

```
In [ ]: import pandas as pd
import numpy as np
from matplotlib import pyplot as plt
```

```
In [ ]: # Matplotlib styles
plt.style.use('ggplot')
plt.rcParams.update({
    'figure.figsize': (15, 4),
    'axes.prop_cycle': plt.cycler(color=["#4C72B0", "#C44E52", "#55A868", "#8172B2",
    'axes.facecolor': "#EAEAF2"
}))
```

Importing Dataset

```
In [ ]: # Imports the data
df = pd.read_csv("./datasets/alcohol.csv")

# Sets all the column names to lowercase
df.columns = map(str.lower, df.columns)

df
```

Out[]:

	year	pb	qb	eb	pw	qw	ew	ps	qs	es	tce	cpi
0	1955	54.00	80.5	10.42	54.42	3.35	1.67	60.10	1.475	4.24	258.5	60.33
1	1956	55.17	80.8	10.69	55.44	3.35	1.70	60.17	1.575	4.53	271.2	62.92
2	1957	57.58	81.0	11.18	55.78	3.58	1.83	60.22	1.600	4.61	284.9	64.94
3	1958	58.41	78.4	10.98	57.09	3.52	1.84	61.28	1.625	4.76	299.4	66.79
4	1959	54.18	82.1	10.66	55.43	3.87	1.96	61.59	1.725	5.08	313.7	67.16
5	1960	52.97	85.1	10.81	59.18	3.98	2.12	61.50	1.850	5.44	326.8	67.90
6	1961	57.92	85.1	11.82	62.73	4.09	2.35	67.26	1.925	6.19	341.0	69.74
7	1962	61.25	87.8	12.89	63.59	4.03	2.35	70.42	1.950	6.57	358.3	72.51
8	1963	63.74	87.5	13.37	74.60	4.37	2.98	67.52	2.050	6.62	379.0	73.99
9	1964	67.17	91.1	14.67	82.94	4.66	3.54	71.64	2.200	7.54	401.9	76.38
10	1965	74.23	91.2	16.23	84.98	4.66	3.62	78.81	2.050	7.73	425.2	79.89
11	1966	78.74	92.2	17.40	88.60	5.01	4.06	83.53	2.075	8.29	447.7	83.03
12	1967	82.62	93.8	18.58	85.55	5.74	4.49	86.35	2.075	8.57	467.7	85.24
13	1968	85.03	94.8	19.32	96.07	5.85	5.14	91.41	2.150	9.40	501.3	89.30
14	1969	91.80	98.4	21.65	103.54	5.86	5.55	98.01	2.000	9.38	529.6	94.10
15	1970	100.00	101.6	24.36	100.00	6.54	5.99	100.00	2.300	11.00	574.0	100.00
16	1971	108.03	105.4	27.30	110.05	7.05	7.10	103.32	2.425	11.98	639.5	109.41
17	1972	115.00	107.5	29.64	117.05	7.84	8.40	104.39	2.775	13.86	720.8	117.34
18	1973	119.62	112.1	32.15	124.70	9.54	10.89	106.70	3.500	17.86	818.6	128.04
19	1974	134.31	114.4	36.83	150.89	9.26	12.79	108.66	3.850	20.01	943.9	148.52
20	1975	168.60	117.6	47.53	172.81	9.38	14.84	135.81	3.675	23.87	1162.3	184.50
21	1976	202.05	118.9	57.59	182.37	10.51	17.54	133.64	4.150	26.53	1348.9	215.16
22	1977	230.98	117.3	64.95	213.42	10.27	20.06	186.34	3.533	31.49	1542.9	249.10
23	1978	244.52	120.7	70.75	223.34	11.41	23.32	174.67	4.260	35.59	1778.1	269.68
24	1979	279.33	121.4	81.30	261.22	12.20	29.17	194.52	4.691	43.64	2106.2	306.14
25	1980	338.84	116.3	94.47	308.08	12.06	34.01	228.37	4.422	48.30	2436.9	361.01
26	1981	399.80	110.5	105.91	341.21	12.91	40.32	257.37	4.190	51.58	2705.7	403.97
27	1982	441.81	108.1	114.49	356.83	13.86	45.26	281.87	3.954	53.31	2970.8	438.63
28	1983	478.39	110.4	126.61	373.27	15.28	52.20	300.28	4.062	58.34	3243.8	458.84
29	1984	519.67	109.9	136.91	381.47	16.20	56.56	321.06	4.036	61.98	3464.6	481.59
30	1985	570.95	108.6	148.65	408.97	16.52	61.84	332.62	4.292	68.28	3765.7	510.83

Alcohol Consumption Over Time

```
In [ ]: # Plots the graph
fig, ax1 = plt.subplots()
```

