

The influence of tenant diversity on the performance of shopping centres

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Abstract

This study investigated whether a relationship exists between tenant diversity and the return on investment in South African regional and super-regional shopping centres. The Simpson diversity index was used to calculate the tenant diversity in 10 super-regional shopping centres and 50 regional centres in South Africa. The analysis was performed over one-year, three-year and five-year periods.

The regression analysis showed that a positive linear relationship exists between retail categories diversity and the return on investment over a three- and five-year period in the case of regional shopping centres that are located in the Western Cape province. A weak linear relationship exists between return on investment and retail categories diversity for all super-regional shopping centres and regional shopping centres that are located in the Gauteng province.

Keywords: *Diversity, Tenant Mix, Resilience, Return On Investment, Shopping Centres, Performance Of Malls*

Originality: The influence of tenant diversity on the performance of shopping centres in South Africa has not been researched prior to this research.

1. Introduction

The success of a shopping centre is influenced by a number of factors (Hottman, 2014; Sirmans and Guidry, 1993; Anderson, 2004; Wesley, 2006; Gerbich, 1998a, 1998b; Hutchison, Adair and McWilliam, 2008; Jensen, 2005; Findlay & Sparks, 2010). It is generally acknowledged that the tenant mix influences the behaviour of consumers (Teller & Reutterer, 2008; De Nisco & Warnaby, 2014) and that it is an important element of successful centres (Kirkup & Rafiq, 1994; Oppewal, Louviere & Timmermans, 1997; Terblanché, 1998; Downie, Fisher & Cherayl, 2002:5; Borgers et al., 2010; Yiu & Xu, 2012; Calvo-Porrá & Lévy-Mangin 2018). However, the exact relation between the performance of a shopping centre and its tenant mix has not yet been quantified. Should such a quantitative relationship be established, it would be of great practical importance to developers and investors in shopping centres.

To investigate this relationship, the tenant mix as well as the success of a centre need to be quantified. From a financial point of view, the success of a centre can be measured by the sustainability of an acceptable return on investment over time, i.e. the centre must be resilient and capable of adapting to changing socio-economic circumstances.

This leaves the problem of quantifying the tenant diversity. In this paper, it is proposed that tenant mix diversity can be measured by mathematical measures of diversity commonly applied in other disciplines, like information theory and ecology. The phrase “tenant mix” is interpreted to encompass the total number of different retail categories (the richness) and the spread of individual tenants across each of the categories (the evenness).

While research on the importance of diversity and heterogeneity in biological and ecological systems as well as in enterprises and organisations has thrived (e.g. Andriani, 2001; Page, 2011; Zolli, 2012; Chatterjee and Blocher 1992; Harrison and Klein 2007; Liebllich, 2017), few consistent findings have emerged. Of specific interest to this paper is whether diversity in tenant types (i.e. retail categories) in a shopping centre correlates with the return on investment of the centre and, if so, what the correlation is.

2.Literature review

Measurement of diversity

Mathematically, diversity is used to describe the distribution of differences among the members of a unit concerning a common attribute. However, encapsulating the complex and multidimensional concept of ‘diversity’ in a single measure is problematic. Problems include, firstly, that ‘diversity’ is such a broad concept that it has been defined in different ways and, secondly, that diversity indices typically condense all relevant information about a system’s diversity into a single real number (Chao et al. 2014; Daly et al. 2018).

In this study, we focused on the diversity of retail categories in shopping centres (hereafter referred to merely as ‘diversity’ for ease of reference). ‘Retail categories’ in this study (as synonym for ‘tenant type’ or ‘tenant group’) corresponds to the concept of ‘species’ in ecology.

Diversity can be divided into three components: richness, evenness, and disparity (Jost 2006). The total number of retail categories present in the shopping centre is referred to as its *richness*.

In addition to the richness, the distribution of the number of individual tenants between the retail categories is an important component of diversity. If a retail category is represented by only a few individual tenants, it should be clear that it contributes less to the shopping centre’s diversity than a retail category represented by a number of individual tenants.

The equitability of a centre’s retail category distribution is referred to as its evenness. A centre’s tenant mix is perfectly even if every retail category is present in equal proportions, and uneven if one retail category dominates the abundance distribution.

Most classical diversity indices do not account for any disparity between categories, implicitly assuming that distinct categories have nothing in common. To allow for the absence of disparity, similarity indices may be employed to measure similarity between shopping centres based on retail category composition. Such an index may be useful in comparing centres under different managements and can also be used to compare compositional changes over time.

The investigation of the effect of disparity or similarity on the success of a shopping centre falls outside the scope of the present study. Rather, attention was focused on traditional indices of diversity that combine

both richness and evenness. Such indices include the Shannon Index and the Simpson Index.

The present analysis applied the Simpson Index (D) only because it is a dominance index that is suitable for the diversity of a single community (Tuomisto, 2010; DeJong, 1975). The single community, in this case, is a shopping centre. The diversity (D) increases as the number of individuals in a single-retail category increase. The increase in the number of individuals per retail category will result in an increase in the overall diversity of a shopping centre.

