Brazilian Derivatives and Securities

Update 1 - 28-May-2016

Fixings: IR: CDI

In [1]:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
```

In chapter 17 of our book we warn that things change (and fast). This is the first online update of our book, and it deals with the CDI.

In fact, it deals with the fall(back) of the CDI.

Bach in 2014, as we wrote the first two chapters of the book, we had seen the spread CDI-Selic go (and stay) up, and therefore we were worried about this spread being another risk factor, as new contracts started trading at BVMF referring to the Selic instead of the CDI. The chart below shows the spread up to 2014.

In [2]:

```
path=''
filename='CDI.xlsx'
```

In [3]:

```
CDIfile=pd.ExcelFile(''.join((path,filename)))
CDIdata=CDIfile.parse('Sheet1')
CDIData=CDIdata.set_index('Date')
```

In [4]:

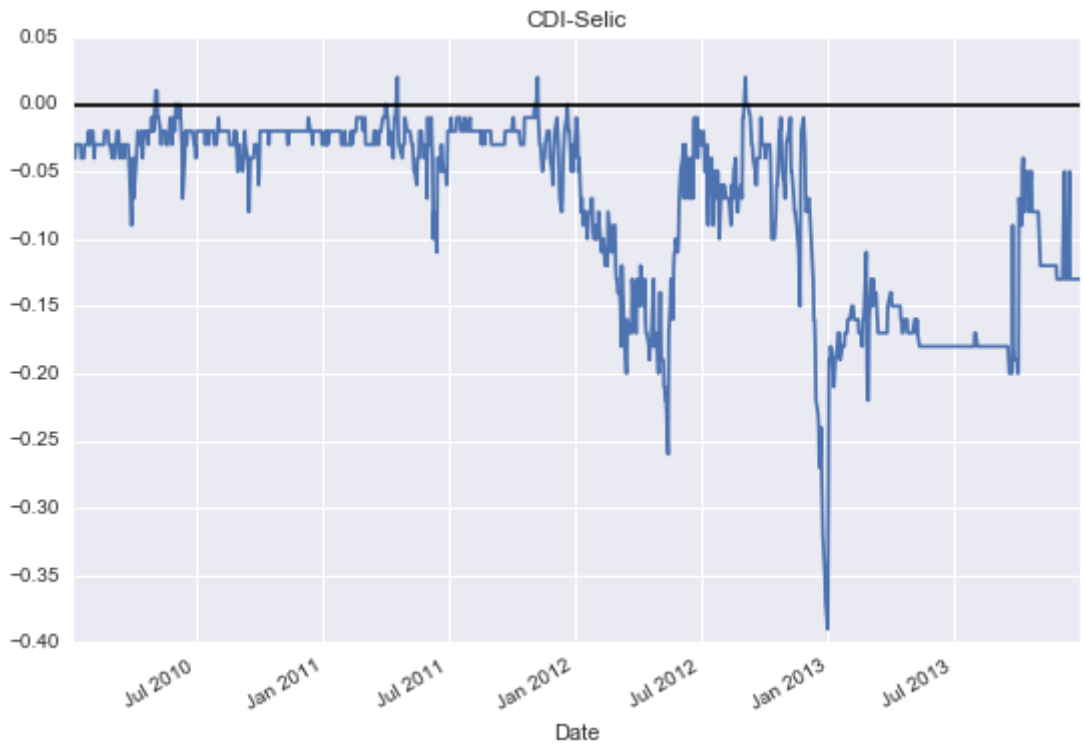
```
CDIData['Spread']=CDIData['CDI']-CDIData['SELIC']
CDIData['Fallback']=pd.isnull(CDIData['StdDev'])
```

In [7]:

```
plt.figure(figsize=(9, 6), dpi=1200)
CDIData['Spread']['2010-1-1':'2014-1-1'].plot(title="CDI-Selic")
plt.axhline(0, color='k')
```

Out[7]:

```
<matplotlib.lines.Line2D at 0x11c4dd128>
```



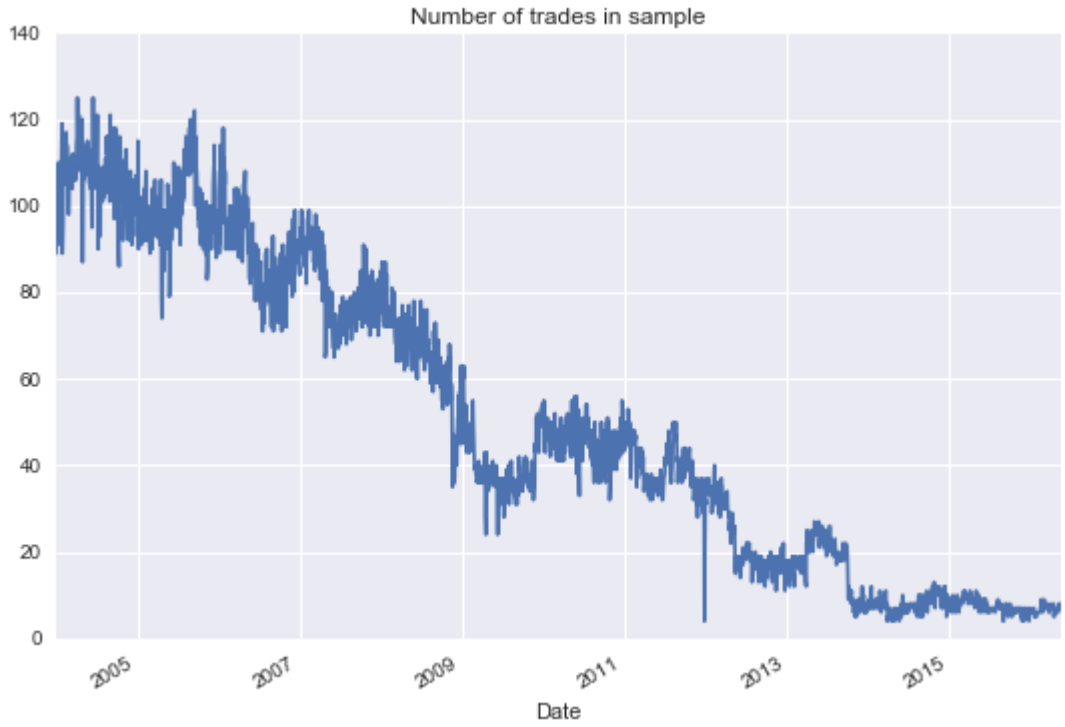
But the number of trades in the daily sample continued to decrease:

In [9]:

```
plt.figure(figsize=(9, 6), dpi=1200)
CDIData['#Op'].plot(title="Number of trades in sample")
```

Out[9]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x11cea9b00>
```

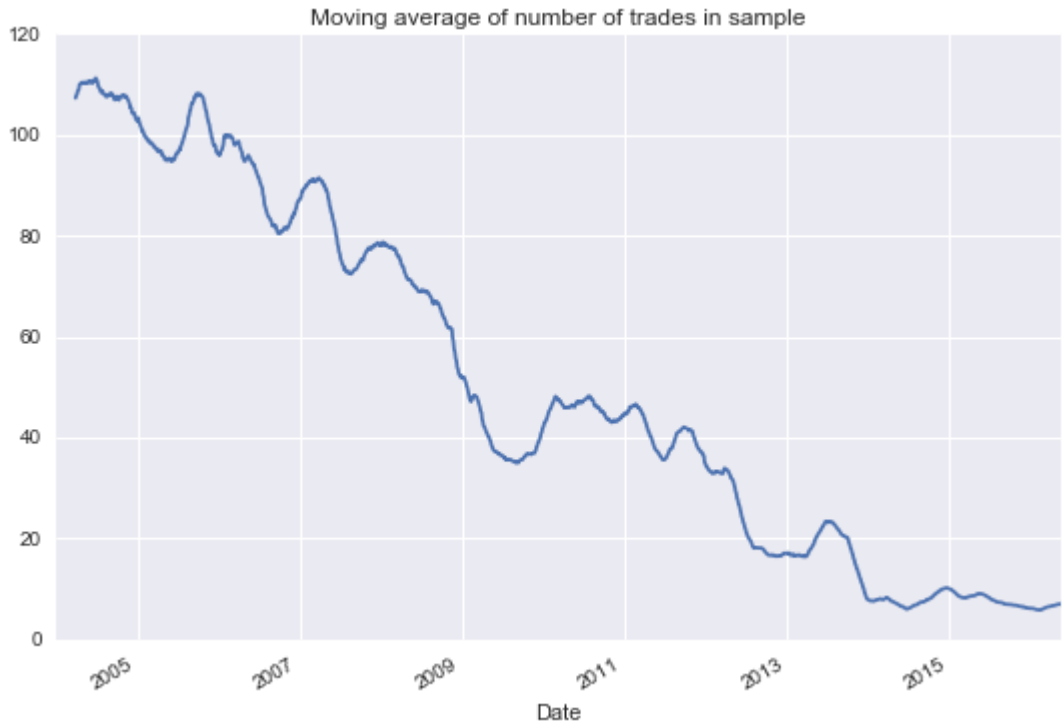


In [10]:

```
plt.figure(figsize=(9, 6), dpi=1200)
CDIData['#Op'].rolling(window=60).mean()\
    .plot(title="Moving average of number of trades in sample")
```

