THE REPUBLIC OF SOUTH AFRICA (RSA)

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Annotation: The Republic of South Africa (RSA) is a country located in the southern part of Africa, renowned for its rich natural resources, diverse culture, and complex historical processes. The country boasts one of the most developed economies in Africa, with significant potential in the sectors of industry, agriculture, and tourism.

Keywords: Republic of South Africa, Economy, Industry, Agriculture, Foreign Trade Turnover, Transportation.

The Republic of South Africa (RSA) (in Afrikaans: *Republiek van Suid-Afrika*; in English: *Republic of South Africa*) is a country in southern Africa. It covers an area of 1,221,000 km² and has a population of over 60.41 million people. The capital city is Pretoria. Administratively, the country is divided into 9 provinces. The leading sectors of the economy include manufacturing (22.6% of GDP), mining (13%), finance (15.21%), trade and tourism (11.52%), transport and communications (9.11%), agriculture (5%), and fishing (4.7%). Promising sectors also include services, oil, and gas extraction and processing.

Industry: South Africa ranks among the top countries in the world for the extraction of gold (over 530 tons annually on average), platinum group metals (close to 100 tons), vanadium, chromium, manganese ores, antimony, and diamonds. It holds 5th place in coal extraction and 7th in uranium mining. The country also mines iron ore, copper, asbestos, and other minerals. Approximately 170 billion kWh of electricity is produced annually. Developed industries include ferrous metallurgy, mechanical engineering, chemicals, oil refining, cement production, textiles, and food production.

Agriculture: Nearly all agricultural production is concentrated in white-owned farms. Major crops include maize (7.7 million tons), sugarcane (21 million tons), wheat (1.5 million tons), potatoes, tobacco, citrus fruits, and other fruits. About 80% (98 million hectares) of the country's land is used for agricultural purposes, and approximately 1.4 million hectares are irrigated. Water for irrigation is sourced from rivers such as the Vaal, Olifants, Crocodile, and Great Fish. Livestock farming includes cattle, sheep, goats, and pigs. In wool production, South Africa ranks behind Australia, New Zealand, and Argentina. Dairy farming is concentrated around major cities.

Transportation: The total length of railways is 33,800 km, of which about 5,000 km are electrified. The length of paved roads is 56,400 km. Oil and petroleum products are transported from ports to major industrial centers via pipelines. The country has a well-developed maritime fleet. Major ports include Durban, Cape Town, Port Elizabeth, and East London. There are three international airports.

Foreign Trade Turnover: South Africa's foreign trade turnover exceeds $40 billion annually. Imports mainly include machinery and equipment, while exports consist of minerals and agricultural raw materials, diamonds and metals, chemical products, and agricultural produce. South Africa ranks 4th globally in wool exports and exports nearly 70 million liters

of wine annually. Major trading partners include the United States, the United Kingdom, Germany, Japan, and Switzerland. The national currency is the rand.

Below is a table presenting the main components of South Africa's Gross Domestic Product (GDP) from 2013 to 2023, broken down by year. The components include imports, construction, services, agriculture, and industry.

Year	Exports ($bn)	Construction ($bn)	Services ($bn)	Agriculture ($bn)	Industry ($bn)	GDP ($bn)
2013	89.2	26.5	217.6	9.2	113.7	363.0
2014	85.3	25.0	204.2	8.9	104.3	348.5
2015	80.5	23.7	194.6	8.6	97.2	326.0
2016	69.9	18.8	166.5	7.7	81.9	293.0
2017	82.2	21.8	189.9	8.5	91.0	311.4
2018	79.7	21.6	180.2	8.3	86.8	300.0
2019	77.1	19.8	171.4	8.1	80.6	288.7
2020	58.5	16.8	134.8	7.1	62.4	234.2
2021	72.2	19.7	162.0	8.1	74.1	266.7
2022	67.2	17.9	151.7	7.6	68.4	251.3
2023	63.9	16.9	142.0	7.1	63.6	235.4

Below is a line graph presenting the main components of South Africa's Gross Domestic Product (GDP) from 2013 to 2023
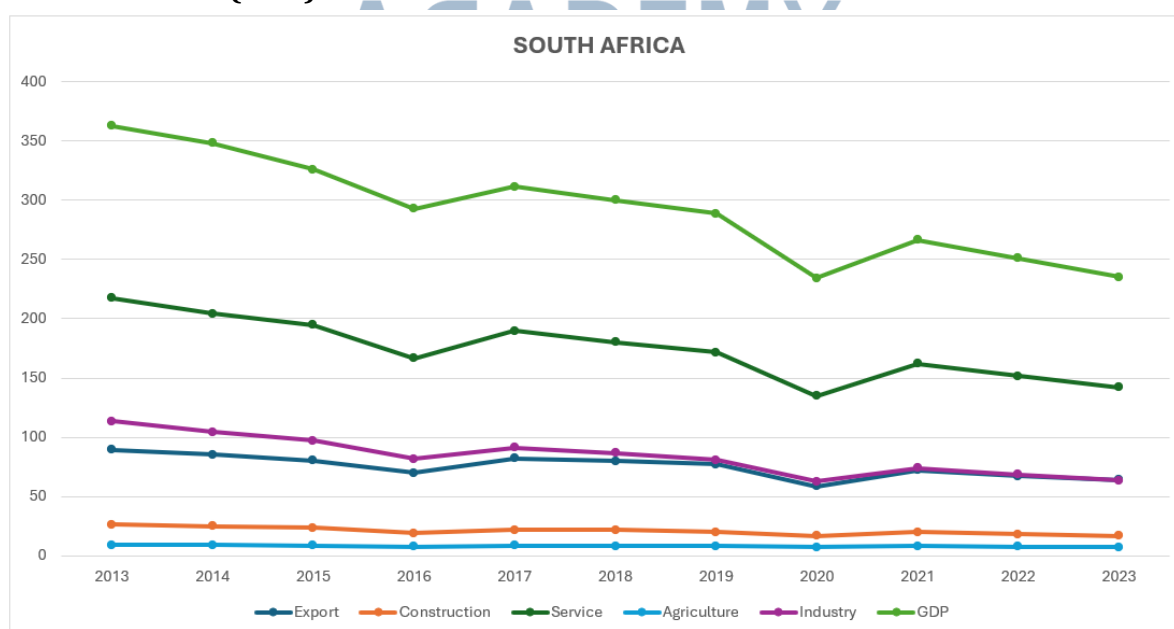
During this period, a decline has been observed across all sectors. This decrease can be attributed to the slowdown in economic growth or the negative impact of global and domestic economic factors. The most significant decline has been in exports, industry, and services.

DESCRIPTION STATISTICS

Exports ($bn)		Construction ($bn)		Services ($bn)		Agriculture ($bn)		Industry ($bn)		GDP ($bn)	
Mean	75.06364	Mean	20.77273	Mean	174.0818	Mean	8.109091	Mean	84	Mean	292.5636
Standard Error	2.87058	Standard Error	0.981658	Standard Error	7.858682	Standard Error	0.206906	Standard Error	5.013908	Standard Error	13.03108
Median	77.1	Median	19.8	Median	171.4	Median	8.1	Median	81.9	Median	293
Mode	#N/A	Mode	#N/A	Mode	#N/A	Mode	8.1	Mode	#N/A	Mode	#N/A
Standard Deviation	9.520638	Standard Deviation	3.255792	Standard Deviation	26.0643	Standard Deviation	0.686228	Standard Deviation	16.62925	Standard Deviation	43.21919
Sample Variance	90.64255	Sample Variance	10.60018	Sample Variance	679.3476	Sample Variance	0.470909	Sample Variance	276.532	Sample Variance	1867.899
Kurtosis	-0.81367	Kurtosis	-0.85486	Kurtosis	-0.84306	Kurtosis	-0.81073	Kurtosis	-0.71296	Kurtosis	-0.93982
Skewness	-0.2908	Skewness	0.480985	Skewness	0.106966	Skewness	-0.10493	Skewness	0.368001	Skewness	0.144939
Range	30.7	Range	9.7	Range	82.8	Range	2.1	Range	51.3	Range	128.8
Minimum	58.5	Minimum	16.8	Minimum	134.8	Minimum	7.1	Minimum	62.4	Minimum	234.2
Maximum	89.2	Maximum	26.5	Maximum	217.6	Maximum	9.2	Maximum	113.7	Maximum	363
Sum	825.7	Sum	228.5	Sum	1914.9	Sum	89.2	Sum	924	Sum	3218.2
Count	11	Count	11	Count	11	Count	11	Count	11	Count	11
Confidence Level(95.0%)	6.396052	Confidence Level(95.0%)	2.187271	Confidence Level(95.0%)	17.51023	Confidence Level(95.0%)	0.461014	Confidence Level(95.0%)	11.17168	Confidence Level(95.0%)	29.03505

CORRELATION

	Exports ($bn)	Construction ($bn)	Services ($bn)	Agriculture ($bn)	Industry ($bn)	GDP ($bn)
Exports ($bn)	1					
Construction ($bn)	0.949179	1				
Services ($bn)	0.978999	0.981682	1			
Agriculture ($bn)	0.979036	0.975408	0.980439	1		
Industry ($bn)	0.94921	0.982169	0.991937	0.959649	1	
GDP ($bn)	0.950792	0.970537	0.989731	0.957419	0.996278	1

There is a strong positive correlation with all variables, especially with services (0.979) and agriculture (0.979). This indicates that as exports increase, these sectors also develop. There is a high correlation with services (0.982) and industry (0.982), reflecting that construction activity is closely linked to these sectors. A strong correlation with GDP (0.971) highlights the significant role of construction in economic growth. There is an extremely strong correlation with industry (0.992) and GDP (0.990), indicating that the services sector is one of the main driving forces of the economy. Agriculture also shows a high correlation with all sectors, particularly services (0.980) and exports (0.979), emphasizing its importance in supporting other sectors. The strongest correlation with GDP (0.996) demonstrates that

industry is the sector contributing the most to the economy. Services show a very high correlation (0.992), indicating the interdependence of these two sectors. There is a very high correlation with industry (0.996) and services (0.990), confirming that these sectors form the core of overall economic production. Correlation analysis reveals a well-integrated economy, where services and industry significantly influence overall economic growth and development. While industry is the primary driver of GDP, the services sector plays a crucial supportive role in the economy. Due to the high interdependence between all sectors, a crisis in one sector can potentially impact the entire economy.

REGRESSION

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.99808
R Square	0.996164
Adjusted R Square	0.992328
Standard Error	3.785502
Observations	11

This demonstrates that the correlation with independent variables is very strong. The model explains nearly all variability in the dependent variable, with 99.6% of the changes in the dependent variable being explained by the independent variables. This indicates a high degree of model fit and accuracy. Even after accounting for the number of independent variables, 99.2% of the variability is explained, confirming the model's reliability. The average difference between observed values and the regression line is 3.79 units, which is small relative to the scale of the data and indicates high model precision. The analysis is based on 11 data points, supporting the validity of the results. The regression model is highly effective and reliable, almost fully explaining the relationships between variables. The high R Square and Adjusted R Square values confirm the accuracy and robustness of the model. This makes it a powerful tool for forecasting and analyzing economic trends. However, for long-term application, it is recommended to validate the model with additional data.

ANOVA

	df	SS	MS	F	Significance F			
Regression	5	18607.34	3721.467	259.6972	4.93E-06			
Residual	5	71.65012	14.33002					
Total	10	18678.99						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	42.09088	40.41174	1.041551	0.345339	-61.7908	145.9726	-61.7908	145.9726
Exports ($bn)	0.420373	1.173017	0.358369	0.734701	-2.59496	3.435711	-2.59496	3.435711
Construction ($bn)	-5.53367	2.734812	-2.02342	0.098938	-12.5637	1.496389	-12.5637	1.496389

Services ($bn)	-0.58479	1.137352	-0.51417	0.629046	-3.50844	2.338868	-3.50844	2.338868
Agriculture ($bn)	14.97077	13.80292	1.084609	0.3276	-20.5108	50.4523	-20.5108	50.4523
Industry ($bn)	3.741298	1.203022	3.109916	0.026553	0.648831	6.833765	0.648831	6.833765

RESIDUAL OUTPUT
PROBABILITY OUTPUT

| Observation	Predicted GDP ($bn)	Residuals	Percentile	GDP ($bn)
1	368.8127	-5.81274	4.545455	234.2
2	343.6505	4.849482	13.63636	235.4
3	323.386	2.613986	22.72727	251.3
4	291.762	1.237975	31.81818	266.7
5	312.67	-1.27	40.90909	288.7
6	299.6906	0.309362	50	293
7	287.5142	1.185796	59.09091	300
8	234.6371	-0.43712	68.18182	311.4
9	267.1863	-0.48631	77.27273	326
10	252.2576	-0.95758	86.36364	348.5
11	236.6328	-1.23285	95.45455	363
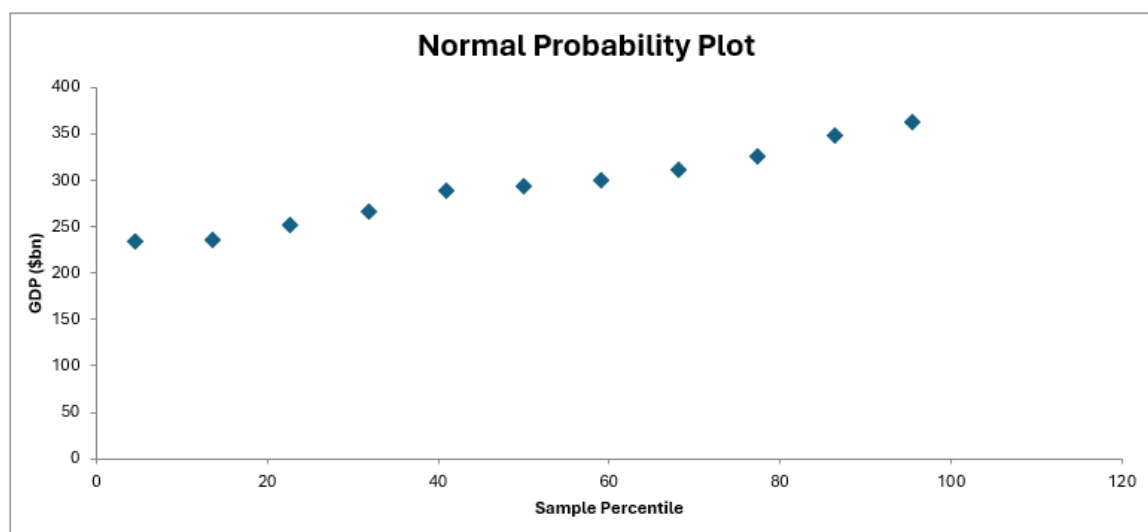
The following chart presents the projected growth rate of South Africa's GDP up to 2026.

Timeline	Values	Forecast	Lower Confidence Bound	Upper Confidence Bound
2013	363			
2014	348.5			
2015	326			
2016	293			
2017	311.4			
2018	300			
2019	288.7			
2020	234.2			
2021	266.7			
2022	251.3			
2023	235.4	235.4	235.40	235.40
2024		195.32511	185.60	205.05
2025		212.68189	202.88	222.49
2026		201.65724	191.77	211.54

Statistic	Value
Alpha	0.13
Beta	0.00
Gamma	0.00
MASE	0.25
SMAPE	0.02
MAE	4.59
RMSE	6.26

The line graph shows the changes of GDP and the prediction till 2016.
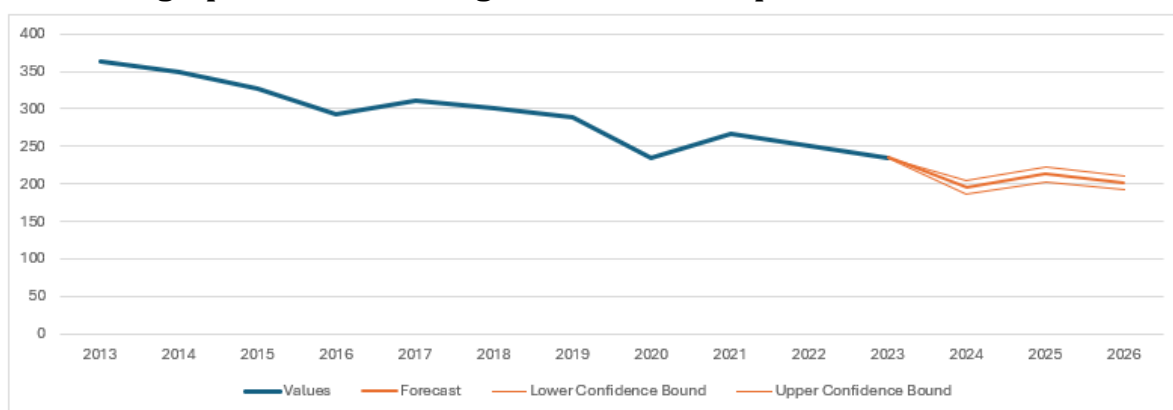
Conclusion: The Republic of South Africa (RSA) is one of the most developed economies in Africa, leading in the industrial, agricultural, and service sectors. The country is among the global leaders in mining minerals such as gold, platinum, chromium, and manganese. Its agriculture is well-developed, focusing on crops like maize, sugarcane, wheat, and livestock products. In foreign trade, South Africa exports mineral raw materials, wool, wine, and

agricultural products. The transport infrastructure is advanced, with major ports located in Durban and Cape Town. Although recent years have seen an economic decline, the country is on the path to recovery.

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