In [1]:
```
import pandas as pd
import matplotlib.pyplot as plt
import warnings
import matplotlib.style as style
```

In [2]:
```
exchange_rates = pd.read_csv("euro-daily-hist_1999_2022.csv")
```

In [3]:
```
exchange_rates
```

Out[3]:

	Period\Unit:	[Australian dollar]	[Bulgarian lev]	[Brazilian real]	[Canadian dollar]	[Swiss franc]	[Chinese yuan renminbi]	[Cypriot pound]	[Czech koruna]
0	2023-12-15	1.6324	1.9558	5.4085	1.4653	0.9488	7.7812	NaN	24.477
1	2023-12-14	1.6288	1.9558	5.3349	1.4677	0.949	7.7866	NaN	24.408
2	2023-12-13	1.6452	1.9558	5.3609	1.4644	0.9452	7.7426	NaN	24.476
3	2023-12-12	1.6398	1.9558	5.3327	1.4656	0.9443	7.7447	NaN	24.42
4	2023-12-11	1.642	1.9558	5.3169	1.4609	0.9478	7.7206	NaN	24.367
...	...	...	...	...	...	...	...	...	...
6451	1999-01-08	1.8406	NaN	NaN	1.7643	1.6138	NaN	0.58187	34.938
6452	1999-01-07	1.8474	NaN	NaN	1.7602	1.6165	NaN	0.58187	34.886
6453	1999-01-06	1.8820	NaN	NaN	1.7711	1.6116	NaN	0.58200	34.850
6454	1999-01-05	1.8944	NaN	NaN	1.7965	1.6123	NaN	0.58230	34.917
6455	1999-01-04	1.9100	NaN	NaN	1.8004	1.6168	NaN	0.58231	35.107

6456 rows × 41 columns

In [4]:
```
#As we already know that periods = time but fro individual perspective it is difficult
```

In [5]:
```
exchange_rates.rename(columns = {'[Chinese yuan renminbi ]' : 'Chinese yuan renminbi',
```

In [6]:
```
exchange_rates['Time'] = pd.to_datetime(exchange_rates['Time'])
```

In [7]:
```
exchange_rates
```

Out[7]:

	Time	[Australian dollar]	[Bulgarian lev]	[Brazilian real]	[Canadian dollar]	[Swiss franc]	Chinese yuan renminbi	[Cypriot pound]	[Czech koruna]	[Danis krone
0	2023-12-15	1.6324	1.9558	5.4085	1.4653	0.9488	7.7812	NaN	24.477	7.45
1	2023-12-14	1.6288	1.9558	5.3349	1.4677	0.949	7.7866	NaN	24.408	7.45
2	2023-12-13	1.6452	1.9558	5.3609	1.4644	0.9452	7.7426	NaN	24.476	7.45
3	2023-12-12	1.6398	1.9558	5.3327	1.4656	0.9443	7.7447	NaN	24.42	7.45
4	2023-12-11	1.642	1.9558	5.3169	1.4609	0.9478	7.7206	NaN	24.367	7.45
...	...	...	...	...	...	...	...	...	...	
6451	1999-01-08	1.8406	NaN	NaN	1.7643	1.6138	NaN	0.58187	34.938	7.44
6452	1999-01-07	1.8474	NaN	NaN	1.7602	1.6165	NaN	0.58187	34.886	7.44
6453	1999-01-06	1.8820	NaN	NaN	1.7711	1.6116	NaN	0.58200	34.850	7.44
6454	1999-01-05	1.8944	NaN	NaN	1.7965	1.6123	NaN	0.58230	34.917	7.44
6455	1999-01-04	1.9100	NaN	NaN	1.8004	1.6168	NaN	0.58231	35.107	7.45

6456 rows × 41 columns

In [8]:

```
exchange_rates = exchange_rates[exchange_rates['Chinese yuan renminbi'] != '-']
exchange_rates['Chinese yuan renminbi'] = exchange_rates['Chinese yuan renminbi'].asty
exchange_rates
```

```
C:\Users\iqra com\AppData\Local\Temp\ipykernel_14108\1107561610.py:2: SettingWithCopy
Warning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/us
er_guide/indexing.html#returning-a-view-versus-a-copy
  exchange_rates['Chinese yuan renminbi'] = exchange_rates['Chinese yuan renminbi'].a
stype(float)
```

Out[8]:

	Time	[Australian dollar]	[Bulgarian lev]	[Brazilian real]	[Canadian dollar]	[Swiss franc]	Chinese yuan renminbi	[Cypriot pound]	[Czech koruna]	[Danish krone
0	2023-12-15	1.6324	1.9558	5.4085	1.4653	0.9488	7.7812	NaN	24.477	7.455
1	2023-12-14	1.6288	1.9558	5.3349	1.4677	0.949	7.7866	NaN	24.408	7.456
2	2023-12-13	1.6452	1.9558	5.3609	1.4644	0.9452	7.7426	NaN	24.476	7.456
3	2023-12-12	1.6398	1.9558	5.3327	1.4656	0.9443	7.7447	NaN	24.42	7.456
4	2023-12-11	1.642	1.9558	5.3169	1.4609	0.9478	7.7206	NaN	24.367	7.456
...	...	...	...	...	...	...	...	...	...	
6451	1999-01-08	1.8406	NaN	NaN	1.7643	1.6138	NaN	0.58187	34.938	7.443
6452	1999-01-07	1.8474	NaN	NaN	1.7602	1.6165	NaN	0.58187	34.886	7.443
6453	1999-01-06	1.8820	NaN	NaN	1.7711	1.6116	NaN	0.58200	34.850	7.445
6454	1999-01-05	1.8944	NaN	NaN	1.7965	1.6123	NaN	0.58230	34.917	7.449
6455	1999-01-04	1.9100	NaN	NaN	1.8004	1.6168	NaN	0.58231	35.107	7.450

6395 rows × 41 columns

In [ ]:

```
```

In [9]:

```
exchange_rates.reset_index(drop=True, inplace=True)
```

In [10]:

```
chinese_to_dollar = exchange_rates[['Time' , 'Chinese yuan renminbi']].copy()
```

In [11]:

```
exchange_rates.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6395 entries, 0 to 6394
Data columns (total 41 columns):
 #   Column                 Non-Null Count  Dtype         
---  ------                 --------------  -----         
 0   Time                   6395 non-null   datetime64[ns]
 1   [Australian dollar ]   6395 non-null   object        
 2   [Bulgarian lev ]       5996 non-null   object        
 3   [Brazilian real ]      6127 non-null   object        
 4   [Canadian dollar ]     6395 non-null   object        
 5   [Swiss franc ]         6395 non-null   object        
 6   Chinese yuan renminbi  6127 non-null   float64       
 7   [Cypriot pound ]       2305 non-null   object        
 8   [Czech koruna ]        6395 non-null   object        
 9   [Danish krone ]        6395 non-null   object        
 10  [Estonian kroon ]      3075 non-null   object        
 11  [UK pound sterling ]   6395 non-null   object        
 12  [Greek drachma ]       515 non-null    object        
 13  [Hong Kong dollar ]    6395 non-null   object        
 14  [Croatian kuna ]       5880 non-null   object        
 15  [Hungarian forint ]    6395 non-null   object        
 16  [Indonesian rupiah ]   6395 non-null   object        
 17  [Israeli shekel ]      6127 non-null   object        
 18  [Indian rupee ]        6127 non-null   object        
 19  [Iceland krona ]       4049 non-null   float64       
 20  [Japanese yen ]        6395 non-null   object        
 21  [Korean won ]          6395 non-null   object        
 22  [Lithuanian litas ]    4098 non-null   object        
 23  [Latvian lats ]        3843 non-null   object        
 24  [Maltese lira ]        2305 non-null   object        
 25  [Mexican peso ]        6395 non-null   object        
 26  [Malaysian ringgit ]   6395 non-null   object        
 27  [Norwegian krone ]     6395 non-null   object        
 28  [New Zealand dollar ]  6395 non-null   object        
 29  [Philippine peso ]     6395 non-null   object        
 30  [Polish zloty ]        6395 non-null   object        
 31  [Romanian leu ]        6394 non-null   float64       
 32  [Russian rouble ]      5933 non-null   object        
 33  [Swedish krona ]       6395 non-null   object        
 34  [Singapore dollar ]    6395 non-null   object        
 35  [Slovenian tolar ]     2050 non-null   object        
 36  [Slovak koruna ]       2561 non-null   object        
 37  [Thai baht ]           6395 non-null   object        
 38  [Turkish lira ]        6394 non-null   float64       
 39  [US dollar ]           6395 non-null   object        
 40  [South African rand ]  6395 non-null   object        
dtypes: datetime64[ns](1), float64(4), object(36)
memory usage: 2.0+ MB
```

In [ ]:

```
```

In [12]:

```
#chinese_to_dollar = chinese_to_dollar[chinese_to_dollar['Chinese yuan renminbi'] != '
#chinese_to_dollar['Chinese yuan renminbi'] = chinese_to_dollar['Chinese yuan renminbi
#chinese_to_dollar
```

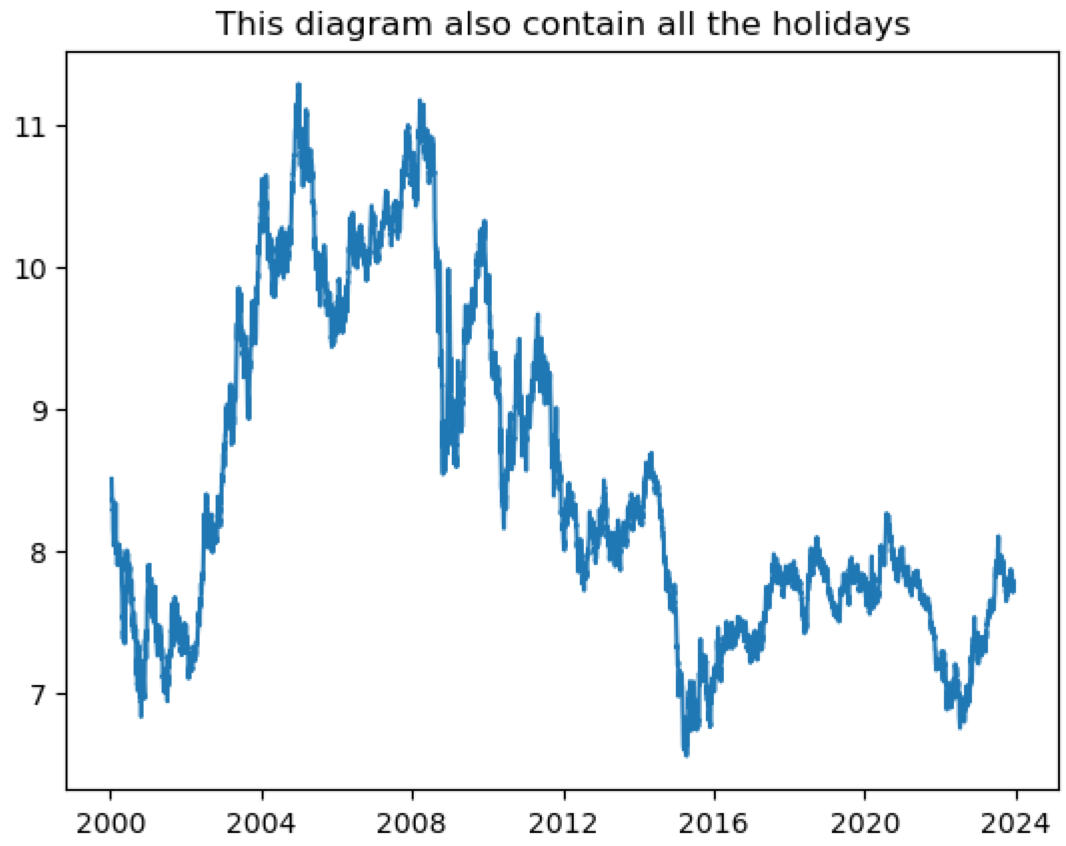
In [13]:

```
chinese_to_dollar.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6395 entries, 0 to 6394
Data columns (total 2 columns):
 #   Column                  Non-Null Count  Dtype         
---  ------                  --------------  -----         
 0   Time                    6395 non-null   datetime64[ns]
 1   Chinese yuan renminbi   6127 non-null   float64       
dtypes: datetime64[ns](1), float64(1)
memory usage: 100.1 KB
```

In [14]:

```python
plt.title('This diagram also contain all the holidays')
plt.plot(chinese_to_dollar['Time'],chinese_to_dollar['Chinese yuan renminbi'])
plt.show()
```