The Shannon Index (H) is less suitable in this context because it is a measure of uncertainty. In the context of a shopping centre, if a tenant is selected randomly from a retail category, (H) would measure how uncertain one is that the selected tenant type belongs to a particular retail category.

The Simpson Index (D) is the probability that two entities (tenants) taken at random from the dataset of interest (all the tenants in the shopping centre) represent the same type (retail category or tenant group). It is the probability of drawing, without replacement, two tenants of different retail categories from a given collection. It is a dominance index because it gives more weight to common or dominant retail categories (cf. Baumgärtner, 2006) and is therefore applicable to regional and super-regional shopping centres that typically contain dominant tenant types (the so-called “majors”), which may occupy up to 50 per cent or more of the total Gross Lettable Area (GLA).

The value of Simpson’s D ranges from 0 to 1, with 0 representing infinite diversity and 1 representing no diversity. The larger the value of D, the lower the diversity. If we use the inverse, the value of the index starts with 1 as the lowest possible figure.

The Simpson Index (D) is defined as $D = 1 / \sum_{i=1}^S P_i^2$. N is the total number of tenants in all retail categories (i.e. the total number of tenants in the centre), n is the number of individual tenants in a specific retail category, and P is the proportion n/N. S is the number of retail categories in the shopping centre.

The diversity (D) is bigger when the individual tenants are distributed equally between the different retail categories than when the individual tenants are distributed unequally between the different retail categories. For example, for a hypothetical shopping centre containing three retail categories with 35, 20 and 11 tenants in each respective category: $D = 1 /$

$$[(35/66)^2 + (20/66)^2 + (11/66)^2] = 1 / (0.53)^2 + (0.30)^2 + (0.17)^2 = 1 / 0.401 = 2.49$$

If, on the other hand, the 66 tenants are distributed equally over the three retail categories (22 tenants in each category), D is calculated to be 3.00.

Super-regional and regional shopping centres

In July 2017, there were 1959 individual shopping centres in South Africa (South African Council for Shopping Centres (SACSC, 2018). Regional and super-regional malls account for 22% of the total shopping centre GLA, i.e. the total floor area available for the exclusive use of retail tenants.

A regional shopping centre has a GLA of 50,000m²-100,000m² and they typically have 150-250 stores. The average radius of primary trade areas is approximately 5-8km and the median travel time to regional shopping centres is 14-20 minutes (Prinsloo, 2010:25; SACSC 2016:21).

A super-regional shopping centre, on the other hand, has a GLA area of 100,000 m² or above. The average radius of primary trade areas exceeds 10km and the median travel time to super-regional shopping centres is 24-30 minutes (Prinsloo, 2010:25; SACSC 2016:21).

Tenant mix

Yiu and Xu (2012) define tenant mix as the relationship between the percentages of shop areas occupied by different store types (i.e. retail categories) in a shopping centre. This is equivalent to the measurement of taxonomic biodiversity, which is based only on the relative abundance of species in the community. In contrast, functional diversity is defined as the value, range, distribution and relative abundance of the functional characteristics of organisms in a community (Chapin *et al.* 2000; Loreau & Hector, 2001; Hooper *et al.* 2005).

Tenant mix contributes to the success of a shopping centre because a proper tenant mix attracts more consumers and thus increases sales for retailers (Yiu & Xu, 2012; Teller & Reutterer, 2008; De Nisco & Warnaby, 2014). The tenant mix of shopping centres supports the objective of maximising returns and profitability (Downie *et al.*, 2002:5). The management of tenant mix is imperative in attracting consumers from other established shopping centres as well as increasing the variety

of the tenant mix to differentiate the shopping centres and attract customers (Kirkup & Rafiq, 1994:29; Wakefield and Baker (1998:515).

3.Methodology

There were 10 super-regional shopping centres and 53 regional shopping centres in South Africa in 2016 (SACSC 2016). The diversity was calculated for all 10 super-regional shopping centres, while the regression analysis between the return on investment and the diversity was performed for nine super-regional shopping centres (data on the return on investment of the tenth centre was not available for the time periods under consideration). The super-regional sample was too small for quantitative parametric statistical analysis (Pearson's correlation), therefore Spearman's correlation was used to measure the strength of a linear relationship between return on investment and diversity in the nine super-regional centres.

A correlation coefficient measures the strength and the direction of a linear relationship between two variables on a scatter plot. A correlation coefficient that ranges from 0.10 to 0.90 indicates a positive relationship and 1 indicates a perfect positive relationship. A negative relationship is seen when the correlation coefficient (r) ranges from -0.10 to -0.90 and -1 indicates a perfect negative relationship. A relationship between two variables is moderate when the correlation coefficient ranges from 0.30 to 0.50 (or -0.30 to -0.50) and strong when the correlation coefficient ranges from 0.60 to 0.90 (or -0.60 to -0.90).

