Germany Macro Dashboard

An overview of important indicators of the German economy's health.

In [1]:
```
# Import libraries, datetime for plotting and datastore configuration
from pyReach import *
from sutils import *
import sutils
```

Import data from Bundesbank website

In [2]:
```
# Create dictionary where keys represent bond tenors and values are the URL of correspo

tenor = ['6 MO', '1 YR', '2 YR', '5 YR', '7 YR', '10 YR', '20 YR', '30 YR']

base_url = "https://www.bundesbank.de/statistic-rmi/StatisticDownload?tsId="

DE = {"DE6 MO_input": base_url + "BBK01.WT3210",
      "DE1 YR_input": base_url + "BBK01.WT3211",
      "DE2 YR_input": base_url + "BBK01.WT3213",
      "DE5 YR_input": base_url + "BBK01.WT3219",
      "DE7 YR_input": base_url + "BBK01.WT3223",
      "DE10 YR_input": base_url + "BBK01.WT3229",
      "DE20 YR_input": base_url + "BBK01.WT3449",
      "DE30 YR_input": base_url + "BBK01.WT3500"}
```

In [3]:
```
# Clean and join bond yields from Bundesbank web site
results = instrument_names(tenor[:])
instruments = results[0]
input_name = results[1]

DE_bond_yields = clean_and_join(input_name, tenor, DE)
DE_bond_yields.to_csv("data/DE_bond_yields.csv")
DE_bond_yields.tail()
```

Out[3]:

DATE	6 MO	1 YR	2 YR	5 YR	7 YR	10 YR	20 YR	30 YR
2020-05-13	-0.59	-0.64	-0.73	-0.75	-0.66	-0.51	-0.20	-0.07
2020-05-14	-0.60	-0.65	-0.74	-0.75	-0.67	-0.53	-0.22	-0.09
2020-05-15	-0.61	-0.66	-0.75	-0.76	-0.67	-0.53	-0.23	-0.10
2020-05-18	-0.61	-0.66	-0.75	-0.76	-0.68	-0.54	-0.23	-0.09
2020-05-19	-0.58	-0.61	-0.68	-0.69	-0.60	-0.46	-0.15	-0.02

In [4]:
```
### Load Germany Govt Bond Yield Time series from source CSV File
input_table = "data/DE_bond_yields.csv"
tenors = ['6 MO', '1 YR', '2 YR', '5 YR', '7 YR', '10 YR', '20 YR', '30 YR']
```

```
item = "DEG"
desc = "German Govt Bond Yield"
source = "Bundesbank:" + input_table
freq = 'B'

store_yields = sutils.store_csv_series(input_table, tenors, freq, item, desc, source)
DE_bond_yields = sutils.treasury_df(tenors, item)
print(DE_bond_yields.tail())
```

```
            6 MO  1 YR  2 YR  5 YR  7 YR  10 YR  20 YR  30 YR
2020-05-13 -0.59 -0.64 -0.73 -0.75 -0.66  -0.51  -0.20  -0.07
2020-05-14 -0.60 -0.65 -0.74 -0.75 -0.67  -0.53  -0.22  -0.09
2020-05-15 -0.61 -0.66 -0.75 -0.76 -0.67  -0.53  -0.23  -0.10
2020-05-18 -0.61 -0.66 -0.75 -0.76 -0.68  -0.54  -0.23  -0.09
2020-05-19 -0.58 -0.61 -0.68 -0.69 -0.60  -0.46  -0.15  -0.02
```

In [5]:

```
# Cell to explicitly create treasury dataframe
tenors = ['6 MO', '1 YR', '2 YR', '5 YR', '7 YR', '10 YR', '20 YR', '30 YR']
item = "DEG"

combined = pd.DataFrame()
for col in tenors:
    name = item + "." + col.replace(" ","_")
    combined[col] = putils.AtlasTimeSeriesToPandasSeries(name)

DE_bond_yields = combined
print(DE_bond_yields.tail())
```

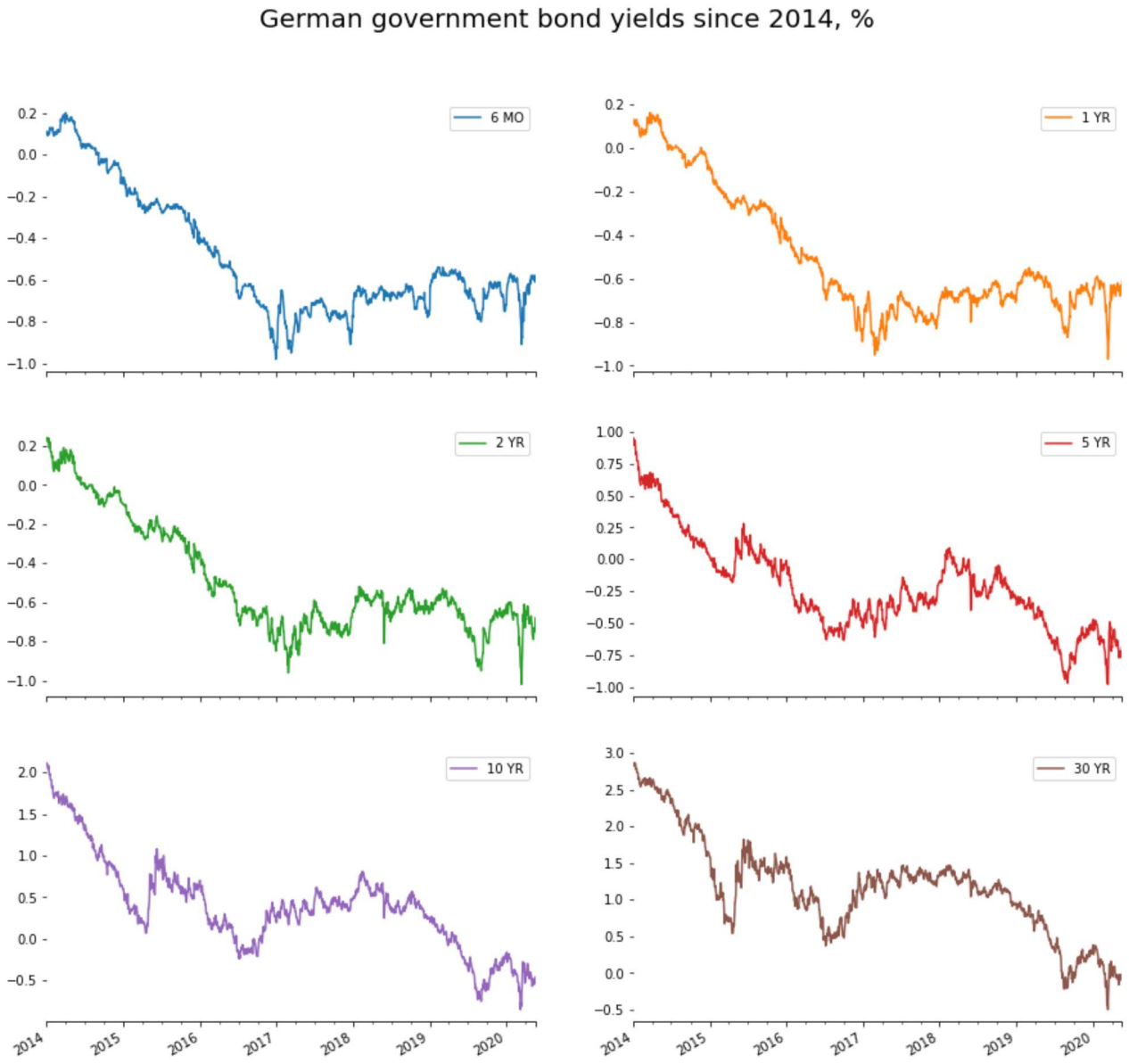
```
            6 MO  1 YR  2 YR  5 YR  7 YR  10 YR  20 YR  30 YR
2020-05-13 -0.59 -0.64 -0.73 -0.75 -0.66  -0.51  -0.20  -0.07
2020-05-14 -0.60 -0.65 -0.74 -0.75 -0.67  -0.53  -0.22  -0.09
2020-05-15 -0.61 -0.66 -0.75 -0.76 -0.67  -0.53  -0.23  -0.10
2020-05-18 -0.61 -0.66 -0.75 -0.76 -0.68  -0.54  -0.23  -0.09
2020-05-19 -0.58 -0.61 -0.68 -0.69 -0.60  -0.46  -0.15  -0.02
```

Visualising German bond yields for different tenors

In [6]:

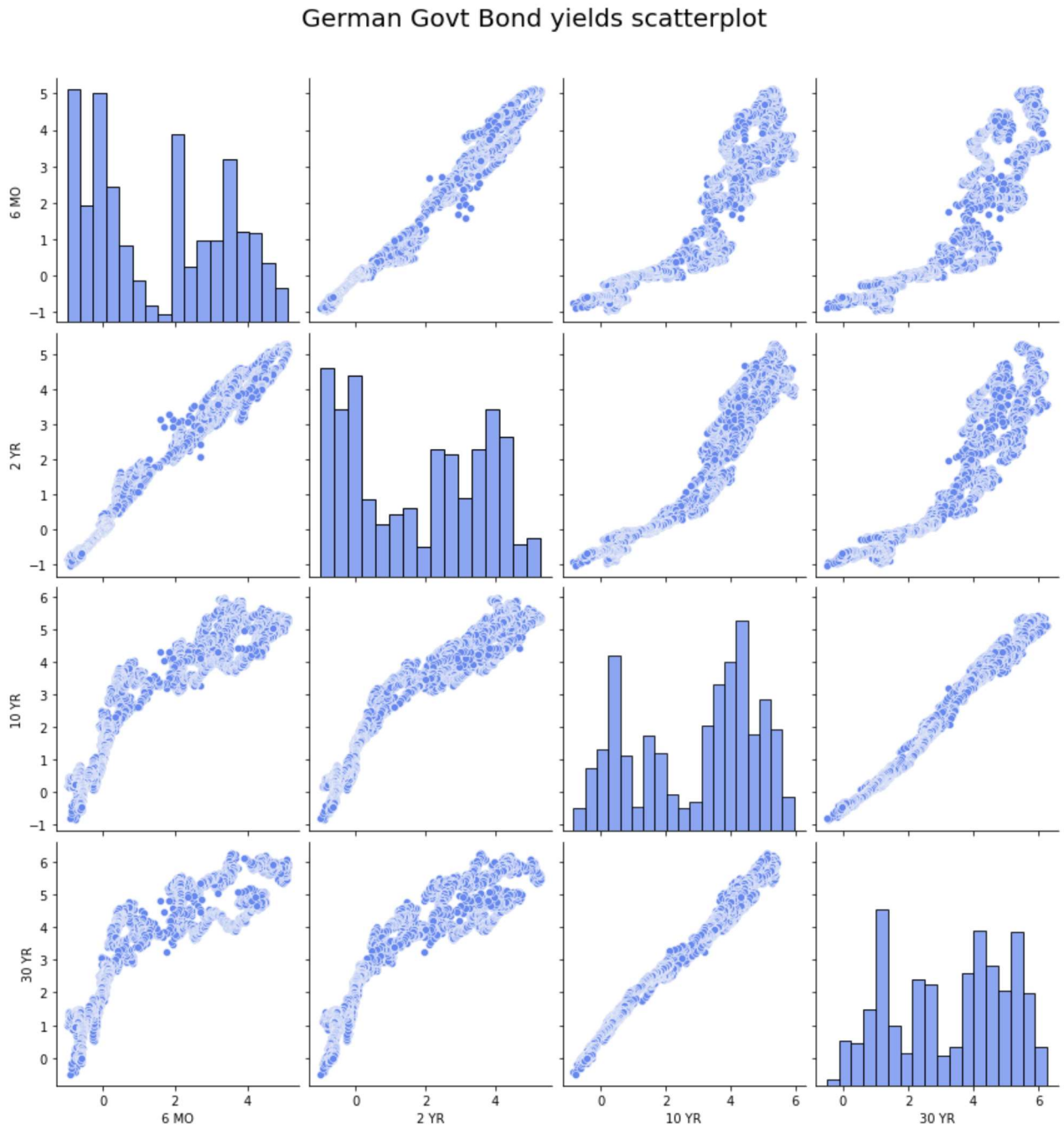
```
start = '20140101'
print(DE_bond_yields.tail())

select_columns = ['6 MO', '1 YR', '2 YR', '5 YR','10 YR', '30 YR']

DE_bond_yields_subplot = DE_bond_yields[select_columns]

DE_bond_yields_subplot.loc[start:].plot(subplots=True, layout=(5,2), figsize=(15, 25))
sns.despine(left=True, bottom=False, right=True)
plt.suptitle("German government bond yields since 2014, %", fontsize=20, y=0.92)
plt.show();
```

```
            6 MO  1 YR  2 YR  5 YR  7 YR  10 YR  20 YR  30 YR
2020-05-13 -0.59 -0.64 -0.73 -0.75 -0.66  -0.51  -0.20  -0.07
2020-05-14 -0.60 -0.65 -0.74 -0.75 -0.67  -0.53  -0.22  -0.09
2020-05-15 -0.61 -0.66 -0.75 -0.76 -0.67  -0.53  -0.23  -0.10
2020-05-18 -0.61 -0.66 -0.75 -0.76 -0.68  -0.54  -0.23  -0.09
2020-05-19 -0.58 -0.61 -0.68 -0.69 -0.60  -0.46  -0.15  -0.02
```