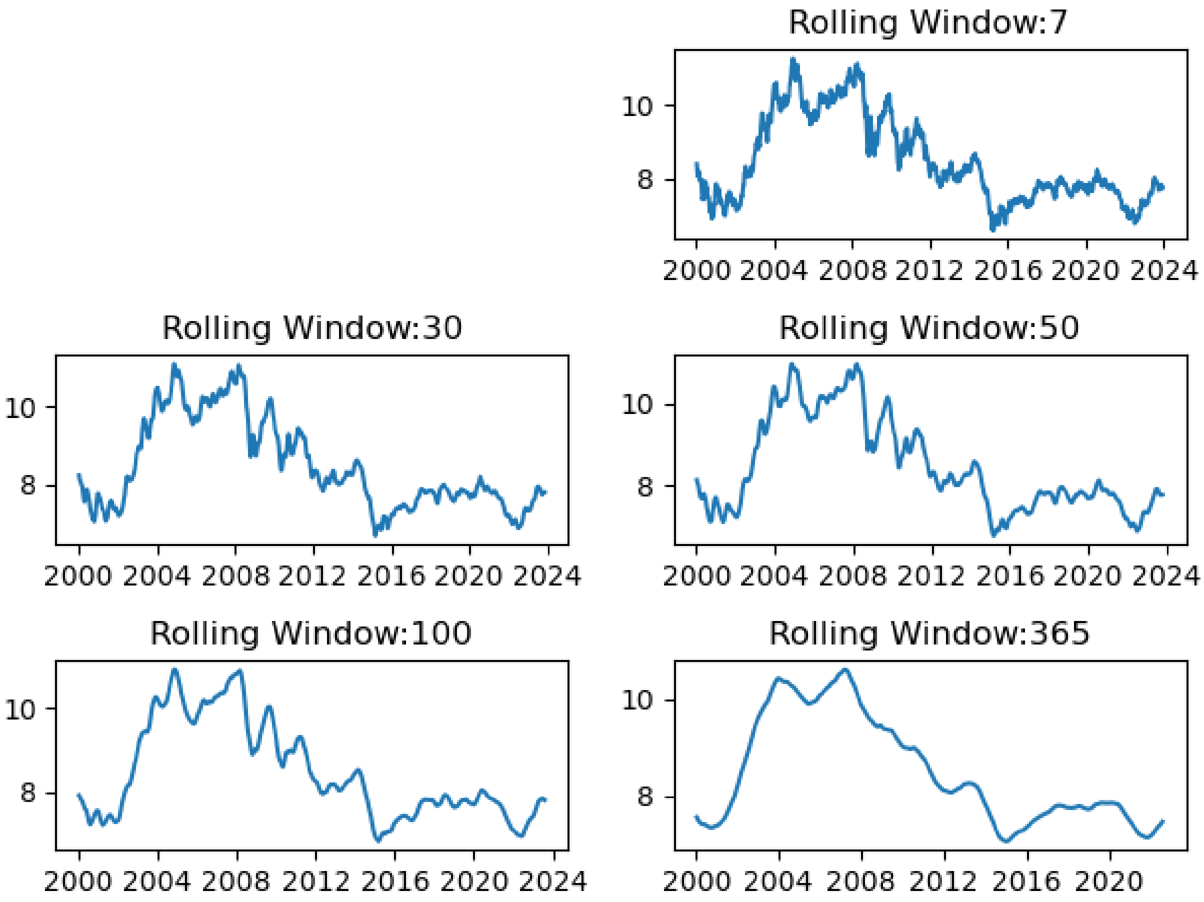


Now we make analysis on rolling meaning we find what insight we can get if we convert on week, days, month and year how much fluctuation are there

In [15]:

```python
plt.title('Graph based on rolling')
plt.plot(chinese_to_dollar["Time"],chinese_to_dollar["Chinese yuan renminbi"])

for i, rolling_mean in zip ([2,3,4,5,6,7],
                            [7,30,50,100,365]) :
    plt.subplot(3,2,i)
    plt.plot(chinese_to_dollar["Time"],
             chinese_to_dollar["Chinese yuan renminbi"].rolling(rolling_mean).mean())
    plt.title("Rolling Window:" + str(rolling_mean))
plt.tight_layout()
plt.show()
```

```
C:\Users\iqra com\AppData\Local\Temp\ipykernel_14108\1713599069.py:6: MatplotlibDepre
cationWarning: Auto-removal of overlapping axes is deprecated since 3.6 and will be r
emoved two minor releases later; explicitly call ax.remove() as needed.
  plt.subplot(3,2,i)
```