The diversity was also calculated for 50 regional shopping centres. These shopping centres were selected from all the regional centres in South Africa using stratified random sampling, resulting in a 99% confidence interval and a 5% margin of error. A regression analysis was performed for 25 regional shopping centres (instead of 50) regional shopping centres because of the limited availability of sufficient data.

The diversity was calculated by determining the various retail categories of the shopping centres and calculating the Simpson Index, using a standard classification of the various retail categories of Morgan Stanley Capital International (MSCI, 2019, see Table 1). The total number of retail categories (tenant groups) is expressed as 'S' in Table 2, 'N' represents the total number of tenants, and 'n' represents number of tenants in each retail category (tenant group). The values of the Simpson Index (D) in figures 1 to 10 were provided by MSCI as averages over one-, three- and five-year periods. It is different from the D in Tables 2

and 3 because MSCI calculated tenant diversity only for centres for which they had data for the return on investment, whereas Tables 2 and 3 presented the calculations of D for all the centres in the research sample.

Shopping centres that have a uniform distribution of shops in each tenant group will have a higher value of D. The greater the Simpson Index (D), the higher the overall diversity of a specific shopping centre. In table 2 and 3, the shopping centres with the highest value for D are the most diverse.

Table 1: Retail Categories (MSCI, 2019)

	Retail categories
1	Food retailers (restaurants, coffee shops, fast foods, barrows & kiosks)
2	Large grocery retailers and department stores
3	Apparel: fashion and footwear (men, boys, women, girls, children)
4	Leather and travel goods
5	Homeware, furniture & interior
6	Spa, salon, barber, health and beauty
7	Accessories, jewellery & watches
8	Electronic, computer, cell phone, audio
9	Entertainment and leisure
10	Books, cards, gift stores and stationery
11	Services: Services: dry cleaning, postal, internet cafes and courier services
12	Eyewear and optometrists
13	Non-turnover generating stores: financial services, banks, foreign exchange, ATMs, learning centres, offices
14	Motor related
15	Sport Utilities: gyms, fitness studios
16	Sportswear and outdoor goods
17	Specialty: gambling, toys, vet stores, fine ware, hobby stores, tobacco stores

An undertaking by MSCI to preserve confidentiality necessitated the non-disclosure of the financial data of individual centres. Financial data are therefore presented as averages for each region in which the selected regional and super-regional shopping centres are located. The averages for the regional and super-regional centres were calculated over a one-year period (2018), three-year period (2015-2017) and five-year period (2013-2017).

A regression analysis was then performed to determine if there is a correlation between tenant diversity and the actual return on investment.

Findings

i. Super-regional shopping centres

Table 2 shows the calculated diversity in all 10 South African super-regional centres.

Table 2: Quantification of diversity in South African super-regional shopping centres

Name of super-regional shopping centre	S (Total number of retail categories)	N (total number of individual tenants)	ΣP_i^2	$D = 1 / \Sigma P_i^2$
Cresta	17	240	0.118	8.47
Centurion Mall	17	226	0.127	7.88
Wetsgate	17	174	0.138	7.22
Gateway uMhlanga	17	394	0.140	7.14
The Pavilion	17	178	0.151	6.62
Menlyn	17	336	0.139	7.20
Mall of Africa	17	280	0.193	5.19
Sandton City	17	378	0.173	5.80
Eastgate	17	257	0.209	4.79
Canal Walk	17	432	0.146	6.86

As indicated earlier, the diversity index that was used in the correlations for a one-, three- and five-year period was the Simpson Index. The diversity index is not expected to change dramatically over these periods since a centre’s tenant mix usually changes gradually (if at all) over the relatively short periods of time under consideration.

No clear correlation was found between ROI and the Simpson Index (D) over a one-year period (Figure 1). The correlation coefficient ($r = -0.133$) shows that a very weak negative linear relationship exists between the two variables. Figure 2 shows a moderate positive linear relationship between the diversity and total return in super-regional shopping centres over a three-year period (from 2015 to 2017). The regression analysis of the five-year period (2013-2017) indicated a weak negative correlation between total return and diversity (Figure 3).

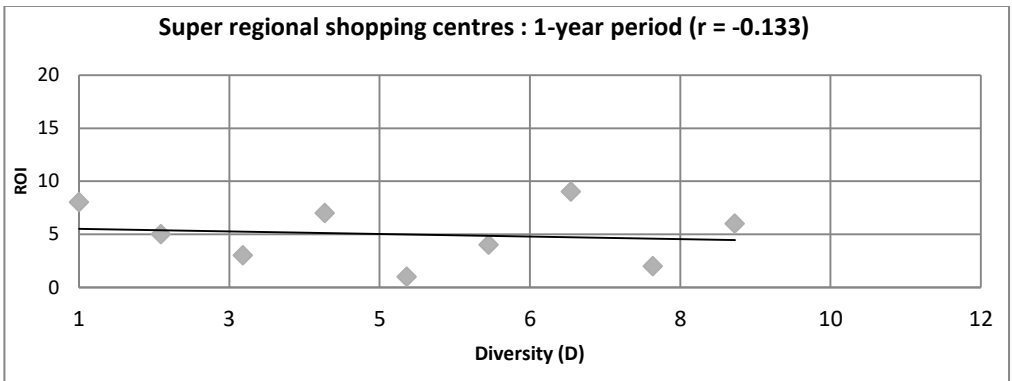


Figure 1: Correlation between return on investment (ROI) and retail categories diversity (Simpson Index, D) in South African super-regional shopping centres: One-year period (2018)

