

# MACROECONOMICS II

## *Assignment 1*

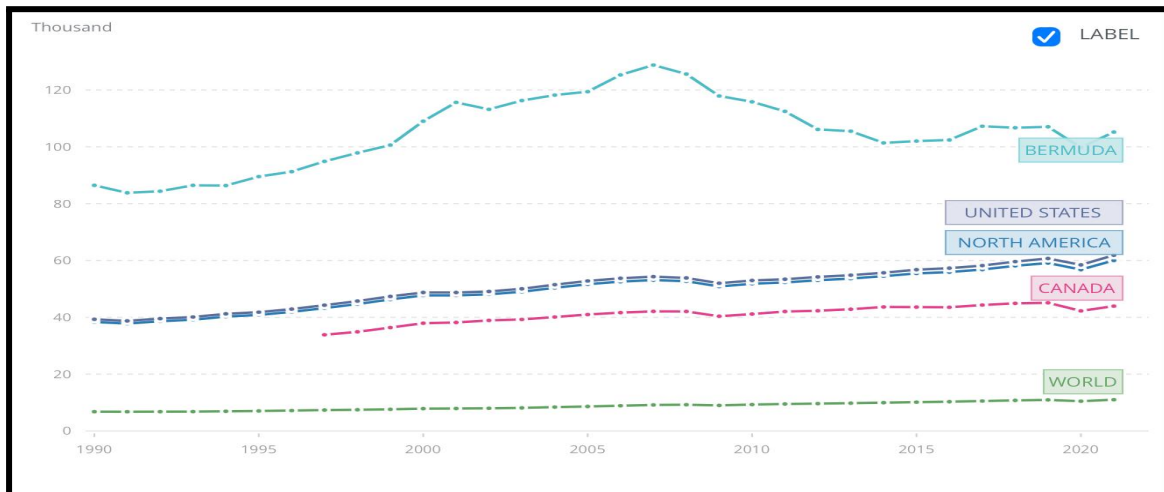
**Region in study: North America**

**By:**

1. **Rajesh Kumar Jha**, Ph.D., 1st Semester, CITD, J.N.U  
Enrolment Number : 22/42/MI/002
2. **Ayush Raj Pandey**, M.A. Economics, CITD, J.N.U  
Enrolment Number : 22/42/HE/005
3. **Harsh Mittal**, M.A. Economics, CITD, J.N.U  
Enrolment Number : 22/42/HE/018

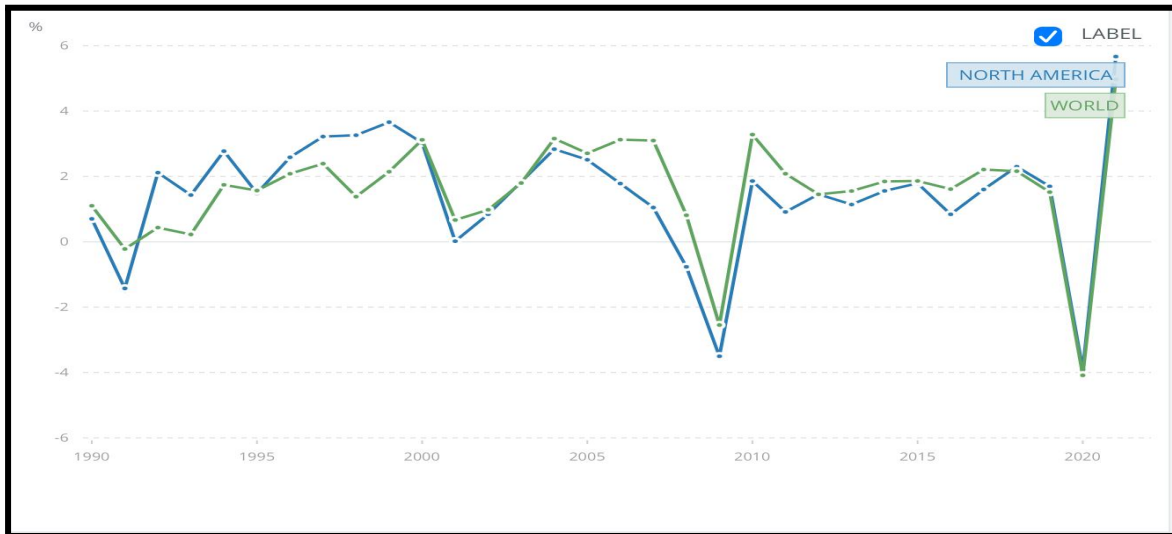
## Initial Comparisons

Our study for North America includes , namely The United States, Canada and Bermuda (as grouped by The World Bank). These three belong to the top 25 countries in the World when it comes to G.D.P. per capita (constant 2015 US\$) for the year 2021. This can be seen in Fig. 1,



with the line graph for the world average being considerably lower than all three.

Figure 1: GDP per capita (constant 2015 US\$)



**Figure 2: GDP growth (annual %, constant 2015 US\$)**

**Source: World Bank national accounts data**

Regarding annual G.D.P. growth percentage (constant 2015 US\$), we see that most of the peaks and bottoms for North America as a region and the World as a whole coincide (figure 2 above). Prominent dips occurred during the 'Gulf War' recession (G.D.P. growth rate for North America fell from 1.9% in 1990 to -0.1% in 1991; for the world, it fell from 2.9% in 1990 to 1.5% in 1991, almost half. ), 'Dot-com' recession ( for North America 4.2% in 2000 to only 1% in 2001; for World as whole it fell from 4.5% in 2000 to 2% in 2001), 'The Great Recession' from December 2007 to June 2009 ( where North America went from 2% in 2007 to -2.6% in 2009 and the World fell from 4.4% to -1.3% in 2009 ) and the recent 'Coronavirus' crisis where both North America and World as a whole showed identical fall magnitude wise too ( North America: 2.3% in 2019 to -3% in 2020; World: 2.6% in 2019 to -3.1% in 2020).

Now when we compare each country concerning North America as a region ( as shown in figure 3, 4, 5), we observe that the line graph of The United States is almost the same as North America. It shows the apparent mighty economic influence of the U.S.A. in this region.

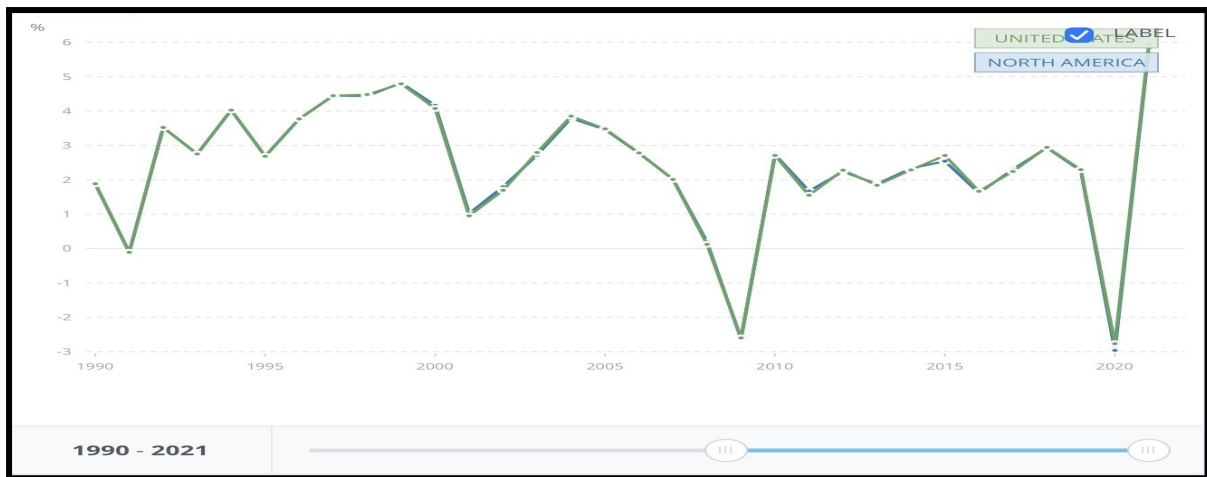


Figure 3: GDP growth (annual %,North America, United States, constant 2015 US\$)

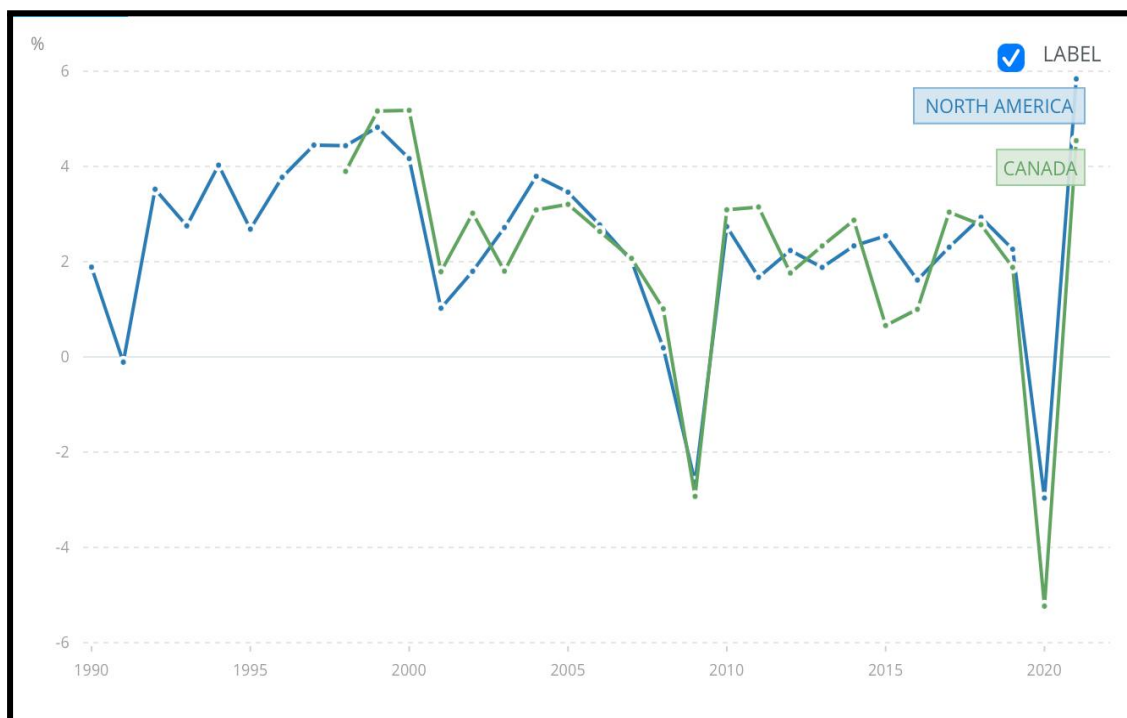
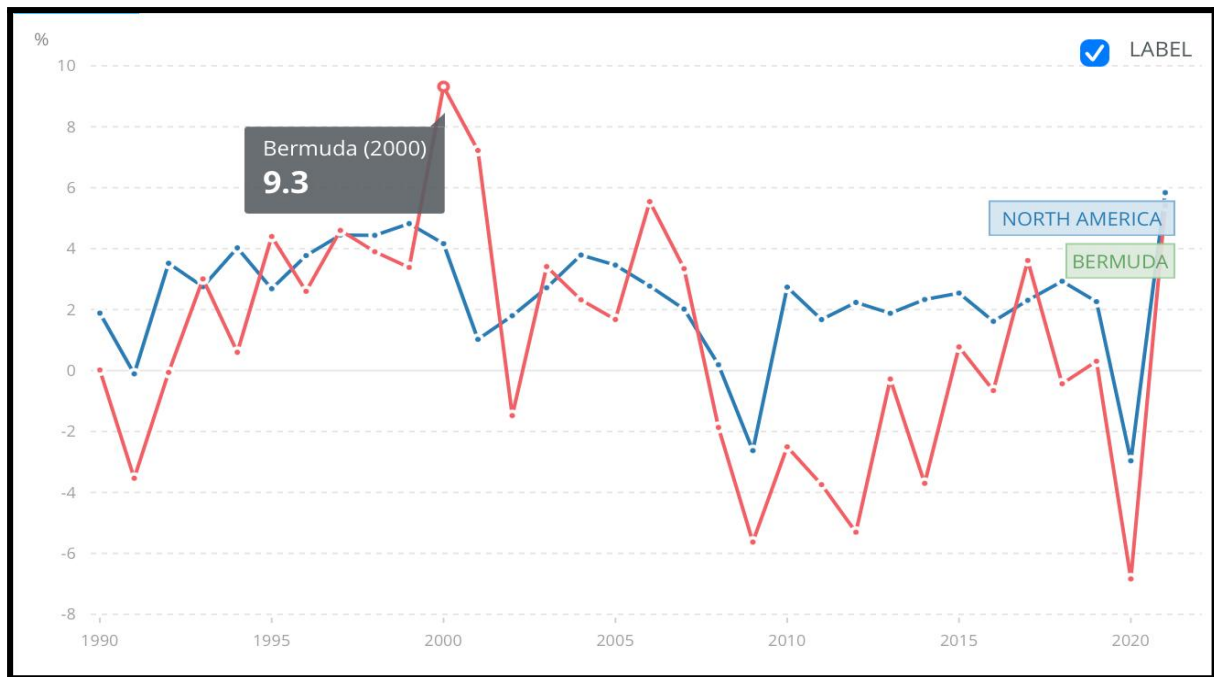


Figure 4: GDP growth % (North America, Canada )



**Figure 5: GDP growth % (North America, Bermuda) ; Source: World Bank national accounts data**

Canada is also similar, but the most disjointed out of the 3 is Bermuda. This observation aligns with their economic size and strength in this region ( at constant 2015 US\$, G.D.P. (in millions ) of The U.S. in 2021 was 20,529,459.73, Canada stood at 1,680,392.78 while Bermuda stacked at 6,718.03 only).

## Mean Analysis<sup>1</sup>

**TABLE 1 (from 1990-2021)**

COUNTRY/ REGION	MEAN GDP per capita (current US\$)	MEAN GDP growth rate	Mean of Income share held by highest 10% (X)	Mean of Income share held by lowest 10% (Y)	Spread (X-Y)	Standard Deviation  (GDP per capita) (GDP growth rate)	Skewness  (GDP per capita) (GDP growth rate)
--------------------	---	-------------------------	--	---	-----------------	--	---

<sup>1</sup> For more disaggregated data : [https://drive.google.com/drive/folders/1nVUVt1z\\_pBAHbm-9AV115ADMVh1GeVd?usp=sharing](https://drive.google.com/drive/folders/1nVUVt1z_pBAHbm-9AV115ADMVh1GeVd?usp=sharing)

The U.S.A	47,068.60	3.9%	28.55%	2%	26.55%	13372.36 1.86246	0.148705 -1.0923
Canada	36,718.15	4.2%	48.4%	2.85%	45.55%	12463.06 2.276770	0.011437 -1.85921 9
Bermuda	70,465.90	2.72%	—	—	—	31315.81 3.84974	-0.3185 -0.07875
North America	46,007.65	3.85%	—	—	—	18692.54 2.52290	-0.21028 -0.86557
World	8,270.35	4.4%	—	—	—	2635.99 1.65773	0.12211 -1.8965

The most straightforward inference from Table 1 is that while Bermuda's mean G.D.P. per capita is the highest, its growth rate is the lowest. In fact, Bermuda's mean G.D.P. growth rate is lower than both North America and World average. Bermuda also shows the greatest variability, as evidenced by the standard deviation column. Comparing the North American region with some of the best-performing countries in terms of G.D.P. growth rate, say China and Vietnam, we find that it significantly underperforms for the most part (figure 6).

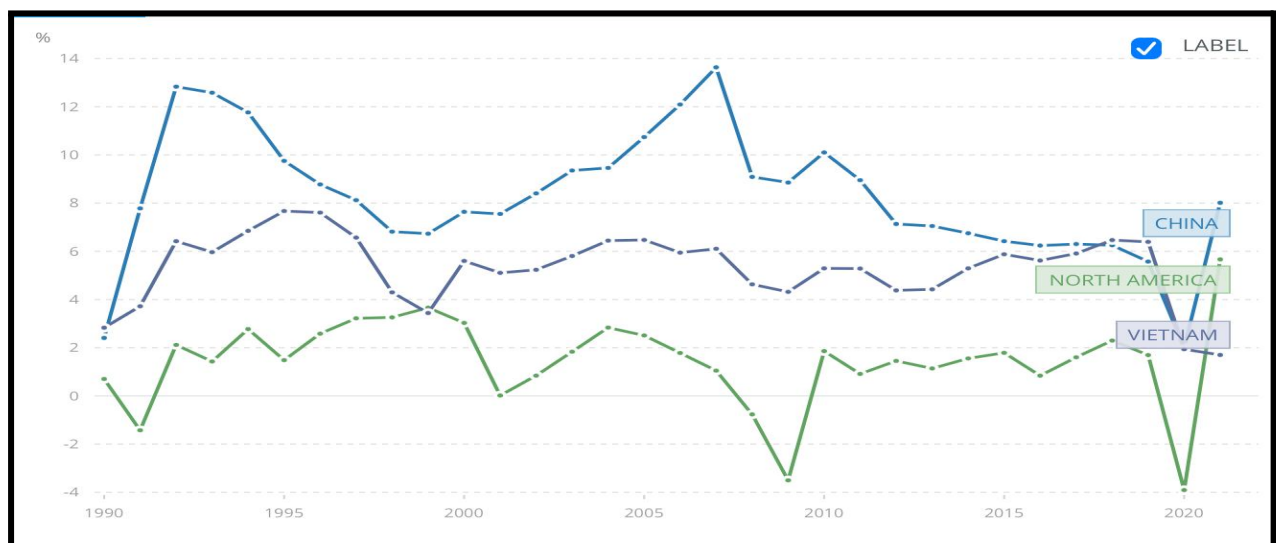


Figure 6: GDP per capita growth (annual %) - China, North America, Vietnam

Figure 7: Income share held by lowest 10%

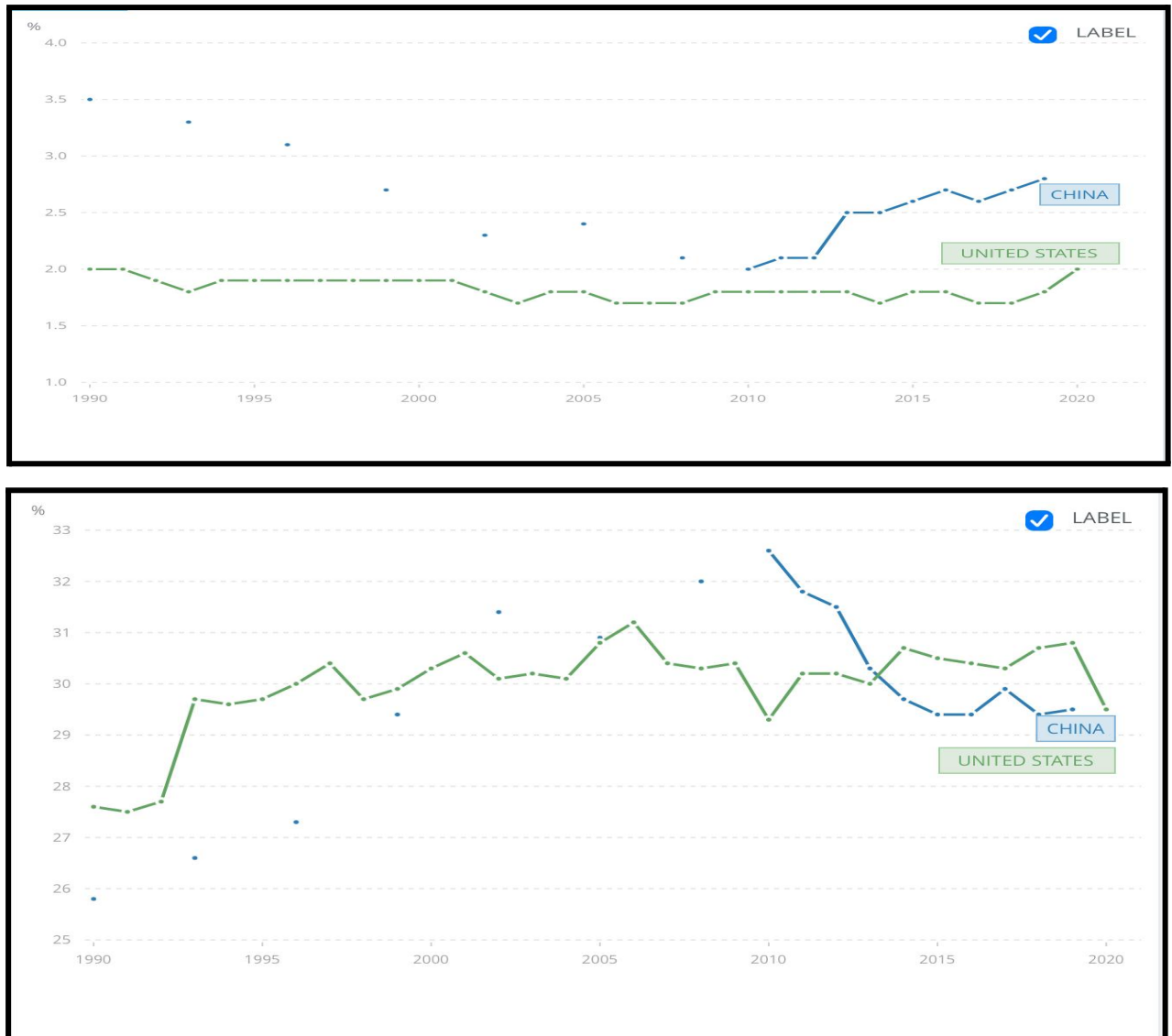


Figure 8: Income share held by highest 10%

Source: World Bank national accounts data

For the same period, when we compare the U.S.A. with China on two parameters of the income distribution, we find that for income share held by the lowest 10% (figure 7), China has constantly been better than the U.S.A. ( which is an almost perfect representation of the North American region as we see a high degree of graphical congruence between the U.S.A.

and North America as a region on the whole). The story is not straightforward regarding the income share held by the highest 10% (figure 8). Before 2000, China was doing slightly better than the U.S. on the inequality front, as the income share held by the lowest 10% was constantly higher than the U.S. till 2000. The income share held by the highest 10% is lower than the U.S. Post that, till 2013, China remained above the U.S. line and then fell. Figure 8 shows a significant divergence during the 'The Great Recession' (December 2007 to June 2009). China's limited exposure to subprime mortgages, stringent financial regulations and tight flow of capital in and out of the country saved China from the severe consequences of this recession.

### **What if growth rates** (from 1990-2021)

COUNTRY/ REGION	GDP per capita (constant 2015 US\$) (1990) (2021)	Compound Annual Growth Rate (Z)	GDP per capita if economy grew by (Z+1)%	GDP per capita if economy grew by (Z-1)%
The U.S.A	39,303.5 61,855.5	1.43%	84,742.39	45,088.11
Canada	33,861.1 ('97) 43,936.3	1.05%	56,237.54	34,286.91
Bermuda	86,436.2 105,187.8	0.62%	144,553.88	76,521.74
North America	38,357.5 60,011.7	1.41%	82,187.55	43,723.33
World	6,792.6 11,011.1	1.52%	15,062.99	8,018.91



Column 2 in the above table shows the G.D.P. per capita year-on-year growth ( constant 2015 US\$). Column 3 and 4 tells us what would have happened if the compound annual growth rate of G.D.P. per capita was one percentage point higher or lower, respectively.

- As we can see, if the growth rate of the U.S.A. was one percentage point higher than what it is, per capita G.D.P. would have more than doubled from its value in 1990.
- The same is true for North America as G.D.P. per capita would have gone from 38,357.5 to 82,187.55 ( growth by a factor of 2.14) if G.D.P. per capita grew at 2.41% instead of 1.41%.
- Another noteworthy observation is how Bermuda's economy just grew at 0.62% year on year and would have been a severe debacle if the economy grew at  $(0.62-1)\%$  i.e. -0.38%.
- For the world economy to catch up with North America, it would have needed to grow at 7.05 per cent every year since 1990.
- The required per-year growth rate would have been 7.15% to catch up with the United States. for 32 years from 1990 to 2021.

We can see that minute changes in growth rate impact economies in a significant way, and therefore, it is vital that we fully understand how these growth rates are determined and the models behind them.

*Thank You.*