

## Box 1 Unpacking alternative measures of change in economic activity<sup>1</sup>

The level of economic activity in South Africa is measured quarterly by Statistics South Africa (Stats SA).<sup>2</sup> The headline measure of change in the real gross domestic product (GDP) published by Stats SA will no longer be the quarter-to-quarter seasonally adjusted and *annualised* change. Instead, from the second-quarter 2021 GDP release,<sup>3</sup> it will only be the quarter-to-quarter seasonally adjusted<sup>4</sup> change. In short, the annualisation of the growth rate in real GDP will no longer be applied, in favour of a simplified format of expression. In clarifying the forthcoming change by Stats SA, this box discusses the different measures to express changes in economic activity.

### Measures of growth in the real value of gross domestic product

	R millions	Percentage change	R millions	Percentage change	R millions	Percentage change	Percentage change	R millions	Percentage change
	Real GDP at market prices (constant 2010 prices)	Year-on-year	Real GDP at market prices (constant 2010 prices, seasonally adjusted and annualised)	Current headline growth rate Quarter-to-quarter (seasonally adjusted and annualised)	Real GDP at market prices (constant 2010 prices)	Year-on-year (over four quarters)	Year-to-date, year-on-year (not seasonally adjusted)	Real GDP at market prices (constant 2010 prices, seasonally adjusted and annualised)	New headline growth rate Quarter-to-quarter (seasonally adjusted)
2018.....	3 144 539	0.8							
2019 Q1...			3 136 302	-3.2	761 633	0.0	-	3 136 302	-0.8
2019 Q2...			3 161 917	3.3	788 307	0.9		3 161 917	0.8
2019 Q3...			3 155 290	-0.8	793 431	0.1		3 155 290	-0.2
2019 Q4...			3 143 840	-1.4	805 965	-0.5	-	3 143 840	-0.4
2019.....	3 149 337	0.2							
2020 Q1...			3 129 987	-1.8	764 788	0.4	-	3 129 987	-0.4
2020 Q2...			2 609 584	-51.7	648 135	-17.8	-8.8	2 609 584	-16.6
2020 Q3...			2 967 862	67.3	744 590	-6.2	-7.9	2 967 862	13.7
2020 Q4...			3 010 318	5.8	771 925	-4.2	-	3 010 318	1.4
2020.....	2 929 438	-7.0							
2021 Q1...			3 044 465	4.6	740 624	-3.2	-	3 044 465	1.1

- Not applicable

Sources: Stats SA and SARB

The only difference between the current and the new headline statistic, as already mentioned, is annualisation. Annualised growth rates reflect changes in economic activity well during periods of relative stability, but during periods of instability, such as during the coronavirus disease 2019 (COVID-19) period, they can exaggerate changes and be misleading.

Measuring changes over different time horizons, applying (or not) seasonal adjustment, and expressing them with or without annualisation will lead to different interpretations of changes in economic aggregates. The percentage change in real GDP from one year to the next, such as the -7.0% change from 2019 to 2020, reflects year-on-year growth<sup>5</sup> and is but one measure of change in this aggregate.

The current headline quarter-to-quarter seasonally adjusted<sup>6</sup> and annualised rate measures the percentage change in real GDP between two successive quarters, expressed on an annual basis, such as the 67.3% increase from the second quarter of 2020 to the third quarter.<sup>7</sup> This converts the quarter-to-quarter growth

1 This box relates to the statistics published on pages S-117 and S-156 in this edition of the *Quarterly Bulletin (QB)*.

2 South Africa's gross domestic product (GDP) statistics are compiled by Stats SA.

3 Selected seasonally adjusted and annualised quarterly statistics published in the *QB* in table KB809 on page S-156 will, as from the September 2021 edition, include both the current and the new headline quarter-to-quarter growth rates. The ratios of selected seasonally adjusted and annualised quarterly data in table KB812 on page S-158 will remain unchanged. The current practice of publishing quarterly seasonally adjusted data in 'rand millions' as annual equivalent values will continue.