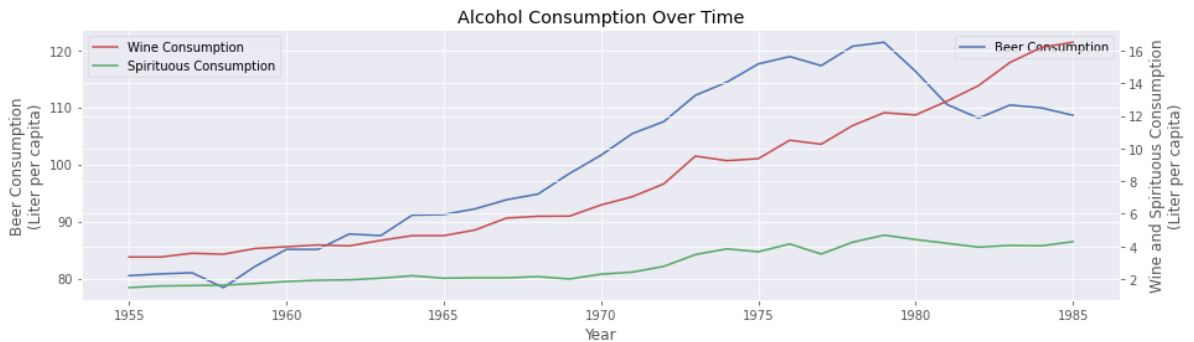
```

ax1.plot(df['year'], df['qb'], label="Beer Consumption")
ax1.set_ylabel("Beer Consumption\n(Liter per capita)")
ax1.set_xlabel("Year")
ax1.legend()

ax2 = ax1.twinx()
ax2.plot(df['year'], df['qw'], label="Wine Consumption", c="#C44E52")
ax2.plot(df['year'], df['qs'], label="Spirituos Consumption", c="#55A868")
ax2.set_ylabel("Wine and Spirituos Consumption\n(Liter per capita)")
ax2.set_xlabel("Year")
ax2.legend()

plt.title("Alcohol Consumption Over Time")
plt.show()

```



Alcohol Price Over Time

```

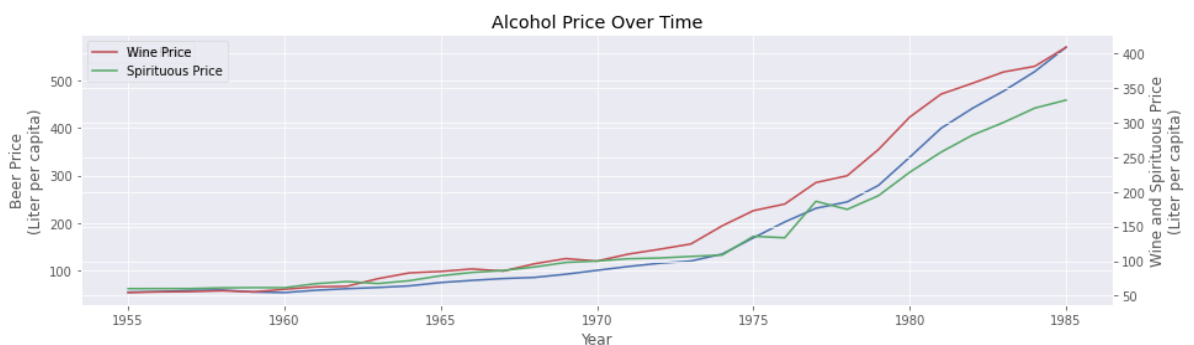
In [ ]: # Plots the graph
fig, ax1 = plt.subplots()

ax1.plot(df['year'], df['pb'], label="Beer Price")
ax1.set_ylabel("Beer Price\n(Liter per capita)")
ax1.set_xlabel("Year")
ax1.legend()

ax2 = ax1.twinx()
ax2.plot(df['year'], df['pw'], label="Wine Price", c="#C44E52")
ax2.plot(df['year'], df['ps'], label="Spirituos Price", c="#55A868")
ax2.set_ylabel("Wine and Spirituos Price\n(Liter per capita)")
ax2.set_xlabel("Year")
ax2.legend()

plt.title("Alcohol Price Over Time")
plt.show()

