The Contribution of Economic Sectors to the Western Cape's Economic Growth

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Abstract

The study uses the ordinary least squares (OLS) method to analyse the relationship between economic growth and the three broadly defined economic sectors (primary, secondary and tertiary) in the Western Cape during the period 1995Q2 to 2023Q3. The empirical results show that all three sectors have a statistically significant positive impact on economic growth in the Western Cape. In terms of magnitude, the tertiary sector, which is the services sector of the economy, has the largest impact on gross domestic product (GDP) growth followed by the secondary sector and the primary sector.

1. Introduction

The process of economic growth is generally accompanied by changes in the relative importance of sectors within the economy. Economic growth is usually measured as the percentage change in GDP from one period to another. The GDP of an economy comprises the output from the primary, secondary and tertiary (services) sectors. As an important source of employment and livelihood, agriculture (primary sector) is key to the socio-economic development of many economies, while manufacturing is regarded as the engine of growth. The process of economic development and structural changes[1] dictates that as an economy develops, reliance on the primary sector usually shifts to the secondary sector and eventually to the tertiary sector or services sector.

The global economic landscape has experienced a notable transformation caused by an expansion in the secondary and tertiary sectors and a decline in the primary sector. Globally, the services sector has been making a greater contribution to economic activity, which means this sector is now a dominant contributor to GDP. The Western Cape economy is driven by the services sector, with the sector accounting for over 70% of both economic output and employment. Generally, the tertiary sector is regarded as more stable relative to the primary and secondary sectors. Tertiary sector dominance therefore potentially strengthens the economy, making it more resilient in dealing with exogenous shocks.

The remainder of the paper follows this structure: Section Two gives an overview of the Western Cape's economic sectors; Section Three presents the literature review; Section Four describes the methodology used in this study; the empirical results are discussed in Section Five and Section Six concludes the study.

2. Overview of the Western Cape's economic sectors

The Western Cape economy is driven by the services sector which is dominated by finance, real estate and business services. The services sector has expanded in the province during the past couple of years. The contribution from this sector to gross value added (GVA) averaged 67.1% from 1995 to 1998, and 69.2% between 1998 and 2022 as shown in Figure 1. The sector's share of GVA increased further from an average of 70.6% during the period 2003–2016 to 74.9% during 2019–2022.

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[1] Structural change entails changes in the structure of production and employment within and between all sectors of the economy as well as the decline of old ones and the emergence of new sectors (Gabardo, Pereima and Einloft, 2017).

Figure 1: Composition of GVA, 1995–2022

■ Primary sector ■ Secondary sector ■ Tertiary sector
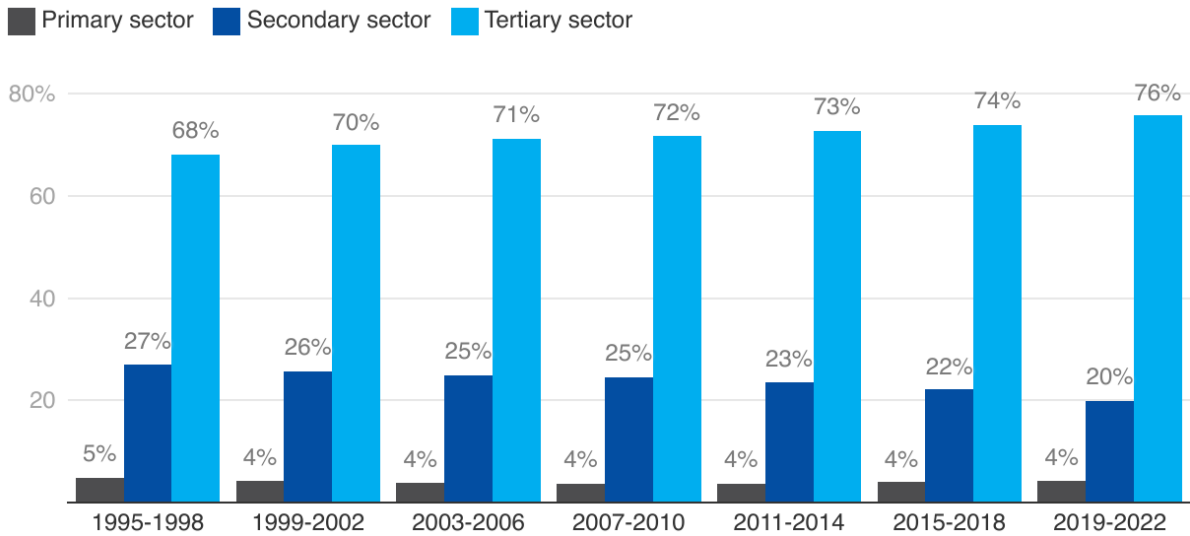
Source: Quantec (2024)

Figure 2 shows the share of GVA per sector from the first quarter of 1995 to the third quarter of 2023. The services sector was the largest contributor to GVA, averaging 71.3% of real GVA per quarter. This was followed by the secondary sector, with an average share of 24.4% of GVA and finally by the primary sector, with an average share of 4.3% of GVA per quarter. While the share from the services sector to GVA increased from the first quarter of 1995 to the third quarter of 2023, the contribution of the secondary sector declined over the same period. The primary sector's contribution has remained fairly constant, averaging 4.3% per quarter.

Figure 2: Share of GVA, 1995Q1–2023Q3

■ Primary sector share ■ Secondary sector share ■ Tertiary sector share
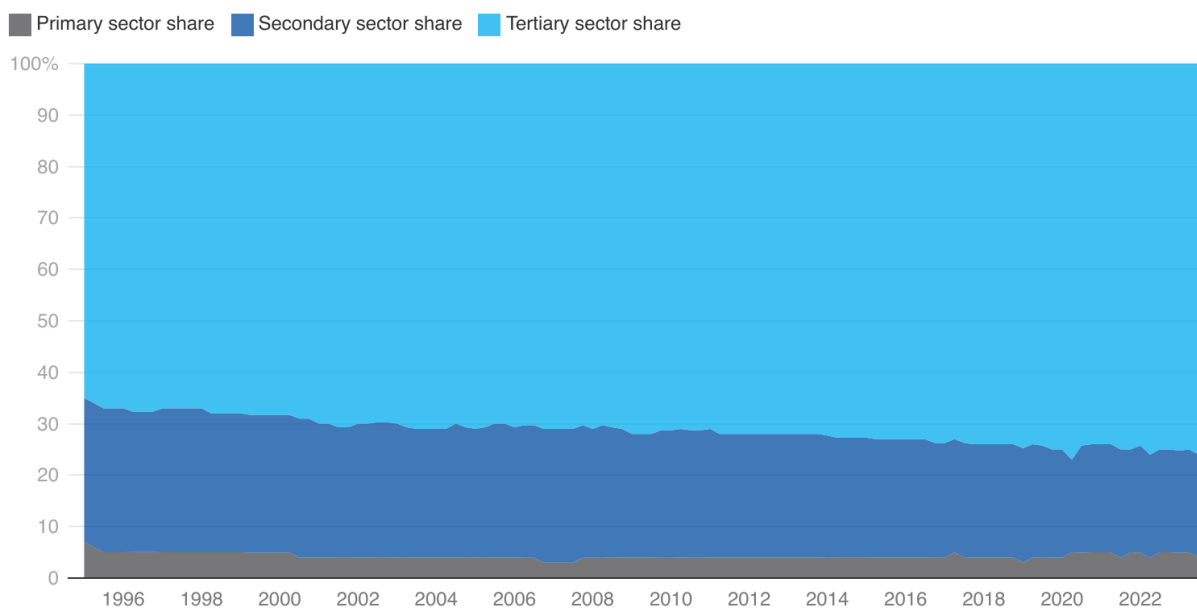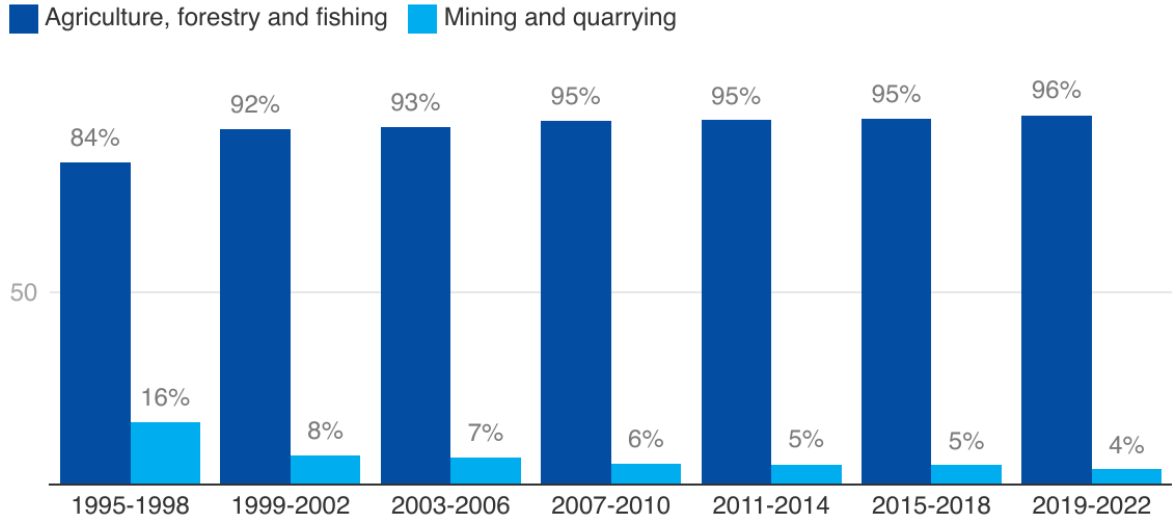

Source: Quantec (2024)

The Western Cape's primary sector is dominated by agriculture, forestry and fishing which accounted for an average of approximately 93% of the sector's GVA from 1995 to 2022. As shown in Figure 3, the

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contribution of agriculture, forestry and fishing to GVA within the primary sector increased from 83.7% between 1995 and 1998 to 96% between 2019 and 2022.
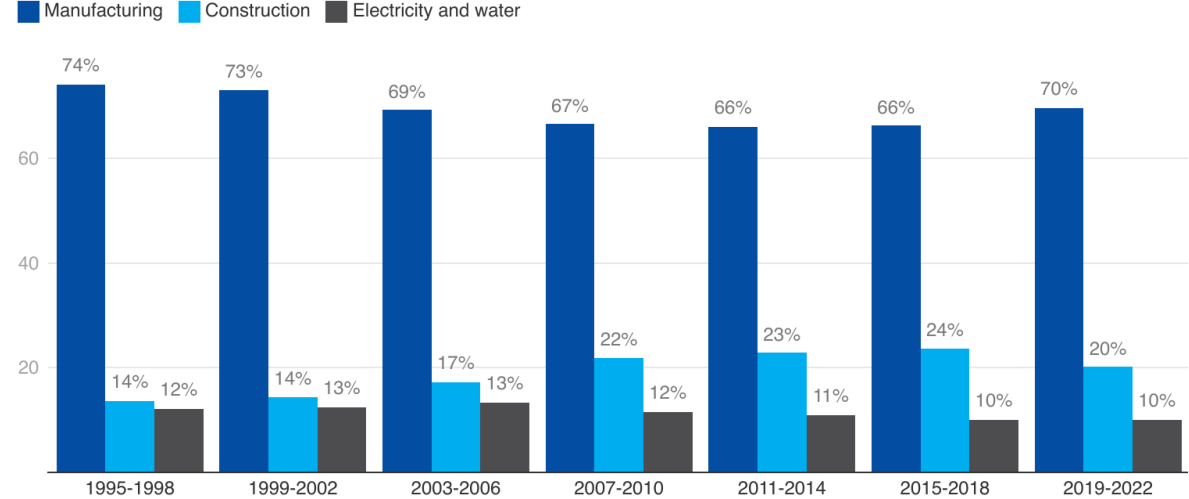
Figure 3: Share of GVA per industry within the primary sector, 1995–2022

Source: Quantec (2024)

As illustrated in Figure 4, manufacturing is the largest industry in the secondary sector, with construction the second largest. The manufacturing industry's contribution to GVA in the secondary sector averaged 69% per annum between 1995 and 2022, declining from 74.2% (1995–1998) to 69.7% (2019–2022).

Figure 4: Share of GVA per industry within the secondary sector, 1995–2022

Source: Quantec (2024)

Finance, real estate and business services is the largest industry in the services sector. This is followed by trade, hotels and restaurants, as shown in Figure 5. Between 1995 and 1998, the finance, real estate and business services industry contributed an average of 35.9% to GVA in the services sector. The industry's contribution to GVA has been rising, averaging 43.7% per year from 2019 to 2022.

Figure 5: Share of GVA per industry within the tertiary sector, 1995–2022
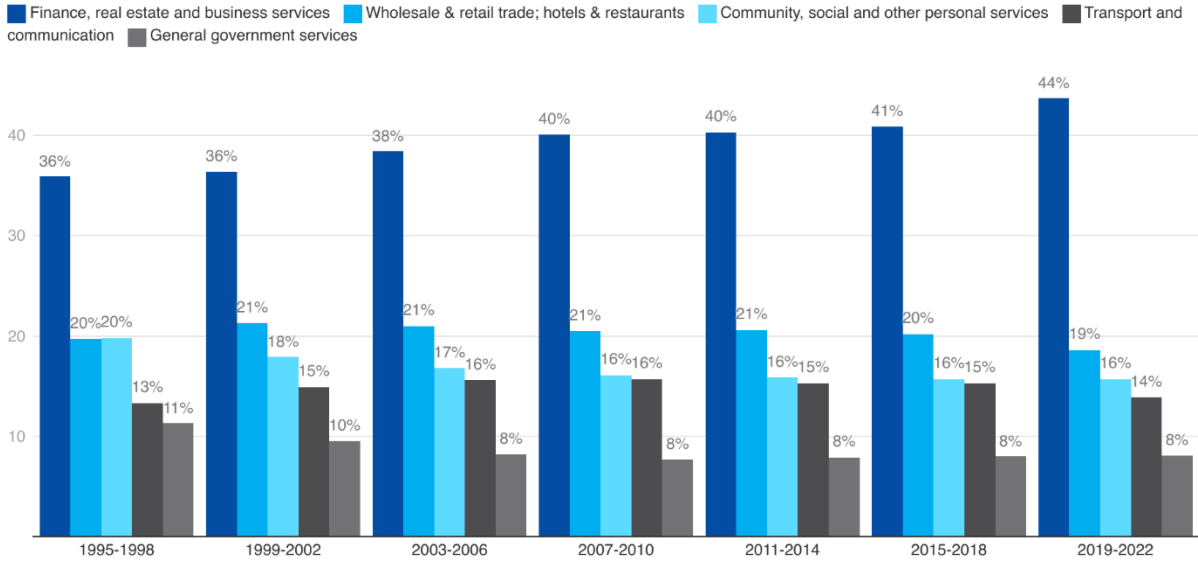
Source: Quantec (2024)

3. Literature review

As an economy grows, it experiences changes in the relative importance of the three broadly defined sectors, namely the primary, secondary and tertiary sectors. This section reviews both the theoretical and empirical literature relating to structural changes and sectoral contribution to economic growth.

3.1 Theoretical literature

The structural change theory, by Lewis (1954) and Ranis and Fei (1961), focuses on the shift from traditional agriculture-based economies with surplus labour to industrial and more advanced economies. This theory, which dominated development theory during the 1960s and 1970s, stipulates that developing nations must structurally transform from the dominance of traditional agriculture, which is characterised by low labour productivity, to a modern industrial economy with high labour productivity. Structural change theorists are of the view that by shifting their reliance from rural subsistence agriculture to modern industrial production, underdeveloped countries can transform their economies.