In [16]:

```
chinese_to_dollar["rolling_mean"] = chinese_to_dollar["Chinese yuan renminbi"].rolling
```

In [17]:

```
financial_rises_china = chinese_to_dollar.copy(
)[(chinese_to_dollar['Time'].dt.year >=2006
  )&(chinese_to_dollar['Time'].dt.year <=2009)]
financial_rises_china_7_8 = chinese_to_dollar.copy(
)[(chinese_to_dollar['Time'].dt.year >=2007
  )&(chinese_to_dollar['Time'].dt.year <=2008)]
```

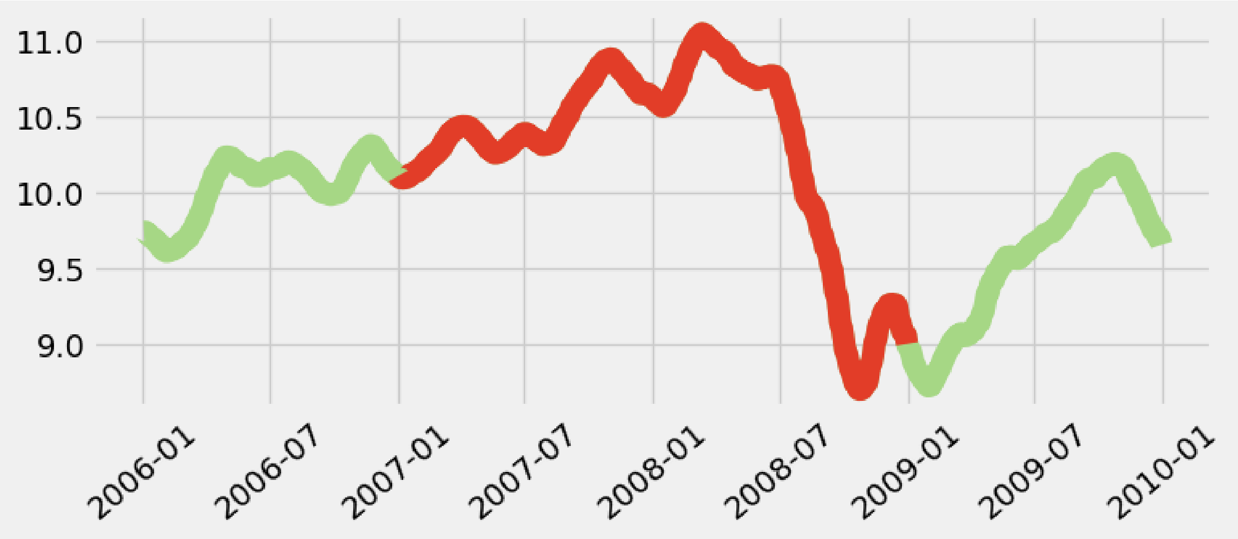
In [18]:

```
style.use('fivethirtyeight')

fig, ax = plt.subplots(figsize = (8,3))
ax.plot(financial_rises_china["Time"],
       financial_rises_china["rolling_mean"],
       linewidth = 10 , color = "#A6D785")

ax.plot(financial_rises_china_7_8["Time"],
       financial_rises_china_7_8["rolling_mean"],
       linewidth = 10 , color = "#e23d28")
plt.xticks(rotation=40)

#ax.set_xticklabels([])
```

```
#x =0.02
#for year in ["2006",'2007',"2008","2009","2010"]:
#    ax.text(x , -0.02, aplha= 0.5, fontsize = 30, transform = plt.gca().transAxes)
#    x += 0.22888
#ax.set_xticklabels([])
```

Out[18]:

```
(array([13149., 13330., 13514., 13695., 13879., 14061., 14245., 14426.,
        14610.]),
 [Text(13149.0, 0, '2006-01'),
  Text(13330.0, 0, '2006-07'),
  Text(13514.0, 0, '2007-01'),
  Text(13695.0, 0, '2007-07'),
  Text(13879.0, 0, '2008-01'),
  Text(14061.0, 0, '2008-07'),
  Text(14245.0, 0, '2009-01'),
  Text(14426.0, 0, '2009-07'),
  Text(14610.0, 0, '2010-01')])
```



EFFECT OF CORONA ONTO CHINA ECONOMY AND ON THEIR MONEY

In [19]:

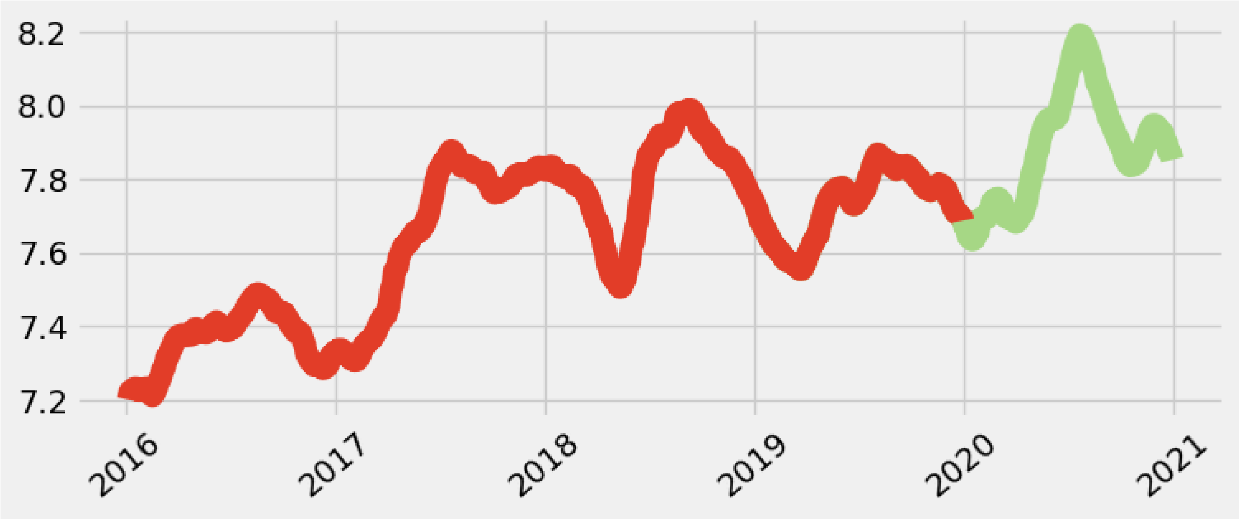
```
corona_rises_china = chinese_to_dollar.loc(
)[(chinese_to_dollar['Time']>='2019-01-01'
  )&(chinese_to_dollar['Time']<='2020-12-31')]
corona_rises_china_7_8 = chinese_to_dollar.loc(
)[(chinese_to_dollar['Time']>='2016-01-01'
  )&(chinese_to_dollar['Time']<='2019-12-31')]
```

In [20]:

```
style.use('fivethirtyeight')

fig, ax = plt.subplots(figsize = (8,3))
ax.plot(corona_rises_china["Time"],
       corona_rises_china["rolling_mean"],
       linewidth = 10 , color = "#A6D785")

ax.plot(corona_rises_china_7_8["Time"],
       corona_rises_china_7_8["rolling_mean"],
       linewidth = 10 , color = "#e23d28")
plt.xticks(rotation=40)
```

Out[20]:

```
(array([16436., 16801., 17167., 17532., 17897., 18262., 18628.]),
 [Text(16436.0, 0, '2015'),
  Text(16801.0, 0, '2016'),
  Text(17167.0, 0, '2017'),
  Text(17532.0, 0, '2018'),
  Text(17897.0, 0, '2019'),
  Text(18262.0, 0, '2020'),
  Text(18628.0, 0, '2021')])
```



As you cna see from above grapgh covid have siginifican effect ON chinese monetary and economy.