```



Log Change of Alcohol Consumption Over

Time

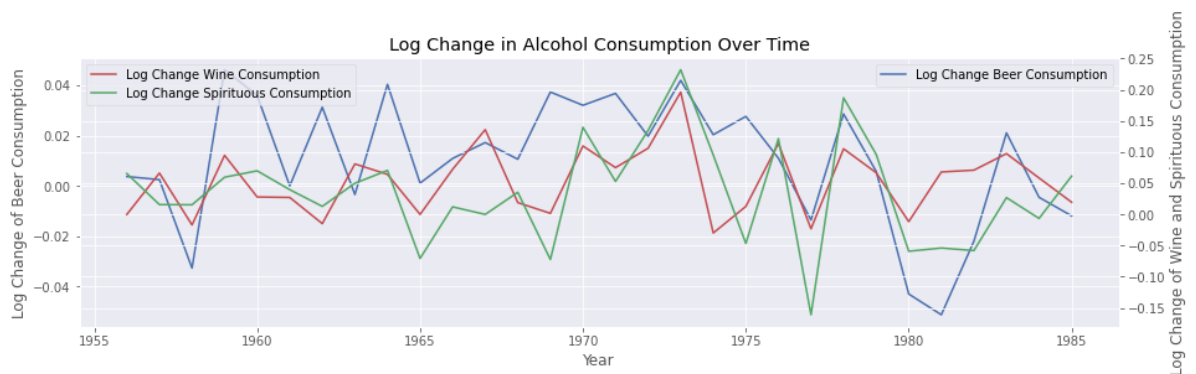
```
In [ ]: # Obtains the Log Changes
df['log(qb)'] = np.log(df['qb'])
df['log(qw)'] = np.log(df['qw'])
df['log(qs)'] = np.log(df['qs'])

# Plots the graph
fig, ax1 = plt.subplots()

ax1.plot(df['year'], df['log(qb)'].diff(), label="Log Change Beer Consumption")
ax1.set_ylabel("Log Change of Beer Consumption")
ax1.set_xlabel("Year")
ax1.legend()

ax2 = ax1.twinx()
ax2.plot(df['year'], df['log(qw)'].diff(), label="Log Change Wine Consumption", c='r')
ax2.plot(df['year'], df['log(qs)'].diff(), label="Log Change Spirituous Consumption", c='g')
ax2.set_ylabel("Log Change of Wine and Spirituous Consumption")
ax2.set_xlabel("Year")
ax2.legend()

plt.title("Log Change in Alcohol Consumption Over Time")
plt.show()
```



Log Change of Alcohol Price Over Time

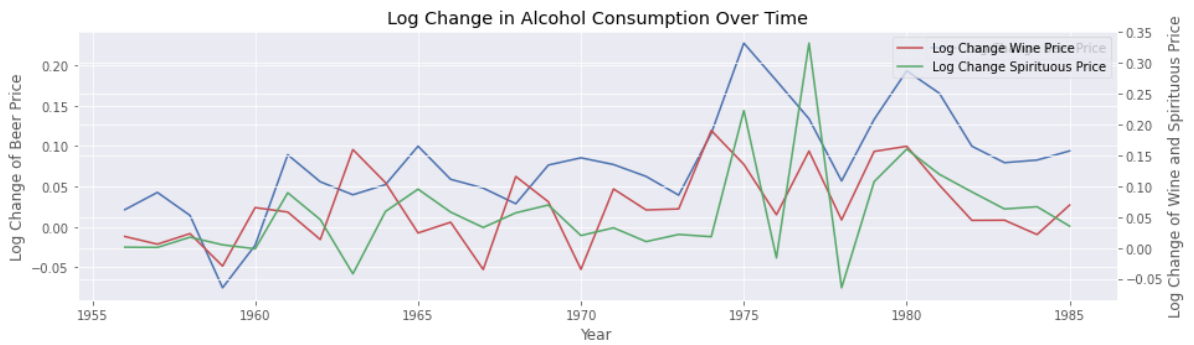
```
In [ ]: # Obtains the Log Changes
df['log(pb)'] = np.log(df['pb'])
df['log(pw)'] = np.log(df['pw'])
df['log(ps)'] = np.log(df['ps'])

# Plots the graph
fig, ax1 = plt.subplots()

ax1.plot(df['year'], df['log(pb)'].diff(), label="Log Change Beer Price")
ax1.set_ylabel("Log Change of Beer Price")
ax1.set_xlabel("Year")
ax1.legend()

ax2 = ax1.twinx()
ax2.plot(df['year'], df['log(pw)'].diff(), label="Log Change Wine Price", c="#C44E52")
ax2.plot(df['year'], df['log(ps)'].diff(), label="Log Change Spirituous Price", c='g')
ax2.set_ylabel("Log Change of Wine and Spirituous Price")
ax2.set_xlabel("Year")
ax2.legend()
```

