University engagement as local economic development: Estimating the economic impact of a South African university using a Keynesian multiplier approach

Samuel Fongwa, University of the Free state, South Africa, **Stewart Ngandu** and **Bongiwe Mncwango**, Human Sciences Research Council, South Africa

Abstract

Universities engage with their communities through a plethora of approaches. One largely neglected form of engagement is the contribution of the university to local economic development. Empirical studies on the economic impact of universities in Africa have been significantly lower compared to the global North. However, this is not because universities in Africa are not contributing to the economic development of their immediate and extended regions. This paper aims to contribute to closing that gap through an empirical study of a newly established South African university within a secondary city characterized by high unemployment, a declining economic sector, but with a growing staff and student body and high university expenditures. The analysis uses a Keynesian-type multiplier impact model, to demonstrate that the university contributes a minimum of R2 billion to the local municipality, which translates to about 19% of the district GDP. This contribution is made through a combination of direct and indirect activities of the university and its constituencies – staff, students, visitors, and local businesses. The paper concludes that intentional engagement policies and practices from the universities coupled with active commitments from local or provincial government and other external stakeholders could ensure the university serves a stronger anchoring and developmental role within the city and region.

Keywords: *Universities, economic impact, Keynesian model, anchor institution framing*

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Introduction

The economic impact of universities has gained significant prominence in academic literature as universities use such studies to justify funding demands and their relevance to society. Beck et al., (1995) define the economic impact of a university as the difference between the existing economic activity in a region given the presence of the institution, and the level of economic activity if the institution had not existed. Using a range of methodologies including student spending, staff spending, visitors spending, university operation cost and other indirect economic activities, scholars have captured the economic contribution and impact of universities in their regions, cities and localities.

While some South African universities have undertaken studies to quantify and qualify the economic impact of universities (such as Bureau for Economic Research [BER], 2018; Dyason et al., 2019), most universities, especially in rural or secondary cities, have not considered such studies. Furthermore, local and provincial governments show limited interest in understanding the role of the university in the local or regional economy in order to adequately establish the economic development contribution of their universities (Organisation for Economic Co-operation and Development [OECD], 2022). However, with the difference in institutional capabilities and contextual variations, each university needs to understand how best it can contribute economically to its city and region (Incera et al., 2022; Fongwa, 2018). As argued by Nauffal (2019, p. 345):

> The recognition of a university as an economic asset offers a unique opportunity for the institution to strengthen itself and enhance its ability to contribute to its community in areas that are aligned with its mission and purpose. It also brings attention to the role educational institutions play in building partnerships with industry that stimulate innovation and help ensure various sectors' continued vitality and relevance.

This paper is conceptually situated within the place-making discourse of universities and higher education institutions (Bank et al., 2018; Fongwa, 2023). The contribution of universities to the development of their immediate and extension regions has been adequately documented in the global literature (Agasiti & Bertoletti, 2020; Amendola et al., 2020; Valero & Van Reenen, 2019). In 2016, the Russell Group of United Kingdom (UK) universities is estimated to make an economic impact of more than £27.2 billion, of which £21.3 billion was outside London.

Within the South African context, the contribution of universities to local economic development has not received as much attention. This study, therefore, attempts to highlight the economic impact of a South African university. The study uses the case of the Sol Plaatje University, a new university in an economically declining secondary city, to show how the university is contributing to the economy of its city and region and could play a stronger role if this was adequately valued and supported by the different stakeholders especially in rural settings (Fongwa et al., 2022).

The paper is divided into five main sections. The next section provides a brief literature review of the role of universities in cities using the anchor institution framing. After that is a brief explanation of the methodology and the context of the study. The third section presents the analysis of the empirical data. The fourth section operationalizes the model to show the economic impact of the university on the economy through a multiplier approach. The last section presents a few implications and conclusion.

University Community Engagement as Local Economic Development: Evidence from Economic Impact Studies

Engaged universities, or universities that see themselves as part of their wider community, city and region not only in policy rhetoric but in their daily activities, contribute to the economic development of their communities. Whether as anchor institutions or as entrepreneurial universities, the obvious ways in which universities contribute to economic development is as a local employer, and purchaser of goods and services and the subsequent indirect and multiplier effects from such engagements. Unfortunately, economic impact studies as a form of university engagement have not received adequate attention especially in developing country context where data collection remains a challenge (Bolaz et al., 2015; Warden 2014).

Beck et al. (1995, p. 246) define economic impact as "the difference between existing economic activity in a region or city given the presence of the institution (university) and the level that would have been present if the institution did not exist". The economic impact of universities in cities or regions assumes the level of economic growth or activity which would not have existed if the university was not present. Three aspects are presented in this short review. First, the historical context behind university economic impact studies and what has informed and influenced the increase in economic impact studies. Second, the dominant methodologies and approaches in conducting impact studies and third, the case for the current methodology for estimating the economic impact of Sol Plaatje University based on the context.

Many reasons have been proposed for university impact studies. Counterfactual or export versus import substitution analysis has been used to justify the economic contribution to a specific geographical area (Siegfried et al., 2007). Other studies have compared universities' contribution to rural areas compared to metropolitan areas within the local economic development discourse and position universities as growth poles (Fongwa, 2013). Still other studies have attempted to show the dollar return of government spending in higher education using such studies to justify an increase in university funding from the public tax base (Dyason et al., 2019).

An obvious contribution of universities who engage with their immediate communities has been through the economic transformation of their cities and regions (Brown & Heaney, 1997). Looking through the microeconomic foundation of endogenous economic theory (Lucas, 1988), universities contribute significantly to their local economies through

a range of facets. This contribution is observed through activities such as the generation of and attraction to new business ventures, direct and indirect creation of jobs for locals, visits from regional and international visitors, providing jobs for locals, procurement of local goods and services and even supporting the social and cultural development of their communities (Wangenge-Ouma & Fongwa, 2012).

Caffrey & Isaacs (1971) had early on identified the core elements in determining the economic impact of universities in their immediate cities and regions along three steps. First, they calculate the direct spending; second, they estimate the indirect and induced effects with a multiplier; and finally, they sum the direct and indirect effects. This final number represents the estimated economic impact of the university. These included employment by the university, university expenditures on procurement of goods and services, income and expenditures of staff, students and visitors, and economic activities of businesses (Kotosz et al., 2015).

Given the complexity of determining the economic impact of the university on society and the economy through an evidence-based approach, a range of methodologies and approaches have been adopted (Drucker & Goldstein, 2007; Guerrero & Urbano, 2014; Roessner et al., 2013). Starting mainly from the 1980s, the rates of return studies within the labour force were a dominant methodology to show the economic impact of universities through the graduates produced based on input and output indicators (Elliott et al., 1988). The 1990s were largely characterised by the economic impact of research activities with the strong evolution of the entrepreneurial university discourse (Goldstein, 1990; Jaffe, 1989). Within the economic impact studies, about two or three methodologies have been adopted. The Input-Output (I-O) model and the Social Accounting Matrix (SAM) have been the dominantly used approaches. While the I-O model is more linear in approach, illustrating the demand and supply relationship within the economy supported by the university (Allgurn, 2010), the SAM focuses more on the flow of income, representing transactions across a range of stakeholders and its financial impact on the local economy (Dyason et al., 2019). Within these methodologies, several assumptions are usually made in determining the gross and or net impacts of the university on economic development.

An overview of the context: Kimberley and Sol Plaatje University

Kimberley is the capital city of the Frances Baard Municipality, situated in the Northern Cape Province[1] of South Africa. Kimberley was well known from the late 1800s to the early 1900s for its large deposits of quality diamonds, which made it known as the Diamond City. With the demise of industrial mining, especially within the Big Hole around 1914, the city experienced a gradual socio-economic decline with growing unemployment and poverty levels. In 2020, the unemployment rate was at 28.7%, slightly lower than the national

1 Northen Cape is the smallest of South Africa's nine provinces, with a population of 1.293 million, which constituted 2% of the country's population in 2020.

average of 32.5% (Northern Cape Provincial Government [NCPG], 2021). The third quarter of 2020 shows that the provincial unemployment rate increased by 5.6 percentage points, with the number of employed people increasing by 21,000 and the unemployed increasing by 38,000 (NCPG, 2021).

While agriculture and mining remain the main economic activities, they have both been experiencing decline in the recent past. For 2019, only 9.2% of the population aged 20 years and above had a post-secondary qualification, with about 30% completing the National School Certificate. While 55% of the Northern Cape population lives in poverty, Frances Baard Municipality has the highest number of people living in poverty (62.3%) (Ibid).

The establishment of Sol Plaatje University (SPU) as a new university in 2013 has been perceived by most as an opportunity for economic rejuvenation of the declining economy. Mataga et al. (2022, p. 180) argue that "the expectation that the university would change the economic, social and cultural dynamics of the city of Kimberley and the Northern Cape province was always evident, even at the planning stages of the new university". As stated in its mission strategic plan, "SPU is envisaged as an intellectual space to produce ideas and knowledge that facilitate and enrich participation in and democratic transformation of political, social, cultural, and economic life" (SPU, 2015, p. 11). Seven years after its first student intake, SPU has become a major player within the city through the growing number of staff, students, and businesses able to contribute to the economy even beyond the intellectual project significantly.

Economic Impact Methodologies

Studies aimed at estimating the economic impact of the universities have adopted a range of methodologies. One of the most applied methodologies is the demand and supply side analysis of the economic contribution of the university. As argued by Blackwell et al. (2002), the demand side impact includes expenditures linked to the presence of the university in a region. These include spending from local sources, staff, students, visitors. According to Siegfried et al. (2007) a counterfactual analysis describes how better-off a region will be economically and otherwise, such as higher employment opportunities, Gross Domestic Product (GDP) revenue and overall perception of the area while eliminating the risk of double counting such benefits using a multiplier method. Fongwa & Wangenge-Ouma (2015) show how such an analysis can be conducted in an area of less data availability. While supply side impact relates to the economic impact of the university based on human capital produced and retained in the area, knowledge is produced and applied in the local industry through technology transfer.

For this study, taking into account the context of the university and the region, the focus was on the demand side impacts. Data was collected largely through three set of surveys. One for the firms or businesses in the city, one for the academic and non-academic staff and another for the students. While the aim of the student and staff survey was to gauge expenditures in the region and that of their visitors, the firm or business survey

was to gauge the contribution of the university to the economic activities as observed or self-reported by the businesses. In a previous study, Ohme (2004) used a survey of local businesses situated within a five-mile radius of the University of Delaware's campus to investigate these benefits. Kelly & McNicoll (2011) used a similar approach to determine the impact of University of Kent within the South-East region of the UK using university expenditures including staff cost. PricewaterhouseCoopers ([PwC], 2009) used a similar multiplier model to estimate the additional economic impact of out-of-town students on the local economy surrounding the University of Manitoba. In estimating the economic impact of universities, Kotosz et al. (2015) recommend multiplier and primary data-based models to estimate short-run gross primary and induced impacts at the local and regional levels.

Study design and approach

This study, therefore, adopts the Keynesian-type approach, which includes multipliers such as inputs from business growth and development, university expenditure, and staff and student expenditure with a multiplier range of 1.4 to 2.39. The new university has attracted a number of out-of-town students and staff and continues to attract a range of academic and non-academic visitors into the city and region. The economic activity of these staff, students and visitors stimulates business activities, creates jobs and through other multiplier effects contributes to economy of the region which had been in decline due to the closing of several mines.

Three components define the total economic impact of a university in a region or city. These are direct spending by the university, university staff spending and student spending. Of the three types of economic impact, the first, *direct*, only captures the first round of direct spending to get the total economic impact which factors in successive rounds of spending, that is, the *indirect* and *induced* impacts we need to calculate the multiplier for the local economy. This is given by $\mathfrak{m}$ the basic *Keynesian economic multiplier* for Kimberley, based on the businesses in the sample. The basic form of an economic multiplier is the inverse of total leakages minus one, that is;

$$\mathfrak{m} = \frac{1}{1-m} = \frac{1}{leakage} \qquad \textit{Equation 1}$$

With an average leakage of 44%, we get a value of the basic Keynesian multiplier of $\mathfrak{m}$ = 2.27. In Table 1, we contrast this multiplier with that from other studies conducted on relatively small regions within South Africa. The value of 2.27 is externally validated by the cited empirical literature and is fairly close to the average of 2.54.

Table 1: Multipliers from other studies in South Africa, Source: Botha et al. (2012); Ngandu et al. (2014)

Author/s	Location	Multiplier
Kruger et al. (2010)	Oudtshoorn, Western Cape	3.00
Saayman and Rossouw (2011)	Grahamstown, Eastern Cape	2.77
Botha et al. (2012)	Volksblad, Bloemfontein, Free State	2.90
Ngandu et al. (2014)	Ba-Phalaborwa, Limpopo	1.49
Average		*2.54*

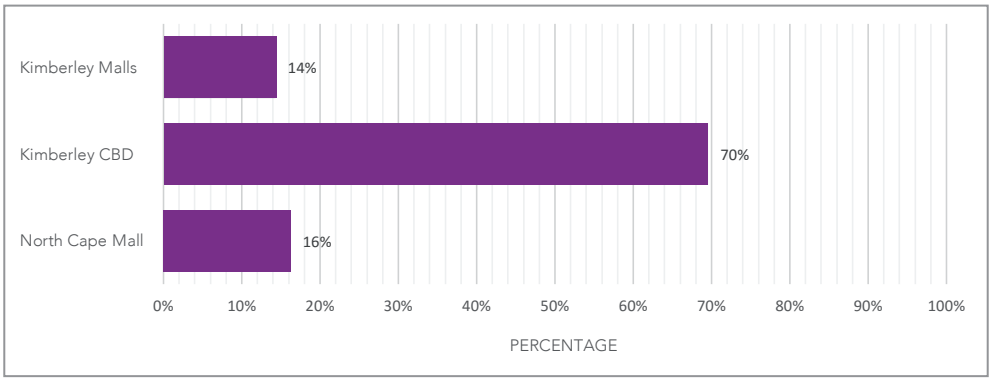
The use of the basic *Keynesian economic multiplier* allows us to capture both the *indirect and induced economic effects*. Based on the expenditure pattern of the sampled university population, which measures direct impact, the effects of successive rounds of spending will be captured by the traditional Keynesian multiplier (Janeczko et al., 2002). While it would have been ideal to use either input-output tables or a SAM multiplier model, this approach represents a relatively efficient and parsimonious method of assessing economic impact in small local economies (Saayman & Saayman, 2004; Van der Merwe, 2008). It should be noted that, the use of the Keynesian multiplier approach has been widely used for similar studies. In Hungary, Kotosz (2014) argues that in the absence of widespread secondary background datasets, a mixture of local or national datasets instead of questionnaires (Garrido-Yserte & Gallo-Rivera 2010) may be used. Kotosz et al. (2015) argue that the Keynesian multiplier model with adequate estimated flows may achieve accurate results on short-term impacts: direct, indirect and most induced impacts. They caution that the main shortcoming of the model is "the impossibility of estimating a significant part of the catalytic impact [of the university] such as externalities, worker productivity changes and local welfare of R&D activities" (Kotosz, et al., 2015, p.13).

Sample size of respondents

Three set of survey instruments were developed for the study. These were informed by the literature, and using instruments used in previous studies (such as BER, 2018). A firm questionnaire was developed to fully capture the university's economic influence in stimulating local businesses and gauge the extent of leakage from the local economy. A student and staff questionnaire was developed to capture their respective expenditures in the city as well as the number of visitors they receive on an average basis. These instruments along with other research related documents went through the ethics committee of the Human Sciences Research Council which approved the study. The study also received approval from the senior management of Sol Plaatje University. The data was analysed using SPSS and presented in the form of descriptive tables.

Figure 1, below shows that 105 businesses were surveyed. Purposive sampling was used, targeting three locations that would give a reasonably representative sample of businesses. Of the 105 firms, the majority, 70%, were in the Central Business District (CBD), while the remaining were proportionally situated in the North Cape Mall (16%) and other Kimberley Malls (14%).

Figure 1: Location of firms in the SPU survey (n = 105). Source: HSRC-SPU Kimberley Firm Survey 2022



Based on the responses of these businesses, we were able to determine the magnitude of the leakage from Kimberley's local economy by determining what percentage of inputs they procure from outside sources. Since the supply and demand for products and services should be equal, the business survey would indicate how much the university influences the volume of business in the local economy. The leakage of stock purchases from local businesses represents a flow that does not stay in the local economy. By failing to account for this, we might overestimate the stimulating effect of the additional customers the university's presence has generated.

Business surveys are an established methodology for understanding the economic conditions of regions. This tool is often used to understand general economic performance and sectoral trends (Cox & Binder, 1995; Snijkers et al., 2013). One variant of the latter is the popular business confidence survey, which has been used for a long time to predict the direction in which the economy is moving. In these surveys, confidence is generally considered a headline indicator of possible changes in the economy's direction. An increase in confidence is seen as positive, while a decrease indicates a potential downturn. We therefore expect businesses in Kimberley to be able to make similar assessments with respect to the changes that they might have experienced since 2014 (Willimack & Snijkers, 2013).

Staff and student survey

A survey was conducted among the 585 staff at the university to estimate monthly expenditures in the local economy. Table 2 shows the profile of the staff respondents who participated in the survey. It shows a 34% response rate of the total staff.

Table 2: Sample Staff profile. Source: HSRC-SPU Kimberley Firm Survey 2022

Staff	No.	%
Senior management	5	2%
Academic	74	36%
Administrative	38	19%
Support	80	39%
Other	6	3%
Total	203	100%

The staff survey asked questions about different expenditure items, including remittances and investment earnings from outside of Kimberley, medical aid visits and the number of visitors received. Since the survey asked questions about net income, medical costs represent expenses deducted from employee income that is only spent in the local economy when staff access health services there.

The student survey had a total response of 282 students. Considering the 1829 returning students (SPU, 2021 Annual Report), mainly second and third-year students as well as Honours (Fourth year) students were sampled as they are expected to have a better understanding of their monthly expenses compared to first-year students. The 282 responses gave a 15% response rate placing it between the 5%-30% acceptable rate for online surveys.

Table 3: Sampled student profile by place of origin

Place of origin of students	Sample	%
Kimberley	44	16%
Northern Cape	79	28%
Outside Northern Cape	159	56%
Total	282	100%

The student survey focused on students' expenses in the city and province including the number of visitors and their expenses.

Results from the Data Analysis

The survey data allowed for classifying businesses into two categories: those that existed prior to the establishment of the university and those that came to Kimberley following its founding in 2014. Each category provides unique insights. On the one hand, pre-existing businesses that were already operating in the area can provide an understanding of the changes in the level of business due to the establishment of the university. On the other hand, firms that moved to Kimberley after 2014 can shed valuable insight into how the university contributed to their decision to move to Kimberley.

Profile of businesses

From the survey data Table 4, it is evident that most of the businesses surveyed were established before 2014, accounting for 78% of the total. The remaining 24% of the companies were established after 2014. It is worth noting that most of the sample is in retail clothing and the food and restaurant industry.

Table 4: Type of business by year of establishment in Kimberley (n = 105). Source: HSRC-SPU Kimberley Firm Survey 2022

Type of business	%	Before 2014	%	After 2014	%	Total
Construction/Hardware/ Building	1%	1	4%	1	2%	2
Convenience Stores	8%	6	11%	3	9%	9
Curio/Book/ Gift Shop	4%	3	7%	2	5%	5
Furniture Stores/Home Decor	5%	4	11%	3	7%	7
Hotels/Motels/B&B/ Lodges	6%	5	0%	0	5%	5
Household Appliances/Computers/ Cellphone	8%	6	4%	1	7%	7
Liquor Outlets	6%	5	7%	2	7%	7
Motor Vehicle/Supplies/Repairs/ Service	3%	2	7%	2	4%	4
Nightclubs/Bars/Entertainment	1%	1	11%	3	4%	4
Petrol Station	4%	3	4%	1	4%	4
Pharmacy/Surgery	6%	5	4%	1	6%	6
Retail Clothing/Shoes	14%	11	0%	0	10%	11
Supermarket/Grocery Store/Fresh Produce	3%	2	15%	4	6%	6

Type of business	%	Before 2014	%	After 2014	%	Total
Takeaways/Restaurants/Food Outlets	14%	11	4%	1	11%	12
Wholesale	5%	4	0%	0	4%	4
Other/Banks/Perfume Outlets/Dry Cleaner/Coffee Shop	12%	9	11%	3	11%	12
Total	100%	78	100%	27	100%	105
Sample distribution		74%		26%		

Observed growth in business since the establishment of SPU

As previously mentioned, businesses regularly produce performance data, which can be utilized to monitor growth and progress over time. The survey also explores the extent to which such growth has been achieved since the establishment of SPU. Among those who conducted business in Kimberley, 44% recognized the potential for growth impact, while 25% were confident that their business had experienced growth (refer to Table 5). This percentage was even greater for those who established their business after 2014, at 42%.

Table 5: Would you say your business has observed growth since the establishment of SPU? Source: HSRC-SPU Kimberley Firm Survey 2022

Growth in business	%	Before 2014	%	After 2014	%	Total
Certainly	25%	19	42%	11	29%	30
Possibly	44%	34	31%	8	41%	42
Not sure	27%	21	19%	5	25%	26
Not at all	4%	3	8%	2	5%	5
Total	100%	77	100%	26	100%	103

As will be discussed in the section on the multiplier effects of SPU, the growth in business generates both indirect and induced impacts that continue to make a positive contribution to Kimberley's economy.

Spending patterns

Respondents were also asked to assess whether there were in differences in spending patterns between university customers relative to other customers. Table 6, shows that about 50% of businesses felt that university customers spent 10 to 20% more than other

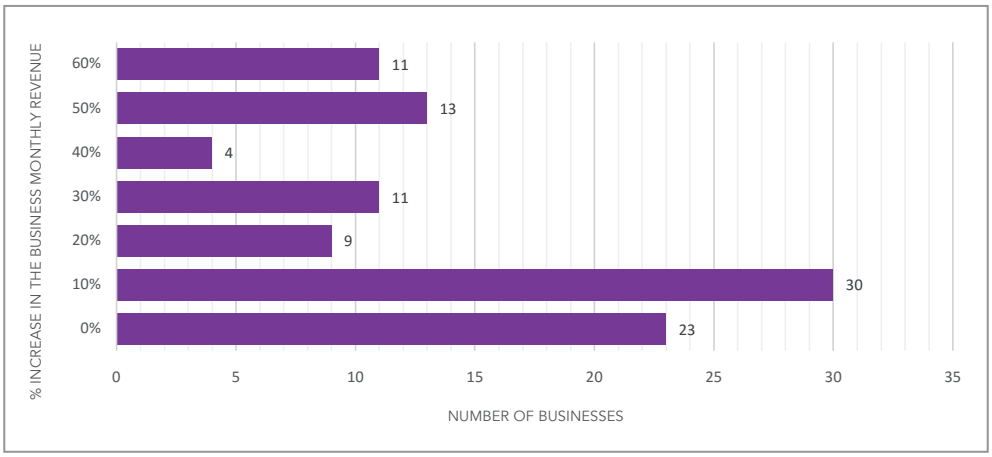
customers. For those businesses established after 2014, the ones that were more likely to have been located in Kimberley because of SPU, these had more of them reporting that they spent 21 to 50% more than 22% relative to 15% of the before 2014 group.

Table 6: Which statement would you say best describes the spending patterns of your main customers? Source: HSRC-SPU Kimberley Firm Survey 2022

Relative to other customers, university customers spend…	%	Before 2014	%	After 2014	%	Total
More than 50%	4%	3	11%	3	6%	6
21 to 50%	15%	12	22%	6	17%	18
10 to 20%	51%	40	48%	13	50%	53
Spend the **same**	10%	8	4%	1	9%	9
Not sure	19%	15	15%	4	18%	19
Total	**100%**	**78**	**100%**	**27**	**100%**	**105**

Businesses could distinguish between customer types based on their sales patterns during vacations and when the university is in session. Figure 2 depicts the number of firms that connect university activities with a corresponding percentage increase in revenue.

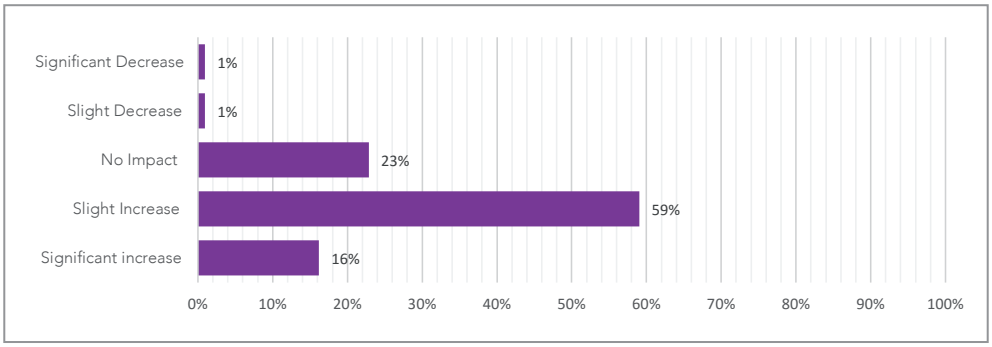
Figure 2: University activities lead to a __ % increase in the monthly business revenue (n = 101) Source: HSRC-SPU Kimberley Firm Survey 2022



Impact of SPU on business monthly revenue

Thirty-nine percent of firms reported increases in revenue, between 10% and 20%, and this was supported by findings that show that 59% saw a marginal increase in their monthly revenue, with 16% saying the impact of SPU (staff and students) led to significant increases, see Figure 3.

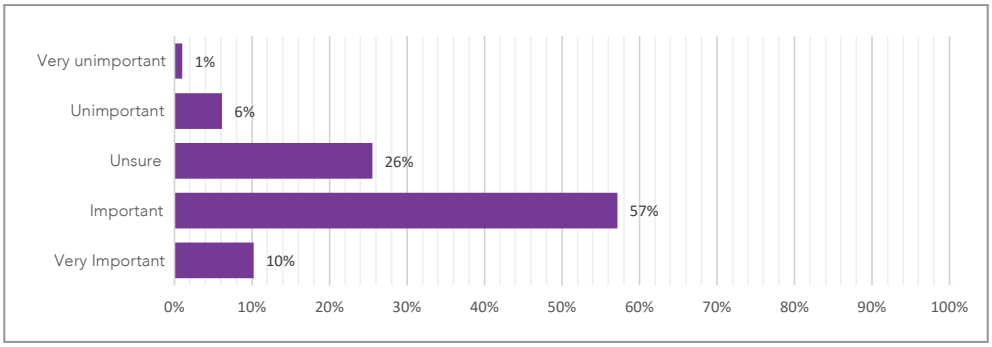
Figure 3: What Impact does SPU (staff/student) have on your monthly revenue? (n = 105). Source: HSRC-SPU Kimberley Firm Survey 2022



Importance of SPU to business growth and development

Considering that revenue cannot increase without growth, the importance of SPU to these businesses' growth and development affirms the previous findings. Figure 4, shows that 67% reported that SPU was 'important' to 'very important' for growth and development, with only 7% indicating that it was either 'unimportant' or 'very unimportant'. In addition to increasing revenue, the significance of this finding is that growth and business development are essential ingredients for long-term business sustainability and raising the level of economic activity in Kimberley.

Figure 4: How important is the university to your business growth and development? (n = 98). Source: HSRC-SPU Kimberley Firm Survey 2022



Employment impacts

In a country like South Africa, with a high unemployment rate, understanding the employment stimulus of any form of socioeconomic activity is important. Table 7 below shows that, on average, 32% of businesses surveyed routinely employ additional workers as a result of the university. Precisely and understandably, the majority of these, 52%, are the post-2014 entrants who reported using additional workers relative to 26% of those businesses that had already been operating in Kimberley.

Table 7: Additional workers as a result of the university? Source: HSRC-SPU Kimberley Firm Survey 2022; p-value 0.012

Additional workers	%	Before 2014	%	After 2014	%	Total
Yes	26%	20	52%	14	32%	34
No	74%	58	48%	13	68%	71
Total	100%	78	100%	27	100%	105

The reported p-value of 0.012 shows that the observed association, with respect to pattern and magnitude, between employing additional workers and the year of establishment is statistically significant. This finding is crucial as it highlights the significant contribution of businesses attracted to Kimberley by the presence of the university in terms of creating employment opportunities and supporting livelihoods in the local economy.

To further understand the nature of these employment impacts Table 8 shows that 1-10 additional workers had been employed by the 33 businesses that indicated employing additional staff as a result of the university. More encouraging is that 39% of the same businesses indicated that the jobs were permanent, thus contributing to sustainable sources of household income (see Table 9).

Table 8: Job opportunities due to university

Number	%	Total
None	67%	70
1-10	32%	33
11-20	1%	1
Total	100%	104

Table 9: Nature of contracts of jobs (n = 33)

Type of contract	%	Total
Temporary	61%	19
Permanent	39%	13
Total	100%	33

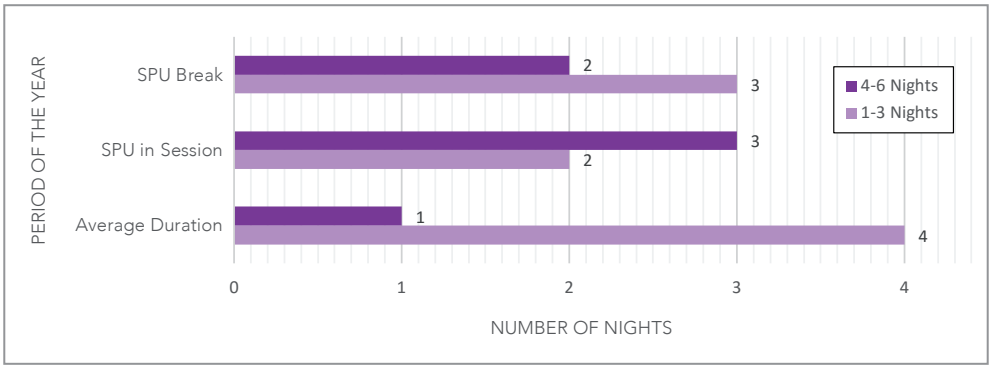
Source: HSRC-SPU Kimberley Firm Survey 2022

Tourism or visitors effects

An important part of universities are the academic and non-academic events that happen throughout the year. This attracts visitors through what has been referred to as MICE, *Meetings, Incentives, Conferences & and Exhibitions* (Zhou, 2021). One of the primary beneficiaries of MICE is accommodation businesses, and the duration of stay by MICE tourists and academic visitors plays an important role in transmitting economic impact in the local economy.

