

範例文字

Exploring the Nexus of Geopolitics, Public Relations, and Financial Performance in the Semiconductor Industry

Jim

Project Purpose

- ❖ This project aims to investigate the intricate relationship between geopolitical events, public relations (PR) strategies, and the financial performance of TSMC (Taiwan Semiconductor Manufacturing Company) and a key competitor in the semiconductor industry. By leveraging Python programming tools like Pandas for data manipulation and Plotly for data visualization, the project seeks to analyze historical financial data, geopolitical occurrences, and PR activities.

Area of Interest

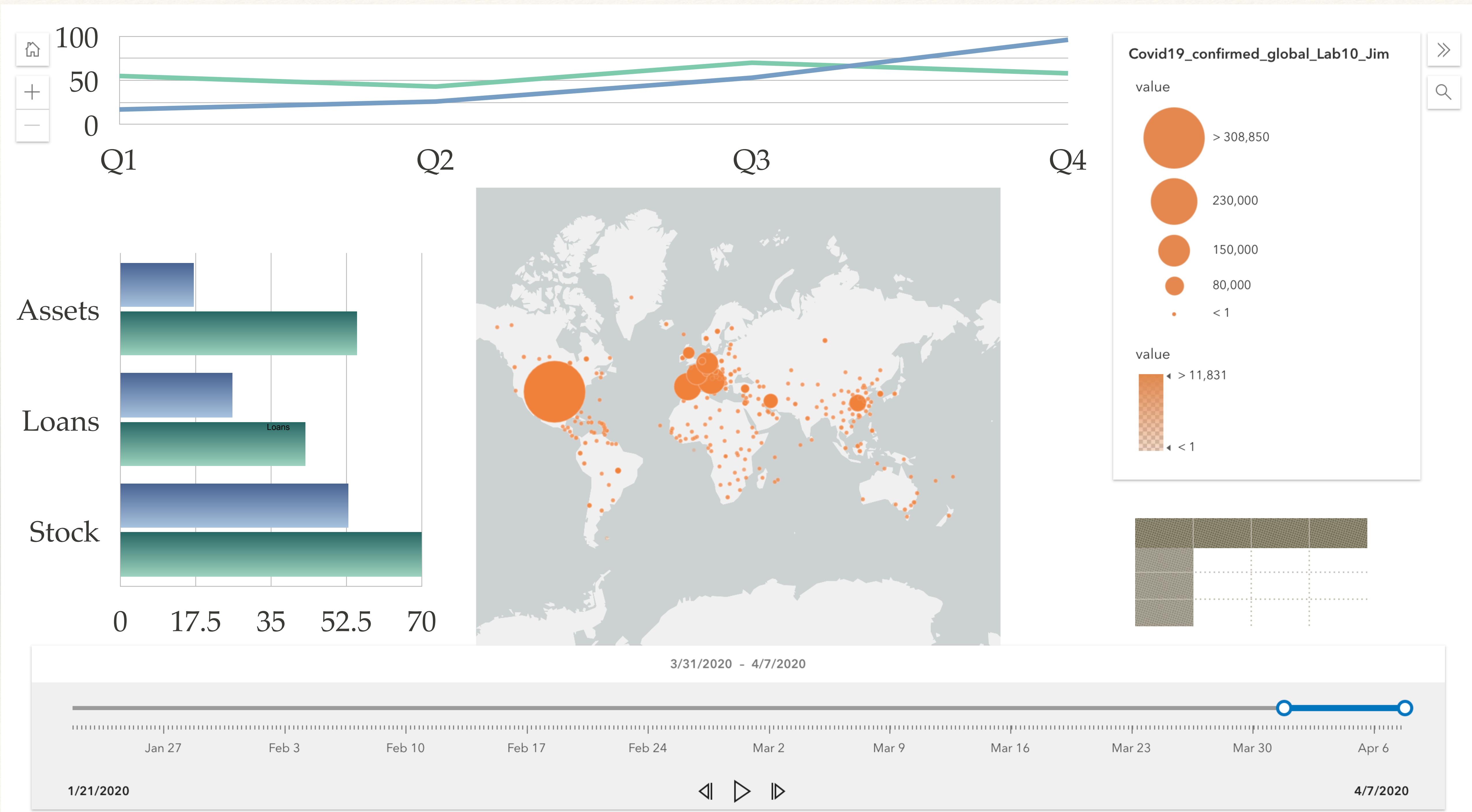
- ❖ The geographic area of study is Taiwan/ East Asia, focusing on TSMC's operations. Taiwan's unique geopolitical position and TSMC's significant role in the global semiconductor market make this area crucial for understanding the impact of external factors on the industry.