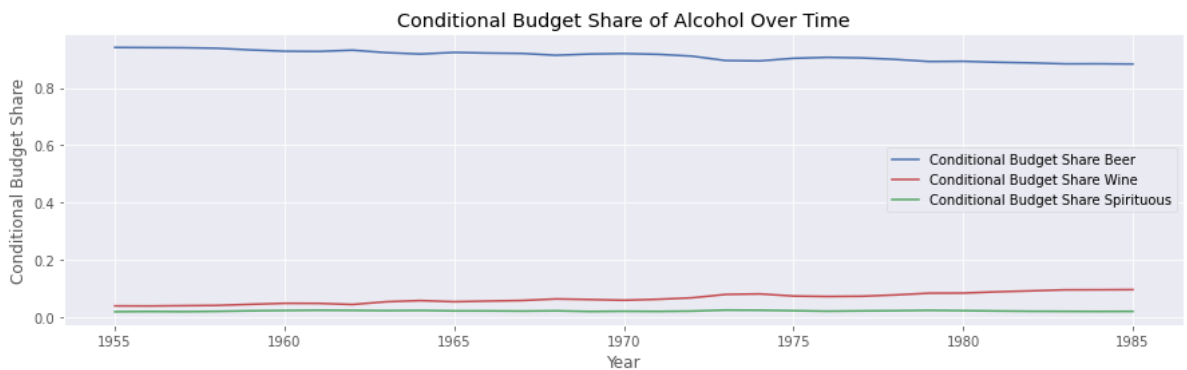
```
plt.title("Log Change in Alcohol Consumption Over Time")
plt.show()
```



Conditional Budget Shares

```
In [ ]: # Obtains the Conditional Budget Shares
df['cbsb'] = df['qb']*df['pb'] / (df['qb']*df['pb'] + df['qw']*df['pw'] + df['qs'])
df['cbsw'] = df['qw']*df['pw'] / (df['qb']*df['pb'] + df['qw']*df['pw'] + df['qs'])
df['cbss'] = df['qs']*df['ps'] / (df['qb']*df['pb'] + df['qw']*df['pw'] + df['qs'])

# Plots the graph
plt.plot(df['year'], df['cbsb'], label="Conditional Budget Share Beer")
plt.plot(df['year'], df['cbsw'], label="Conditional Budget Share Wine")
plt.plot(df['year'], df['cbss'], label="Conditional Budget Share Spirituous")
plt.title("Conditional Budget Share of Alcohol Over Time")
plt.ylabel("Conditional Budget Share")
plt.xlabel("Year")
plt.legend()
plt.show()
```

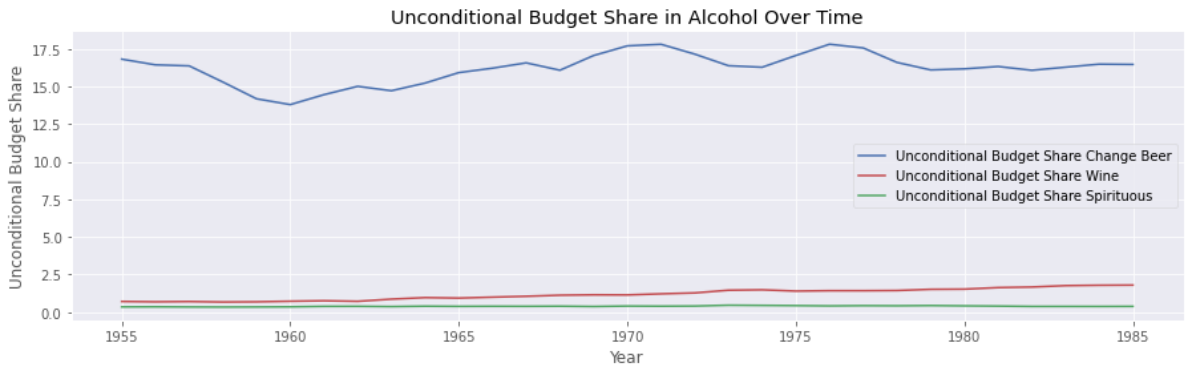


Unconditional Budget Shares

```
In [ ]: # Obtains the Unconditional Budget Shares
df['ucbsb'] = df['qb']*df['pb'] / df['tce']
df['ucbsw'] = df['qw']*df['pw'] / df['tce']
df['ucbss'] = df['qs']*df['ps'] / df['tce']

# Plots the graph
plt.plot(df['year'], df['ucbsb'], label="Unconditional Budget Share Change Beer")
plt.plot(df['year'], df['ucbsw'], label="Unconditional Budget Share Wine")
plt.plot(df['year'], df['ucbss'], label="Unconditional Budget Share Spirituous")
plt.title("Unconditional Budget Share in Alcohol Over Time")
plt.ylabel("Unconditional Budget Share")
plt.xlabel("Year")
```

```
plt.legend()  
plt.show()
```



```
In [ ]:
```