Of the five accommodation businesses surveyed, four had an average duration of stay of 1 to 3 nights, with one having an average duration of 4 to 6 nights (Figure 5, below). The results show a higher duration of stay when SPU is in session, a finding that suggests the presence of a positive contribution to MICE tourism in Kimberley.

Figure 5: Average duration of stay, university in session and on break/holiday. Source: HSRC-SPU Kimberley Firm Survey 2022



Due to the sample size, these figures might appear small; however, if these effects extrapolate to the entire accommodation sector in Kimberley, then their cumulative contribution to the region's tourism visits could be relatively significant. This is more so given that MICE tourism is often not driven by traditional tourist attractions but can induce return visits that ultimately contribute to the local economy That is, an academic might never have thought of visiting Kimberley, but attending a conference at SPU might influence their future vacation decisions in favour of this destination.

Multiplier Effects of SPU

Stock leakage from Kimberley

To compute the basic Keynesian multiplier, we use the question on total stock leakage from the surveyed businesses. Specifically, respondents were asked to state the percentage of their stock purchased outside of Kimberley. This expenditure flow is accounted for because

it is money the business receives and passes on to outside suppliers; as such, it does not stimulate local economic activity. In South Africa, most manufactured goods are produced in Gauteng; this means smaller provinces like Northern Cape and by extension, Kimberley tend to be net importers. Table 10, below, confirms the latter; just over half of the businesses indicated that they procure 80% of their stock outside the local economy. From an impact and value chain perspective, it is also interesting and encouraging to note that 41% procure all their stock locally.

Table 10: What percentage of your stock is purchased outside Kimberley? Source: HSRC-SPU Kimberley Firm Survey 2022; p-value = 0.074

Percentage	%	Before 2014	%	After 2014	%	Total
0%	47%	36	23%	6	41%	42
20%	1%	1	0%	0	1%	1
50%	3%	2	4%	1	3%	3
80%	43%	33	77%	20	51%	53
Total	100%	72	100%	27	100%	99

Relative to the employment impacts, which appear to be driven by new entrants, the two types of firms play unique roles in delivering the total impact of SPU on Kimberley. Seventy-seven percent of new entrants reported leakages as high as 80%, while more established enterprises claimed no leakage. The lower leakage of the more established enterprises shows that they are better integrated into the local economy through recruiting local supply networks for their stock requirements. This is a desirable result, as these companies play a crucial role in transmitting the bulk of the local economic impact from direct SPU expenditure flows. This means a substantial amount of an increase in expenditure obtained from the SPU population will be passed on to downstream enterprises, indicating stronger backward linkages and consequently larger multiplier effects.

Estimated multiplier

Using the leakage ratios in Table10, we come up with an estimated unweighted average leakage of 44%. The decision not to weigh is partly methodological and is quite common in the literature (see Saayman & Saayman, 2004 and van der Merwe, 2008). Assigning weights would have required collecting additional information, for example, on sales volumes, information that some businesses are often unwilling to share. Furthermore, the survey instrument was designed with time in mind and had to be as parsimonious as possible to encourage participation.

The realised value of this multiplier means that every rand spent by an individual from the SPU population generates R2.27 ($0.13[2]). This means that this expenditure creates an additional economic impact, *indirect* and *induced*, of R1.27 ($0.70). That is, every R1,000,00 ($59) worth of SPU related spending has the potential to create a total economic impact of R2,700,000 ($159). Accordingly, every R1,000,00 spent by individuals from the SPU population generates an additional R1.27 ($70) of economic impact, *indirect* and *induced*.

Economic Contribution of SPU to Kimberley and Frances Baard Municipality

The purpose of this section is to calculate the total economic impact resulting from SPU's presence in Kimberley and the district of Frances Baard. It is possible to calculate the university's total economic impact by considering various expenditure items related to the university. To carry out the analysis, we used expenditures made by university staff and students as the basis for our analysis. From the annual report, we were able to get the total recurrent expenditures exclusive of staff costs, but we had no detailed financial information that would have allowed us to break down the expenditures to determine how much was spent in the local economy. Determining which proportion should be considered in the analysis is difficult without knowing the sectoral destination of the university's payments. To better understand the size of this expenditure item, we examined the results of a study that was conducted on the University of Stellenbosch (BER, 2018). Just 16% of the R403,301,919 ($23,794,813) spent by the university remained in the local economy. According to this estimate, SPU's recurrent expenditures will be about R37,683,000 ($2,223,297) per year, which is small in comparison with the 42% (R216,900,00/$1,279,710) of total recurrent expenditures accounted for by personal costs. As a result, we opted to leave out this expenditure item since it would not have any sizable effect on the overall picture of the total economic contribution that we get from the combined direct spending of students and staff.

Direct, Indirect and Total Economic Impact of SPU Staff

The results of the economic analysis of the SPU staff are presented in Table 1. We present both the lower bound and upper bound estimates of population parameters based on the confidence levels obtained from the sample statistics. By doing this, we are able to see the possible range of values based on whether the population parameter is above or below the sample mean. The mean total staff net income was estimated at R167,940,594 ($9,908,495). The table also includes gross staff wages and salaries from the 2020 annual report of R229,762,000 ($13,555,958), an amount that is relatively close to the upper bound estimate of R203,227,723 ($11,990,435).

2 Calculated at R1=$0.059 rate of 23rd December 2022

*Table 1: Estimates of Direct, Indirect and Total Economic Impact of SPU Staff. Sources: Author Estimates, *SPU Annual Report 2020*

#	Item	Lower Bound	Mean	Upper Bound	SPU Staff Costs 2020*
A	Direct Staff Annual Income	R139,029,000	R167,940,594	R203,227,723	R229,762,000
A1	+ Total remittances, investment earnings & other business (10% of staff)	R525,175	R957,759	R1,390,342	
A2	**Total Direct Income**	**R139,554,175**	**R168,898,353**	**R204,618,065**	
C	Direct Staff Spending from Income (73%)	R101,874,548	R123,295,797	R149,371,187	R167,726,260
C1	+ Annual Staff Medical Aid Spending	R1,012,366	R795,548	R1,229,184	
C2	+ Annual Staff Visitor Spending	R1,012,366	R795,548	R1,229,184	
C3	**Total Direct Spending**	**R103,899,280**	**R124,886,893**	**R151,829,555**	**R167,726,260**
D	Total Economic Impact (2.27)	R235,851,365	R283,493,248	R344,653,090	R380,738,610
E	**Indirect + Induced Impacts [D – C3]**	**R131,952,085**	**R158,606,355**	**R192,823,535**	**R213,012,350**
F	**Lower Bound Estimate – 70%**				
F1	Direct Staff Spending from Income (70%) + C1 + C2	R99,712,654	R119,819,943	R145,691,013	
F2	Total Economic Impact (2.27)	R226,347,726	R271,991,270	R330,718,599	
F3	Indirect + Induced Impacts [F2 – F1]	R126,635,071	R151,160,981	R183,466,523	
G	**Upper Bound Estimate – 77%**				
G1	Direct Staff Spending from Income (77%) + C1 + C2	R109,481,447	R131,642,827	R160,014,277	
G2	Total Economic Impact (2.27)	R248,522,884	R298,829,218	R363,232,410	
G3	Indirect + Induced Impacts [G2 – G1]	R139,041,437	R167,186,391	R203,218,132	

Based on the sample, 10% of the staff were estimated to receive income from remittances and investments from outside Kimberley (see line item A1 in the table above). In order to calculate the estimated total direct staff income (line item A2), we calculated the average annual income receipts and applied them to 55 of the 550 employees in the 2020 annual report. From the survey, it was estimated that 70% to 77% of staff income is spent within the local economy, resulting in mean total direct staff spending of R123,295,797 ($7,274,452) (line item C), which is 73% of total income. We used the same approach to determine

medical expenses (line item C1) and the number of visitors from outside of town (line item C2). Respondents were asked to state the number of visits to a medical practitioner and the average amount spent per visit. An estimate of the number of visits per year, the duration of stay, and the average amount spent by out-of-town visitors were derived, and then the sample proportion of the staff that indicated that they received visitors was applied to the total staff population. As a result of these line items, we have estimated total direct spending between R103,899,280 ($6,310,058) to R151,829,555 ($8,957,944) per year within the local economy (line item C3). We then applied the multiplier to these amounts to get an estimated total economic impact of between R235,851,365 ($13,915,231) and R344,653,090 ($20,334,532 – that is, direct, indirect, and induced impacts). Therefore, we estimate that direct staff spending alone could have created R131,952,085 ($7,785,173) to R192,823,535 ($11,376,589) of additional economic income in the local economy, in the form of *indirect* and *induced* impacts. Panels F and G show the results of the lower (70%) and upper bound (77%) direct spending from staff income. This shows an estimated total economic impact between R330,718,599 ($19,512,397) and R363,232,410 ($21,430,712), lines F2 and G2, respectively.

Direct, Indirect and Total Economic Impact of SPU Students

Table 2 shows the sample distribution from the student survey, which includes both undergraduates and postgraduates. A total of 16% of the respondents indicated that they were from the Kimberley region when asked about their place of residence. Taking the sample proportion as a percentage, it was applied to the total student population of 2,349 for the year 2020. Consequently, 366 students were excluded from the analysis as their spending does not represent new injections into the local economy.

*Table 2: Where do you live when the university closes or where is your home address? Source: HSRC-SPU Kimberley Firm Survey 2022, *SPU Annual Report 2020*

Place of origin	Sample	%	Distribution of student population
Kimberley	44	16%	366
Northern Cape	79	28%	658
Outside Northern Cape	159	56%	1,325
Total	282	100%	2,349*

The expenditure of student visitors was included in the total direct expenditure, and following that, an estimate was made of how much of the total expenditure was spent in Kimberley. In Table 13, line item H2 shows the estimated total direct spending to be between **R63,767,864** ($3,762,304) and **R95,704,223 ($5,646,549)**. Applying the multiplier to line item H2 produced an estimated total economic impact between **R144,753,051**

($9,539,368) and **R217,248,587** ($1,017,667 – line item I). This means that direct student spending could have generated an additional **R80,985,187** ($4,778,126) to **R121,544,364 ($7,171,117)**, in the form of indirect and induced impacts.

Table 3: Estimates of Direct, Indirect and Total Economic Impact of SPU Students. Sources: Author Estimates

#	Item	Lower Bound	Mean	Upper Bound
H	Direct Annual Student Spending in Kimberley (80%)	R63,206,971	R78,754,628	R94,314,276
H1	+ Annual Student Visitor Spending	R560,893	R938,808	R1,389,947
H2	**Total Direct Spending**	**R63,767,864**	**R79,693,435**	**R95,704,223**
I	Total Economic Impact (2.27)	R144,753,051	R180,904,098	R217,248,587
J	**Indirect + Induced Impacts [I – H2]**	**R80,985,187**	**R101,210,663**	**R121,544,364**
K	**Lower Bound Estimate – 78%**			
K1	Direct Student Spending (78%) + C1 + C2	R49,799,123	R62,288,663	R74,860,768
K2	Total Economic Impact (2.27)	R113,044,010	R141,395,264	R169,933,944
K3	Indirect + Induced Impacts [K2 – K1]	R162,843,133	R203,683,927	R244,794,713
L	**Upper Bound Estimate – 83%**			
L1	Direct Student Spending from Income (83%) + C1 + C2	R52,959,472	R66,226,394	R79,576,482
L2	Total Economic Impact (2.27)	R120,218,001	R150,333,915	R180,638,615
L3	**Indirect + Induced Impacts [L2 – L1]**	**R173,177,473**	**R216,560,309**	**R260,215,097**

Total Economic Impact and Contribution to District GDP

Considering the three components of impact described in Section 1.3, Table 4, summarises the total economic contribution. Based on the estimated total impact from the staff and students, the total economic impact is between **R380,604,416 ($22,455,661)** and **R561,901,677 ($3,062,199)**. To understand how important this contribution is to Kimberley and Frances Baard, we calculated the proportion of this total impact relative to provincial and district GDP. Since GDP estimates are not available below the district level, we took the provincial GDP for the Northern Cape for 2019 and Frances Baard's estimated contribution of 35.6%. The table indicates that the direct spending of the SPU population could have contributed between **1.6%** and **2.3%** of the district's annual GDP. To gain a deeper understanding of the magnitude of this contribution, we estimated the monthly GDP for Frances Baard. The results show that the annual total economic impact of SPU is between **19%** and **28%** of monthly district GDP.

Table 4: Total Economic Impact and Contribution to District GDP. Sources: Author Estimates

Item	Lower Bound	Mean	Upper Bound
Total Direct Impact (Staff + Student) Indirect + Induced Impacts (Staff + Student)	R167,667,144 R212,937,272	R204,580,329 R259,817,018	R247,533,778 R314,367,898
Total Economic Impact of SPU on Kimberley	**R380,604,416**	**R464,397,346**	**R561,901,677**
Northern Cape GDP (2019) Frances Baard Contribution to NC GDP 35.6% Monthly Frances Baard GDP (2019)	R68,441,000,000 R24,364,996,000 R2,030,416,333		
SPU Percentage Annual Contribution to District GDP	**1.6%**	**1.9%**	**2.3%**
SPU Percentage Monthly Contribution	**18.7%**	**22.9%**	**27.7%**

In a 2018 study by BER (2018) where they adopted an Economic Impact Assessment methodological design based on an analysis of demand and supply factors to show that Stellenbosch university contributes more than 15% of output and more than 18% of gross added generated in the municipality which is close to the 19% contributed by SPU. With SPU being a much stronger economic agent in the city compared to SU in Stellenbosch, SPU is expected to even contribute more than the 19% to 28% it currently contributes. Furthermore, this study focuses only on the demand factors (university expenditure, staff, student and visitors' expenditures and business activities) due to the young nature of the university where supply-side factors (human capital, research, innovation, technology transfer) are not yet adequately developed. While the university expenses will reduce over time as the university eases on its massive infrastructural development as a new university, the expected doubling of student and staff numbers resulting in more expenditures, growth in the number of businesses and business activities as well as visitors' expenditures could compensate for the drop in university expenses through infrastructural development.

Implications and Conclusion

Three implications could be drawn from the study. These implications relate to the university or higher education institutions, the policymakers and researchers, and academics in the field. Starting off with academics, the study adopts a multiplier effect to measure the economic impact of universities on their cities and regions. This multiplier effect is just one approach to understanding the economic impact of universities. While the study relates to university employment, it does not account for the economic impact of a skill-based approach (Bluestone, 1993). While the skill-based approach is closely linked to the human capital theory approach, Brown and Heaney (1997) along with other scholars have questioned its value compared to the economic-based approach adopted in this study. They argue that there is a substantial overestimating of the skill-based approach (Dyason et al.,

2019). Hence, the need for more empirical studies using the economic-based approach, especially within the South African context.

The second implication is the need for conscious acknowledgement of the economic impact of universities. As shown by the results of this study, there is little doubt that SPU is exerting a significant positive economic impact on Kimberley and the Frances Baard municipality, as indicated by total direct spending from the university's population. These expenditures were amplified by factoring in both the indirect and induced effects. This resulted in a substantial total impact that forms a relatively significant economic contribution to the region.

As anchor institutions, university managers must consciously position universities as agents for local economic development, especially those in rural and secondary cities. With the potential of increased students at most South African universities with the introduction of tuition-free education, the economic contribution of universities to their cities and regions can become even more substantial. This contribution can be achieved by enhancing the nature of engagement, partnerships, and collaboration towards local impact such as employment for locals, and supporting local businesses through explicit procurement policies among others. If conceptualised within an anchor university strategy, SPU can make a significant contribution to local employment, and play an economic leadership role through the procurement of goods and services that benefits the local supply chain beyond its academic function (McCauley-Smith et al., 2020). Jansen (2023) has warned that the corrupt relationship between universities and some local stakeholders, has constrained some universities from making the expected contribution to the local economy.

The study also has implications for the broader higher education and development policy landscape. This study demonstrates that higher education institutions play an essential role in supporting their immediate local economies. However, universities seldom appear in discussions of regional development, which are typically dominated by industrial, mining, and agricultural sectoral strategies. Universities also play a role in enforcing democracy, reducing inequality and reducing unemployment. According to the business survey conducted to estimate the multiplier for Kimberley, SPU has shown a positive impact on not only existing businesses but also new businesses that came on stream after 2014. As a result of SPU, both types of businesses reported that they had experienced an increase in business activity. Based on the university's direct employment contribution to the municipality and the estimated total economic impact, it is indisputable that SPU is one of the most important institutions in the local economy. This is regardless of whether other university expenditures were included or not. Its imperviousness to the business cycle and the boom-and-bust cycle of mining means that its contribution plays a vital role in the sustainability of the businesses and workers who depend on it. However, as argued by Nauffal (2019, p. 345), "there is little awareness of the full breadth of the aggregate fiscal benefits for the [city, region and] country generated by this sector", the university sector. Building from the quadruple helix concept, Kitagawa (2010) emphasized the importance of regional government policies in developing a strong link between universities and regional

advantage. Local, provincial, and national government departments need to increasingly integrate the university as a major player within development policy discourse, planning and implementation and even providing funding support for the university.

In conclusion, when one considers the economic impact of SPU on the local and regional economy within the context of a failing mining town, the university has the potential to contribute even more sustainably to the city and provincial economy. The university, however, needs to reposition its mandate to consciously consolidate its contribution to the local economy, finding new ways of engaging with its immediate and extended community while remaining focused on the academic core function of teaching, learning and research.

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Notes on Contributors

Lead author
Samuel Fongwa
Centre for Development Support, University of the Free state, South Africa / CODESRIA, Senegal
Samuel.fongwa@codesria.org
https://orcid.org/0000-0002-0648-2536

Co-author
Stewart Ngandu
Human Sciences Research Council, Pretoria, South Africa
https://orcid.org/0000-0003-1523-6908

Co-author
Bongiwe Mncwango
Human Sciences Research Council, Pretoria, South Africa
https://orcid.org/0000-0003-2061-8847

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