FINANCIAL SUSTAINABILITY AND PROFITABILITY OF HIGH PERFORMANCE TRAINING CENTRES

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ABSTRACT

High Performance Centres (HPCs) in South Africa are seen as a fairly new discipline, although these centres have been in operation internationally for much longer. In the South African SPORT context, the Sport Science Institute of South Africa (SSISA) opened its door in 1995, being the first of its kind in South Africa. Furthermore, universities in South Africa are under immense pressure to be self-sustainable and to rely less on government funding and generate more third-stream revenues. University HPCs are seen as strategic assets to the university, but generally do not receive continuous direct funding from the universities. The onus rest on these HPCs to be sustainable and even profitable, with retained earnings being used for capital improvements and additions, as well as general operational expenses of the centres. The aim of this research is to establish whether commercial, private, government-operated and university HPCs can be financially sustainable and profitable. To reach the aim, variance analyses were completed of the financial ratios of university HPCs compared to non-university (consisting of commercial and government-supported centres) HPCs, as well as between HPCs in the Northern compared to the Southern Hemisphere.

***Keywords*:** High Performance Centre; University; University Sport; Profitability; Financial Sustainability; Financial Ratios.

INTRODUCTION

In the professional era of sport as well as the emergence of sports management and sports science as independent disciplines, it has become increasingly important to manage sport on the basis of sound commercial business principles (Bester, 2011), with profitability being the key driver of any commercial business.

Already in 2012, the South African Sports Confederation and Olympic Committee (SASCOC) released a Strategic Framework for Sport Academies, in which it was proposed that South African universities act as district academies of sport, where services should be provided to athletes free of charge (SASCOC, 2012). The SASCOC president, Mr Gideon Sam, further emphasised this by stating that the Operation Excellence (OPEX) programme should be replaced by South African universities (Kok, 2015). These proposals place additional pressure on university High Performance Centres (HPCs) to be sustainable and profitable, without these additional government source of income.

As a result of the situational factors described above, there has been a wider interest in establishing ways in which university sports codes and HPCs can improve their indirect

financial contributions to the university environment. It is generally accepted that financial ratios are used to measure the financial success of organisations. This research reviewed the financial data and ratios of university HPCs, compared with the financial ratios of government-supported and commercial HPCs, to establish whether the centres can be financially sustainable and profitable. The study also investigated the primary goals, roles and objectives of these HPCs within university, national and international sports structures. It concludes with the proposal of a business framework that may enhance the probability of HPCs being financially sustainable and profitable. Previous studies have failed to address these issues and focused more on policy-level decisions (De Bosscher *et al.,* 2010).

From a national sport funding and government support perspective, Sotiriadou (2009) reported that national sports federations (NSFs) in Australia need to be less dependent on funding received from the Australian Sports Commission (ASC) and rather increase their relationships with key stakeholders to improve the allocation of financial resources from other sources. These stakeholders can, and should, include universities. Universities already have the necessary sports infrastructures in place to accommodate university sports and, in most cases, enjoy mass participation through organised recreational activities. More recently, Bostock *et al.* (2017:25) stated that United Kingdom (UK) sports funding cuts to national governing bodies of sport, triggered a cyclical need for turnaround management strategies. According to Escoda (2018), HPCs in Spain are receiving up to 70% less funding from the Spanish federal government compared to before the 2012 London Olympic Games.

In South Africa, the National Lotteries Commission announced that the maximum grants awarded to NSFs would be R5 million per year. For provincial sports federations, the maximum amount would be R2.5 million per year (NLC, 2018). The evidence discussed above indicates that sporting federations would have to rely less and less on government funding. In both the African and South African contexts, universities can collaborate or partner with NSFs and provincial sports federations to achieve sporting success. A key question that remains unanswered thus far is where (and from whom) universities receive their funding and whether these HPCs can be financially sustainable and profitable.

HPCs are mostly seen as a support service to the sport environments as a cost centre (SUSPI, 2014), without much emphasis on commercialisation or profitability. In saying this, HPCs still have to apply most of the same business operations and functions as a commercial facility (Berrett & Slack, 2001). There are still sales and marketing functions, financial statements have to be drawn up and analysed and, in some instances, investors, or shareholders, need to see a return on their investments.

Globally, greater emphasis has been placed on the commercialisation of university sport that also includes the commercialisation of support services, such as HPCs. The aim of the commercialisation of university sport and other support services is to generate additional revenues by providing various products and services that can also include event hosting, hospitality and the provision of consultancy services, mainly sports scientific testing and programme prescription. For example, Loughborough University (2015) provides strength and conditioning sessions, sports science consultancy services and programmes at their high-performance gymnasium on campus. Similarly, the facilities at the University of Bath (2015) are also open for public use, thus increasing revenue streams from non-university (student and student-athletes) sources. In general, university HPC need to increase the scope of revenue sources to ensure that the centres are sustainable and even profitable in the long run.

PURPOSE OF RESEARCH

HPCs are a fairly new phenomenon and the field of sports science is a very new discipline that needs to be explored and researched further. As mentioned, it was only in the mid- to late 1980s that sports management and sports science became recognised tertiary qualifications (Massengale & Swanson, 1997). Further research is needed to determine whether HPCs are commercially feasible as independent business units at the various universities, particularly at South African tertiary institutions.

The aim of this research was to establish whether university HPCs can be sustainable and profitable within a tertiary institution environment. A comparison was drawn between the business practices and financial data of private commercial facilities and government-funded facilities, compared to university HPCs.

LITERATURE REVIEW

The primary objective of the research study was to investigate and determine the financial feasibility, sustainability and profitability of HPCs, in particular at tertiary institutions in South Africa. The key simple financial ratios of participating centres were analysed and compared, specifically between the results and findings of university HPCs, privately owned HPCs, those centres funded by local and/or national government sources in South Africa and selected countries internationally. Key financial concepts and ratios need to be defined to critically compare the financial positions of HPCs.

Financial ratios are often used to measure the success of an organisation compared to previous years (trend analysis) and/or to measure the financial performance of an organisation compared to other organisations within the same industry (comparative analysis). Musallam (2018) states that financial ratios are one of the most commonly used tools to measure the performance of an organisation. A combination of ratios is used from both the income statement and the balance sheet to give an accurate picture of the financial performance of an organisation. These financial ratios are seen as the simplest mathematical expression of two magnitudes that are expressed in relation to each other (Jacobs, 2001). The use of financial ratios is still seen as the traditional approach to measure financial performance and to predict the future financial position of the organisation.

According to Gitman (2003), financial ratio analysis involves methods of calculating and interpreting financial ratios to analyse the financial performance of an organisation. Ismaila (2011) further points out that financial ratio analysis is a fairly general technique based on relatively standard methods to analyse the financial position of an organisation. Although organisations measure their respective financial performances differently these days, the use of financial ratios is still seen as the traditional approach to measure financial performance and to predict the future financial position of an organisation. Malayawan (2015:21) states that financial ratios are used to predict the future state of an organisation and can possibly serve as good indicators to predict bankruptcy. Davidson *et al.* (2007) concluded that financial ratios are identified as a summary of measures of organisational effectiveness and are used for all kinds of purposes, including:

- Determining the ability of an organisation to repay its debt;
- Evaluation of business success; and
- Statutory regulation of an organisation's performance.

PURPOSE OF STUDY

For the purpose of this study, a profit creation rather than wealth maximisation approach was followed, hence the narrow focus on profitability ratios. Ratios, rather than absolute values, are used to control the effect of the size of an organisation on its financial performance. Delen *et al.* (2013:3971) found that financial ratios provide the following benefits to an organisation:

- Financial ratios provide an effective tool to measure the performance of managers for rewards (incentives);
- Financial ratios are used to measure the performance of departments in multi-level organisations;
- Financial ratio analysis can project the future by critically analysing historical information;
- Creditors and suppliers can use financial ratios to gain insight into the overall financial performance of an organisation;
- Ratios are used to evaluate the competitiveness of rivals by comparing the ratios between businesses in the same industry;
- Financial ratios provide critical information that is used to evaluate the financial performance of acquisitions;
- Historical financial ratios are used as predictors for future performance.

Delen *et al*. (2013:3971) further comment that authors have varying opinions on how many financial ratios are sufficient to predict the future success of an organisation. The suggested number of ratios ranges from 48 ratios listed by Gombola and Ketz (1983), 59 ratios listed by Ho and Wu (2006), 24 ratios listed by Karaca and Çigdem (2012) to only 15 ratios suggested by Uyar and Okumus (2010). It is clear from this evidence that authors do not agree on which ratios are critical to predict financial success, nor on how many ratios are needed to predict the future success of the organisation. Table 1 summarises the simple financial ratios used in this study.

Table 1. **SUMMARY OF FINANCIAL RATIOS USED IN STUDY**

Ratio	Formula	References
Gross profit margin	Gross profit / total sales (revenues)	Fabozzi *et al.* (2008); Marshall *et al.* (2004)
Net profit margin	Net profit / total sales (revenues)	Karabag & Berggren (2014); Musallam (2018)
Return on assets (ROA)	ROA = net profit / total assets	Jele (2015)
Return on equity (ROE)	Net Income/equity	Marshall *et al.* (2004)
Current asset turnover ratio	$\dfrac{total\ Income}{current\ assets}$	Ertuğrul & Karakaşoğlu (2009)
Debt ratio	Total liabilities / total assets	Ertuğrul & Karakaşoğlu (2009) Hough *et al.* (2011)
Current ratio	Current assets / current liabilities	Mukherjee & Roy (2015)

Resource: Researcher's compilation

METHODOLOGY

The first phase in the research process was the collection of quantitative data through a questionnaire consisting of 31 questions.

The questionnaire included a variety of questions, including close-ended Likert scale questions and open-ended questions. The second step involved semi-structured interviews with those initial participants who indicated their willingness to participate in an interview, after completing the online questionnaire. The mixed-method approach was chosen to cross-validate and corroborate the research findings. This mixed-method research design approach is displayed in Figure 1.
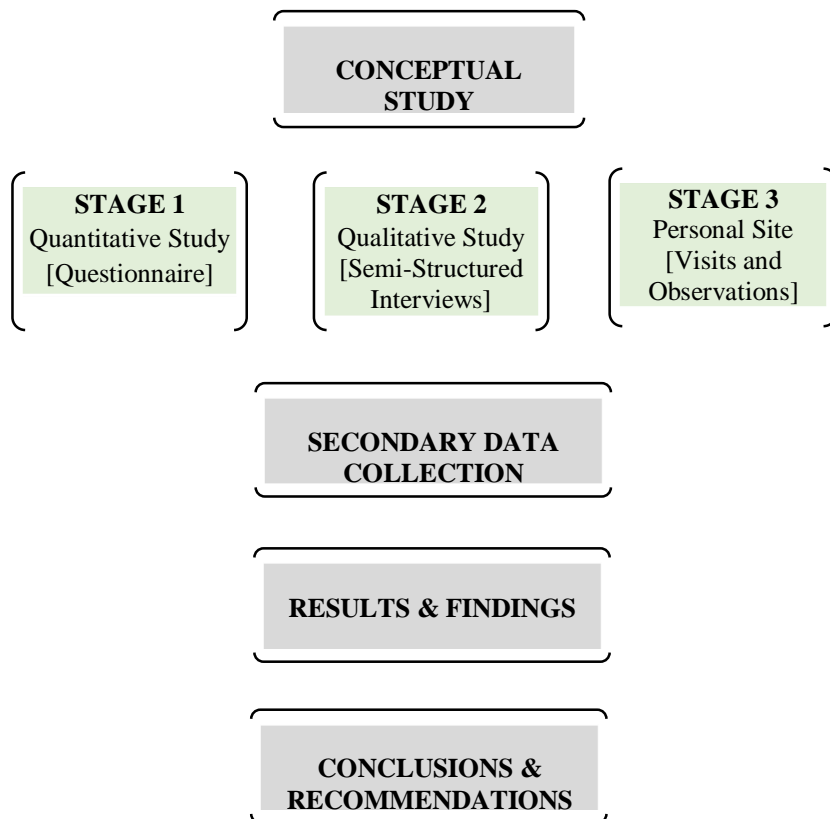
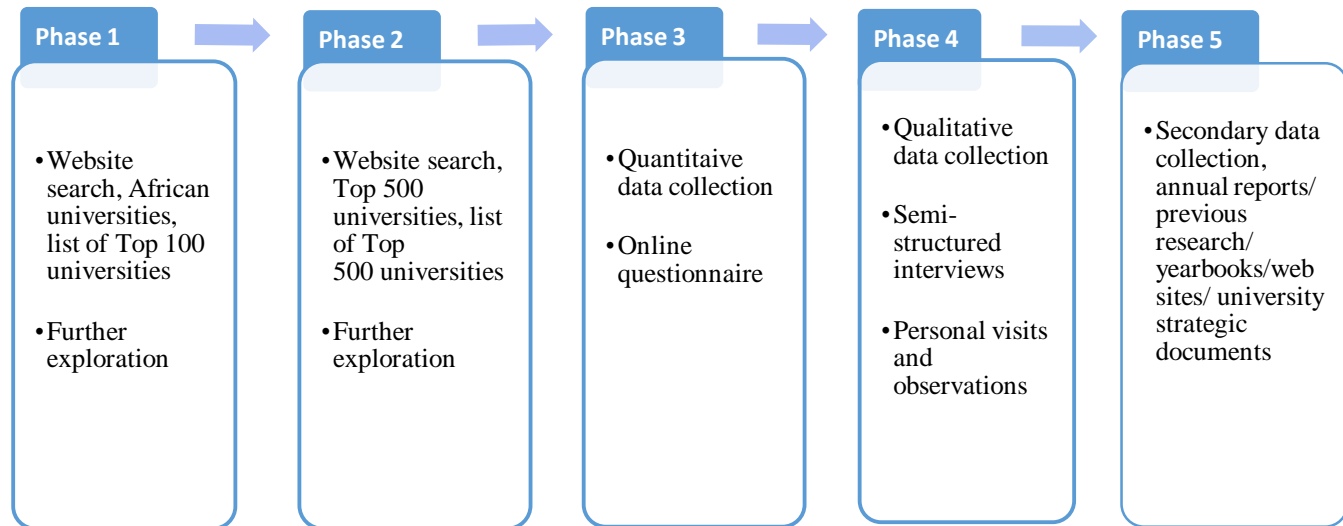*Figure 1.*   **RESEARCH DESIGN APPROACH**

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
• Website search, African universities, list of Top 100 universities • Further exploration	• Website search, Top 500 universities, list of Top 500 universities • Further exploration	• Quantitaive data collection • Online questionnaire	• Qualitative data collection • Semi-structured interviews • Personal visits and observations	• Secondary data collection, annual reports/ previous research/ yearbooks/web sites/ university strategic documents

Figure 2.   **PROCESS OF COLLECTING PRIMARY AND SECONDARY DATA**

The primary data were collected by making use of an online questionnaire that was distributed to HPCs by means of an e-mail link via Checkbox®. Semi-structured interviews were conducted with those centres that had agreed to further exploratory research, in person, telephonically or via Skype. Lastly, the researcher personally visited various centres to conduct these interviews and for general observation.

Secondary data involve the collection of mostly quantitative data (Mouton, 2008:164). Secondary data were collected from government publications, HPC websites, university annual reports, previous research relating to HPCs and other university strategic documents, where available. The data-collection process is displayed in Figure 2. This research project was exploratory and descriptive, as the primary and secondary objectives did not focus on the influence of one variable on another, but rather on the *what, when* and *how much.* Ultimately, the purpose of this research was to explore the financial sustainability and profitability of HPCs and to present a framework for future testing.

The study site for this research study was the Association of Sport Performance Centres (ASPC), as well as HPCs at selected universities. The ASPC was formed in 1999 with the purpose of sharing knowledge and experiences that would ultimately benefit the centres and the athletes attending the centres. In 2017, the association had 65 centre members and 8 individual members, totalling 73 members (ASPC, 2017). The study aimed to test the following two hypotheses:

1. To test for any statistically significant variances between the financial ratios of university compared to non-university (government-supported and commercial)

   H_0: There is no statistically significant variance between the financial ratios of university HPCs compared to the financial ratios of non-university HPCs.

   H_1: There is a statistically significant variance between the financial ratios of university HPCs compared to the financial ratios of non-university HPCs.

2. To test for any statistically significant variances between the financial ratios of HPCs in the Northern Hemisphere compared to HPCs in the Southern Hemisphere.

   H_0: There is no statistically significant variance between the financial ratios of Southern Hemisphere HPCs compared to the financial ratios of Northern Hemisphere HPCs.

   H_1: There is a statistically significant variance between the financial ratios of Southern Hemisphere HPCs compared to the financial ratios of Northern Hemisphere HPCs.

Ethical considerations

Ethical clearance application was submitted, in accordance with the Unisa Policy on Research Ethics to the UNISA Department of Business Management on 22 June 2016. Ethical clearance was granted on 24 June 2016 and allocated the reference number: UNISA 2016_CEMS_BM-048. The study formed part of a postgraduate qualification.

Analysis of data

For this study, Spearman correlation analysis was used to test the relationship between various variables. The formula of the Spearman correlation test is as follows (Mancosa, 2010:173):

$$r_s = 1 - \frac{6\sum d^2}{n(n^2 - 1)}$$

Where:

r_s = rank correlation coeffient

n = number of pairs of data

d = difference between ranks for the two observations within a pair

Correlations were calculated between the following two variables: Gross profit margin and Net profit margin.

Hereafter, a two-tailed analysis of variance (ANOVA) was completed on the statistical data gathered from the HPCs. The ANOVA test is applied when comparing three or more population means simultaneously. To use the ANOVA test, the following is assumed (Lind *et al.*, 2008:412):

- All the populations tested follow a normal distribution;
- Populations have equal standard deviations;
- Populations are independent.

The aim of this test was to determine whether any significant variances exist between centres in the Northern and Southern hemispheres, as well as to determine whether there are statistically significant variances between the data collected from university HPCs and the rest of the responding HPCs (comprising of both commercial and government-supported centres). The ANOVA test consisted of both fixed-effect tests and testing for least significant difference (LSD).

Variances of the following variables were calculated: Gross profit margin; Net profit margin; Current ratio; Debt ratio; ROA; ROE; and Current asset turnover ratio.

RESULTS

A Spearman correlation test was done to determine whether there were significant variances between the overall gross profits and net profits of all the centres for 2014, 2015 and 2016. The results of this test are displayed in Table 2.

Table 2. **SPEARMAN CORRELATION TEST: NET PROFIT VS. GROSS PROFIT 2014–2016**

Variable 1	Variable 2	Spearman	Spearman p-value	Number of cases (n)
2014 gross profit	2014 net profit	0.87	<0.01	18
2015 gross profit	2015 net profit	0.25	0.32	18
2016 gross profit	2016 net profit	0.48	0.03	20

Table 3 indicates that there was a significant difference (p<0.01) between the gross profits and the net profit of all centres in 2014 and, to a lesser extent, in 2016. There was no real statistical difference between the gross and net profits in 2015 (p=0.32).

Table 3. SUMMARY OF HYPOTHESIS TESTING OF FINANCIAL RATIO ANALYSIS BETWEEN UNIVERSITY AND NON-UNIVERSITY HPCS

H_0	H_1	Variable	p-Value	Accepted/ Rejected
No statistically significant variance between university and non-university HPCs	A statistically significant variance between university and non-university HPCs	Total income	0.03	H_0 rejected
No statistically significant variance between university and non-university HPCs	A statistically significant variance between university and non-university HPCs	Gross profit margin	0.83	H_0 accepted
No statistically significant variance between university and non-university HPCs	A statistically significant variance between university and non-university HPCs	Net profit margin	0.63	H_0 accepted
No statistically significant variance between university and non-university HPCs	A statistically significant variance between university and non-university HPCs	ROA	0.85	H_0 accepted H_0 rejected * year
No statistically significant variance between university and non-university HPCs	A statistically significant variance between university and non-university HPCs	Current ratio	0.16	H_0 accepted
No statistically significant variance between university and non-university HPCs	A statistically significant variance between university and non-university HPCs	Debt ratio	0.10	H_0 accepted
No statistically significant variance between university and non-university HPCs	A statistically significant variance between university and non-university HPCs	Current asset turn-over ratio	0.15	H_0 accepted
No statistically significant variance between university and non-university HPCs	A statistically significant variance between university and non-university HPCs	ROE	0.10	H_0 accepted

A two-tailed ANOVA was completed (using SPSS) to test for any statistically significant variances in terms of the following:

- The mean averages of university HPCs were compared to the mean averages of non-university HPCs. The period of 2014–2016 was ignored.
- A statistical test across all three years (2014–2016) was completed for all of the centres. The fact that certain centres are university HPCs was ignored in this analysis.
- A final test was done on a combination of the two variables set out above.

University HPCs, in this case, refer to any centre that has received any form of funding from university financial sources. 'Non-university' centres, in this case, refer to all centres that have not received any form of funding or financial support from universities. The p-values were calculated in all cases. The null hypothesis was rejected at a 5% significance level, meaning that a p-value of more than 0.05 indicates that there were no significant variances between the results of the two variables tested. A p-value of less than 0.05 indicates a significant difference between the two values tested. The analyses are detailed in the sections to follow (Table 3 & Table 4).

***Table 4*. SUMMARY OF HYPOTHESIS TESTING OF FINANCIAL RATIO ANALYSIS BETWEEN HPCS IN SOUTHERN AND NORTHERN HEMISPHERE**

H_0	H_1	Variable	p-Value	Accepted/ Rejected
No statistically significant variance between HPCs in Southern and Northern Hemisphere	A statistically significant variance between HPCs in Southern and Northern Hemisphere	Total income	0.33	**H_0 accepted**
No statistically significant variance between HPCs in Southern and Northern Hemisphere	A statistically significant variance between HPCs in Southern and Northern Hemisphere	Gross profit margin	0.78	**H_0 accepted**
No statistically significant variance between HPCs in Southern and Northern Hemisphere	A statistically significant variance between HPCs in Southern and Northern Hemisphere	Net profit margin	0.77	**H_0 accepted**
No statistically significant variance between HPCs in Southern and Northern Hemisphere	A statistically significant variance between HPCs in Southern and Northern Hemisphere	ROA	0.64	**H_0 accepted**
No statistically significant variance between HPCs in Southern and Northern Hemisphere	A statistically significant variance between HPCs in Southern and Northern Hemisphere	Current ratio	0.87	**H_0 accepted**
No statistically significant variance between HPCs in Southern and Northern Hemisphere	A statistically significant variance between HPCs in Southern and Northern Hemisphere	Debt ratio	0.87	**H_0 accepted** **H_0 rejected * year**
No statistically significant variance between HPCs in Southern and Northern Hemisphere	A statistically significant variance between HPCs in Southern and Northern Hemisphere	Current asset turnover ratio	0.21	**H_0 accepted**
No statistically significant variance between HPCs in Southern and Northern Hemisphere	A statistically significant variance between HPCs in Southern and Northern Hemisphere	ROE	0.20	**H_0 accepted**

ROA = Return on assets; ROE = Retrun on equity

DISCUSSION AND CONCLUSIONS

Financial feasibility studies, prior to the opening of HPCs, do not seem to be the norm and it gives the impression that it does not really matter whether they are profitable or not. HPCs receive substantial ongoing funding primarily from three sources: provincial and/or national governments, university strategic funding and, to a lesser degree, private sectors through direct investments. Therefore, the majority of HPCs had not done a feasibility study prior to the centres opening. The fact that HPCs receive little direct funding from investors, could indicate that there is a low expectation of a return on investment from a shareholder perspective. When start-up funding and money for operating expenses are received from governments, there is a lower or reduced drive towards commerciality and profitability. Rather, the focus is shifted towards the effective management of allocated budgets.

Even more important, university HPCs showed positive gross and net profits. Revenues are derived from a variety of different target markets throughout the year, and indirect financial support is received from the university to ensure the sustainability of the centre. The indirect financial support includes the universities not charging the HPCs a facility rental and the HPCs not being liable for any utility bills (water and electricity bills, for example).

Those centres with higher sales and marketing budgets as well as formal sales and marketing strategies have a higher income derived from a variety of different target markets, including students, athletes and the public, compared to those centres that rely on continuous financial support from government sources. In saying that, higher income does not always result in higher gross and net profit margins. The gross and net profits may vary depending on the operational expenses of the centres. Centres with a higher income may typically have higher operating costs. The gross profits of the responding HPCs varied substantially. Centres showed high gross profits, but there are also centres that showed significant losses per year. The same can be said about the net profits of the centres. It seems that some of the centres are extremely profitable, but there are also centres that suffer substantial net losses every year.

Furthermore, HPCs do not agree on the financial feasibility and profitability of the centres. The majority of HPCs, through self-assessment, felt that the centres cannot be profitable, yet they see the centres as sustainable. The source of the perception of the sustainability of the centres is seen in the fact that HPCs are continuously financially supported by governments and universities. HPCs differ worldwide and there seems to be no consistent objective to make a profit, or profit does not seem to matter, to many of the HPCs. At centres where funding is received from national governments to sustain operations, there is no drive towards profitability, with centres indicating that they are in fact not supposed to be profitable. Being profitable would imply that the centres have not adequately spent the funds allocated to them. Governments fund these centres only according to the number of athletes that are sent to the centres by the various NSFs. Overall, at government-supported centres, it is not an expectation to generate money in addition to the financial support received from governments.

In conclusion, is was evident from the research that centres that derive revenues from a variety of sources tend to be more sustainable. Universities, in general, only operates at full capacity for around 9 to 10 months of the year. During the university recess periods, student and student-athletes are also not making use of the centres, decreasing both usage numbers and potentially also revenues. The university can be compensated for this by deriving revenues from additional sources, such as public membership revenues and consultancy services in a variety of sport industries. Furthermore, those centres providing accommodation and food services also appear to be more sustainable. Although the initial capital investment is high due

to the cost of construction, it seems that the revenues and margins are very healthy, compared to membership revenues only.

Net income variance analysis

A statistically significant variance was found in the total income of non-university HPCs between 2014 and 2015 (p-value of 0.01), as well as between 2015 and 2016 (p-value of 0.04). In contrast, no statistically significant variances were found in the total income of university HPCs for the same period. A possible explanation is the fact that governments usually inject more money into the preparation of athletes in the two years prior to an Olympic Games. The Olympic Games in Rio de Janeiro were held in 2016. The total income of university HPCs remained consistent, as these HPCs do not benefit from the increased financial support that other HPCs receive. Whether the HPCs that may have received additional government funding leading up to Olympic Games are in the Northern or Southern hemispheres had no effect on the statistical variance analysis.

Gross profit margin variance analysis

No statistically significant variances showed in the gross profit margins of university HPCs, compared to non-university HPCs, for all three years from 2014 to 2016. The same result was seen in the statistical variance analysis of the gross profit margins of HPCs in the Northern and Southern hemispheres. It is concluded that all HPCs, irrespective of whether these centres are affiliated to universities, commercially driven or government-supported, can show positive gross profit margins. Whether the centres are in the Northern or Southern hemispheres held no influence on the ability of the centres to show positive gross profits.

Net profit margin variance analysis

Furthermore, no statistically significant variances showed in the net profit margins of university HPCs, compared to non-university HPCs, for all three years (2014–2016). The same was seen in the statistical variance analysis of the net profit margins of HPCs in the Northern and Southern hemispheres. It is concluded that all HPCs, irrespective of whether these centres are affiliated to universities, commercially driven or government-supported, can show positive net profit margins. Whether the centres are in the Northern or Southern hemispheres held no influence on the ability of the centres to show positive net profits.

ROA variance analysis

No statistically significant variances showed in the ROA margins of university HPCs, compared to non-university HPCs, for all three years from 2014 to 2016. The same result was seen in the statistical variance analysis of the ROA margins of HPCs in the Northern and Southern hemispheres. It is concluded that all HPCs, irrespective of whether these centres are affiliated to universities, commercially driven or government-supported, can show positive ROA margins. Whether the centres are in the Northern or Southern hemispheres had no effect on the ability of the centres to show positive ROA margins.

Current ratio variance analysis

No statistically significant variances showed in the current ratio variance analysis of university HPCs, compared to non-university HPCs, for all three years from 2014 to 2016. The same was

seen in the statistical variance analysis of the current ratios of HPCs in the Northern and Southern hemispheres. It is concluded that all HPCs, irrespective of whether these centres are affiliated to universities, commercially driven or government-supported, can show a positive current ratio. Whether the centres are in the Northern or Southern hemispheres held no influence on the ability of the centres to show a positive current ratio.

Debt ratio variance analysis

No statistically significant variances showed in the debt ratio variance analysis of university HPCs, compared to the debt ratios of non-university HPCs, for all three years from 2014 to 2016 combined. The same was seen in the statistical variance analysis of the debt ratios of HPCs in the Northern and Southern hemispheres for all three years from 2014 to 2016 combined.

However, the statistical variance analysis test between the debt ratios of university and non-university HPCs for the years alone (ignoring whether the centres are university or non-university of in the Northern or Southern hemispheres) showed a statistically significant variance (p-values of 0.01) in the debt ratios of university HPCs from 2014 to 2016, and from 2015 to 2016. Further statistically significant variances showed in the debt ratios of centres in the Northern and Southern hemispheres between 2014 and 2016, as well as 2015 and 2016. The exact reason for such a variation is inconclusive but may be attributed to the fact that university HPCs opt to lease equipment directly from the suppliers, and these centres are mostly in the Southern Hemisphere.

Current asset turnover variance analysis

No statistically significant variances showed in the current asset turnover ratio variance analysis of university HPCs, compared to the current asset turnover ratios of the non-university HPCs, for all three years from 2014 to 2016. The same was seen in the statistical variance analysis of the current asset turnover ratios of HPCs in the Northern and Southern hemispheres. It is concluded that all HPCs, irrespective of whether these centres are affiliated to universities, commercially driven or government-supported, can show a positive current asset turnover ratio. Whether the centres are in the Northern or Southern hemispheres held no influence on the ability of an HPC to show a positive current asset turnover ratio.

