Foreign Trade of vulnerable economies in Africa- Analysis of Geopolitical Risk Index

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Abstract:

In the world, economies of developing nations and the developed ones, everyone is affected by the risks of geopolitical tensions. But we always forget about vulnerable economies like African and many island nations. These countries become more vulnerable in terms of economic growth when they face uncertainties due to international factors and in-house challenges. It has been observed that macroeconomic fundamentals are not always being affected by geopolitical tensions, as problems like unemployment and inflation are the result of internal aggressions. And most African nations are facing issues related to militia unrest, repression, poverty and environmental concerns. Thus, the purpose of this study is to understand the cause-and-effect of the US-China Trade war and shift in the trading pattern leading to economic instability faced by vulnerable African nations. In this study, the focus will be on the structure of trade of these vulnerable economies to see the reaction of Gross Domestic Product growth and Geopolitical Risk Index (GPRI) data, which is being estimated using the panel data variables from the year 2018 to 2023. Gross Domestic Product growth data is being collected from the World Bank and the UN database. The index measurement data has been assessed from the Economic Polity Uncertainty and Global Trade Alert database to support the intervention assessment of African economies and trade.

Keywords: Trade war, US-China, geopolitical tension, GPRI, GDP growth

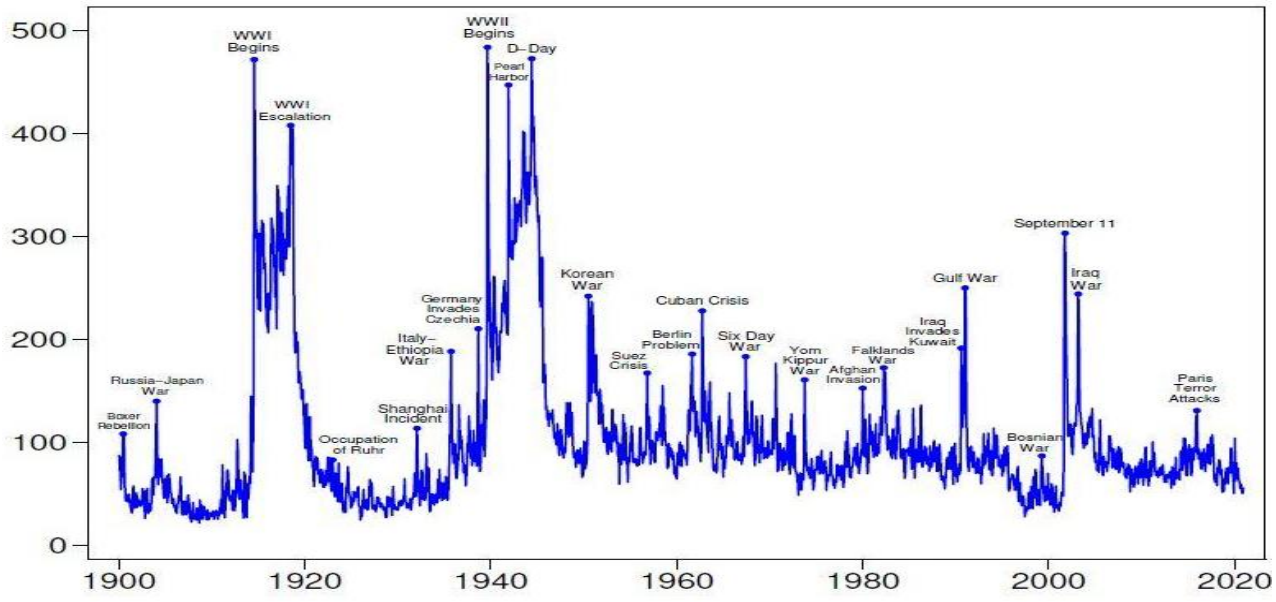
"When elephants fight, it is the grass that suffers."

This African proverb sums up how it is smaller, vulnerable nations that suffer most in geopolitical conflicts among the ostensible great powers. Risks from geopolitics, whether in the forms of tensions, conflicts, or violence, affect economies by restricting their growth and large price inflation and disrupt markets and break supply chains (Caldara & Iacoviello, 2022). These risks include an increase in political instability, economic disruptions, and environmental or health crises, and all of these not only affected the nations concerned, but the entire global community.

As in point, the most recent Russia-Ukraine war has disrupted energy flows and brought more food insecurity to continents (S&P Global, 2024). Economies fragile and heavily dependent on outside funding, trade, and resources are especially open to risk. African countries are heavily indebted and have Chinese loans, worrying risks further from weak governance and geopolitical tensions, such as the U.S.-China rivalry (Kaya, A., 2024). While 40 percent of the world's renewable energy resource potential is found in Africa, energy insecurity and, even worse, governance challenges within the continent make the robustness of that resilience a global affair (African Biodiversity Loss Raises Risk to Human Security, 2022).

Thus, here in this study, we have undertaken the analyses of Geopolitical Risk by using the Geopolitical Risk (GPR) Index to understand the United States of America, China and South Africa. Dario Caldara and Matteo Iacoviello construct a new measure of adverse geopolitical events based on a tally of newspaper articles covering geopolitical tensions, and examine its evolution and economic effects since 1900. Compared to the 2019 version, the revised index slightly changes the words (Caldara & Iacoviello, 2022).

Fig. 1 represents the recent GPR Index from 1985 through 2020, it is normalized to 100 throughout the 1985-2019 period.

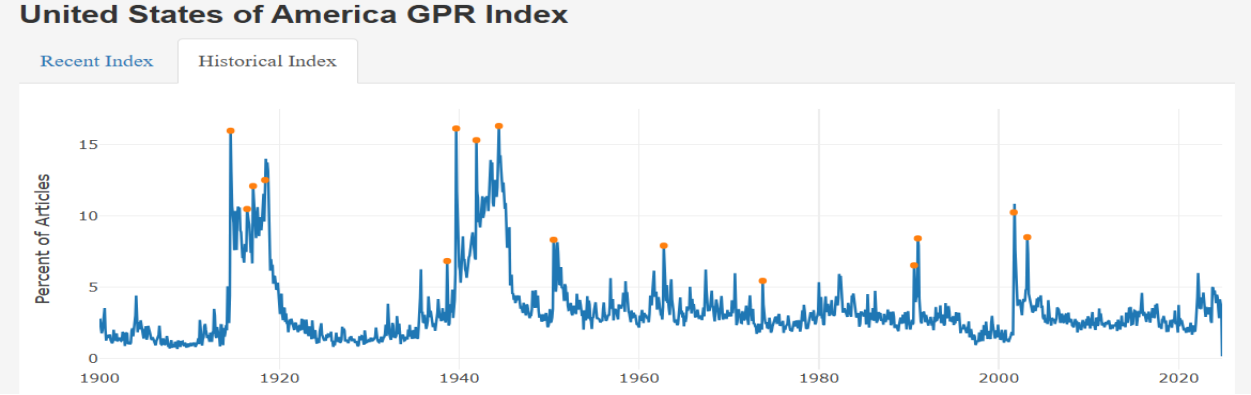


Source: (Caldara & Iacoviello, 2022)

In figure.1, GPR Index is being characterized by several spikes corresponding to key adverse geopolitical events. The first spike recorded in April 1986 and recently the 2015 Paris terror attacks (Caldara & Iacoviello, 2022).

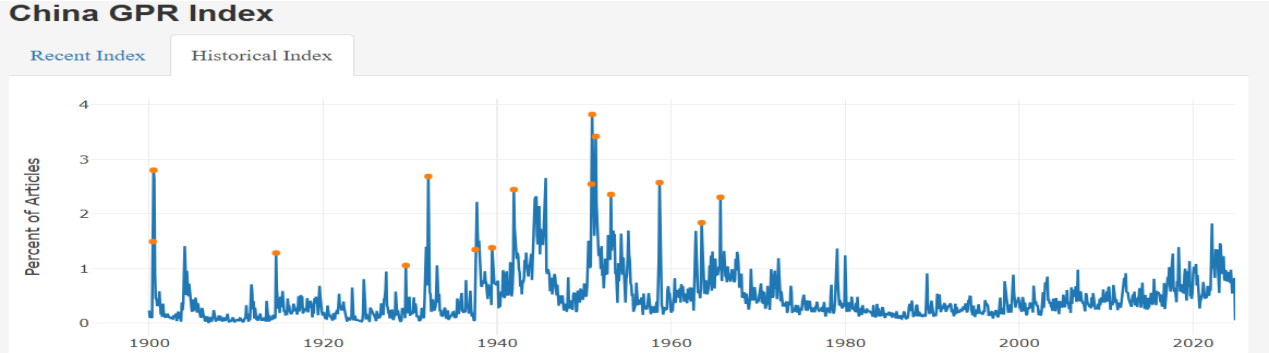
Figure. 1, 2 and 3 represents the GPR Index of the Unites States of America, China and South Africa, respectively. You can observe the increase in spikes with a yellow-ish dot on the top representing the major geopolitical event which has brought the threat to the world economies. In the United States of America, you can observe the spike near 2000 which denotes the 11 September, 2001 terror attack and after that the 2003 Iraq war. Whereas, in the China, we can see the last spike dot in 1965, when Indo-China war occurred. These GPR Index graphs represents the geopolitical ups-and-downs with the recent one concerning the trade-oriented dispute among two world leaders, i.e. the United States and China. But, if we analyse the graph of the South Africa, the value from the year 2000 onwards is very low, means there is no major internal disturbance which had brought the global-economic concern. In the year 1986, the South Africa faced an economic turmoil due to severe restrictions from international markets and an internal unrest put an burdening pressure on inflation (Caldara et al., 2024). It explained how external factors, political unrest can impact a country's economic stability.

Fig. 2 represents the recent GPR Index from 1900 through 2020, for the United States of America



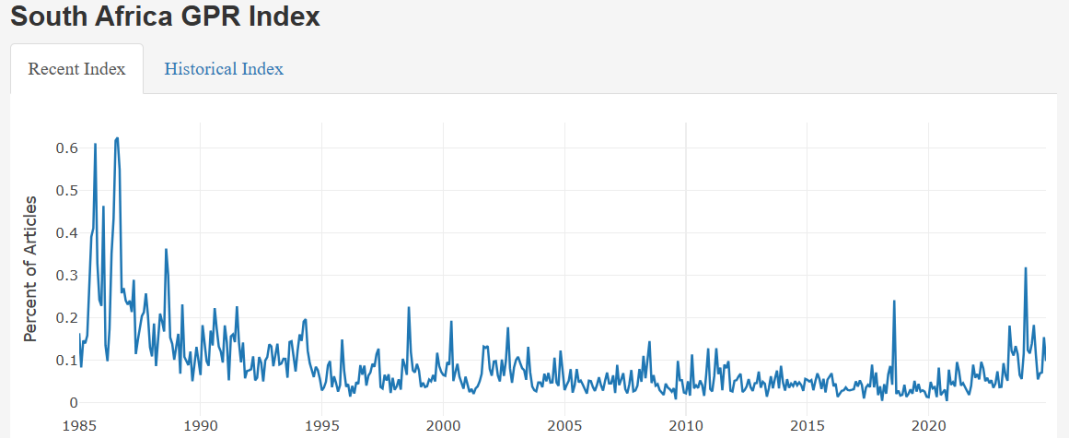
Source: (Caldara & Iacoviello, 2022)

Fig. 3 represents the recent GPR Index from 1900 through 2020, for the China.



Source: (Caldara & Iacoviello, 2022)

Fig. 4 represents the recent GPR Index from 1900 through 2020, for the South Africa.



Source: (Caldara & Iacoviello, 2022)

Thus, here, the empirical analyses of GDP growth percentage of South Africa is done to observe the change due to geopolitical incidents by keeping the GPR Index as an independent variable and Inflation, GDP growth rate, Trade to GDP, Debt to GDP as dependent variable. The dataset is an annual span from 2015 to 2024, it includes country-level variables measuring GDP growth rate, public debt % to GDP, inflation and trade % to GDP, the main source of data is the IMF's international financial statistics.

The construction of a large panel allows a deep dive into the relationship between geopolitical risks and GDP growth rate at the country level. We have analysed 120 observations pertaining to different variables. Based on the results, we can assert that for the China, Inflation and Debt variables are not being affected by the Geopolitical Risk, as the dependence on GPR is 1.06% and 10.73% respectively. Whereas, the real GDP and Trade% to GDP accounts for 77.07% and 6512% dependence respectively. In the case of South Africa, we can insist on the un-reliability of Real GDP and Inflation on Geopolitical Risk, which has 0.07% and 0.39% dependence on GPR. But, the Public Debt and Trade % to GDP has a 41.56% and 48.72% dependence on GPR. And the United States of America have around 38.04% of Inflation dependence on GPR, while all the three variables, i.e. Real GDP, Public Debt and Trade to GDP accounts 2.91%, 19.02% and 13.39% of dependence on GPR which is comparatively less that Inflation.

Thus, from this study, we can claim that even the most developed country in African nation is also affected from the Geopolitical tension like US-China Trade war, Ukraine-Russia unrest, etc. Economies are mostly faces impact on the Trade percent on GDP along with disturbance in Public Debt as it accounts a major percent from FDIs, other foreign investments and loans provided by International organisations. A lot of countries focus only on a few trade partners, but today there is a need to improve geopolitical relation and at the same time have multiple alternate or trusted friends from different economies across the world. We have also observed that in all type of economic development countries do have a major dependence on Imports because of their geographic location, demographic needs and other socio-economic parameters which is a result of internal unrest, political issues, etc. Thus, the focus on indigenization of sources to manufacture according to the societal needs and sole focus on improving domestic market. When an economy diversifies its regional production and at the same time rely on different trading partners it reduces the burden. Like in the case of South Africa, Investments and Trade has a major foreign and global influence. Thus, here the economy can improve the focus on the small and medium enterprises. Real GDP and Inflation in South Africa is a result of internal and political issues. The economy may improve its institutional working by making governance and crisis management strong. It should work upon the foreign financial reliance

and making itself resilient with strong foreign exchange and improving credit lines with international institutions.

A Transformation must take place from state-controlled and socialistic economic systems to market-driven ones. These inordinate shackle regulations, primarily due to socialist principles, have tended to corrupt and thus dissuade entrepreneurs' growth which is creating an unfavourable business environment. The nations must inspire a complete paradigm shift to free-market policies, which will definitely provide the much-needed competition, innovations, and entrepreneurship that Botswana has proven. While many Sub-Saharan African countries tend to be stifled policy-wise, Botswana introduced competitive market ideals. The world can learn from Botswana's strategic diversification, investment in human capital, and strong governance practices. These principles, applied globally, will enable economies to reduce external dependency on volatile factors while strengthening internal markets.

A stepwise process must be adopted here, wherein the first priority is identifying the vulnerable areas of social construction: energy and agriculture, and have policies to boost local production capacity while creating international alliances. In tandem, the government also sanctions regulatory reforms which would reduce the scope of corruption and promote entrepreneurship. Establishing "startup cities" with different regulatory frameworks would complement industrialization, create an enabling environment for innovation, and attract investments. In the long run, these measures will provide resilience against geopolitical disruptions and move nations further along the path towards sustainable growth.

Thus, we can conclude the study by stating that macroeconomic fundamentals are not always being affected by geopolitical tensions, as problems like unemployment and inflation are the result of internal aggressions. But, also, the geopolitical tensions do make economies vulnerable based on its dependency in the world economy.

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Sources for Data:

1. Real GDP % growth: https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOWORLD
2. Inflation %: https://www.imf.org/external/datamapper/PCPIPCH@WEO/OEMDC/ADVEC/WEOWORLD
3. Public Debt to GDP: https://www.imf.org/external/datamapper/GGXWDG_NGDP@WEO/OEMDC/ADVEC/WEOWORLD
4. Trade to GDP: https://www.imf.org/external/datamapper/BCA_NGDPD@WEO/OEMDC/ADVEC/WEOWORLD
5. GPR: https://www.matteoiacoviello.com/gpr.htm

ANNEXURE

1. Tables:

	China					South Africa					USA				
YEAR	GPR	Real GDP	Inflation	Debt	Trade	GPR	Real GDP	Inflation	Debt	Trade	GPR	Real GDP	Inflation	Debt	Trade
2015	0.41	7	1.4	104.7	2.6	0.39	1.3	4.6	45.2	-4.3	2.35	2.9	0.1	41.5	-2.2
2016	0.45	6.8	2	106.6	1.7	0.27	0.7	6.3	47.1	-2.7	2.20	1.8	1.3	50.7	-2.1
2017	0.81	6.9	1.6	105.5	1.5	0.33	1.2	5.3	48.6	-2.4	2.63	2.5	2.1	55	-1.9
2018	0.92	6.7	2.1	106.8	0.2	0.36	1.6	4.6	51.5	-2.9	2.48	3	2.4	56.7	-2.1
2019	0.86	6	2.9	108	0.7	0.40	0.3	4.1	56.1	-2.6	2.29	2.6	1.8	60.4	-2.1
2020	0.75	2.2	2.5	131.8	1.7	0.18	-6.2	3.3	68.9	2	1.74	-2.2	1.2	70.2	-2.8
2021	0.73	8.4	0.9	124.5	2	0.13	5	4.6	68.7	3.7	1.85	6.1	4.7	71.9	-3.7
2022	1.18	3	2	118.6	2.5	0.21	1.9	6.9	70.8	-0.5	3.53	2.5	8	77.4	-3.9
2023	1.05	5.2	0.2	118.7	1.4	0.29	0.7	5.9	73.4	-1.6	2.82	2.9	4.1	84.4	-3.3
2024	0.86	4.8	0.4	121	1.4	0.26	1.1	4.7	75	-1.6	3.10	2.8	3	90.1	-3.3

Table.1: Segregated Data from IMF database and Geopolitical Risk database.

2. Results on relationship between GPR and dependent variables (Real GDP, Inflation, Public Debt to GDP and Trade to GDP)

	Mean				
Countries	GPR	Real GDP	Inflation	Debt	Trade
China	0.80	5.70	1.60	114.62	1.57
South Africa	0.28	0.76	5.03	60.53	-1.29
USA	2.50	2.49	2.87	65.83	-2.74

Table.2: Mean of GPR, Real GDP, Inflation, Public Debt to GDP, Trade to GDP.

	Standard Deviation				
Countries	GPR	Real GDP	Inflation	Debt	Trade
China	0.225247	1.825377	0.83666	9.037898	0.695773
South Africa	0.084716	2.631425	1.02279	11.29673	2.304973
USA	0.520065	1.902866	2.146649	14.7468	0.715821

Table.3: Standard Deviation of GPR, Real GDP, Inflation, Public Debt to GDP, Trade to GDP.

Countries	Covariance				
	GPR	Real GDP	Inflation	Debt	Trade
China		-0.22	-0.02	0.74	-0.04
South Africa		0.01	-0.01	-0.62	-0.18
USA		0.17	0.69	3.34	-0.14

Table.4: Covariance of GPR, Real GDP, Inflation, Public Debt to GDP, Trade to GDP.

The regression line is defined as: $Y = ß_0 + ß_1 X$

Countries	$ß_1$				
	GPR	Real GDP	Inflation	Debt	Trade
China		-0.07	-0.03	0.01	-0.09
South Africa		0.00	-0.01	0.00	-0.03
USA		0.05	0.15	0.02	-0.27

Table.5: represents $ß_1$ value of Real GDP, Inflation, Public Debt to GDP, Trade to GDP with GPR being independent variable.

Countries	$ß_0$ (Intercept)				
	GPR	Real GDP	Inflation	Debt	Trade
China		5.75	1.62	114.61	1.64
South Africa		0.76	5.03	60.53	-1.28
USA		2.37	2.50	65.79	-2.08

Table.6: represents $ß_0$-Intercept value of Real GDP, Inflation, Public Debt to GDP, Trade to GDP with GPR being independent variable.

Countries	$(Y = ß_0 + ß_1 X)$ to predict value for given X				
	GPR	Real GDP	Inflation	Debt	Trade
China		5.38	1.58	115.65	1.50
South Africa		0.76	5.01	60.24	-1.24
USA		2.49	2.93	66.80	-1.35

Table.7: representing the regression value to predict value of X.

3. Graphs related to the China:

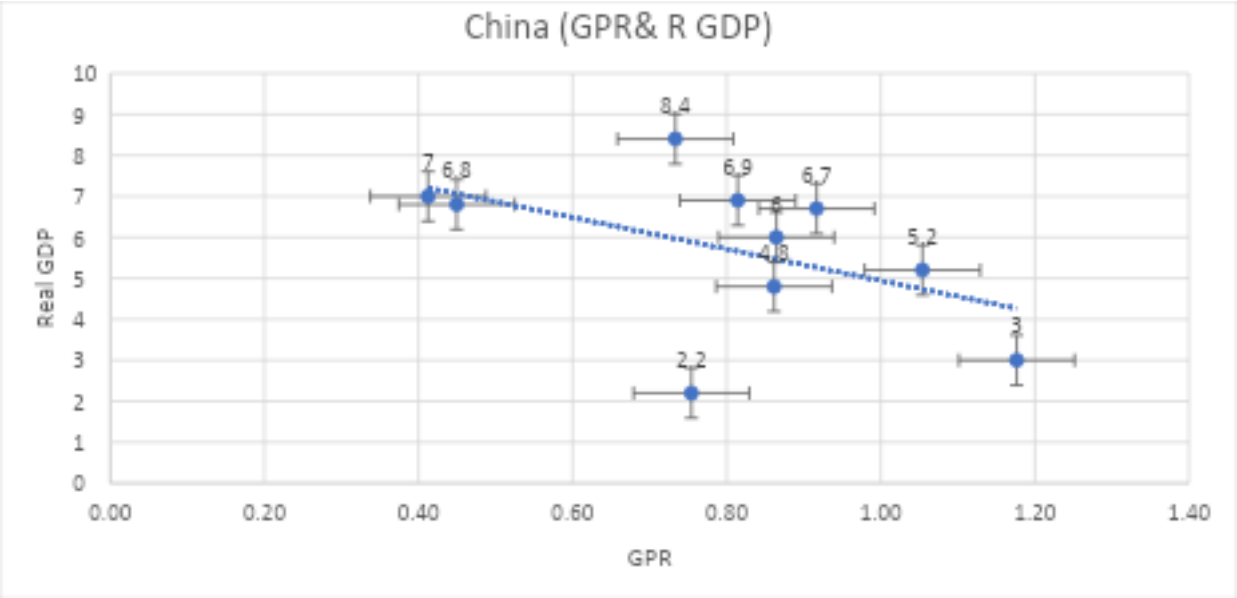
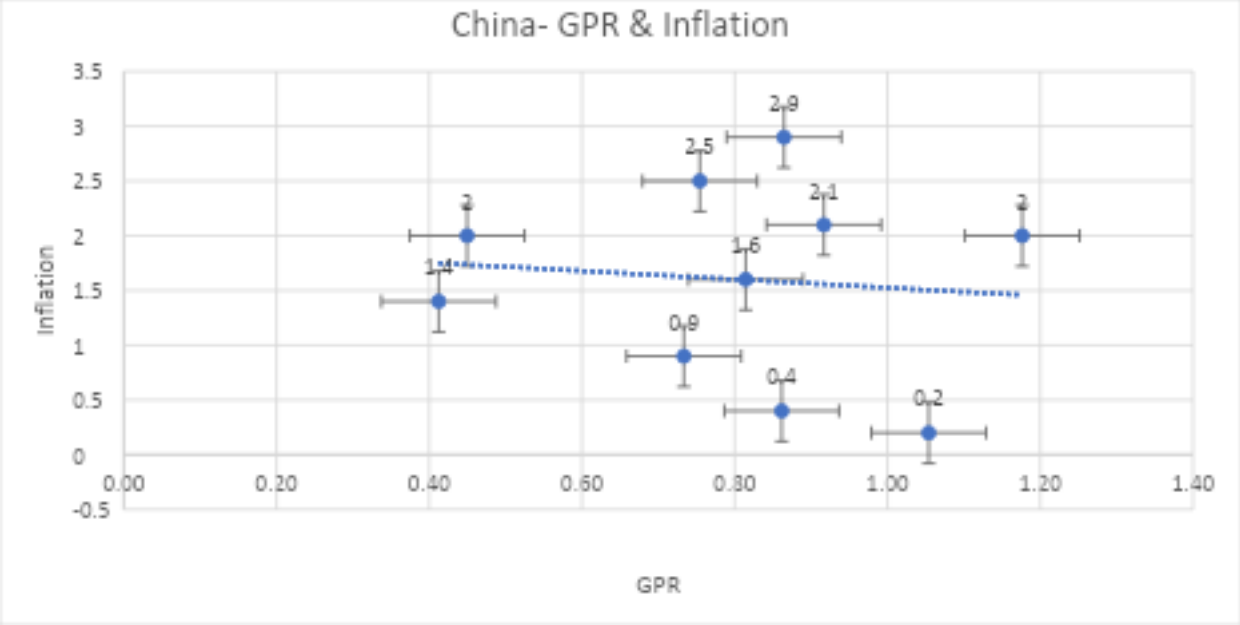


Figure.5 Regression between GPR and Real GDP.



Fiure.6 Regression between GPR and Inflation.

Figure.7 Regression between GPR and Debt to GDP.

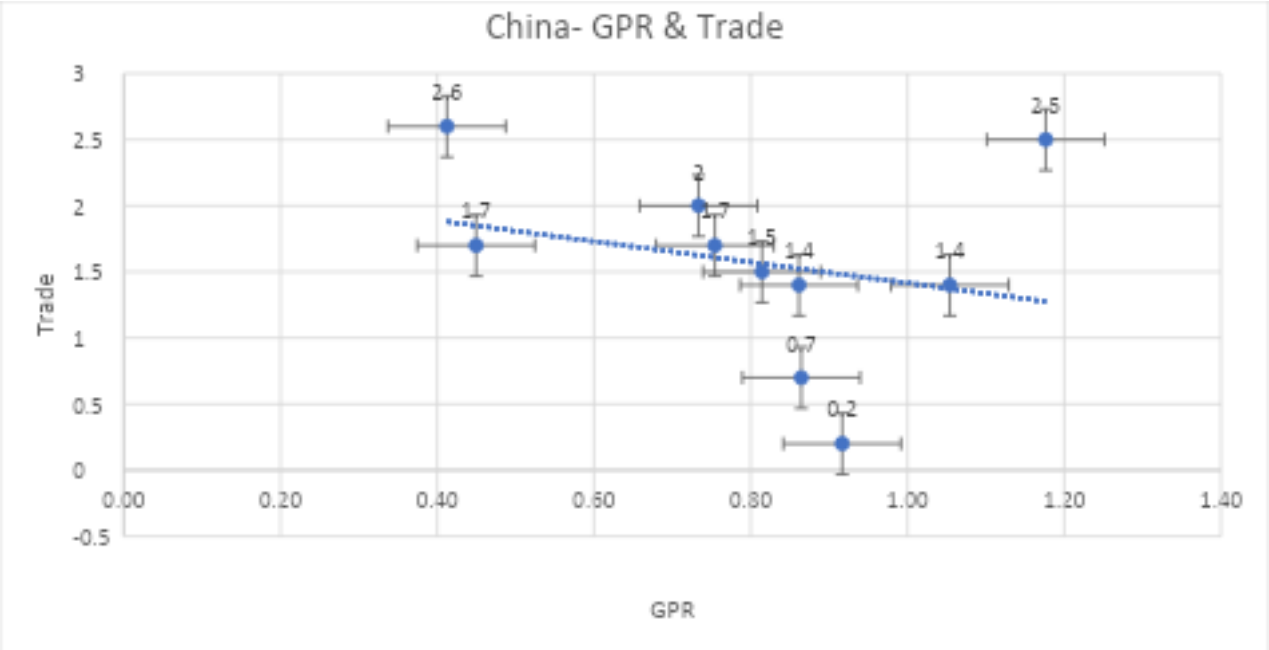


Figure.8 Regression between GPR and Trade to GDP.

4. Graphs related to the South Africa:

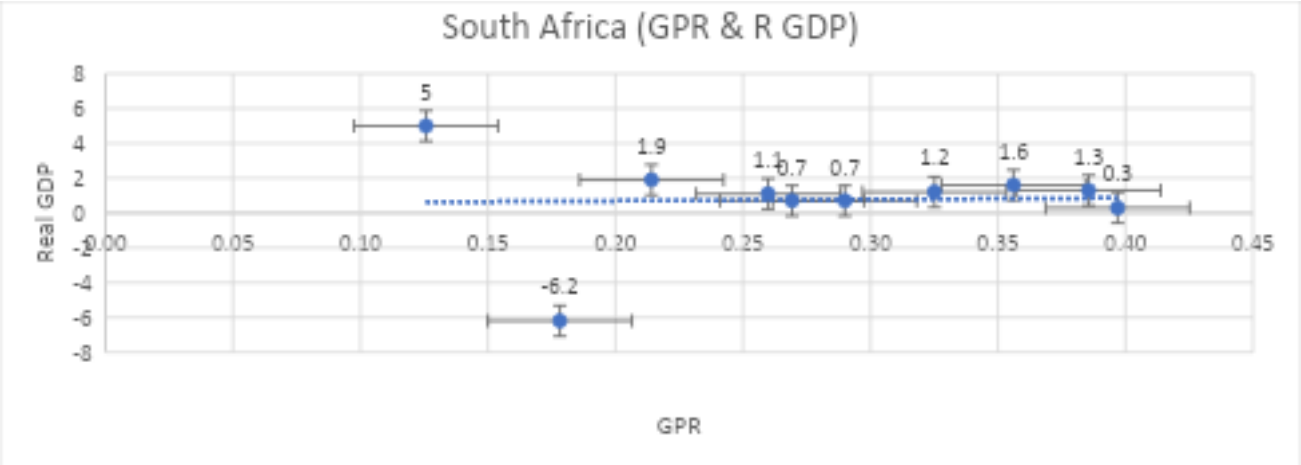


Figure.9 Regression between GPR and Real GDP.

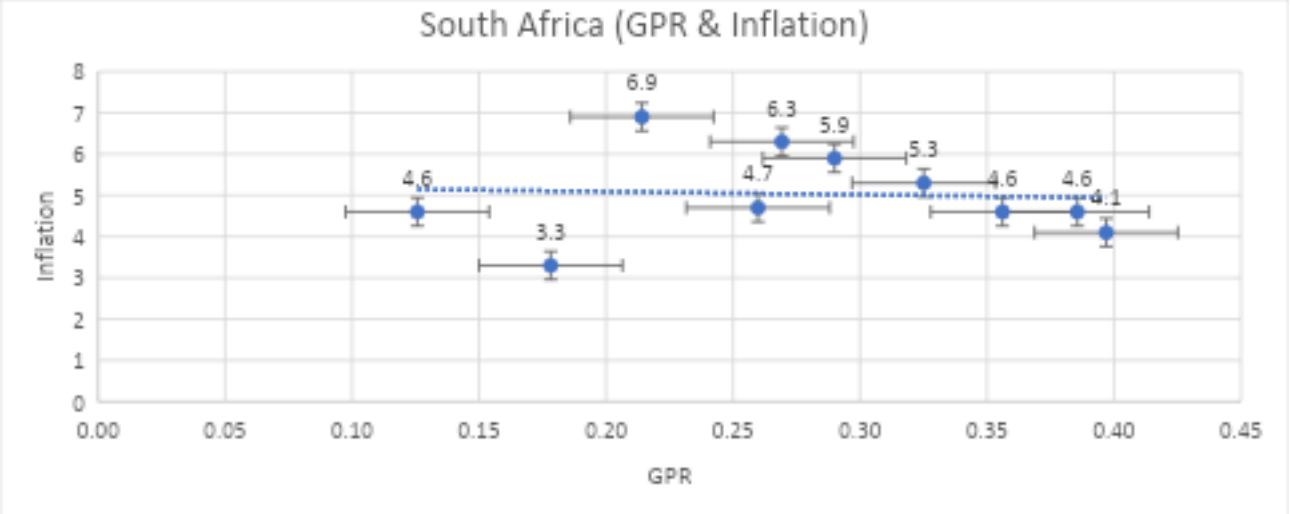


Figure.10 Regression between GPR and Inflation.

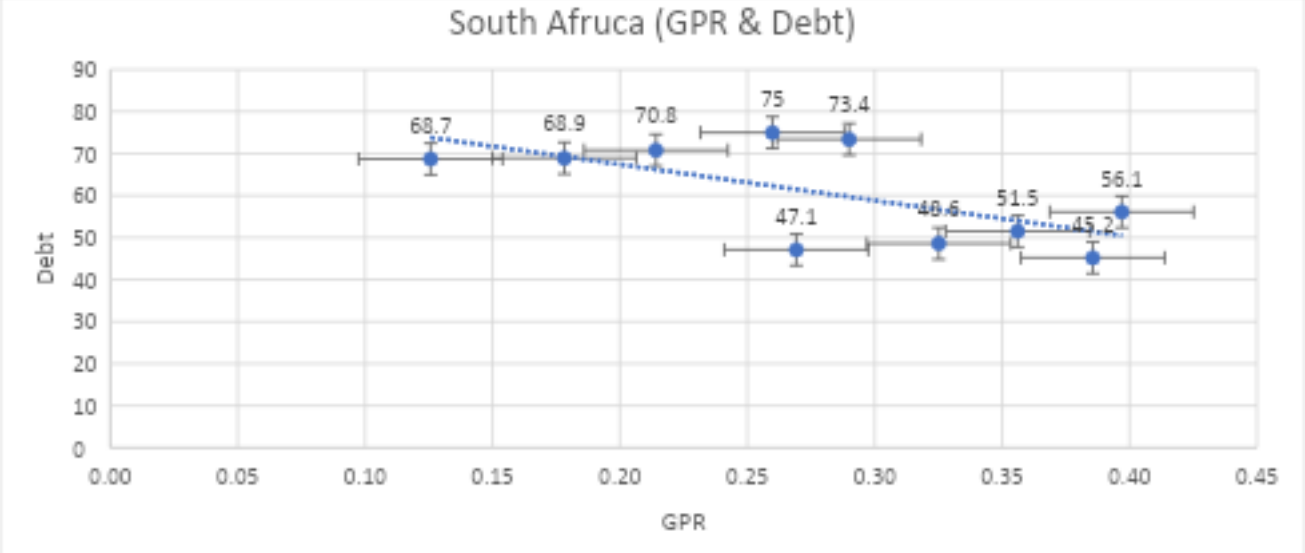


Figure.11 Regression between GPR and Debt to GDP.

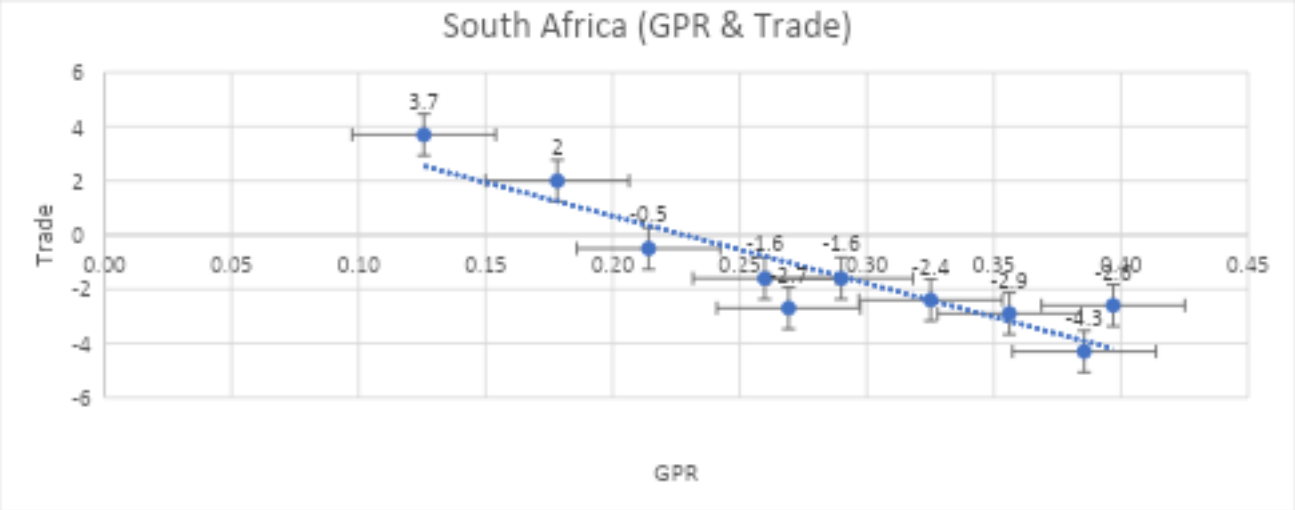


Figure.12 Regression between GPR and Trade to GDP.

5. Graphs related to the United States of America:

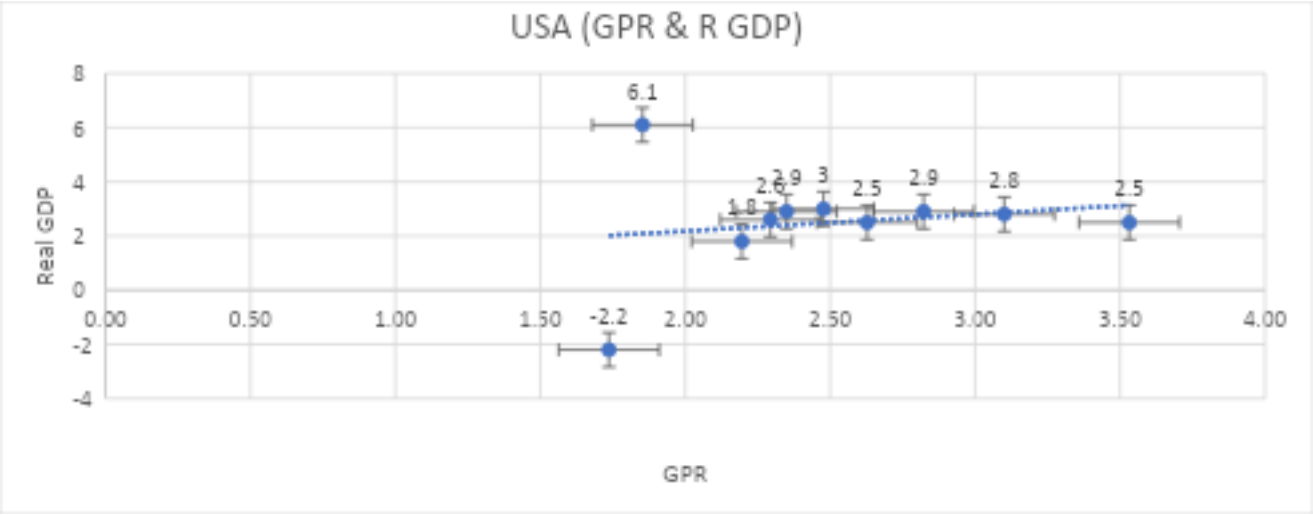


Figure.13 Regression between GPR and Real GDP.

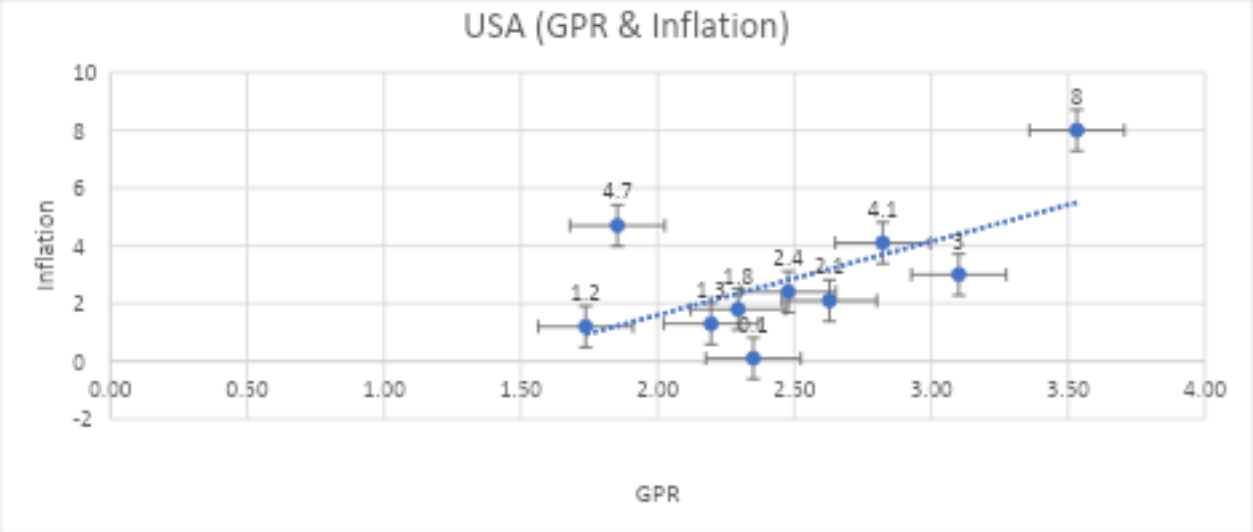


Figure.14 Regression between GPR and Inflation.

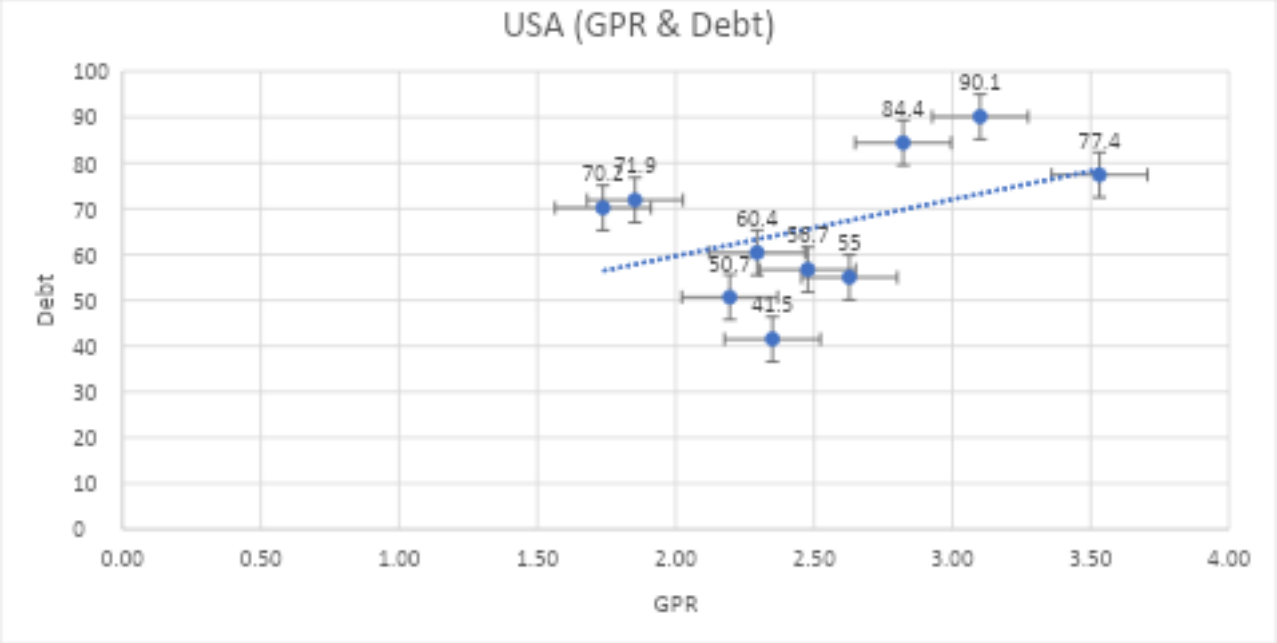


Figure.15 Regression between GPR and Debt to GDP.

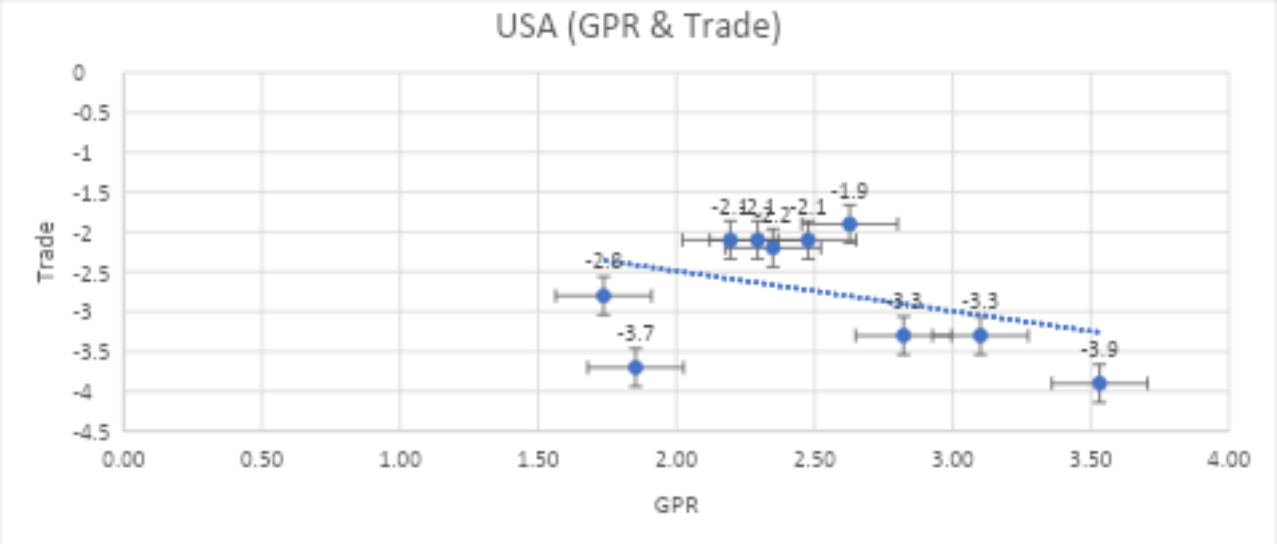


Figure.16 Regression between GPR and Trade to GDP.