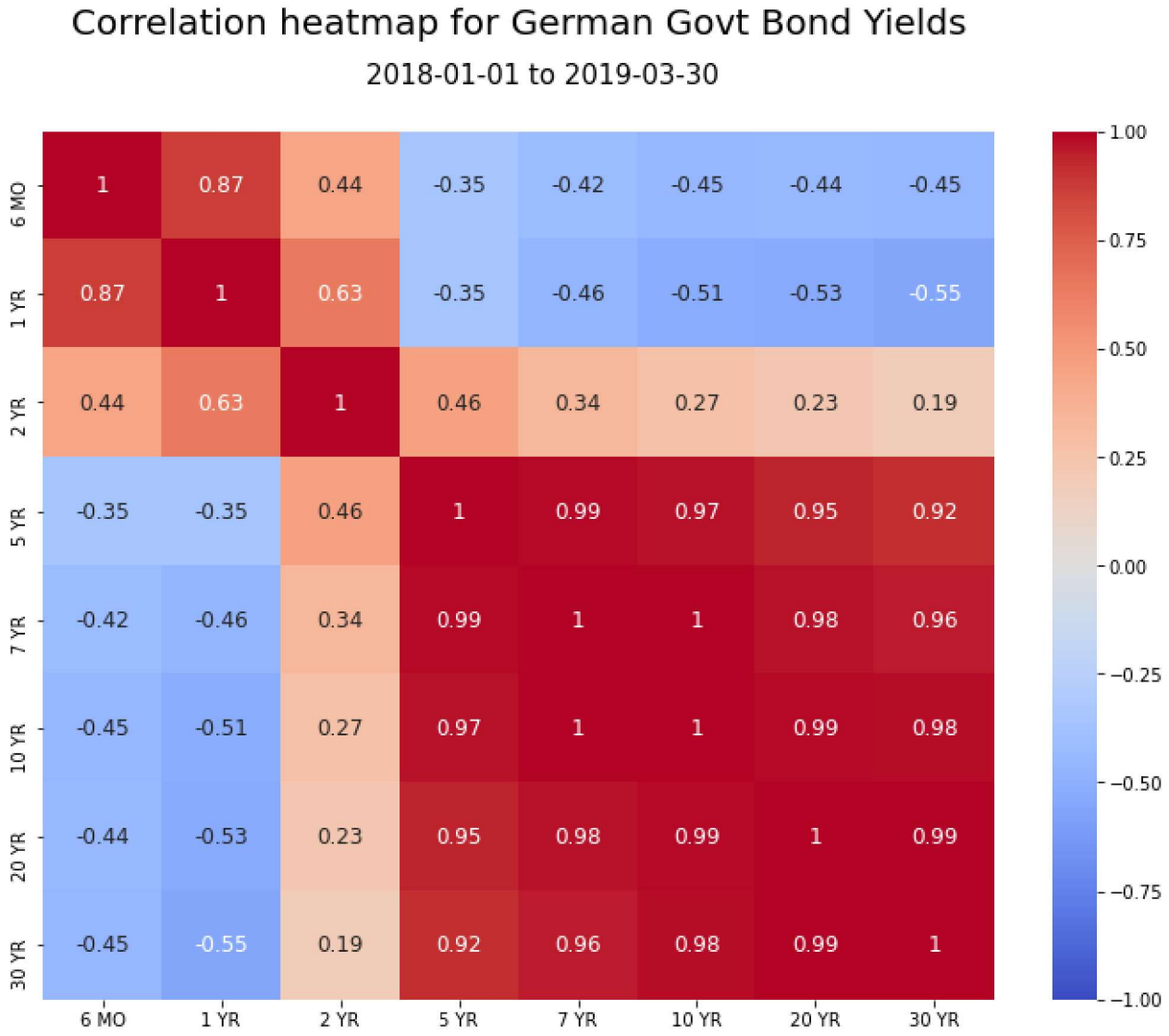
In [7]:

```
sns.set_palette("coolwarm")
sns.pairplot(DE_bond_yields[['6 MO', '2 YR','10 YR', '30 YR']],height=3)
plt.suptitle("German Govt Bond yields scatterplot", fontsize=20, y=1.05)
plt.show()
```