4 For the announcement of the change to the headline GDP growth rate measure and the formulas to calculate the various growth rates, see statistical release P0441 – *Gross Domestic Product (GDP), 4th Quarter 2020*, available at [http://www.statssa.gov.za/?page\\_id=1854&PPN=P0441&SCH=72708](http://www.statssa.gov.za/?page_id=1854&PPN=P0441&SCH=72708).

5 This is calculated as the level of real GDP at market prices (constant 2010 prices) in the current year *minus* the level of the previous year, *divided by* the previous year's level, with the result then *multiplied by* 100.

6 Seasonal adjustment eliminates seasonal and calendar effects from the data, which could distort quarterly growth rates.

7 This is calculated as the level of real GDP at market prices (constant 2010 prices, seasonally adjusted and annualised) in the current quarter *divided by* the level in the previous quarter, which is then annualised by raising it to *the power of four* (because there are four quarters in a year). Then 1 is *subtracted from* the result, and *multiplied by* 100.



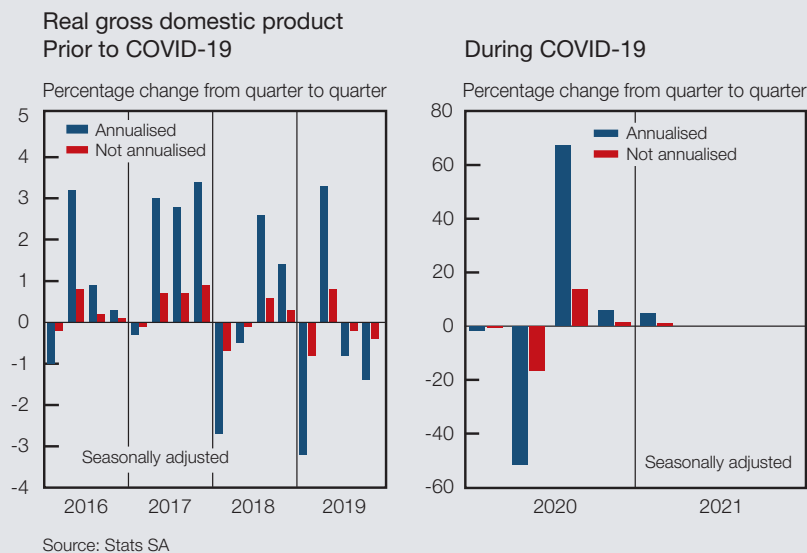
rate in a specific quarter into an annual growth rate, as if the quarter-to-quarter growth persisted over four successive quarters. This conversion of the short-term quarter-to-quarter rate into an annual rate makes it comparable to the previously discussed year-on-year rate while aiding interpretation when this rate of change is compared with other economic aggregates, such as consumer price inflation, which is usually expressed as an annual change in its headline format.

The percentage change over four quarters<sup>8</sup> calculates the change in an economic aggregate between similar quarters in two successive years, such as the change of -17.8% in real GDP from the second quarter of 2019 to the second quarter of 2020. In this case, seasonal adjustment is not required, as the same quarters of different years are compared. An advantage of the year-on-year growth rates is that they are normally less volatile than the quarter-to-quarter growth rates, because a comparison is made between different levels in an aggregate over a more extended period of time, which is less prone to erratic shorter-term movements.

Another calculation to ascertain changes in an economic aggregate is the year-to-date rate,<sup>9</sup> which measures the percentage change from either the first six or the first nine months of a year compared to the same period in the following year, such as the -7.9% change in real GDP from the first nine months of 2019 to the first nine months of 2020. Seasonal adjustment is also not required in this case, as the same quarters of different years are compared with each other, where it is assumed that the same seasonal patterns have transpired. The year-to-date growth rate is often an even smoother measure of change in an economic aggregate than the year-on-year change, since the data of more quarters are used in the calculation.

The quarter-to-quarter seasonally adjusted rate<sup>10</sup> will in future be used by Stats SA as the headline measure to indicate the percentage change in real GDP and its main components between two successive quarters. This measure renders an increase of 13.7% between the second and third quarter of 2020. The difference between the previous headline measure of change in real GDP and the new headline measure in the third quarter of 2020 (67.3% and 13.7% respectively) indicates the degree of amplification that results from annualisation. This new headline measure of change in the real GDP in South Africa is also common practice in many other countries, including Australia, Brazil, Canada, France, Germany, Italy, Japan, Mexico, New Zealand, Norway, Sweden and the United Kingdom.

When comparing the current and the new headline measures of change in real GDP before and during the COVID-19 period, it becomes evident that, during times of relatively steady economic growth, annualisation is a useful method to express quarter-to-quarter economic performance in annual terms. However, during periods of economic instability, it can be misleading.



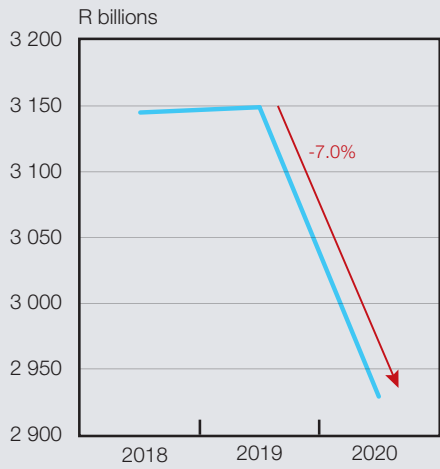
8 This is calculated as the level of real GDP at market prices (constant 2010 prices) in the current quarter *divided by* the level in the same quarter of the previous year, *minus 1*. The rate is then *multiplied by 100*.

9 This is calculated as the level of real GDP at market prices (constant 2010 prices) in the current quarter *divided by* the level in the same quarter of the previous year, *minus 1*. The rate is then *multiplied by 100*.

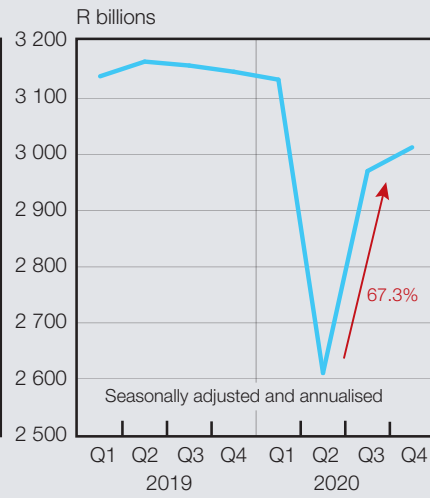
10 This is calculated as the level of real GDP at market prices (constant 2010 prices, seasonally adjusted and annualised) in the current quarter *divided by* the level in the previous quarter, *minus 1* and *multiplied by 100*.

## Real gross domestic product: percentage changes

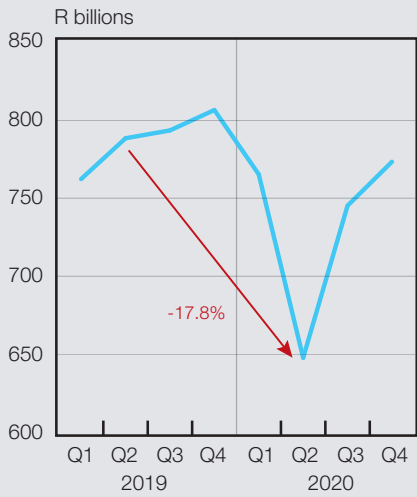
Over one year



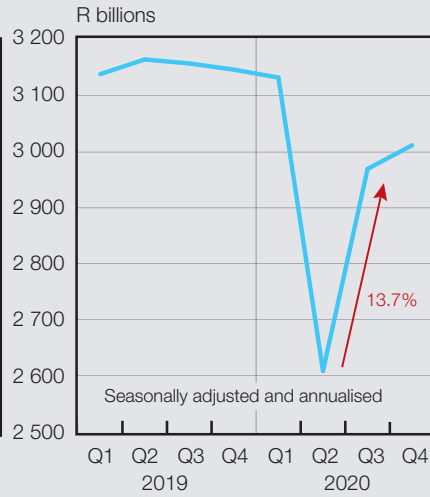
From quarter to quarter (annualised: current headline growth rate)



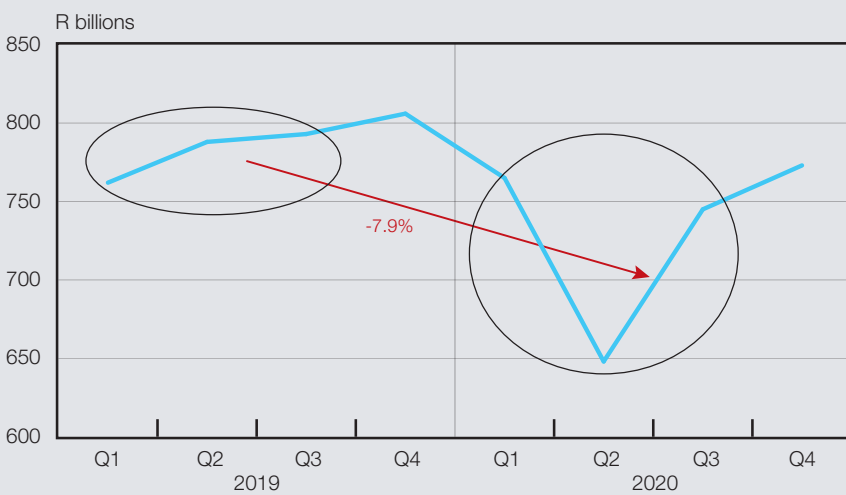
Over four quarters



From quarter to quarter (not annualised: new headline growth rate)



Year-to-date



Source: Stats SA

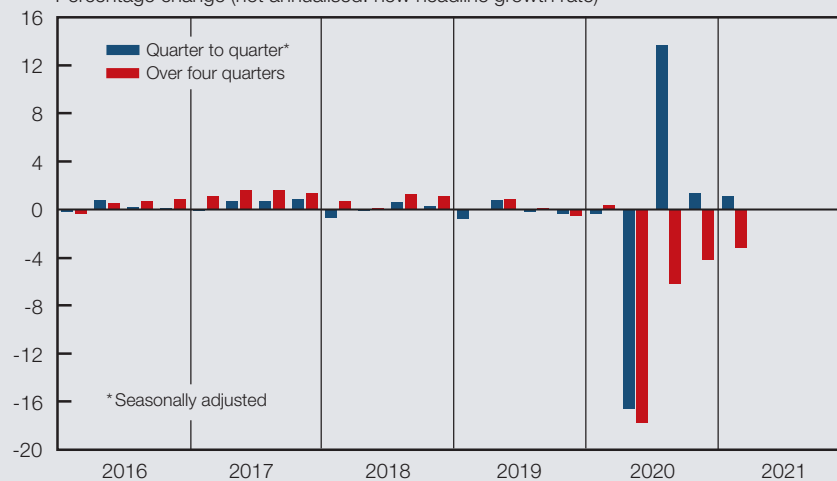




Quarter-to-quarter rates of change, whether annualised or not, always indicate change in the same direction. When identifying the turning points in the business cycle of a country, an analysis of changes in the real GDP is of paramount importance. Accordingly, the most appropriate measure of change in real GDP should be applied. For instance, when changes in the real GDP are annualised, these rates are comparable with previous annual changes and facilitate comparisons over different periods. However, the year-on-year change for a specific quarter could be positive while the quarter-to-quarter change for the same reference quarter could be negative. Therefore, the appropriate measure of changes in real GDP should be applied for different analysis purposes.

### Real gross domestic product

Percentage change (not annualised: new headline growth rate)



Source: Stats SA