Box 1 Electricity load shedding and economic activity

South Africa has experienced sporadic incidents of electricity supply disruptions of varying intensity since the end of 2007, commonly referred to as load shedding. The impact of load shedding on economic activity differs depending on its severity (stages 1 to 4) and duration (number of days). In addition to the electricity, gas and water sector, the real gross value added (GVA) by the electricity-intensive mining and manufacturing sectors has often been affected the most, with the agricultural and transport sectors also affected. However, some incidents of load shedding appear to have had a negligible effect on output, while the real GVA by the electricity, gas and water sector as well as South Africa's total real gross domestic product (GDP) at times contracted in the absence of load shedding. This implies that many other factors also influence real GDP outcomes.

The incidence of load shedding, in terms of the number of days in each of the stages per quarter, was used to derive a measure of the intensity of the effect thereof.[1]

Incidence and intensity of electricity load shedding

Quarter-to-quarter percentage change at seasonally adjusted annualised rates

		Number of days per stage				
Year	Quarter*	Stage 1	Stage 2	Stage 3	Stage 4	Intensity
2008	Q1	3	3	7	1	34
2014	Q1	1	0	0	0	1
	Q2	2	0	0	0	2
	Q4	1	1	1	0	6
2015	Q1	6	5	0	0	16
	Q2	38	15	1	0	71
	Q3	12	11	0	0	34
2018	Q2	2	1	0	0	4
	Q3	1	0	0	0	1
	Q4	5	7	0	0	19
2019	Q1	1	7	2	5	41

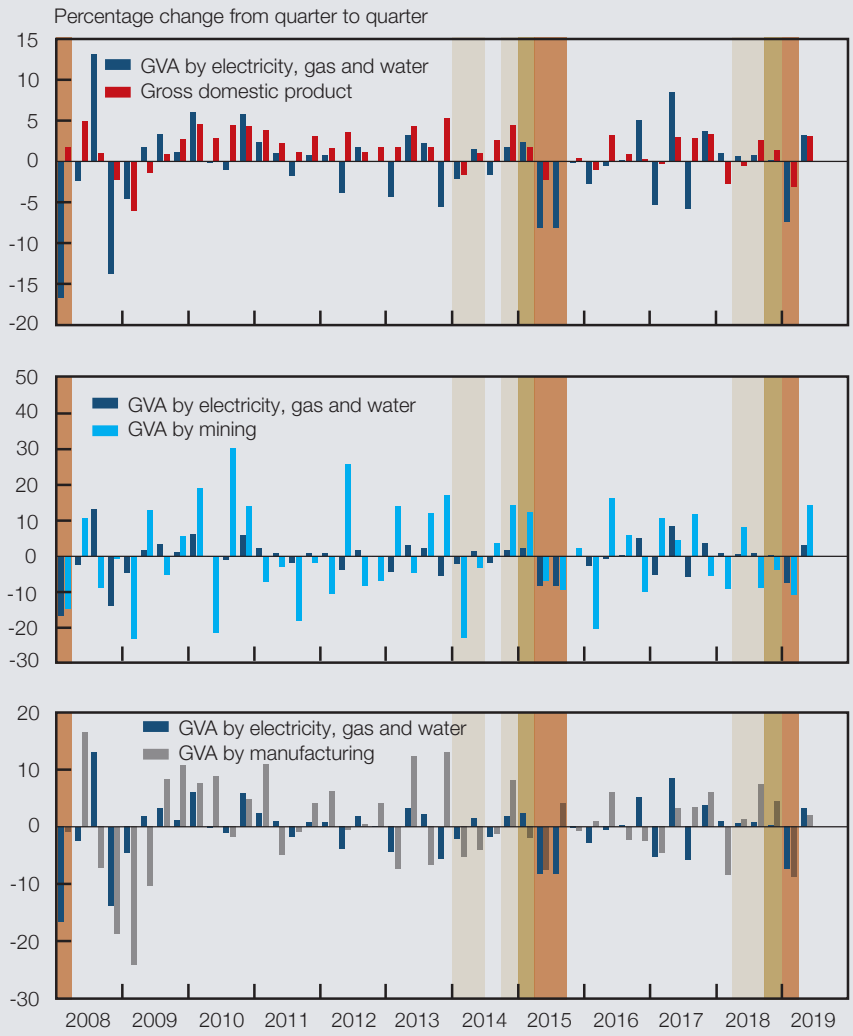
* The table only reflects quarters in which load shedding occurred

Sources: Eskom and SARB

The accompanying figure shows the quarter-to-quarter seasonally adjusted and annualised growth in South Africa's real GDP and in the real GVA by the electricity, gas and water; mining; and manufacturing sectors along with the intensity of load shedding. This shows that load shedding has been most severe in the first quarter of 2008, the third and fourth quarter of 2015, and in the first quarter of 2019. During all of these four quarters, the real GVA by the electricity, gas and water sector contracted notably while South Africa's total real GDP did not always contract. Counterfactually, positive growth outcomes could have been higher. The real GVA by the electricity-intensive mining sector contracted in all four high-intensity load shedding quarters, while that by the manufacturing sector contracted in only three of the four quarters.

1 The intensity of load shedding, per quarter, was calculated as the sum of the number of days of load shedding multiplied by the stage number per stage.

South Africa's real gross domestic product and real gross value added by selected sectors



Sources: Stats SA, Eskom and SARB

In addition, South Africa's total real GDP and the GVA by these three sectors contracted in a number of other quarters over this period in which either none or only low-intensity load shedding occurred. Weak real output growth probably resulted from various factors other than electricity supply disruptions over this period, such as a number of prolonged labour strikes, maintenance and safety stoppages in the mining sector, weak domestic and global demand as well as political and policy uncertainty which has affected business and consumer confidence and constrained overall economic growth.

The impact of load shedding on real GDP was also tested by a regression model,[2] with the quarter-to-quarter seasonally adjusted and annualised growth in real GDP as the dependent variable and the derived measure of load shedding intensity as the explanatory variable. The model was also estimated with the GVA by each of the subsectors of GDP as the dependant variable.

The results show that as the intensity of load shedding increases, South Africa's real GDP growth decreases by a statistically significant 0.06%. The real GVA by all of the economic subsectors displayed a negative correlation to the intensity of load shedding, albeit not all statistically significant.

Among the statistically significant relationships, the intensity of load shedding had the biggest negative impact on growth in the real GVA in the following sectors: agricultural (0.27%), mining (0.19%), electricity, gas and water (0.18%), manufacturing (0.09%) and transport (0.05%).

2 The estimation was corrected for possible autocorrelation and heteroscedasticity.

Regression results of load shedding on real output growth

Economic sector	Coefficient
South Africa's total GDP	-0.0578***
Agriculture, forestry and fishing	-0.2684*
Mining	-0.1851**
Manufacturing	-0.0934**
Electricity, gas and water	-0.1776***
Construction	-0.0433
Trade, catering and accommodation	-0.0268
Transport, storage and communication	-0.0460**
Finance, insurance, real estate and business services	-0.0023
General government	-0.0292
Personal services	-0.0078

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level