ROE variance analysis

No statistically significant variances showed in the ROE margins of university HPCs, compared to the ROE ratios of non-university HPCs, for all three years from 2014 to 2016. The same was seen in the statistical variance analysis of the ROE margins of HPCs in the Northern and Southern hemispheres. It is concluded that all HPCs, irrespective of whether these centres are affiliated to universities, commercially driven or government-supported, can show positive ROE margins. Whether the centres are in the Northern or Southern hemispheres held no influence on the ability of the centres to show positive ROE margins.

LIMITATIONS

This research study has offered a full evaluative perspective of the financial sustainability and profitability of HPCs. A comprehensive analysis was completed on the financial ratios of various HPCs, whether affiliated to universities, commercially operated or supported by

national governments. The study encountered several limitations in methodology that need to be considered for future studies on the financial sustainability and profitability of HPCs:

HPCs rarely publish or disclose annual financial results, even in official university publications. As a result, there was hesitance from some of the centres to provide the requested financial information to complete the financial ratio analysis. These centres were not included in the financial ratio analysis, but the rest of the information obtained through the research instruments (that excluded financial information) was included in this study.

The participants indicated a general inaccessibility to specific financial information due to the above-mentioned lack of HPCs' responsibility to disclose financial results. In some cases, the financial results of the HPCs are embedded in the overall financial results of the universities' sports environment. These centres were not included in this study.

A further limitation is seen in the vast differences in the overall goals and objectives of the various centres, as not all centres are commercially driven to be profitable. These centres are (sometimes entirely) funded by national governments with no commercial drive. The responsibility of these centres is restricted to managing budgets annually allocated to them and they primarily focus on athlete development. The results in the statistics could have been skewed as a result of this.

Jewell and Mankin (2011) researched 77 textbooks on the calculation of financial ratios and found that that there are very few authors who agree unanimously on the calculation of only a few financial ratios. The seven ratios selected to test for financial sustainability and profitability should not be seen as inclusive of all ratio analyses.

Language barriers may have contributed to the fact that not all the HPCs associated to the ASPC responded to the primary research instrument or the semi-structured interviews. These instruments were set in English and non-English-speaking nations (Germany, the Netherlands, Italy and Spain, in particular) struggled with the interpretation of some of the questions. These HPCs also could not express themselves in their mother tongue during the semi-structured interviews.

RECOMMENDATIONS

It is highly recommended that each aspiring HPC complete a detailed financial feasibility study prior to the centre opening. It is imperative that the feasibility study, once determined and approved, be followed by structured annual business plans. This is imperative given the high capital outlay required for the construction of the facility and the cost of specialised equipment.

Even though government-supported HPCs are not under any obligation to generate additional revenues other than funding received from governments, it makes commercial sense to drive additional revenues through sound sales and marketing strategies. This can be achieved through an extensive sales and marketing strategy. This standard business practice will ultimately increase the revenues of the centres and, coupled with conscious internal cost-saving efforts, enhance the overall likelihood of financial sustainability.

It is recommended that professionals that are specialists in the area of management, manage HPCs. Ex-athletes need to undergo extensive management training before taking up such positions within the HPC. HPCs need to follow normal business practices to enhance the probability of sustainability and profitability, and these practices need to be overseen by a professional management structure.

The assumption made by Bohlke (2017) that national governments are expected to be a financial resource provider to high-performance sports programmes and infrastructures, may

not be applicable to the South African and African environments. It is worth noting that the National Lotteries Commission does make some funding available to South African sport, but not to support services, such as HPCs. As also noted by De Bosscher *et al.* (2010), financial support is one of the key pillars of driving international sporting success. Without this ongoing funding, it will be difficult for South Africa to successfully compete at the highest international sport levels.

In addition, South Africa is faced with a growing number of socio-economic challenges that severely restrict the funding available for sport. R121 billion is distributed annually in the form of grants, which includes family and children grants (42%), old-age grants (41%), disability grants (16%) and social protection grants (1%). The total number of households in South Africa that have received any form of grant has increased from 29.9% in 2003 to 45.5% in 2015. Numerically, the number of households have increased from 4 million in 1994 to over 17.5 million in 2017.

The financial success of HPCs should not be dependent on the continuous financial support from NSFs, national and provincial governments, university strategic funding or donations. The financial success of the HPCs should be driven by sound business principles and organisational structures, similar to any other for-profit organisation. It is suggested, however, that the universities indirectly support the HPCs financially by providing both the human resource and financial management functions to the HPCs, and not charging the HPCs a full commercial facility rental.

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