Methodology

- ❖ Data Collection: Utilizing credible sources such as annual reports, market analyses, and reputable news outlets to ensure data accuracy and reliability.
- ❖ Data Analysis: Employing Python programming functions, especially Pandas, for efficient data manipulation and Plotly for creating interactive visualizations.
- ❖ Data Sources: Extracting data from ICEWS, TSMC's official website, and Taiwan government open data for comprehensive analysis.

End Product Description

- ❖ Interactive Line Charts: Illustrating trends in geopolitical events, PR strategies, and financial performance over the past decade.
- ❖ Comparative Bar Charts: Highlighting key comparisons between TSMC and its competitor.
- ❖ Time Series Analysis: Offering a dynamic exploration of the complex interplay between geopolitical events, PR strategies, and financial trends within the semiconductor industry.
- ❖ A map showing key international events for each quarter



顯示方式	縮放	125%	加入類別	樞紐分析表	插入	表格	圖表	文字	形狀	媒體	註解	分享	格式	整理
+ 工作表 1														

Event ID	Event Date	Source Name	Source Sectors	Source Country	Event Text	CAMEO Code	Intensity	Target Name	已輸入表格資料並可進行調整。 >
18073096	2012-01-01	North Korea		North Korea	Demand de-escalation of military engagement	1056	-5.0	Military (United States)	Military, Government
18073150	2012-01-01	South Korea		South Korea	Host a visit	43	2.8	Lee Myung Bak	Center Right, International Religious, Ideological
18073168	2012-01-01	North Korea		North Korea	Criticize or denounce	111	-2.0	South Korea	
18073167	2012-01-01	North Korea		North Korea	Engage in symbolic act	17	0.0	Kim Jong-II	(National) Major Party, Parties, Government I
18073180	2012-01-01	North Korea		North Korea	Demand de-escalation of military engagement	1056	-5.0	Military (United States)	Military, Government
18073183	2012-01-01	China		China	Express intent to provide economic aid	331	5.2	North Korea	
18073192	2012-01-01	North Korea		North Korea	Make an appeal or request	20	3.0	Citizen (North Korea)	Social, General Population / Civilian / Social
18073191	2012-01-01	North Korea		North Korea	Make statement	10	0.0	Kim Jong-II	(National) Major Party, Parties, Government I
18073193	2012-01-01	North Korea		North Korea	Threaten	130	-4.4	South Korea	
18073271	2012-01-01	North Korea		North Korea	Engage in symbolic act	17	0.0	Kim Jong-II	(National) Major Party, Parties, Government I
18073286	2012-01-01	North Korea		North Korea	Criticize or denounce	111	-2.0	South Korea	
18073285	2012-01-01	North Korea		North Korea	Engage in symbolic act	17	0.0	Kim Jong-II	(National) Major Party, Parties, Government I
18073328	2012-01-01	China		China	Arrest, detain, or charge with legal action	173	-5.0	Men (China)	General Population / Civilian / Social, Social
18073389	2012-01-01	North Korea		North Korea	Demand de-escalation of military engagement	1056	-5.0	Military (United States)	Military, Government
18073419	2012-01-01	North Korea		North Korea	Make statement	10	0.0	Kim Jong-Un	Executive Office, Elite, Executive, Government
18073426	2012-01-01	North Korea		North Korea	Make statement	10	0.0	Kim Jong-Un	Executive Office, Elite, Executive, Government
18073476	2012-01-01	China		China	Make statement	10	0.0	Kim Jong-Un	Executive Office, Elite, Executive, Government
18073477	2012-01-01	North Korea		North Korea	Engage in symbolic act	17	0.0	Kim Jong-II	(National) Major Party, Parties, Government I
18073532	2012-01-01	North Korea		North Korea	Make an appeal or request	20	3.0	Citizen (North Korea)	Social, General Population / Civilian / Social
18073551	2012-01-01	China		China	Rally support on behalf of	53	3.8	Kim Jong-Un	Executive Office, Elite, Executive, Government
18073552	2012-01-01	North Korea		North Korea	Make statement	10	0.0	Indigenous People (Japan)	General Population / Civilian / Social, Social
18073577	2012-01-01	North Korea		North Korea	Make an appeal or request	20	3.0	Citizen (North Korea)	Social, General Population / Civilian / Social
18073602	2012-01-01	China		China	Express intent to provide economic aid	331	5.2	North Korea	
18073669	2012-01-01	South Korea		South Korea	Host a visit	43	2.8	Kim Jong-Un	Executive Office, Elite, Executive, Government
18073688	2012-01-01	North Korea		North Korea	Make an appeal or request	20	3.0	Citizen (North Korea)	Social, General Population / Civilian / Social
18073689	2012-01-01	North Korea		North Korea	Demand	100	-5.0	United States	
18073690	2012-01-01	China		China	Make statement	10	0.0	South Korea	
18073705	2012-01-01	North Korea		North Korea	Make statement	10	0.0	Military (North Korea)	Military, Government
18073708	2012-01-01	North Korea		North Korea	Host a visit	43	2.8	Kim Jong-Un	Executive Office, Elite, Executive, Government
18073706	2012-01-01	North Korea		North Korea	Make statement	10	0.0	Kim Jong-II	(National) Major Party, Parties, Government I
18073729	2012-01-01	China		China	Make statement	10	0.0	South Korea	

The screenshot shows a Jupyter Notebook interface running in a browser. The top navigation bar includes tabs for GitHub, Content - My C..., Dash, Documents/EPPS..., localhost, and a specific notebook titled '6317 final - Go...'. The main title 'jupyter Data Analysis and Visualization' indicates the last checkpoint was 1 day ago (autosaved). The toolbar below the title bar includes File, Edit, View, Insert, Cell, Kernel, Widgets, Help, Not Trusted, Python 3 (ipykernel), Logout, and various cell creation and execution icons.

In [2]:

```
import pandas as pd
import plotly.express as px
import dash
import dash_core_components as dcc
import dash_html_components as html
from dash.dependencies import Input, Output

# Load Financial Data for TSMC
tsmc_fs_path = '/Users/jimpan/Documents/EPPS 6317/Labs/final Jim/TSMC financial/TSMC_FS.csv'
tsmc_data = pd.read_csv(tsmc_fs_path)

# Load Financial Data for Samsung
samsung_fs_path = '/Users/jimpan/Documents/EPPS 6317/Labs/final Jim/samsung financial/Samsung_FS.csv'
samsung_data = pd.read_csv(samsung_fs_path)

# Load geopolitical event data for East Asia
geodata_path = '/Users/jimpan/Documents/EPPS 6317/Labs/final Jim/geo data/geo data east asia/2012_geo_event_EA.csv'
geo_event_data = pd.read_csv(geodata_path)

# Load Maege geo data
m_geodata_path = '/Users/jimpan/Documents/EPPS 6317/Labs/final Jim/geo data/geo data east asia/merged_geo_event_data'
merge_geo_event_data = pd.read_csv(m_geodata_path)

# Convert 'Event Date' column to datetime
merge_geo_event_data['Event Date'] = pd.to_datetime(merge_geo_event_data['Event Date'])

# Make a copy of the DataFrame for the map chart
geo_event_data_copy_map = merge_geo_event_data.copy()

# Make a copy of the DataFrame for the line chart
geo_event_data_copy_line = merge_geo_event_data.copy()

# Add 10 to 'Intensity' column in the copied DataFrame for the map chart
geo_event_data_copy_map['Intensity'] = geo_event_data_copy_map['Intensity'] + 10

# Specify the center coordinates for East Asia (you can adjust these values)
east_asia_center = {'lat': 35, 'lon': 105}

# Sort the dataframes by 'Event Date'
geo_event_data_copy_map.sort_values(by='Event Date', inplace=True)
geo_event_data_copy_line.sort_values(by='Event Date', inplace=True)

# Create a Dash web application
```

GitHub Content - My C... Dash Documents/EPP... localhost 6317 final - Go... Logout

jupyter Data Analysis and Visualization Last Checkpoint: 1 天前 (autosaved)

File Edit View Insert Cell Kernel Widgets Help Not Trusted Python 3 (ipykernel)

Create a comparative bar chart for the selected financial metric using the entire dataset
fig = px.bar(
 combined_df,
 x='Year',
 y=[tsmc_column, samsung_column],
 title=f'{selected_metric} - TSMC vs Samsung - All Years',
 labels={'value': selected_metric, 'variable': 'Company'},
 color='Company', # Use the 'Company' column for color differentiation
 facet_col='Company', # Separate bars for TSMC and Samsung
 facet_col_spacing=0.1 # Adjust spacing between facets as needed
)

return fig

Callback to update the TSMC and Samsung total assets line chart
@app.callback(
 Output('total-assets-chart', 'figure'),
 [Input('financial-metric-dropdown', 'value')])
def update_total_assets_chart(selected_metric):
 # Add a 'Company' column to distinguish between TSMC and Samsung
 tsmc_data['Company'] = 'TSMC'
 samsung_data['Company'] = 'Samsung'

 # Concatenate the dataframes
 combined_df = pd.concat([tsmc_data, samsung_data])

 # Create an interactive line chart for the selected financial metric
 fig = px.line(
 combined_df,
 x='Year',
 y=[f'TSMC {selected_metric}', f'Samsung {selected_metric}'],
 title=f'{selected_metric} - TSMC vs Samsung - All Years',
 labels={'value': selected_metric, 'variable': 'Company'},
 color='Company' # Use the 'Company' column for color differentiation
)

return fig

Run the Dash app
if __name__ == '__main__':
 app.run_server(debug=True, mode='external', port=8050)