Kaldor's first law of growth recognises the importance of the manufacturing industry as the engine of growth. The law emphasises that the growth rates relating to manufacturing output and GDP growth are positively related. Kaldor (1966) observed that there was a positive relationship between industrial growth and economic performance in developed economies during the period 1952/4 to 1963/4. Kaldor also claimed that the manufacturing sector's growth is associated with growth in other sectors. Furthermore, Kaldor's second law (also referred to as Verdoorn's law) asserts that there is a causal relationship between productivity and output growth in the manufacturing sector.

The Clark-Fisher model maintains that the process of economic development ultimately results in the emergence of a large tertiary sector that employs most of the labour force. The emergence of a large services sector is associated with high income elasticity of demand and low labour productivity. The demand for services, such as tourism and financial services, generally increases as income rises, which

eventually leads to the allocation of more resources to service production. The traditional notion that economic development emanates from industrialisation has been challenged by services-led growth. Factors such as increasing tradability of services and investments in information and communications technologies have helped to nullify the criticism that the services sector is characterised by low productivity (Pilat, 2000).

Pasinetti (1981 and 1993) contributed to the structural change theory by focusing on the structural dynamics of the economic system. Pasinetti's view of structural change recognises that instability and disequilibrium are normal occurrences in the economic system (Gabardo, Pereima and Einloft, 2017). Technical progress is seen as the main architect of structural changes, according to Pasinetti. This type of progress in a particular sector leads to an improvement in productivity and subsequently to an increase in per capita income. The increased income brings about changes in consumers' preferences and eventually the emergence of new products. Over time, the coefficients of labour and demand in that sector are adjusted by technical progress and changes in consumers' tastes.

Balanced and unbalanced growth theories provide another avenue for explaining the link between structural changes and economic growth (Gabardo et al, 2017). According to the proponents of balanced growth, as an economy grows, the allocation of capital and labour remains constant over time across different sectors. Thus, all industries are required to grow at a similar rate during a period of economic expansion. On the contrary, unbalanced growth theory suggests that creating imbalances in the system through the concentration of investment in key industries can help less developed countries to grow faster. The theory asserts that development would automatically spread to other industries through forward and backward linkages with strategic industries.

3.2 Empirical literature

Nyamekye, Tian and Cheng (2021) assessed the agricultural sector's impact on Ghana's economic growth using an error correction model. The results of the study indicated that the sector makes a positive and significant contribution to economic growth. The findings also showed that both the secondary and the services sectors have a positive impact on Ghana's economic growth.

Katircioglu (2006) analysed the effect of the agricultural sector in North Cyprus using time series data from 1975 to 2002. The findings indicated that there is a long-run relationship between growth in output in the agricultural sector and GDP growth. The results of the Granger causality test also suggested that growth in the agricultural sector causes growth in total output.

Libanio and Moro (2011) studied the importance of the manufacturing industry to economic growth using panel data of seven Latin American countries during the period 1985–2001. The results showed that the manufacturing sector exhibited significant increasing returns and is the growth engine in the seven Latin American economies. Furthermore, the study found a positive relationship between growth in productivity and output growth in the manufacturing sector.

Magoti and Mtui (2020) examined the relationship between economic growth and the services sector in Tanzania using the autoregressive distributed lag (ARDL) model. They found that real GDP growth has a positive relationship with the growth rate in the services sector in the long run. The results also indicated that there is a bidirectional causality between the growth in the services sector and GDP growth in Tanzania.

Murselzade and Cavusoglu (2021) looked at China and examined the relationship between economic growth and two sub-sectors in the services sector – real estate, and hotel and catering – using time series data from 1990 to 2018. The findings revealed that both the real estate, and the hotel and catering services have had a significantly positive impact on China's economic growth in both the long run and the short run.

Castillo, Flores and Rodríguez (2014) examined the relative importance of the secondary and tertiary sectors to GDP in Mexico using quarterly time series data from the first quarter of 1993 to the fourth quarter in 2011. The study found that, on average, the long-run elasticities of GDP are larger in the tertiary sector than in the secondary sector.

Hussin (2013) analysed the contribution of economic sectors to GDP growth in China and Malaysia using correlation analysis and a multiple regression model. The study found that the agriculture, manufacturing and services sectors are positively related to GDP per capita in both China and Malaysia. Moreover, while the manufacturing sector was the largest contributor to China's economic growth, the services sector contributed the most to Malaysia's economic growth.

4. Methodology

This study uses the ordinary least squares (OLS) method to determine the relationship between economic growth and the three broad economic sectors in the Western Cape. Hill, Griffiths and Lim (2012) assert that the OLS method can be adopted when estimating the unknown parameters in a linear regression model. However, using the OLS estimation method on non-stationary time series data will result in a spurious regression. This means that the variables in the study must be stationary to avoid making inferences that are misleading. Time series data is regarded as stationary if the series' mean and variance remain constant over time, otherwise it is non-stationary. The Augmented Dickey-Fuller (ADF) test is adopted to check whether each of the variables of interest has a unit root or not.

4.1 Model specification

GDP growth is dependent on growth in the three broad sectors, namely, the primary, secondary and tertiary sectors. The relationship between GDP growth and its key components can be expressed as:

$$GDPGr = f(PSGr, SSGr, TSGr) \ _____(1)$$

where real GDP growth (GDPGr) is set as a function of primary sector growth (PSGr), secondary sector growth (SSGr) and tertiary sector growth (TSGr).

The model can be expressed as:

$$GDPGr = \beta_0 + \beta_1 GDPGr_{t-1} + \beta_2 PSGr + \beta_3 SSGr + \beta_4 TSGr + \varepsilon_t \quad _____(2)$$

where $GDPGr_{t-1}$ is a one-period lag of GDP growth, β_0 is the intercept, β_1 to β_4 are the coefficients, and ε_t is the error term. The relationships between real GDP growth and the growth rates across the three sectors are expected to be positive.

4.2 Data

The study uses quarterly time series data from 1995 to 2023 to estimate the model specified in the previous section. The list of variables used in this study and their definitions are provided in Table 1.

Table 1: List of Variables

Variable	Definition	Source
Real GDP growth (GDPGr)	Growth rate of real GDP at constant 2015 prices (seasonally adjusted and annualised) from one period to another.	Quantec
Primary sector growth (PSGr)	The change in the primary sector's real GVA from one quarter to the next.	
Secondary sector growth (SSGr)	The quarterly change in the secondary sector's real GVA.	
Tertiary sector growth (TSGr)	The increase or decrease in the tertiary sector's GVA per quarter.	

5. Results and discussion

This section presents both the descriptive statistics and the empirical results of the study.

5.1 Descriptive statistics

Table 2 illustrates the correlation matrix among the variables in the study. It can be observed that economic growth is positively and significantly related to growth rates in the three broad sectors of the Western Cape economy. This means that an increase in GDP is associated with an increase in all three sectors of the economy. The tertiary sector (with a correlation coefficient of 0.9669) has the strongest relationship with overall GDP, followed by secondary sector (with a correlation coefficient of 0.9573) and then by the primary sector (with a correlation coefficient of 0.2499). The lower correlation coefficient between overall GDP growth and primary sector growth does not mean that the sector, particularly agriculture, is less important to province's economy. This is because growth rates are measured as the differences in quarterly values, which means that the rate of growth will be low if the changes from one period to another are insignificant.

Table 2: Correlation matrix, 1995Q2–2023Q3

	GDP growth	Primary sector growth	Secondary sector growth	Tertiary sector growth
GDP growth	1.0000			
Primary sector growth	0.2499**	1.0000		
Secondary sector growth	0.9573***	0.1194	1.0000	
Tertiary sector growth	0.9669***	0.1140	0.8910***	1.0000

Note: *** 1% significance level; ** 5% significance level; * 10% significance level

Table 3 shows the summary statistics of the variables used in the study. As can be seen from the table, the tertiary sector recorded the highest quarterly average growth rate between the second quarter of 1995 and the third quarter of 2023. The tertiary sector was followed by the primary sector and the secondary sector. During this period, the primary sector recorded the maximum quarterly growth rate, while the minimum growth rate was recorded by the secondary sector. Overall GDP increased by 0.7% per quarter from 1995Q2 to 2023Q3. On an annual basis, the average GDP growth was 2.7% between 1996 and 2022, as shown in Table 6 in the appendix. Moreover, the average annual growth rate in the tertiary sector increased by 3.2% per annum, while the primary and secondary sectors recorded an average annual growth rate of 2.3% and 1.5% respectively.

Table 3: Descriptive statistics, 1995Q2–2023Q3

	GDP growth	Primary sector growth	Secondary sector growth	Tertiary sector growth
Mean	0.0065	0.0044	0.0041	0.0079
Median	0.0070	0.0042	0.0041	0.0083
Maximum	0.1307	0.3047	0.2863	0.0936
Minimum	-0.1706	-0.2496	-0.2826	-0.1389
Std. Dev.	0.0218	0.0671	0.0406	0.0173
Observations	114	114	114	114

Figure 6 shows the pattern of growth across the three broad sectors as well as the level of economic output between 1995Q2 and 2023Q3. The Western Cape's GDP growth averaged 0.7% per quarter during this period. GDP growth as well as growth in all three sectors saw a drop in the second quarter of 2020 before recovering in the following quarter. Figure 6 also depicts that the variables are stationary at level because their means and variances are constant.

Figure 6: Sectoral and overall GDP growth of the Western Cape (%), 1995Q2-2023Q3

Source: Quantec (2024)

5.2 Econometric analysis and empirical findings

This section discusses the empirical results of the study. Before examining the relationship between GDP growth and the three broad sectors, the variables are tested for stationarity to ensure that they are suitable for an OLS regression.

5.2.1 Unit root test

The results of the unit root test, which used the Schwarz Information Criterion (SIC) to determine the appropriate lag length, are presented in Table 4. The results show that all the variables are stationary in their levels. This is because the absolute values of the estimated ADF test exceed the critical value at the 5% level of significance or better. Hence, we reject the null hypothesis, which states that the series has a unit root. This means that the OLS method can be successfully adopted in this study.

Table 4: Augmented Dickey-Fuller test results

Variable	Intercept	Intercept and trend	No Intercept and trend
GDP growth	-14.8233***	-15.0143***	-13.2194***
Primary sector growth	-4.0681***	-4.7526***	-8.1967***
Secondary sector growth	-14.6967***	-14.7007***	-14.5445***
Tertiary sector growth	-14.0512***	-14.5616**	-2.3813**

*Note: *** 1% significance level; ** 5% significance level; * 10% significance level*

5.2.2 Regression results

Table 5 presents the estimated coefficients from the OLS regression analysis to determine the relationship between GDP growth and growth in the primary, secondary and tertiary sectors. The nature of the relationship can be expressed as:

$$GDPGr = -0.0003 + 0.0293GDPGr_{t-1} + 0.0412PSGr + 0.2544SSGr + 0.6828TSGr \quad _____(3)$$

The results show that all three sectors make a significant contribution to the Western Cape's economic growth. They indicate that GDP growth increases by approximately 0.68 for every unit increase in the tertiary sector's growth rate, which emphasises the importance of the services sector to the province's economy. Moreover, the secondary sector's coefficient of 0.25 implies that for every unit increase in the sector's growth rate, GDP growth increases by 0.25. Likewise, a unit increase in the primary sector's growth rate increases the economy's real GDP growth by approximately 0.04. The findings comply with economic theory and are in line with studies by Hussin (2013), Magoti and Mtui (2020) and Nyamekye et al (2021). Finally, the coefficient of one period lag of GDP is positive and significant at a 1% level, implying that a unit increase in the previous quarter's GDP growth leads to an increase of about 0.03 in the current quarter's GDP growth.

