In [3]:
```
pip install fredapi
```

```
Collecting fredapi
  Obtaining dependency information for fredapi from https://files.pythonhosted.org/pa
ckages/73/64/1db43417cf7ed430f104a347126b5260a1724ee9a1b7d0b1622262c9c4df/fredapi-0.
5.2-py3-none-any.whl.metadata
  Downloading fredapi-0.5.2-py3-none-any.whl.metadata (5.0 kB)
Requirement already satisfied: pandas in c:\programdata\anaconda3\lib\site-packages
(from fredapi) (2.0.3)
Requirement already satisfied: python-dateutil>=2.8.2 in c:\programdata\anaconda3\lib
\site-packages (from pandas->fredapi) (2.8.2)
Requirement already satisfied: pytz>=2020.1 in c:\programdata\anaconda3\lib\site-pack
ages (from pandas->fredapi) (2023.3.post1)
Requirement already satisfied: tzdata>=2022.1 in c:\programdata\anaconda3\lib\site-pa
ckages (from pandas->fredapi) (2023.3)
Requirement already satisfied: numpy>=1.21.0 in c:\programdata\anaconda3\lib\site-pac
kages (from pandas->fredapi) (1.24.3)
Requirement already satisfied: six>=1.5 in c:\programdata\anaconda3\lib\site-packages
(from python-dateutil>=2.8.2->pandas->fredapi) (1.16.0)
Downloading fredapi-0.5.2-py3-none-any.whl (11 kB)
Installing collected packages: fredapi
Successfully installed fredapi-0.5.2
Note: you may need to restart the kernel to use updated packages.
```

In [17]:
```
import fredapi
import matplotlib.pyplot as plt
import pandas as pd
import seaborn as sns

# Set your API key
api_key = '2d2d9fb2f92a3a84a6be02cffe5e0650'

# Initialize the FRED API
fred = fredapi.Fred(api_key=api_key)

# Define series IDs for Gross Federal Debt, Federal Expenditures, and Federal Deficit/
series_ids = {
    "Gross_Federal_Debt": 'GFDGDPA188S',        # Gross Federal Debt as a Percentage o
    "Federal_Expenditures": 'FGEXPND',          # Federal Government Current Expenditu
    "Federal_Surplus_Deficit": 'MTSDS133FMS'    # Federal Surplus or Deficit
}

# Fetch the data for each series and store it in a dictionary
data_dict = {name: fred.get_series(series_id) for name, series_id in series_ids.items(

# Convert the dictionary into a DataFrame for easy viewing and manipulation
df = pd.DataFrame(data_dict)

# Print the head of the DataFrame
print(df.head())

# Save the DataFrame to a CSV file for further analysis if needed
df.to_csv('federal_spending_debt_data.csv')
```

```
            Gross_Federal_Debt  Federal_Expenditures  Federal_Surplus_Deficit
1939-01-01            51.58556                   NaN                      NaN
1940-01-01            49.27162                   NaN                      NaN
1941-01-01            44.46713                   NaN                      NaN
1942-01-01            47.72464                   NaN                      NaN
1943-01-01            70.21725                   NaN                      NaN
```