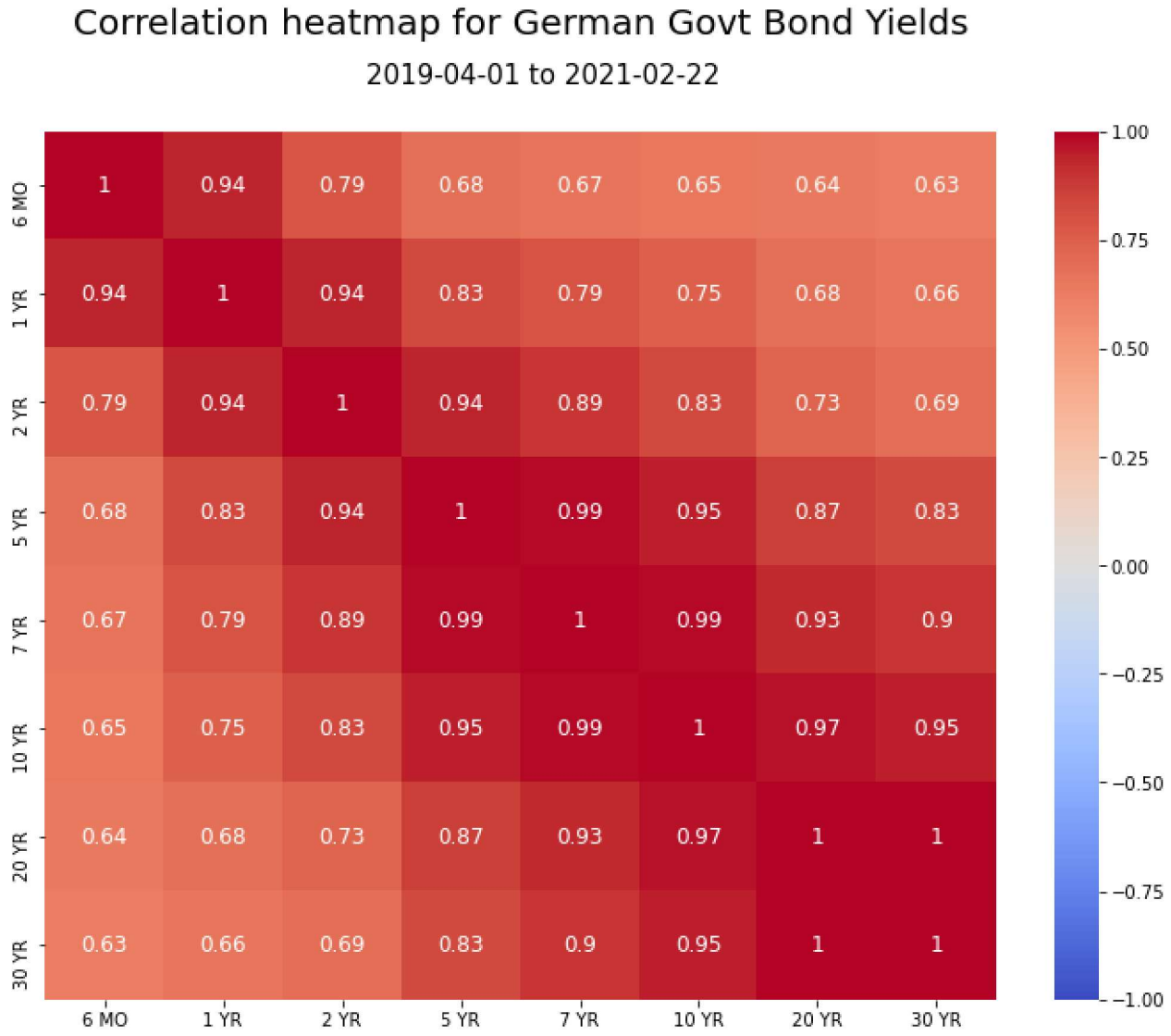
In [8]:

```
start = '2018-01-01'
end = '2019-03-30' #datetime.date.today()
select_tenors= ['6 MO', '1 YR', '2 YR', '5 YR', '7 YR', '10 YR', '20 YR','30 YR']

DE_bond_yields_corr_heatmap = DE_bond_yields.loc[start:end]

plt.figure(figsize=(12,9))
plt.title("Correlation heatmap for German Govt Bond Yields", y=1.1, fontsize=20)
plt.suptitle("%s to %s" %(start, end), y=.94, x=.45, fontsize='15')
sns.heatmap(DE_bond_yields_corr_heatmap[select_tenors].corr(),
            vmin=-1,
            cmap='coolwarm',
            annot=True,
            annot_kws={"fontsize":12});
```



In [9]:

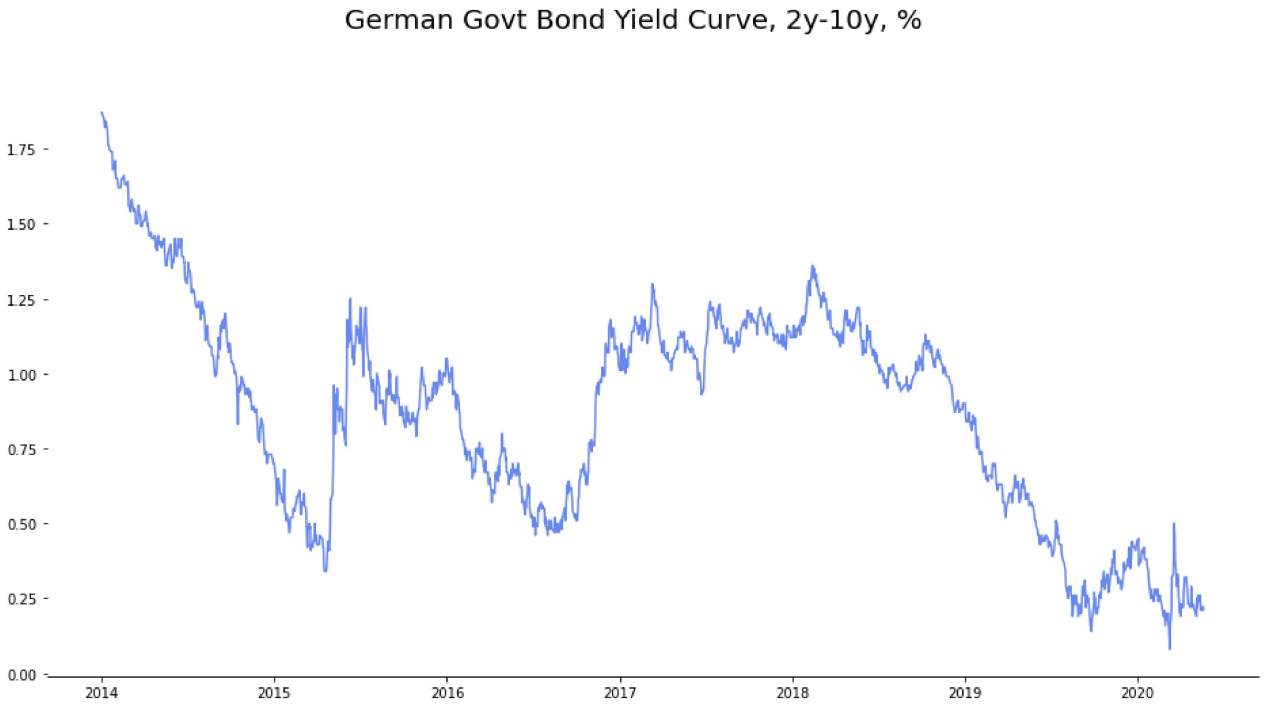
```
start = '2019-04-01'
end = datetime.date.today()
select_tenors= ['6 MO', '1 YR', '2 YR', '5 YR', '7 YR', '10 YR', '20 YR','30 YR']

DE_bond_yields_corr_heatmap = DE_bond_yields.loc[start:end]

plt.figure(figsize=(12,9))
plt.title("Correlation heatmap for German Govt Bond Yields", y=1.1, fontsize=20)
plt.suptitle("{} to {}".format(start, end), y=.94, x=.45, fontsize='15')
sns.heatmap(DE_bond_yields_corr_heatmap[select_tenors].corr(),
            vmin=-1,
            cmap='coolwarm',
            annot=True,
            annot_kws={"fontsize":12});
```



German yield curves

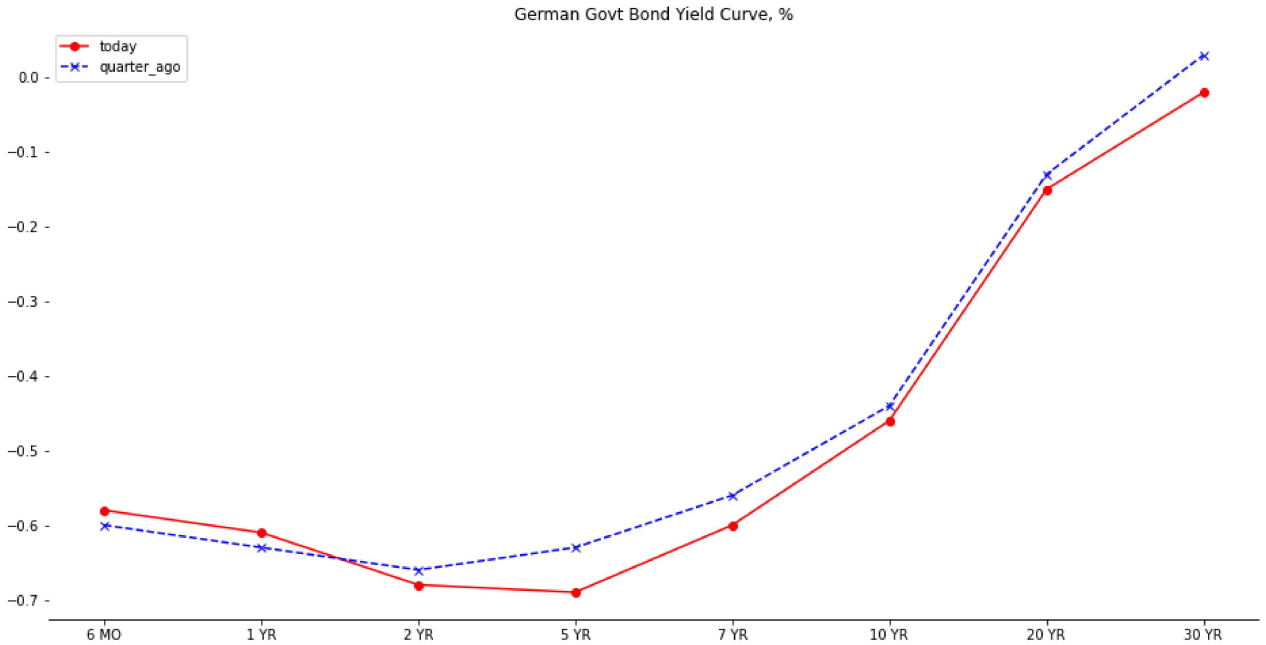
In [10]:
```
# check if correct
DE2y10y = DE_bond_yields['10 YR'] - DE_bond_yields['2 YR']
```

In [11]:
```
start = '20140101'

figure_data = DE2y10y.loc[start:]
plt.figure(figsize=(16, 8))
plt.suptitle("German Govt Bond Yield Curve, 2y-10y, %", fontsize=20)
plt.plot(figure_data)
sns.despine(left=True, bottom=False, right=True)
plt.show();
```



In [12]:

```
DE_today = DE_bond_yields.iloc[-1,:]
DE_quarter_ago = DE_bond_yields.iloc[-63,:]
df = pd.concat([DE_today, DE_quarter_ago], axis=1)
df.columns = ['today', 'quarter_ago']

df.plot(style={'today': 'ro-', 'quarter_ago': 'bx--'}
        ,title='German Govt Bond Yield Curve, %', figsize=(16, 8))
sns.despine(left=True, bottom=False, right=True)
```



In [13]:

```
# WRITE FUNCTION FOR THIS (and all other data sets)

DE_curve_today = DE_bond_yields.iloc[-1:]
DE_curve_month_ago = DE_bond_yields.iloc[-21:-20]
DE_curve_3month_ago = DE_bond_yields.iloc[-63:-62]
DE_curve_6month_ago = DE_bond_yields.iloc[-126:-125]
```

```
DE_curve_year_ago = DE_bond_yields.iloc[-252:-251]

DE_curves_combined = pd.concat([DE_curve_today, DE_curve_month_ago, DE_curve_3month_ago
DE_curves_combined
```

Out[13]:

	6 MO	1 YR	2 YR	5 YR	7 YR	10 YR	20 YR	30 YR
2020-05-19	-0.58	-0.61	-0.68	-0.69	-0.60	-0.46	-0.15	-0.02
2020-04-21	-0.62	-0.65	-0.68	-0.65	-0.58	-0.46	-0.16	-0.05
2020-02-21	-0.60	-0.63	-0.66	-0.63	-0.56	-0.44	-0.13	0.03
2019-11-26	-0.62	-0.64	-0.66	-0.60	-0.51	-0.36	0.01	0.18
2019-06-03	-0.59	-0.64	-0.69	-0.58	-0.44	-0.21	0.29	0.51

Plot German yield curve - today v 3m ago

In [14]:

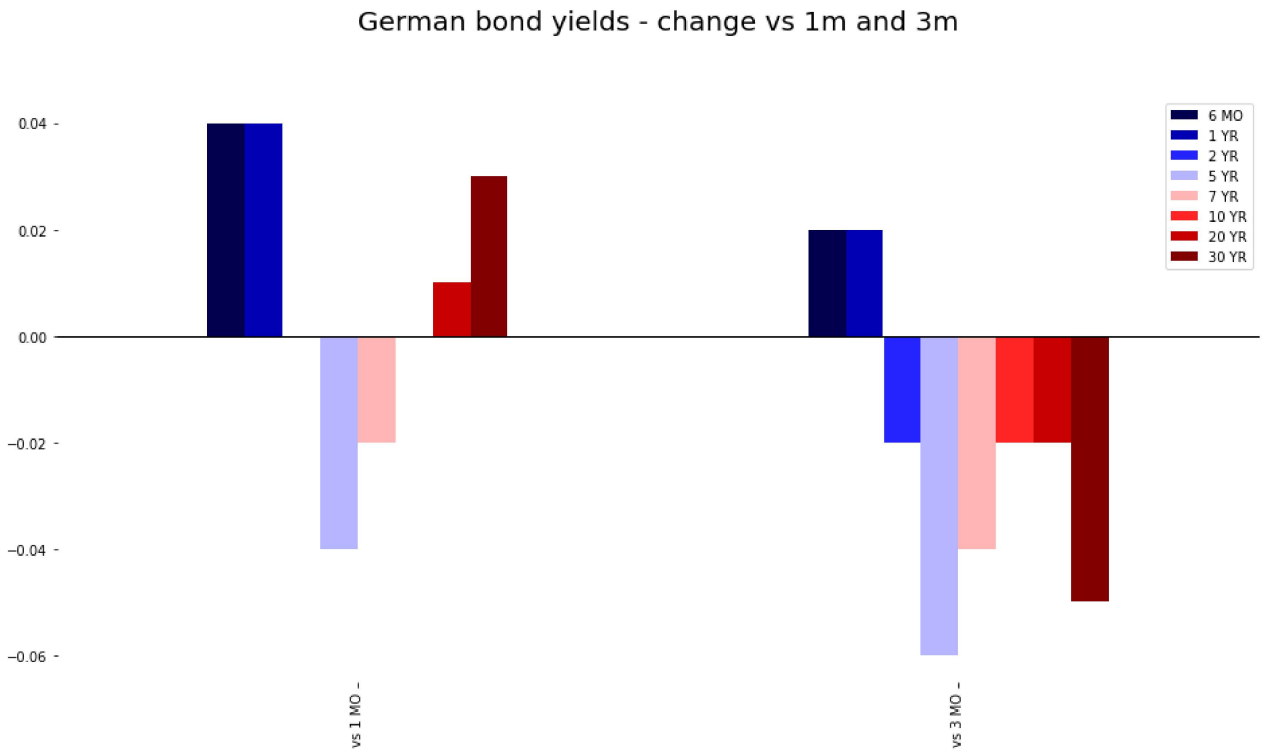
```
# WRITE FUNCTION FOR THIS (and all other data sets)

DE_diff_today_month_ago = DE_curves_combined.iloc[0] - DE_curves_combined.iloc[1]
DE_diff_today_3month_ago = DE_curves_combined.iloc[0] - DE_curves_combined.iloc[2]
DE_diffs_combined = pd.concat([DE_diff_today_month_ago, DE_diff_today_3month_ago], axis

DE_diffs_combined = DE_diffs_combined.T
DE_diffs_combined.rename({0: "vs 1 MO", 1: "vs 3 MO"}, axis='index', inplace=True)
DE_diffs_combined
```

Out[14]:

	6 MO	1 YR	2 YR	5 YR	7 YR	10 YR	20 YR	30 YR
vs 1 MO	0.04	0.04	0.00	-0.04	-0.02	0.00	0.01	0.03
vs 3 MO	0.02	0.02	-0.02	-0.06	-0.04	-0.02	-0.02	-0.05

In [15]:

```
#DE_diffs_combined = pd.DataFrame(data=DE_diffs_combined)
DE_diffs_combined.plot.bar(figsize=(16,8), colormap='seismic')
plt.title("German bond yields - change vs 1m and 3m", fontsize=20, y=1.1)
plt.axhline(0, color = 'k', linestyle = '-', linewidth = 1)
sns.despine(top=True, left=True, right=True, bottom=True)

plt.show()
```



Germany plots finished

In [ ]: