

In this notebook, I discuss Financial and Economy of Vietnam.

```
In [1]: import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import plotly.express as px
import plotly.graph_objects as go
```

I used 3 dataset from WorldBank.

- You can access here: <https://www.worldbank.org/en/home> (<https://www.worldbank.org/en/home>)

Those 3 dataset are:

- GDP growth (annual %) - Vietnam : <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=VN> (<https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=VN>)
- Inflation, consumer prices (annual %) - Vietnam : <https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?locations=VN> (<https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?locations=VN>)
- Unemployment, total (% labor force) (modeled ILO estimated) - Vietnam : <https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?locations=VN> (<https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?locations=VN>)

```
In [2]: GDP_growth = pd.read_csv('GDP_growth.csv')
Inflation = pd.read_csv('Inflation_consumer.csv')
Unemployment = pd.read_csv('Unemployment.csv')
```

Take a look at these dataset:

```
In [3]: GDP_growth.head()
```

Out[3]:

	Country Name	Country Code	Indicator Name	Indicator Code	1960	1961	1962	1963	1964	1965	...	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	Aruba	ABW	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	NaN	NaN	NaN	NaN	NaN	NaN	...	6,429817	-0,020479	3,543630	2,116716	5,482371	5,257855	0,635030	-18,589099	17,172509	NaN
1	Africa Eastern and Southern	AFE	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	NaN	0,254879	7,965825	5,148217	4,579328	5,346210	...	4,219599	3,994682	2,974101	2,224524	2,546973	2,513984	2,087765	-2,888681	4,334927	3,404852
2	Afghanistan	AFG	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	NaN	NaN	NaN	NaN	NaN	NaN	...	5,600745	2,724543	1,451315	2,260314	2,647003	1,189228	3,911603	-2,351101	-20,700000	NaN
3	Africa Western and Central	AFW	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	NaN	1,854872	3,772845	7,278612	5,410812	4,081666	...	6,109741	5,929463	2,750042	0,125435	2,313219	2,813142	3,212407	-0,927800	3,980848	3,762758
4	Angola	AGO	GDP growth (annual %)	NY.GDP.MKTP.KD.ZG	NaN	NaN	NaN	NaN	NaN	NaN	...	4,954613	4,822559	0,943572	-2,580111	-0,147150	-1,316362	-0,702273	-5,638215	1,199211	3,045403

5 rows × 67 columns

```
In [4]: Inflation.head()
```

Out[4]:

	Country Name	Country Code	Indicator Name	Indicator Code	1960	1961	1962	1963	1964	1965	...	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	Aruba	ABW	Inflation, consumer prices (annual %)	FP.CPI.TOTL.ZG	NaN	NaN	NaN	NaN	NaN	NaN	...	-2,372065	0,421441	0,474764	-0,931196	-1,028282	3,626041	4,257462	NaN	NaN	NaN
1	Africa Eastern and Southern	AFE	Inflation, consumer prices (annual %)	FP.CPI.TOTL.ZG	NaN	NaN	NaN	NaN	NaN	NaN	...	5,750981	5,370290	5,245878	6,571396	6,399343	4,720811	4,653665	7,321106	6,824727	10,526577
2	Afghanistan	AFG	Inflation, consumer prices (annual %)	FP.CPI.TOTL.ZG	NaN	NaN	NaN	NaN	NaN	NaN	...	7,385772	4,673996	-0,661709	4,383892	4,975952	0,626149	2,302373	NaN	NaN	NaN
3	Africa Western and Central	AFW	Inflation, consumer prices (annual %)	FP.CPI.TOTL.ZG	NaN	NaN	NaN	NaN	NaN	NaN	...	2,439201	1,768436	2,130817	1,487416	1,764635	1,784050	1,760112	2,437609	3,653533	7,967574
4	Angola	AGO	Inflation, consumer prices (annual %)	FP.CPI.TOTL.ZG	NaN	NaN	NaN	NaN	NaN	NaN	...	8,777814	7,280387	9,353840	30,698958	29,842578	19,830594	17,079704	22,271564	25,754266	NaN

5 rows × 67 columns

```
In [5]: Unemployment.head()
```

Out[5]:

	Country Name	Country Code	Indicator Name	Indicator Code	1960	1961	1962	1963	1964	1965	...	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	Aruba	ABW	Unemployment, total (% of total labor force) (...)	SL.UEM.TOTL.ZS	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
1	Africa Eastern and Southern	AFE	Unemployment, total (% of total labor force) (...)	SL.UEM.TOTL.ZS	NaN	NaN	NaN	NaN	NaN	NaN	...	6,512784	6,555946	6,707142	6,855589	6,940365	6,913046	7,121663	7,631304	7,920219	7,916835
2	Afghanistan	AFG	Unemployment, total (% of total labor force) (...)	SL.UEM.TOTL.ZS	NaN	NaN	NaN	NaN	NaN	NaN	...	7,949000	7,910000	8,989000	10,086000	11,180000	11,110000	11,085000	11,710000	NaN	NaN
3	Africa Western and Central	AFW	Unemployment, total (% of total labor force) (...)	SL.UEM.TOTL.ZS	NaN	NaN	NaN	NaN	NaN	NaN	...	3,804447	3,985878	4,241136	4,112958	4,140484	4,201599	4,261414	4,914143	4,873635	4,742175
4	Angola	AGO	Unemployment, total (% of total labor force) (...)	SL.UEM.TOTL.ZS	NaN	NaN	NaN	NaN	NaN	NaN	...	8,834000	9,580000	9,584000	9,586000	9,535000	9,522000	9,481000	10,350000	10,384000	10,209000

5 rows × 67 columns

In GDP, Inflation, Unemployment dataframe we have 67 columns including:

- Country Name
- Country Code
- Indicator Name
- Indicator Code
- 63 columns: 1960 - 2022

And we just need the information fields of Vietnam.

So we will just get the data points where Vietnam is and drop 3 columns that we do not use which are:

- Country Code
- Indicator Name
- Indicator Code

```
In [6]: drop_columns = ['Country Code', 'Indicator Name', 'Indicator Code']
```

```
In [7]: GDP_growth_VN = GDP_growth[GDP_growth['Country Name'] == 'Vietnam'].reset_index(drop = True) \
        .drop(columns = drop_columns)
Inflation_VN = Inflation[Inflation['Country Name'] == 'Vietnam'].reset_index(drop = True) \
        .drop(columns = drop_columns)
Unemployment_VN = Unemployment[Unemployment['Country Name'] == 'Vietnam'].reset_index(drop = True) \
        .drop(columns = drop_columns)
```

```
In [8]: GDP_growth_VN
```

Out[8]:

	Country Name	1960	1961	1962	1963	1964	1965	1966	1967	1968	...	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	Vietnam	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	5,5535	6,422247	6,987167	6,690009	6,940188	7,464991	7,359281	2,865412	2,561551	8,019798

1 rows × 64 columns

```
In [9]: Inflation_VN
```

Out[9]:

	Country Name	1960	1961	1962	1963	1964	1965	1966	1967	1968	...	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	Vietnam	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	6,592675	4,084554	0,631201	2,668248	3,520257	3,539628	2,795824	3,220934	1,834716	3,156508

1 rows × 64 columns

```
In [10]: Unemployment_VN
```

Out[10]:

	Country Name	1960	1961	1962	1963	1964	1965	1966	1967	1968	...	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0	Vietnam	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	1,32	1,26	1,85	1,85	1,87	1,16	1,68	2,1	2,38	1,923

1 rows × 64 columns

Great. Now we can process the dataframe a little bit to make it easier to visualize.