Table 5: OLS regression coefficients

Dependent variable: GDP growth		
Independent variables	**Coefficients**	
GDP growth (-1)	0.0293***	(0.0047)
Primary sector growth	0.0412***	(0.0014)
Secondary sector growth	0.2544***	(0.0054)
Tertiary sector growth	0.6828***	(0.0120)
Constant	-0.0003**	(0.0001)
Adjusted R-squared	0.9981	
Jarque-Bera	3.7269	prob. 0.1551
Breusch-Pagan-Godfrey – Prob. Chi-Square(4)	0.6838	
Breusch-Godfrey – Prob. Chi-Square(4)	0.0881	

Standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

The adjusted R-squared value of 0.9981 implies that the regressors in the model explain a significant proportion of the variations in the Western Cape's real GDP growth. Furthermore, the post-estimation diagnostic tests for heteroscedasticity, serial correlation and normal distribution indicate that there are no concerns with the model. The Breusch-Pagan-Godfrey heteroscedasticity test checks whether the residuals are heteroscedastic or homoscedastic. Given the Chi-Square probability value in Table 5, we fail to reject the null hypothesis of no heteroscedasticity and conclude that the residuals are homoscedastic. With respect to the normality assumption, the Jarque-Bera statistic indicates that the residuals are normally distributed because the null hypothesis of normal distribution cannot be rejected

at the 5% level of significance. Finally, the results from the Breusch-Godfrey serial correlation test depict no sign of serial correlation because the Chi-Square probability value is greater than 5%.

6. Conclusion

The aim of this study was to ascertain how the primary, secondary and tertiary sectors impact on economic growth in the Western Cape using quarterly time series data from the second quarter of 1995 to the third quarter of 2023. The findings of the study revealed that there is a positive and statistically significant relationship between economic growth and the growth rates of the primary, secondary and services sectors in the Western Cape. The services sector has the largest impact on GDP growth followed by the secondary sector and then by the primary sector.

The growing role of services in the economy is linked to the process of economic development. Economic theory suggests that the process of economic development leads to the emergence of the services sector. Therefore, there is a need to promote technological innovations in the services sector to enhance the sector's productivity so that it continues to play a key role in the Western Cape's economic growth. Moreover, policy should focus on creating the right environment for attracting investment, promoting trade and enhancing competition in the services sector. Also, skills development should be prioritised to ensure that there is an adequate supply of a skilled workforce to complement the growth in the services sector.

The positive and statistically significant relationship between the secondary sector and economic growth is in line with Kaldor's growth law. The findings give an indication that policy which focuses on the expansion of manufacturing output and exports would be critical to economic growth in the province. While the primary sector had the lowest coefficient, this is in no way an indication that agriculture is less important to the Western Cape economy. The industry plays an important role in the province's exports. Therefore, the provision of adequate infrastructure, such as a well-functioning port, and assistance for new technologies would offer a boost to the industry.

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Appendix

Table 6: Growth rates by sectors (%), 1996-2022

Year	GDP	Primary sector	Secondary sector	Tertiary sector
1996	3.4	−1.4	0.6	5.0
1997	2.5	−3.2	3.2	2.3
1998	−0.1	−1.2	−1.6	1.0
1999	3.9	2.0	1.9	5.4
2000	4.4	−2.6	5.6	5.0
2001	3.4	0.8	−0.6	5.9
2002	4.5	6.3	5.7	3.6
2003	3.9	−0.1	0.2	5.5
2004	5.7	2.5	6.8	5.6
2005	5.9	4.5	6.6	6.0
2006	5.9	−4.7	6.5	6.2
2007	6.3	1.5	6.8	6.7
2008	3.7	20.2	1.7	3.9
2009	−1.4	−1.4	−5.1	−0.1
2010	2.4	−3.4	4.1	1.8
2011	3.6	2.3	2.3	4.3
2012	2.9	2.6	2.0	3.1
2013	2.7	3.3	1.5	3.0
2014	1.8	11.3	−0.1	2.0
2015	1.4	−0.9	−0.2	1.8
2016	1.1	−1.9	0.4	1.8
2017	0.8	8.1	−1.3	1.2
2018	1.7	−1.6	0.4	2.4
2019	0.4	−8.1	−1.3	1.3
2020	−5.7	19.7	−12.2	−4.6
2021	4.2	5.3	6.7	3.1
2022	2.6	1.8	−1.2	3.8