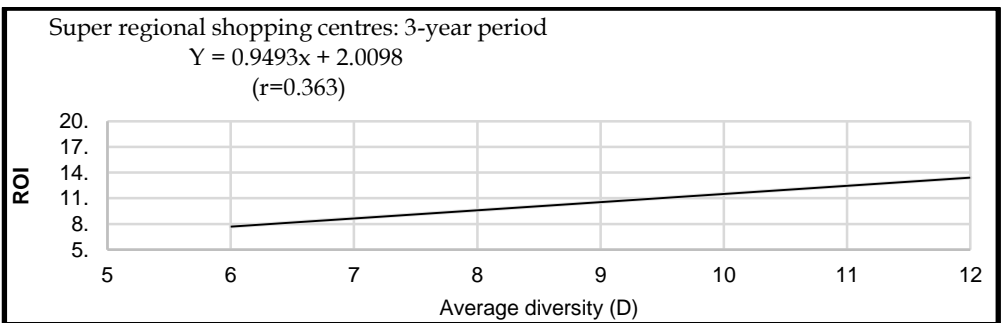


Figure 2: Correlation between return on investment (ROI) and retail categories

diversity (D) in South African super-regional shopping centres: Three-year period (2015-2017).

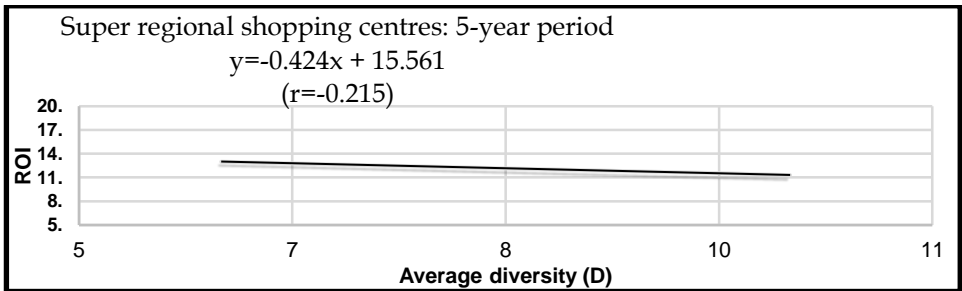


Figure 3: Correlation between return on investment and diversity (D) in South African super-regional shopping centres: Five-year period (2013-2017).

The findings shown in Figures 1 to 3 raise the question of why the relationship between ROI and D changes from positive (in the case of the three-year period) to negative (in the five-year period). The likely reason is that the ROI (for both the three-year and five-year period) is expressed as an average. There was a steady decline in the country's nominal and real GDP between 2012 and 2016 (Figure 11). Because the five-year period was from 2013 to 2017, it is to be expected that the performance of the economy from 2012 to 2016 would affect the average ROI. As the GDP gradually improved from 2016 to 2018 (World Bank, 2019), the average ROI for the three-year period (2015-2017) would show an improvement relative to the average ROI for the five-year period.

i. Regional shopping centres

Table 3 summarises the diversity calculations for the 50 regional shopping centres in the sample analysed.

Regional shopping centre	S (number of retail categories)	N (total number of individual tenants)	ΣP_i^2	$D = 1 / \Sigma P_i^2$
Bay West Mall	17	181	0.131	7.66
Cradlestone Mall	17	157	0.125	7.98
Forest Hill Mall	17	124	0.228	4.39

Galleria Shopping Centre	17	177	0.139	7.20
Hemingways Mall	17	156	0.167	5.97
Greenstone Shopping Centre	17	124	0.162	6.17
Highveld Mall	17	173	0.156	6.42
Kolonnade Retail Park	17	156	0.112	8.90
Mall of The North	17	172	0.216	4.63
Mall @ Reds	17	133	0.118	8.51
Mall of The South, Johannesburg	17	162	0.131	7.66
Randburg Square	17	94	0.141	7.09
Trade Route Mall, Lenasia	17	152	0.136	7.37
Liberty Midlands Mall Pietermaritzburg	17	196	0.242	4.13
N1 City Mall	17	135	0.119	8.39
Garden Route Mall	17	128	0.131	7.65
Clearwater Mall	17	224	0.132	7.58
Moorivier Mall	17	95	0.181	5.51
Somerset Mall	17	190	0.124	8.09
Ilanga Mall	17	125	0.177	5.63
Secunda Mall	17	94	0.129	7.74
Bedford Centre	17	159	0.122	8.22
Blue Route Mall	17	122	0.130	7.70
Boardwalk Inkwazi Shopping Centre	17	143	0.123	8.12
Brooklyn Mall	17	212	0.138	7.25
Bt Ngebs	17	122	0.169	5.91
Cape Gate Regional Centre	17	169	0.107	9.34
Festival Mall	17	148	0.139	7.18

East Rand Mall	17	170	0.193	5.19
Fourways Mall	17	158	0.120	8.35
Jubilee Mall	17	132	0.175	5.72
Denlyn Shopping Centre	17	115	0.150	6.68
Key West Shopping Centre,	17	122	0.112	8.96
Liberty Promenade	17	161	0.131	7.61
Mall@Carnival	17	188	0.124	8.09
Lowveld Mall	17	209	0.135	7.39
Matlosan Mall	17	122	0.117	5.56
Middelburg Mall	17	151	0.132	7.55
Northgate Mall	17	174	0.112	8.89
Parow Centre	17	148	0.132	7.57
Tyger Valley Centre	17	215	0.118	8.46
The Glen Shopping Centre	17	165	0.124	8.08
Woodlands Boulevard	17	158	0.132	7.58
Lakeside Mall	17	156	0.171	5.85
Southgate Mall	17	160	0.140	7.17
V & A Waterfront	17	280	0.131	7.62
Wonderpark Shopping Centre	17	176	0.139	7.22
The Grove Mall	17	136	0.113	8.84
Centurion Lifestyle	17	85	0.085	11.71
Ballito Junction Mall	17	220	0.106	9.39

Table 3: Quantification of diversity in South African regional shopping centre

Figure 4 shows that there is no correlation between diversity and the return on investment for regional shopping centres over a one-year period ($r = -0.041$). Figure 5 shows the correlation between diversity and total return for regional shopping centres over a three-year period. In this

case, the correlation coefficient ($r=0.0078$), indicates that there is again no correlation between diversity and ROI. Figure 6 shows the relationship between total return and diversity over a five-year period. The correlation coefficient ($r= 0.083$) shows that there is no discernible correlation between the two variables.

To ascertain whether there may be a discernible difference between the performance of regional centres in different parts of the country, the analysis was repeated for the two provinces of Gauteng and Western Cape. These two provinces were chosen because they have the biggest concentration of retail space in South Africa. The Gauteng province has over 10.8 million m² of retail space and the Western Cape province has 3.5 million m² of retail space, i.e. about 48% and 16% of the total retail space in the country, respectively. Figures 7 to 10 illustrate the linear regression for Gauteng and the Western Cape for three- and five-year periods. Figure 7 and 8 show that a negative correlation exists between diversity and total return for Gauteng regional shopping centres for the three-year and five-year periods. Figures 9 and 10 illustrate that a strong positive linear relationship exists between diversity and total return for regional shopping centres in the Western Cape, where $r = 0.739$ for the three-year period and $r= 0.575$ for the five-year period. This is indicative of strong and reasonable positive correlations between diversity and total return.

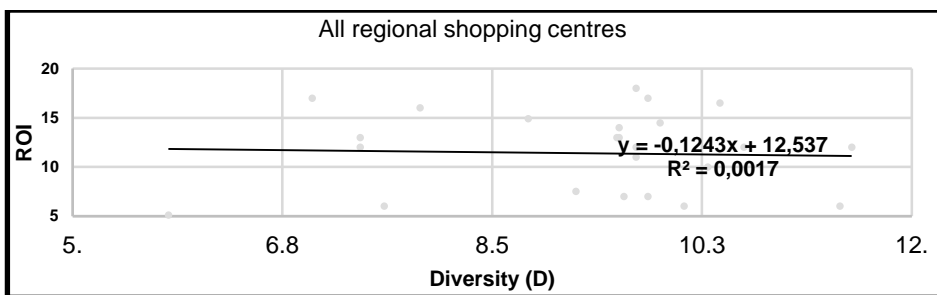


Figure 4: Correlation between return on investment and diversity in South African regional shopping centre: One-year (2018)

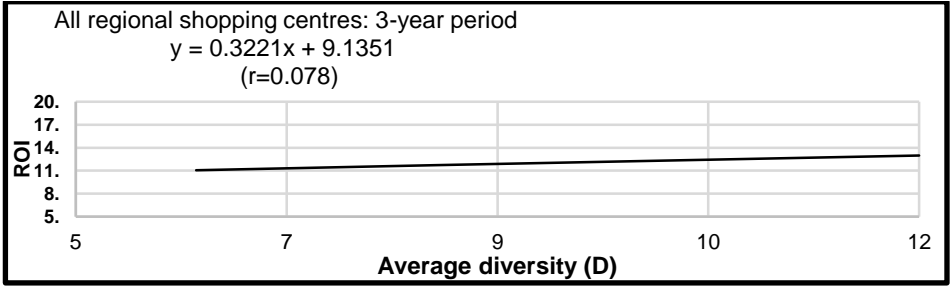


Figure 5: Correlation between return on investment and tenant diversity (D) in South African regional shopping centres: Three-year period (2015-2017)

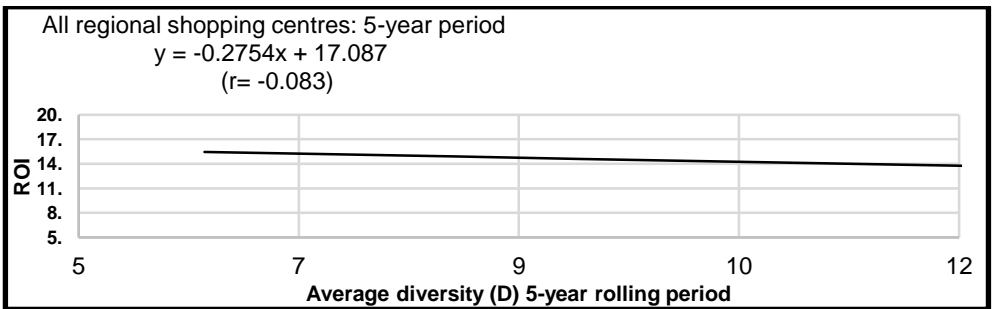


Figure 6: Correlation between return on investment and tenant diversity (D) in South African regional shopping centres: Five-year period (2013-2017).

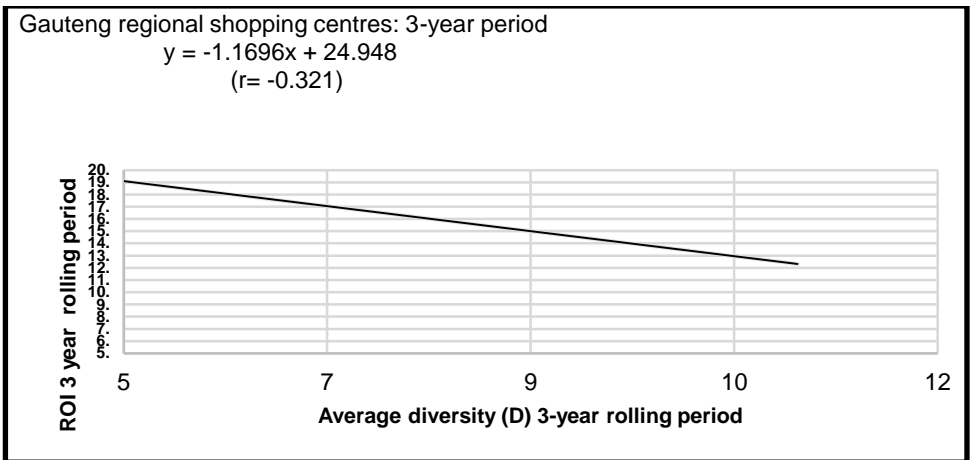


Figure 7: Linear regression line of the correlation between return on investment and tenant diversity (D) in Gauteng regional shopping centres: Three-year period, 2015-2017 (Correlation based on confidential MSCI data).

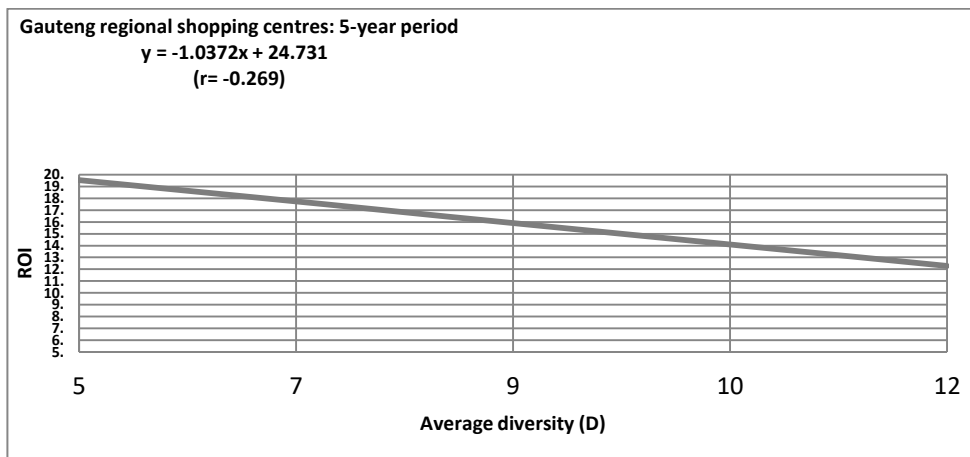


Figure 8: Correlation between return on investment and tenant diversity (D) in Gauteng Regional shopping centres: Five-year period (2013-2017).