GDP growth of VN (% annual)

```
In [11]: GDP_growth_VN_data = GDP_growth_VN.T
GDP_growth_VN_data.columns = GDP_growth_VN_data.iloc[0]
GDP_growth_VN_data = GDP_growth_VN_data[1:].reset_index()
GDP_growth_VN_data.columns = ['Year', 'Value']
GDP_growth_VN_data
```

Out[11]:

	Year	Value
0	1960	NaN
1	1961	NaN
2	1962	NaN
3	1963	NaN
4	1964	NaN
...
58	2018	7,464991
59	2019	7,359281
60	2020	2,865412
61	2021	2,561551
62	2022	8,019798

63 rows × 2 columns

Inflation of VN, Consumer prices (% annual)

```
In [12]: Inflation_VN_data = Inflation_VN.T
Inflation_VN_data.columns = Inflation_VN_data.iloc[0]
Inflation_VN_data = Inflation_VN_data[1:].reset_index()
Inflation_VN_data.columns = ['Year', 'Value']
Inflation_VN_data
```

Out[12]:

	Year	Value
0	1960	NaN
1	1961	NaN
2	1962	NaN
3	1963	NaN
4	1964	NaN
...
58	2018	3,539628
59	2019	2,795824
60	2020	3,220934
61	2021	1,834716
62	2022	3,156508

63 rows × 2 columns

Unemployment (% total labor force) (modeled ILO estimated)

```
In [13]: Unemployment_VN_data = Unemployment_VN.T
Unemployment_VN_data.columns = Unemployment_VN_data.iloc[0]
Unemployment_VN_data = Unemployment_VN_data[1:].reset_index()
Unemployment_VN_data.columns = ['Year', 'Value']
Unemployment_VN_data
```

Out[13]:

	Year	Value
0	1960	NaN
1	1961	NaN
2	1962	NaN
3	1963	NaN
4	1964	NaN
...
58	2018	1,16
59	2019	1,68
60	2020	2,1
61	2021	2,38
62	2022	1,923

63 rows × 2 columns

Now we are ready for visualizing some charts.

```
In [14]: fig1 = px.line(GDP_growth_VN_data, x='Year', y='Value', title='GDP growth of Vietnam (% annual)', template='seaborn')

xaxis_annotation = go.layout.Annotation(
    x=1.07,
    y=-0.07,
    text='(Year)',
    showarrow=False,
    xref='paper',
    yref='paper',
    font=dict(size=12)
)

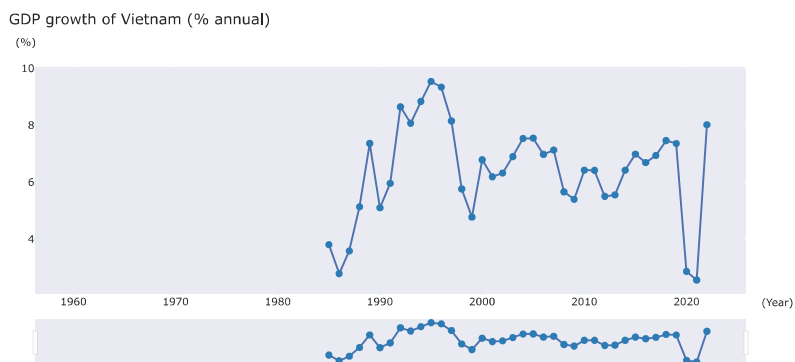
yaxis_annotation = go.layout.Annotation(
    x=-0.03,
    y=1.15,
    text='(%)',
    showarrow=False,
    xref='paper',
    yref='paper',
    font=dict(size=12)
)

tickvals = GDP_growth_VN_data['Year'].unique()[::10]
ticktext = [str(year) for year in tickvals]

fig1.update_layout(xaxis=dict(type='category', tickvals=tickvals, ticktext=ticktext), title_x=0.05,
                    xaxis_title='', yaxis_title='', annotations=[xaxis_annotation, yaxis_annotation])
fig1.update_xaxes(rangeslider_visible=True)

fig1.update_traces(mode='lines+markers', marker=dict(symbol='circle', size=5, line=dict(width=3, color='#2B7CB5')))

fig1.show()
```



Before analysing the chart, let's find out what is GDP growth?

GDP growth stands for "Gross Domestic Product growth", and it refers to the growth rate of a country's GDP over a specific period of time. GDP growth indicates the change in the total value of all goods and services produced in the country over a period of time compared to the previous period.

If the GDP growth rate is positive, this is often seen as a sign of economic development. Conversely, if the growth rate is negative, it may indicate that the country is experiencing an economic downturn.

Review and Evaluation

- Economic Fluctuations:** The data shows fluctuations in GDP growth over time, with some years experiencing higher growth rates while others record lower ones. This could indicate the impact of factors such as international market volatility, domestic policies, and other significant events.
- Resilience in Economic Crises:** Vietnam has seen years of robust economic growth even during times when many other economies faced economic crises. This resilience may indicate the flexibility and adaptability of Vietnam's economy.
- Economic Stability:** From 2000 to 2019, the data suggests that Vietnam maintained relatively stable growth ranging from 4% to nearly 9%. This could be a positive sign of economic stability during that period.
- Challenges and Opportunities for the Future:** Recent data for the years 2020, 2021, and 2022 show fluctuations in economic growth due to the impact of the COVID-19 pandemic, followed by a recovery. This indicates both the challenges and opportunities for economic recovery and development in the future.

```
In [15]: fig2 = px.line(Inflation_VN_data, x='Year', y='Value', title='Inflation of Vietnam (% annual)', template='seaborn')

xaxis_annotation = go.layout.Annotation(
    x=1.07,
    y=-0.07,
    text='(Year)',
    showarrow=False,
    xref='paper',
    yref='paper',
    font=dict(size=12)
)

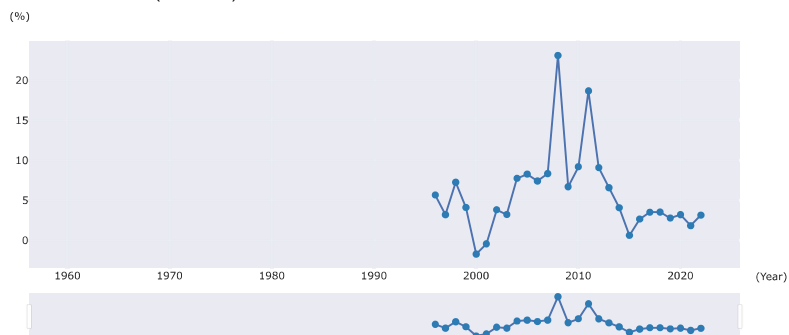
yaxis_annotation = go.layout.Annotation(
    x=-0.03,
    y=1.15,
    text='(%)',
    showarrow=False,
    xref='paper',
    yref='paper',
    font=dict(size=12)
)

tickvals = Inflation_VN_data['Year'].unique()[::10]
ticktext = [str(year) for year in tickvals]

fig2.update_layout(xaxis=dict(type='category', tickvals=tickvals, ticktext=ticktext), title_x=0.05,
                    xaxis_title='', yaxis_title='', annotations=[xaxis_annotation, yaxis_annotation] )
fig2.update_xaxes(rangeslider_visible=True)

fig2.update_traces(mode='lines+markers', marker=dict(symbol='circle', size=5, line=dict(width=3, color='#2B7CB5')))
fig2.show()
```

Inflation of Vietnam (% annual)



Definition

- Inflation is an increase in the general price level in an economy over a specific period of time, usually calculated monthly or annually. It is an indication of currency devaluation, causing a specific amount to lose value compared to the past. Inflation can result in consumers paying more for the same amount of goods and services.
- Inflation can be measured in a variety of ways, but the most common is using the Consumer Price Index (CPI) or the Producer Price Index (PPI). When the inflation rate increases, it can cause economic problems such as loss of value of money, reducing the ability to consume and invest.

Review and Evaluation

- Inflation fluctuations: Vietnam's inflation rate has fluctuated over the years. There are years with low and stable inflation, but there are also years with higher inflation.
- Economic crisis and inflation: There was a period, like 2008, when inflation increased suddenly and high, possibly due to the impact of the global financial crisis.
- Recent stability: Recently, from 2014 to 2022, the inflation rate has tended to stabilize at a relatively low level, indicating inflation control on the part of the government.

```
In [16]: fig3 = px.line(Unemployment_VN_data, x='Year', y='Value',
                    title='Unemployment of Vietnam ( % total labor force) (modeled ILO estimated)', template='seaborn')

xaxis_annotation = go.layout.Annotation(
    x=1.07,
    y=-0.07,
    text='(Year)',
    showarrow=False,
    xref='paper',
    yref='paper',
    font=dict(size=12)
)

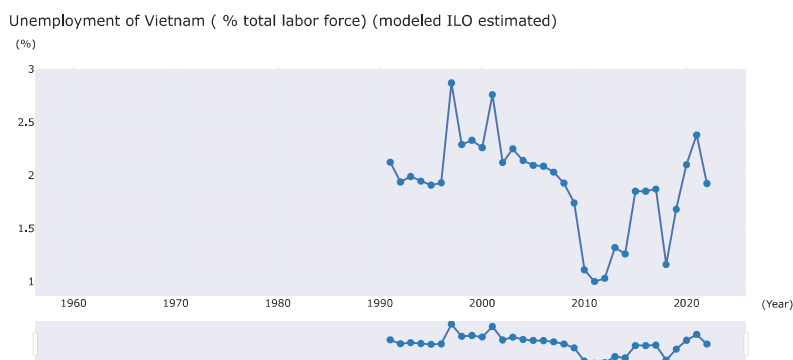
yaxis_annotation = go.layout.Annotation(
    x=-0.03,
    y=1.15,
    text='(%)',
    showarrow=False,
    xref='paper',
    yref='paper',
    font=dict(size=12)
)

tickvals = Inflation_VN_data['Year'].unique()[::10]
ticktext = [str(year) for year in tickvals]

fig3.update_layout(xaxis=dict(type='category', tickvals=tickvals, ticktext=ticktext), title_x=0.05,
                  xaxis_title='', yaxis_title='', annotations=[xaxis_annotation, yaxis_annotation])
fig3.update_xaxes(rangeslider_visible=True)

fig3.update_traces(mode='lines+markers', marker=dict(symbol='circle', size=5, line=dict(width=3, color='#287CB5')))

fig3.show()
```



Definition

"Unemployment (% total labor force)" is a statistical index used to measure the unemployment rate in an economy. This index shows the proportion of unemployed people compared to the total number of people in the labor force.

Specifically, to calculate "Unemployment (% total labor force)," you need to know two main pieces of information:

- Number of Unemployed: This is the number of people in the labor force who do not have a current job and are looking for work.
- Total Labor Force: This is the total number of people in a country or economic region who are able to work or have participated in the labor force, regardless of whether they have a job or not. The total labor force includes both employed and unemployed people.

Review and Evaluation

- Stability in unemployment: Vietnam's unemployment rate is usually stable at a relatively low level in the period from 1991 to 2022.
- Economic adjustment and growth: Data shows that there are small adjustments and fluctuations in the unemployment rate from year to year. This can be linked to economic and policy transformations to maintain stable unemployment in the future.
- Impact of global events: There were periods, like 2009, when the unemployment rate increased, possibly due to the impact of the global financial crisis. Or during the covid-19 epidemic, the unemployment rate increased rapidly from 1.68 to 2.38%. However, this rate later stabilized.
- Challenges and opportunities: Low unemployment rates may indicate stability in the labor market, but also pose challenges in providing jobs for a growing population and growth opportunities in industry.

In conclusion:

1. Stable and developing economic situation: GDP growth rate shows stability in maintaining Vietnam's economic growth throughout many years. This stability may reflect effective economic control and management.
2. Inflation control: A relatively low and stable inflation rate shows the government's control in maintaining price stability and the value of money. This helps protect people's purchasing power and maintain a stable economic situation.
3. Stable labor market: A stable and relatively low unemployment rate may indicate stability in Vietnam's labor market. However, maintaining employment opportunities and developing further career opportunities remains an important challenge.
4. Ability to cope with crises: Data also shows that Vietnam has coped quite well with a number of global economic and financial challenges, such as the 2008 global financial crisis and the impact of the pandemic COVID-19 in 2020.