In [11]:
```
print(df.describe())
```

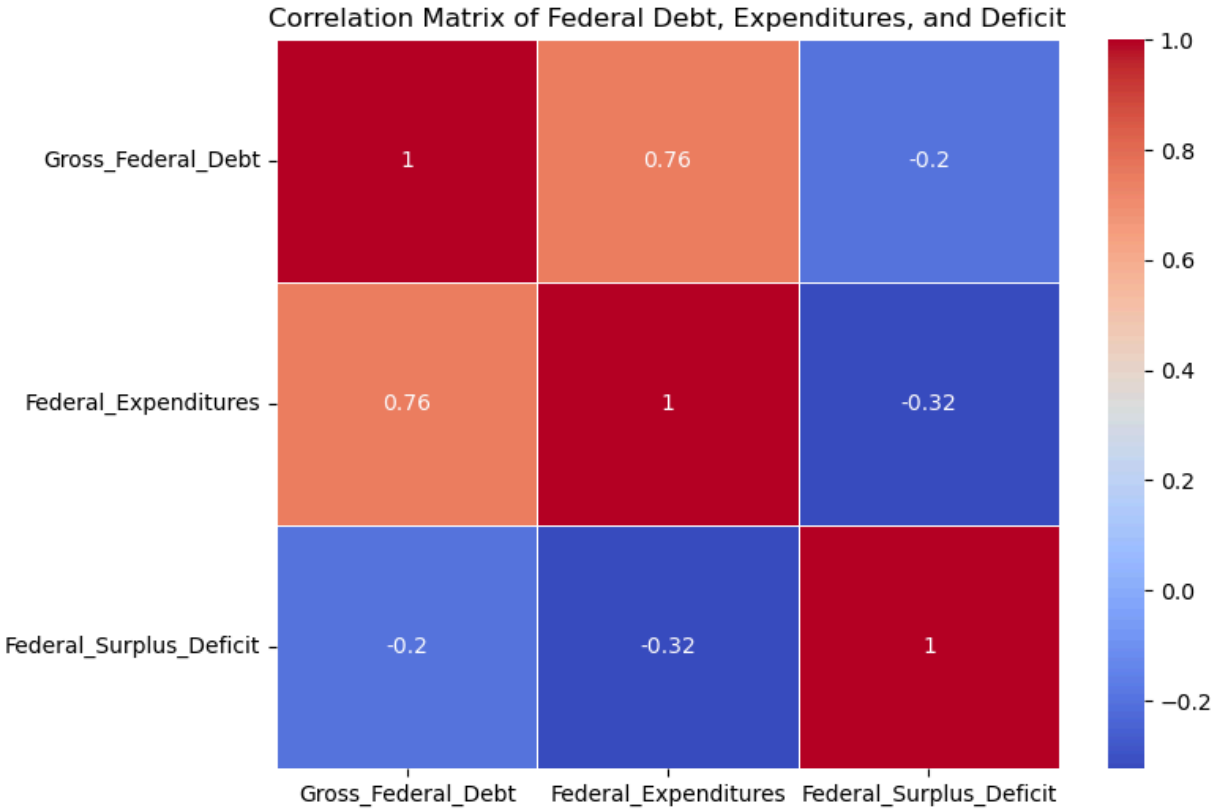
```
       Gross_Federal_Debt  Federal_Expenditures  Federal_Surplus_Deficit
count           85.000000            310.000000               527.000000
mean            64.021199           1644.805887            -47648.144529
std             26.119053           1854.267744            104943.926988
min             31.019250             38.149000           -864074.068492
25%             44.467130            143.535500            -76726.114835
50%             58.430080            990.549500            -28896.000000
75%             82.026830           2530.026750              2808.500000
max            125.982800           8884.291000            308215.060527
```

In [13]:
```
correlation_matrix = df.corr()
print(correlation_matrix)
```

```
                        Gross_Federal_Debt  Federal_Expenditures  \
Gross_Federal_Debt                1.000000              0.755778
Federal_Expenditures              0.755778              1.000000
Federal_Surplus_Deficit          -0.201946             -0.323526

                        Federal_Surplus_Deficit
Gross_Federal_Debt                    -0.201946
Federal_Expenditures                  -0.323526
Federal_Surplus_Deficit                1.000000
```

In [19]:
```
plt.figure(figsize=(8, 6))
sns.heatmap(correlation_matrix, annot=True, cmap='coolwarm', linewidths=0.5)
plt.title('Correlation Matrix of Federal Debt, Expenditures, and Deficit')
plt.show()
```


Correlation Matrix of Federal Debt, Expenditures, and Deficit
Gross_Federal_Debt
Federal_Expenditures
Federal_Surplus_Deficit
1
0.76
-0.2
0.76
1
-0.32
-0.2
-0.32
1
Gross_Federal_Debt
Federal_Expenditures
Federal_Surplus_Deficit
1.0
0.8
0.6
0.4
0.2
0.0
−0.2

In [ ]: