during the periods under study. Average weekly gross notional amounts of the iTraxx Europe Senior Financial index remained fairly steady during the post-announcement period and declined 15% post-implementation. As mentioned previously, large persistent declines were recorded in the iTraxx SovX Western Europe index.

**Table 8: Comparing Index Average Weekly Gross Notional**

| Index                      | Pre-Announcement | Post-Announcement | Change | Post-Implementation | Change |
|----------------------------|------------------|-------------------|--------|---------------------|--------|
| iTraxx Europe Sr Financial | 1,638,587,702    | 1,597,176,960     | -3%    | 1,360,990,196       | -15%   |
| iTraxx SovX Western Europe | 1,237,051,348    | 233,540,788       | -81%   | 36,020,571          | -85%   |
| iTraxx Asia Ex Japan IG    | 117,293,880      | 123,268,449       | 5%     | 145,607,869         | 18%    |
| iTraxx Australia           | 223,823,034      | 183,965,621       | -18%   | 139,257,978         | -24%   |
| iTraxx Japan               | 119,009,370      | 112,437,491       | -6%    | 104,561,295         | -7%    |
| CDX NA IG                  | 8,033,735,058    | 7,719,520,551     | -4%    | 8,536,936,329       | 11%    |
| CDX NA HY                  | 2,211,215,553    | 1,718,966,486     | -22%   | 2,314,586,963       | 35%    |
| CDX Emerging Market        | 239,297,619      | 216,311,151       | -10%   | 261,810,379         | 21%    |

<sup>9</sup> For more information on Markit global indices, go to [www.markit.com](http://www.markit.com).



When comparing the iTraxx Europe Senior Financial index to the most liquid indices in Table 8, we see that the average weekly gross notional amounts of the CDX™ North American Investment Grade and High Yield indices initially declined during the post-announcement period. However, during the post-implementation period, these figures rebounded and exceeded their pre-announcement averages.

Table 9 compares average weekly trade counts of the global indices. Interestingly, we observe a 37% increase in the iTraxx Europe Senior Financial index count post announcement, which normalizes in the post-implementation period. Unlike weekly average gross notional amounts, the trade counts of the North American Investment Grade and High Yield indices increase during multiple periods.

**Table 9: Comparing Index Average Weekly Trade Count**

| Index                      | Pre-Announcement | Post-Announcement | Change | Post-Implementation | Change |
|----------------------------|------------------|-------------------|--------|---------------------|--------|
| iTraxx Europe Sr Financial | 39               | 53                | 37%    | 41                  | -23%   |
| iTraxx SovX Western Europe | 60               | 27                | -54%   | 1                   | -97%   |
| iTraxx Asia Ex Japan IG    | 8                | 8                 | 0%     | 8                   | 0%     |
| iTraxx Australia           | 12               | 11                | -9%    | 9                   | -21%   |
| iTraxx Japan               | 8                | 8                 | 0%     | 13                  | 63%    |
| CDX NA IG                  | 103              | 111               | 7%     | 126                 | 13%    |
| CDX NA HY                  | 97               | 98                | 1%     | 133                 | 36%    |
| CDX Emerging Market        | 19               | 22                | 12%    | 28                  | 28%    |

Although relative volume declined when compared to the most liquid indices in our group, iTraxx Europe Senior Financial index average weekly gross notional currently exceeds pre-announcement volumes of the iTraxx SovX Western Europe index. Using this metric, the index appears to be a viable proxy. As such, the remainder of our analysis focuses on the suitability of this substitute for managing sovereign risks.

Chart 3 describes changes in the correlation of daily prices of the two indices and EU-regulated SCDS over the three analysis periods. Heat mapping is applied to both charts simultaneously in order to better observe relative relationships.

Some interesting changes have taken place over time. For example, we observed that the highest degree of correlation between both indices and single-name SCDS occurred during the pre-announcement period. At that time, both indices were highly correlated with the majority of SCDS and to each other, as one might expect.

**Chart 3: Index and Single-Name Sovereign CDS Price Correlation**

| CDS                    | iTraxx SovX Western Europe |                   |                     | iTraxx Europe Senior Financials |                   |                     |
|------------------------|----------------------------|-------------------|---------------------|---------------------------------|-------------------|---------------------|
|                        | Pre-Announcement           | Post-Announcement | Post-Implementation | Pre-Announcement                | Post-Announcement | Post-Implementation |
| iTraxx SovX WE         | 100%                       | 100%              | 100%                | 92%                             | 66%               | 42%                 |
| iTraxx Europe Sr Fincl | 92%                        | 66%               | 42%                 | 100%                            | 100%              | 100%                |
| Austria                | 86%                        | 92%               | 76%                 | 94%                             | 71%               | 31%                 |
| Belgium                | 92%                        | 91%               | 84%                 | 96%                             | 74%               | 36%                 |
| Denmark                | 92%                        | 92%               | 56%                 | 95%                             | 65%               | 40%                 |
| Finland                | 93%                        | 82%               | 66%                 | 97%                             | 73%               | 39%                 |
| France                 | 93%                        | 91%               | 72%                 | 97%                             | 81%               | 22%                 |
| Germany                | 87%                        | 89%               | 59%                 | 93%                             | 81%               | 5%                  |
| Ireland                | 73%                        | 93%               | 83%                 | 51%                             | 72%               | 29%                 |
| Italy                  | 97%                        | 71%               | 49%                 | 97%                             | 94%               | 79%                 |
| Norway                 | 93%                        | 78%               | 53%                 | 96%                             | 66%               | 45%                 |
| Portugal               | 95%                        | 85%               | 11%                 | 79%                             | 38%               | 27%                 |
| Spain                  | 96%                        | 23%               | 79%                 | 91%                             | 67%               | 68%                 |
| Sweden                 | 86%                        | 88%               | 18%                 | 94%                             | 80%               | 54%                 |
| UK and N Ireland       | 94%                        | 89%               | 2%                  | 93%                             | 69%               | 10%                 |
| Bulgaria               | 77%                        | 93%               | -28%                | 87%                             | 81%               | 41%                 |
| Croatia                | 91%                        | 88%               | -64%                | 95%                             | 86%               | 16%                 |
| Czech Republic         | 87%                        | 85%               | 51%                 | 91%                             | 74%               | 38%                 |
| Estonia                | 85%                        | 78%               | 42%                 | 92%                             | 62%               | 32%                 |
| Latvia                 | 57%                        | 92%               | -27%                | 75%                             | 75%               | 30%                 |
| Lithuania              | 57%                        | 92%               | -47%                | 75%                             | 68%               | 21%                 |
| Poland                 | 90%                        | 91%               | -2%                 | 93%                             | 77%               | 44%                 |
| Slovakia               | 89%                        | 94%               | 67%                 | 88%                             | 66%               | 48%                 |
| Slovenia               | 91%                        | 16%               | -54%                | 90%                             | 43%               | 30%                 |
| Hungary                | 85%                        | 91%               | 12%                 | 93%                             | 66%               | 65%                 |

Source: Bloomberg Historical Pricing

As we moved to the post-announcement period, a decline in correlations emerged. Initially, both indices appeared to be suitable hedges given their high degree of correlation to EU-regulated SCDS. However, in this period, SCDS average correlation declined 10% with the iTraxx SovX Western Europe index and nearly 20% with the iTraxx Europe Senior Financials, as shown in Table 10.

**Table 10: Comparing Index Average Weekly Trade Count**

| Average Correlation                 | iTraxx SovX Western Europe Index |                   |                     | iTraxx Europe Senior Financial Index |                   |                     |
|-------------------------------------|----------------------------------|-------------------|---------------------|--------------------------------------|-------------------|---------------------|
|                                     | Pre-Announcement                 | Post-Announcement | Post-Implementation | Pre-Announcement                     | Post-Announcement | Post-Implementation |
| Constituent SCDS                    | 91%                              | 82%               | 54%                 | 90%                                  | 72%               | 37%                 |
| Other EU-Regulated Single-Name SCDS | 86%                              | 82%               | 29%                 | 89%                                  | 71%               | 37%                 |

Finally, Chart 3 highlights a pronounced drop-off in the correlation of both indices to constituent and other EU-regulated SCDS during the post-implementation period. Although the iTraxx SovX Western Europe index is still roughly 54% correlated to its constituents on average, it is important to recall that its liquidity has diminished substantially. As a consequence, investors are limited to the iTraxx Europe Senior Financials proxy, which has a lower average correlation of 37% to EU-regulated SCDS.

We must note that a breakdown of the correlation of an index and its constituents is quite rare. A lack of liquidity in the iTraxx SovX Western Europe index and its constituent CDS post announcement has likely resulted in unreliable data, and, as a result, has reduced transparency in the market.

### Further Thoughts

The ban on uncovered sovereign CDS risk could result in further market stress when combined with multiple factors such as ECB tapering, bank failure and a lack of liquidity. Prohibiting the purchase of uncovered SCDS protection could permanently impair EU-regulated SCDS markets. As a result, market participants using SCDS to hedge counterparty risk with sovereigns could face higher costs on such hedging activities.

Additionally, any ECB tapering would likely introduce enhanced volatility. Because it is unclear what institutions would ‘replace’ this demand, the effect of a policy shift could be similar to the US bond market reaction following the Federal Reserve’s recent tapering announcement. (During that time, the US bond market experienced a multi-standard deviation change in rates.) Since market participants utilize proxy hedges, such as bond futures and alternative indices, one might also expect spill-over effects to reach far beyond the sovereign bond and SCDS markets.

### Conclusion

On November 1, 2012, the provisions of the regulation that bans short selling through uncovered SCDS of the EU came into effect. The regulation stated that market participants that hold SCDS must also hold the underlying bonds or related exposure. As a result, liquidity of the iTraxx SovX Western Europe index has become severely limited. Liquidity has also declined across constituents and other EU-regulated single-name SCDS.

Investors that utilize EU SCDS (both indices and single names) for EU credit hedging and portfolio diversification must now rely on proxies such as the iTraxx Europe Senior Financials index for this purpose. Our analysis revealed that initially this proxy index adequately reflected the correlation between financials and sovereigns. However, this relationship broke down substantially in the post-implementation period, making this substitute a blunt tool for risk management.

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Since its founding in 1985, the International Swaps and Derivatives Association has worked to make over-the-counter (OTC) derivatives markets safe and efficient.

ISDA's pioneering work in developing the ISDA Master Agreement and a wide range of related documentation materials, and in ensuring the enforceability of their netting and collateral provisions, has helped to significantly reduce credit and legal risk. The Association has been a leader in promoting sound risk management practices and processes, and engages constructively with policymakers and legislators around the world to advance the understanding and treatment of derivatives as a risk management tool.

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