Out[10]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x11ca69f28>
```

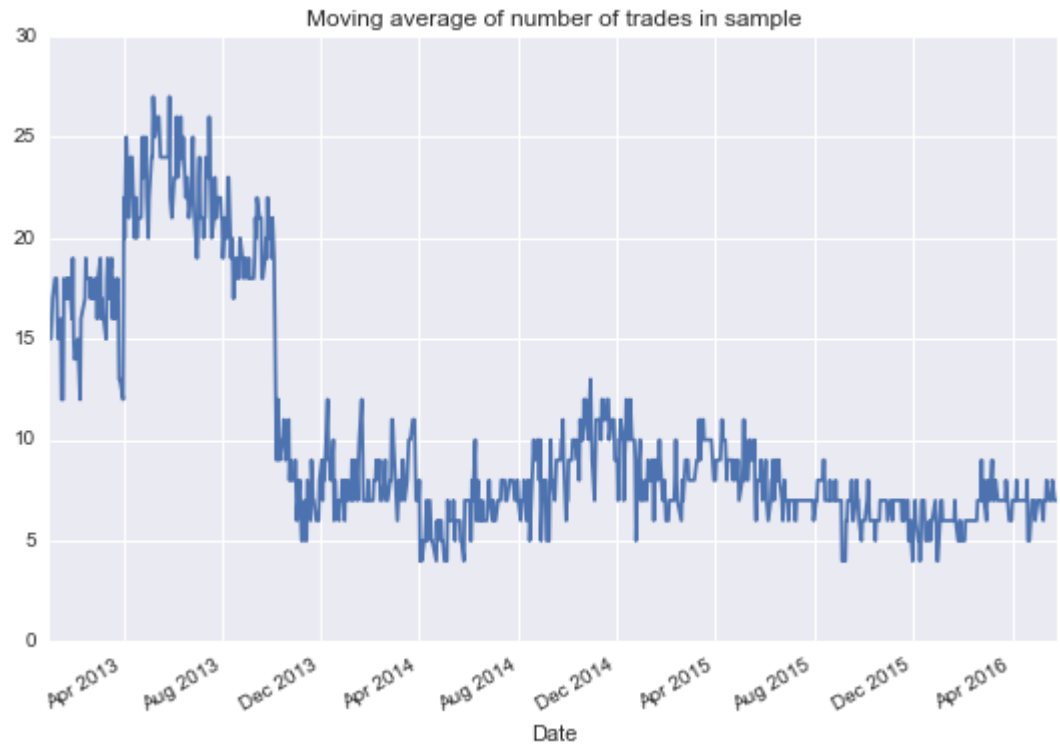


In [12]:

```
plt.figure(figsize=(9, 6), dpi=1200)
CDIData['#Op']['2013-1-1':].plot(title="Number of trades in sample")
```

Out[12]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x11d4340b8>
```



And in 2014 we reached a point where having less than 10 trades was the rule rather than the exception, as seen above.

The fallback methodology implemented by CETIP for these occasions is available here:

http://estatisticas.cetip.com.br/astec/di_documentos/metodologia1_i1.htm (http://estatisticas.cetip.com.br/astec/di_documentos/metodologia1_i1.htm)

Which is basically a linear regression with the CDI as a function of the Selic. We would have modelled the spread as a function of time and the Selic, but …

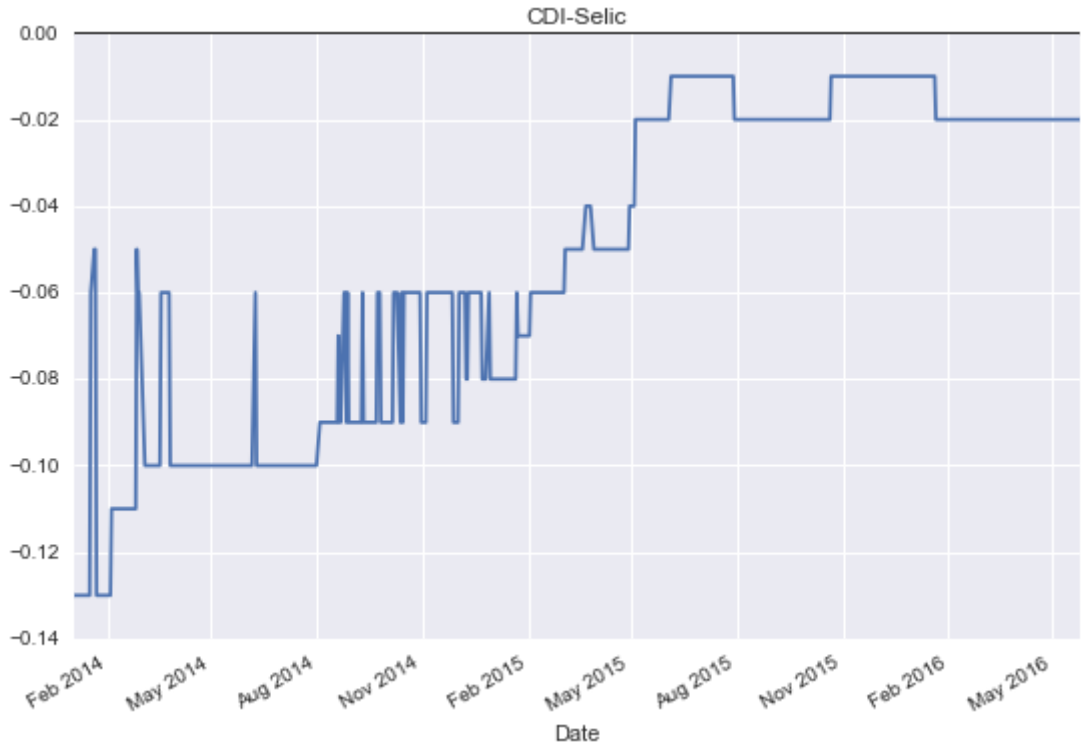
Anyway, with this methodology the spread became closer to zero:

In [13]:

```
plt.figure(figsize=(9, 6), dpi=1200)
CDIData['Spread']['2014-1-1':].plot(title="CDI-Selic")
plt.axhline(0, color='k')
```

Out[13]:

```
<matplotlib.lines.Line2D at 0x11d6e2208>
```

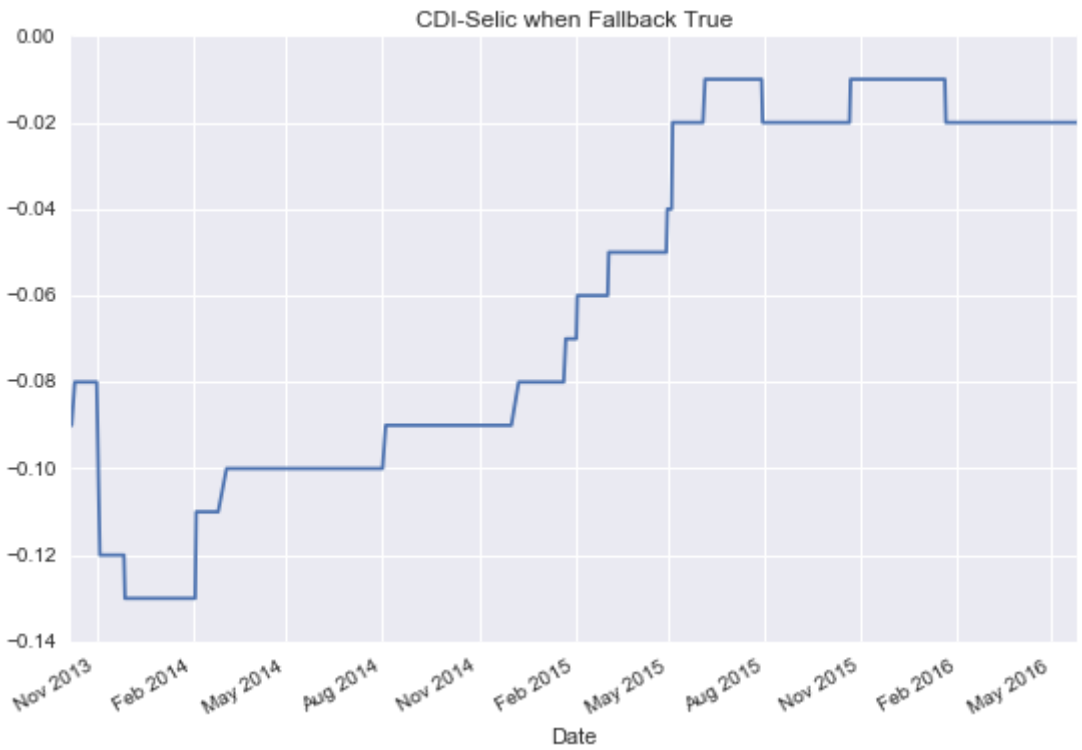


In [14]:

```
plt.figure(figsize=(9, 6), dpi=1200)
CDIData[CDIData['Fallback']]['Spread']\
    .plot(title="CDI-Selic when Fallback True")
```

Out[14]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x11c4c9c50>
```



So, for the last year the fallback has been used every day, and the spread has been negative by 1 or 2 bp for this whole period.

Chances now are rather in favour of a scenario where the CDI becomes equal to the Selic. Until there, watch out.