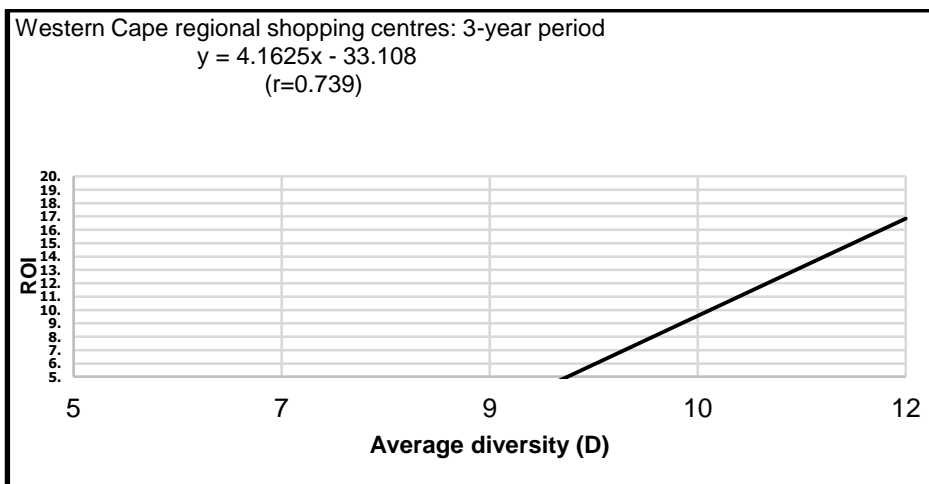


Figure 9: Correlation between return on investment and tenant diversity (D) in Western Cape regional shopping centres: Three-year period (2015-2017).

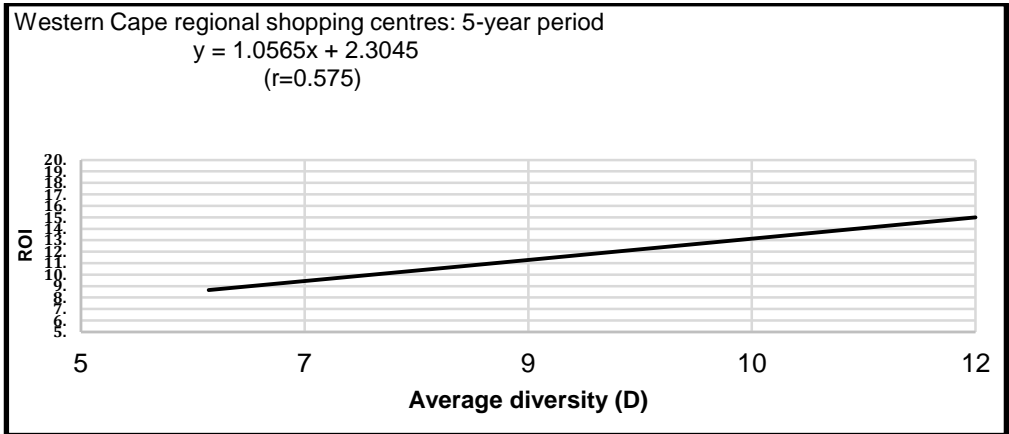


Figure 10: Correlation between return on investment and tenant diversity (D) in Western Cape regional shopping centres: Five-year period (2013-2017).

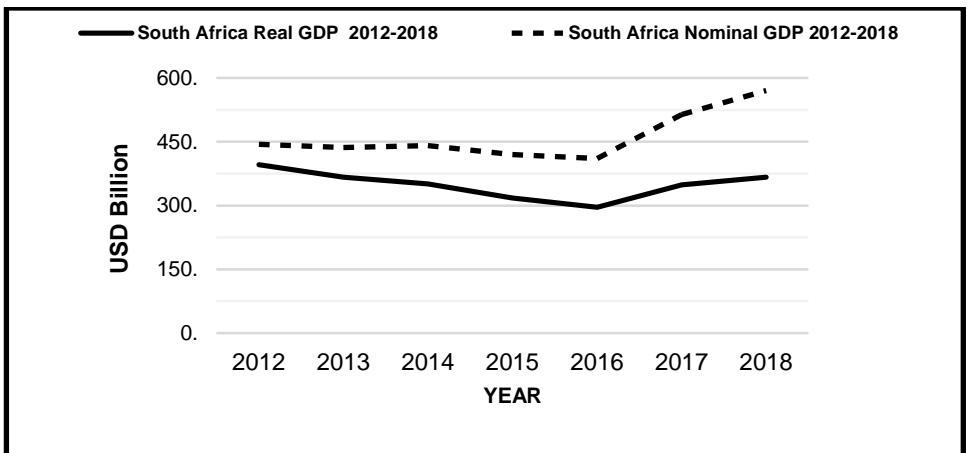


Figure 11: South African real and nominal GDP (2012-2018). Source: World Bank, 2019

The difference in results between Gauteng and the Western Cape may possibly be attributed to two factors. First, as shown in Table 4, Gauteng has a higher number of shopping centres per square kilometre than the Western Cape. This could mean that, in Gauteng, consumers have a wider range of accessible shopping centres to choose from to satisfy their different needs. If one shopping centre does not have the required variety in its tenants, they can move on to the next shopping centre. It may be surmised that diversity is more important in areas where the

density of shopping centres is low. This is seen in the Western Cape, where the number of shopping centres per km² (0.0026 centres/km²) is much smaller than that of Gauteng (0.0427 centres /km²) (Table 4). In the Western Cape, the relationship between diversity and the return on investment is much stronger, possibly because shopping centres in the province are dependent on better diversity to satisfy the needs of their customers. This hypothesis should be tested in future research.

