

1 – Introduction

This project is to create a GDP growth rate simulator tided to the summarized factors that are caused by both natural disaster and terrorist attacks as well as to look at what effect each of those factor have when they are slightly adjusted on the over all growth rate of the GDP compared to the previous years as well as the real GDP growth rates.

2 – Disclaimer

disclaimer that this project uses data from an array of tragic disasters and attacks, with no intention of minimizing the effect they each had or the devastating loss of life they caused.

3 - Aims & Objectives

This project aims to develop a basic C++ GDP growth rate simulator tided to the subsidies factors caused by disasters

Its objectives are:

- an accuracy within 0.5% compared to the real GDP
- The model accounts for both negative and positive effects.

4 - research

Terrorism:

9/11:

- The initial damages cost 21.6 billion dollars
- Unemployment increased from 3.99% to 5.99% from 2000 to 2003
- Dropped GDP growth rate down 3.12% after the attack
- Number of casualties: 2977

Paris 2015:

- The initial damages cost 342 million dollars
- Unemployment remained unchanged
- Dropped GDP growth rate down 0.21% after the attack
- Number of casualties: 130

Parson Green:

- The initial damages cost 342 million dollars
- Unemployment remained unchanged
- No effect on GDP growth rate after the attack
- Number of casualties 0

Earthquakes

Indian Ocean(Indonesia) 2004 :

- 9.1 magnitude
- The initial damages cost 4.6 billion dollars
- Unemployment increased by 0.65%
- GDP growth rate increased by 0.25% after the quake
- Number of casualties: 230,000 across 14 different countries

Haiti 2010

- Magnitude 7.0
- The initial damages cost 4.3 billion dollars
- Unemployment remained unchanged
- Dropped GDP growth rate down from 5.89% to -5.65% after the quake
- Number of casualties: 300,000

5 – Formulas

Terrorism:

- **New growth=Current growth–Shock strength**
- **New growth=Current growth+(Market Boost + Gov Boost) × Normalization Factor**

Earthquakes:

- **Shock = Quake shock strength – Offsetting factor**
- **Growth=(Base growth – Shock + Spending) × normalization_factor**
- **Growth = (Base_growth + Recovery_boost * Spending) x normalization_factor;**
- **Growth=growth × long_term_effects**
- **Growth = Base_growth x normalization_factor**

```
5. Simulate GDP Growth around 2004 Indian Ocean Earthquake
0. Exit Program
Enter your choice: 5
```

```
--- GDP Simulator: 2004 Indian Ocean Earthquake ---
1. Change Quake Shock Strength (currently 0.8)
2. Change Recovery Boost Multiplier (currently 1.1)
3. Change Offsetting Factor (currently 0.75)
4. Change Government Spending per Year
5. Run Simulation
0. Back to Main Menu
Enter your choice: 1
New quake shock strength (e.g., 0.2 – 1.0): 1
```

```
--- GDP Simulator: 2004 Indian Ocean Earthquake ---
1. Change Quake Shock Strength (currently 1)
2. Change Recovery Boost Multiplier (currently 1.1)
3. Change Offsetting Factor (currently 0.75)
4. Change Government Spending per Year
5. Run Simulation
0. Back to Main Menu
Enter your choice: 5
```

```
GDP Growth Simulation around 2004 Indian Ocean Earthquake:
Year      Simulated GDP (%)  Actual GDP (%)
2003      4.75              4.78
2004      4.84              5.03
2005      5.69              5.69
2006      5.48              5.50
2007      6.32              6.35
```

6 – Subsidised factors

quake_shock_strength and shock_strength:

Consumer confidence, Labour force disruption, Capital destruction, Supply shocks

recovery_boost:

Government spending, Investment, FDI, Infrastructure development

offsetting_factor:

External support, Political stability, Technological resilience

normalization_factor:

Labor recovery, Consumer/investor confidence, Long-term policy response

long_term_effects:

Innovation from rebuilding, investor confidence, Capital stock, Productivity

market_recovery_boost:

Consumption, Investment, Labour productivity, Market sentiment

gov_spending_boost:

Government spending, Infrastructure rebuilding, Public investment

7 - Conclusions

In conclusion, while working on this project, it was made clear how many factors affect their GDP growth rate outside of just the disasters themselves. And when looking at the GDP growth rate, how small changes can have massive repercussions on the GDP growth rate as a whole. As well as this, it's clear that to make a version of this code that is truly accurate, it would require a massive amount of data, as well as far more complex formulas.