Bush obama and trump presedency effect on chinese currency

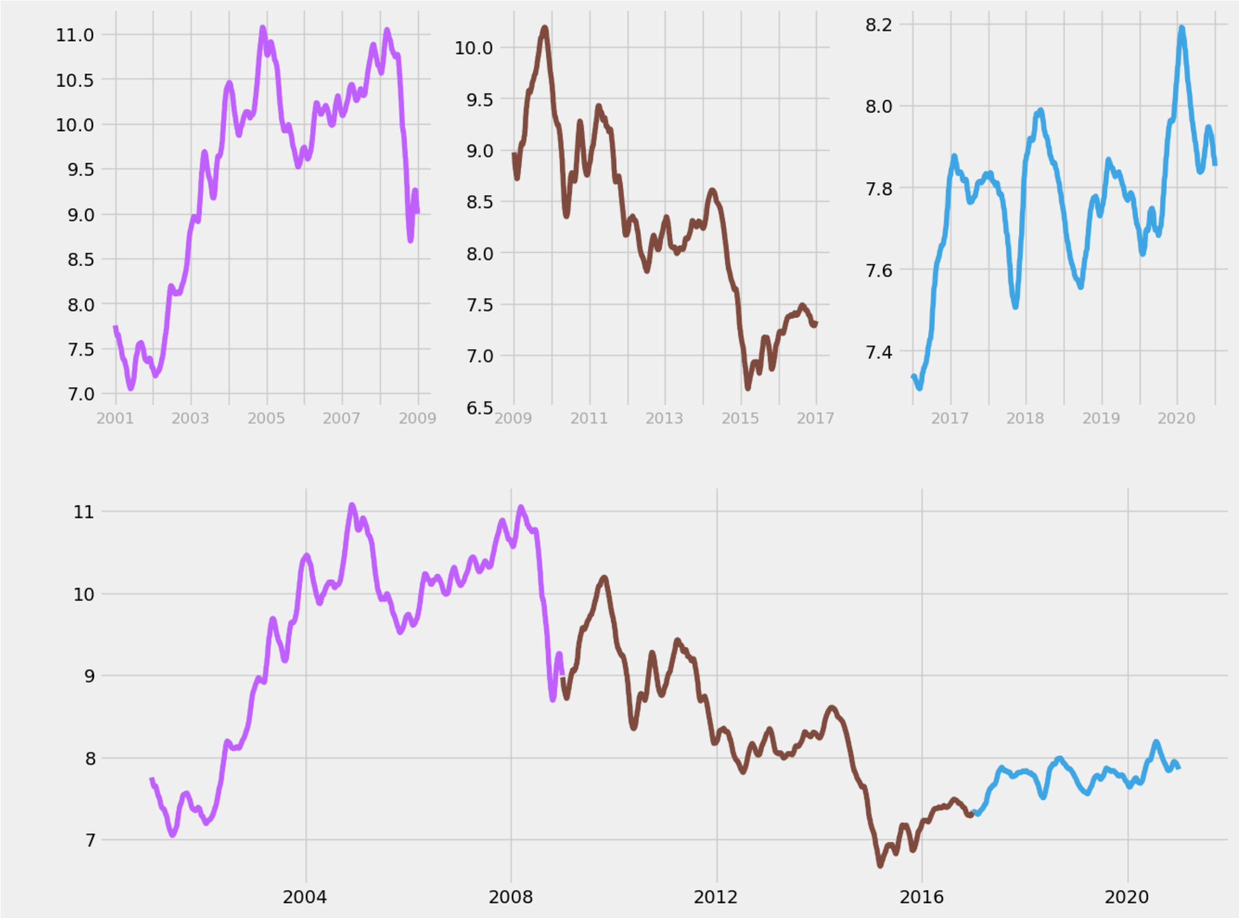
In [21]:

```
bush_obama_trump = chinese_to_dollar.copy(
)[(chinese_to_dollar['Time'].dt.year >=2001
  )&(chinese_to_dollar['Time'].dt.year <2021)]
bush = bush_obama_trump.copy(
)[bush_obama_trump['Time'].dt.year < 2009]
obama = bush_obama_trump.copy(
)[(bush_obama_trump['Time'].dt.year >=2009
  )&(bush_obama_trump['Time'].dt.year <2017)]
trump = bush_obama_trump.copy(
)[(bush_obama_trump['Time'].dt.year >=2017
  )&(bush_obama_trump['Time'].dt.year < 2021)]
```