A second, related, aspect to consider is the difference in the population density of these two provinces. Gauteng has a population density of 809.6 people per km², while Western Cape has a much lower population density of 51.1 people per km² (Table 5). This implies that the view of a single shopper matters more in the Western Cape. This means that a specific shopping centre in the Western Cape would attract more shoppers if it had a wider diversity of tenants. In Gauteng, because there are more people per km², there would be a relatively poorer relationship between the return on investment and the diversity: more people would visit a shopping centre because of the convenience factor and in spite of the relative paucity of diverse retail categories in that specific centre.

Table 4: Number of shopping centres per province in South Africa, (Source: SACSC, 2018)

Provinces (South Africa)	Number of shopping centres	Total GLA per Province (m ²)	Number of shopping centres per Km ²
Eastern Cape	116	1 432 123.3	0.0007
Free State	78	872 010.3	0.0006
Gauteng	777	10 838 143.8	0.0427
Kwa-Zulu Natal	284	3 336 686.4	0.0030
Limpopo	124	1 350 430.3	0.0010
Mpumalanga	120	1 579 793.0	0.0016
North West	95	1 093 892.2	0.0009
Northern Cape	35	274 351.9	0.0001
Western Cape	337	3 622 555.1	0.0026
TOTAL	1966	24 399 986.3	Average=0.0059

Table 5: Population density per province in South Africa, (Source: SAMI, 2019)

Province	Population	Size of province (km ²)	Population density
Western Cape	6 621 103	129 462	51.1
Eastern Cape	6 522 734	168 966	38.6
Northern Cape	1 225 555	372 889	3.3
Free State	2 954 348	129 825	22.8
Kwazulu-Natal	11 384 722	94 361	120.7
North West	3 978 955	104 882	37.9
Gauteng	14 717 040	18 178	809.6
Mpumalanga	4 523 874	76 495	59.1
Limpopo	5 797 275	125 755	46.1
TOTAL	57 725 606	1 220 813	Average: 47.28

5. Discussion

The correlation between tenant diversity and the ROI of regional centres in Gauteng differed appreciably from that of the Western Cape. An explanation for this anomaly may be found in the fact that the population density as well as the number of shopping centres per person are much lower in the Western Cape than in Gauteng. This implies that a shopper in the Western Cape does not have the same freedom to frequent different shopping centres as does the shopper in Gauteng. The availability of more diverse tenants in a specific centre would possibly play a bigger role than in a situation where diverse tenants may be found in different centres that are all within reach of the shopper.

It should be noted that the preceding analysis was carried out for tenant mix diversity only. This is analogous to trying to ascribe the survival of an organism to a single factor. Findlay and Sparks (2010) note that most definitions of retail property consider the quality of service,

range and types of goods, but caution that aspects such as scale, organisational and operational management also need to be considered when defining retail diversity. Definitions that are over-simplistic and focus on a single aspect are flawed as factors that contribute to diversity differ from one shopping centre to the next because retail diversity is situational. However, determination of the tenant mix is a first step in an attempt to characterise the diversity of shopping centres.

An additional consideration is whether ROI is the best indicator of the success of a centre. The survival of the centre over a long period of time may possibly be a better indicator, as it normally reflects that the net income generated by the centre has been sustainable. Lack of comparable data, however, precludes such a comparison.

6. Conclusion

The objective of this research was to investigate whether a relationship between return on investment and the tenant diversity of shopping centres could be quantified. The Simpson indices were used to calculate the diversity in tenant mix for 10 super-regional shopping centres and 50 regional shopping centres in South Africa.

Regression analyses were performed over one-, three-, and five-year periods for representative samples of both regional and super-regional shopping centres. In super-regional shopping centres, there was a weak positive correlation between total return and diversity for all three periods. This means a linear relationship does not exist between tenant diversity and return on investment in South African super-regional shopping centres. The performances of individual super-regional and regional shopping centres may vary significantly because they are subject to different growth drivers and characteristics.

A regression analysis was performed for all regional shopping centres in South Africa as well as for regional centres in Gauteng and the Western Cape, respectively. On average, regional shopping centres exhibited a weak linear relationship between ROI and tenant diversity. In Gauteng regional centres, there was a negative correlation between total return and diversity for both the three-year period and the five-year period. In the Western Cape, the benefit of encouraging a higher diversity was shown by the positive correlation between total return and diversity for both the three-year and five-year periods.

An analysis of the country's population density, real GDP and nominal GDP provided a possible explanation of the differences between the results for regional shopping centres in Gauteng and the Western Cape, respectively. The obtained results show that tenant diversity is more important in areas that have low population density. Tenant diversity is also important in areas that have low ratio of shopping centres per square kilometre. Diversity in tenant mix should still be encouraged because it translates to improved trading and investment performance, which then contributes to the long-term sustainability of shopping centres. The benefit of encouraging a higher tenant mix is seen with centres that can withstand changes over time because of an increase in adaptability.

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