In [31]:

```
style.use('fivethirtyeight')
plt.figure(figsize = (14,18))
#x = plt.subplot(3,3,1)
ax1 = plt.subplot(3,3,1)
ax2 = plt.subplot(3,3,2)
ax3 = plt.subplot(3,3,3)
ax4 = plt.subplot(3,1,2)

#AX1
ax1.plot(bush['Time'] , bush['rolling_mean'],
        color = '#BF5FFF')
ax1.set_xticklabels(['' , '2001' , '' , '2003' , '' , '2005' , '' , '2007' , '' ,'2009
                   alpha = 0.3 , size = 12)
ax1.text(0.11 , 0.25 , 'BUSH' , fontsize = 12 , weight = 'bold',
        color = '#BF5FFF' , transform = plt.gca().transAxes)
ax1.text(0.093 , 0.25, '(2001-2009)', weight = 'bold',
         alpha = 0.3, transform = plt.gca().transAxes)

##AX2
ax2.plot(obama['Time'] , obama['rolling_mean'],
        color = '#7F4A3E')
ax2.set_xticklabels(['' , '2009' , '' , '2011' , '' , '2013' , '' , '2015' , '' ,'2017
                   alpha = 0.3 , size = 12)
ax2.text(0.11 , 0.25 , 'OBAMA' , fontsize = 12 , weight = 'bold',
        color = '#7F4A3E', transform = plt.gca().transAxes)
ax2.text(0.093 , 0.25, '(2009-2017)', weight = 'bold',
        alpha = 0.3, transform = plt.gca().transAxes)

##AX3
ax3.plot(trump['Time'] , trump['rolling_mean'],
        color = '#3DA5E4')
ax3.set_xticklabels(['' , '2017','', '2018','' , '2019' , '' , '2020','' , '2021',''],
                   alpha = 0.3 , size = 12)
ax3.text(0.11 , 0.25 , 'Trump' , fontsize = 12 , weight = 'bold',
        color = '#3DA5E4' , transform = plt.gca().transAxes)
ax3.text(0.093 , 0.25, '(2017-2021)', weight = 'bold',
         alpha = 0.3, transform = plt.gca().transAxes)

##AX4
ax4.plot(bush['Time'] , bush['rolling_mean'],
        color = '#BF5FFF')
ax4.plot(obama['Time'] , obama['rolling_mean'],
        color = '#7F4A3E')
ax4.plot(trump['Time'] , trump['rolling_mean'],
        color = '#3DA5E4')
### Signature
ax4.text(-0.08 , -0.15, 'Rizwan Gagnum' + ' '*133 + 'Source: Bank of Europe',
         size =14 , transform = plt.gca().transAxes)
plt.tight_layout()
plt.show()
```

```
C:\Users\iqra com\AppData\Local\Temp\ipykernel_14108\2557110016.py:12: UserWarning: F
ixedFormatter should only be used together with FixedLocator
  ax1.set_xticklabels(['' , '2001' , '' , '2003' , '' , '2005' , '' , '2007' , '' ,'2
009'],
C:\Users\iqra com\AppData\Local\Temp\ipykernel_14108\2557110016.py:22: UserWarning: F
ixedFormatter should only be used together with FixedLocator
  ax2.set_xticklabels(['' , '2009' , '' , '2011' , '' , '2013' , '' , '2015' , '' ,'2
017'],
C:\Users\iqra com\AppData\Local\Temp\ipykernel_14108\2557110016.py:32: UserWarning: F
ixedFormatter should only be used together with FixedLocator
  ax3.set_xticklabels(['' , '2017','', '2018','' , '2019' , '' , '2020','' , '202
1',''],
C:\Users\iqra com\AppData\Local\Temp\ipykernel_14108\2557110016.py:49: UserWarning: T
ight layout not applied. tight_layout cannot make axes width small enough to accommod
ate all axes decorations
  plt.tight_layout()
```



Rizwan Gagnum

Source: Bank of Europe

Conclusion

In conclusion, the analysis conducted on the Chinese currency's exchange rates, particularly during different presidential administrations, suggests a potential correlation between political events and fluctuations in the currency. The examination of the Bush, Obama, and Trump presidencies reveals periods of both rise and downfall in the Chinese currency. However, it is crucial to note that correlation does not imply causation, and there could be various other factors influencing currency movements, including economic policies, global events, and market dynamics.

While the analysis hints at a possible connection between political changes and currency variations, it is essential to approach such conclusions with caution. The financial markets are complex, and multiple variables contribute to currency movements. Therefore, attributing these fluctuations solely to changes in the presidency may oversimplify the situation.

Further research and a more in-depth analysis, considering additional economic indicators and global factors, would be necessary to draw more definitive conclusions about the relationship between political events and the Chinese currency. The observed patterns could be coincidental, and other external factors may play a more significant role in influencing currency trends.

In [ ]: