THE USE OF CROWDFUNDING AS A SOURCE OF START-UP CAPITAL IN THE SOUTH AFRICAN AUTOMOTIVE SECTOR

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Abstract: The aim of study was to assess and evaluate the ability of SMMEs operating in the automotive industry of Gauteng Province to raise start-up capital by using crowdfunding. The study was conducted by collecting data from a stratified random sample of size n=378 automotive companies operating in the various parts of Gauteng Province. The study found that about 53% of the 378 respondents who took part in the study have used crowdfunding for raising start-up capital at least once in the past, whereas the remaining 47% of respondents did not do the same. About 47% of respondents have found crowdfunding to be helpful in some way as a means of raising start-up capital in the automotive industry of Gauteng Province. About 74% of respondents in the study were actual owners of their automotive companies. Only 7% of respondents were employed managers. About 47% of respondents were members of the Motor Industry Workshop Association (MIWA), whereas about 36% of respondents were members of the National Association of Automobile Manufacturers of South Africa (NAASP). About 36% of them were members of the South African Motor Body Repairers' Association (SAMBRA). About 17% of respondents had no membership. Results obtained from ordered logit analysis and Bayesian analysis showed that the practice of raising start-up capital by using crowd funding in the automotive industry of Gauteng Province was significantly influenced by 3 factors. These predictor variables were the province of main operation, difficulty in applying for a business loan, and inability to produce collateral needed for business loan applications, in a decreasing order of strength.

Key words: Crowd funding, Gauteng Province, Automotive industry, ordered logit analysis

JEL codes: B17, C51, F16, P36, Q41

Introduction and background to study

The aim of study was to assess and evaluate the ability of small, micro and medium-sized enterprises (SMMEs) operating in the automotive industry of Gauteng Province to raise start-up capital by using crowdfunding. The study aims to determine the extent to which finances are accessible to SMMEs operating in the automotive industry of Gauteng Province. Masondo (2018) and Luukkarienen, Teich, Wallenius and Wallenius (2016) have shown that about 34% of SMMEs operating in the automotive industry of Gauteng Province struggle to raise enough capital for new business ventures and expansion. The study places a special emphasis on the ability of emerging, Motor Industry Workshop Association (MIWA), SMMEs in the automotive industry of Gauteng Province to secure loans that are needed for business operation from commercial banks. The automotive sector is a key contributor to Gross Domestic Product (GDP), job creation, export production, industrial and commercial innovation, and tax revenue (De Koker & Jentzsch, 2013: 267-280).

The annual report issued by South Africa's Retail Motor Industry (RMI) for the financial year 2016/2017 (2018: 2-5) highlights the difficulties experienced by emerging enterprises in the automotive industry with regards to the retention of skills and raising venture capital for expansion and business operations. Metelka (2014: 23-25) and Naude (2013: 407-417) have highlighted key obstacles to sustained growth in the South African automotive industry. Both authors have highlighted the need to address the lack of access to finance to emerging SMMEs in the South African automotive industry. Meyskens and Bird (2015: 155-166) have shown the need to consider alternative sources of finance such as crowdfunding in order to address the need for finance by emerging SMMEs in the automotive industry. Studies conducted by Marivate (2014: 53-72) and Masondo (2018: 203-222) have shown that it is still difficult for emerging SMMEs in the South African automotive industry to raise money needed for operation

and expansion. The study conducted by Masondo (2018: 203-222) has shown that there were 2.3 million SMMEs operating in South Africa in 2015 out of which 65% were operating in the informal sector. Luukkarienen, Teich, Wallenius and Wallenius (2016: 26-38) have shown that about 34% of SMMEs operating in the automotive industry of Gauteng Province struggle to raise enough capital for new business ventures and expansion.

Lloyd, Mey and Ramalingum (2014: 569-583) have shown that SMMEs operating in the automotive industry of the Eastern Cape struggle to raise finance from commercial banks. Lehner, Grabmann and Ennsgraber (2015: 171-189) have made a similar assessment about the automotive industry in Gauteng Province, KwaZulu-Natal and the Western Cape, and have proposed crowdfunding as an alternative funding source for emerging entrepreneurs in the automotive industry. The automotive industry is a key sector of the South African economy, and needs to grow on a sustainable basis. The study aims to explore potential sources of funding that could be used by emerging entrepreneurs operating in the automotive industry of Gauteng Province.

Lam and Law (2016: 11-20) have suggested the use of crowdfunding for renewable and sustainable energy projects in industry, including the automotive industry. The authors have highlighted the difficulty in raising enough money and human resources in the automotive industry, with a particular reference to emerging entrepreneurs. Herrington (2018: 3-11) has shown the worsening plight of emerging South African operators of SMMEs in all economic sectors including the automotive industry, and has called for tailor-made solution in terms of mentoring, skills-based training, financial education, and assistance in developmental and operational loans. Fleming and Sorenson (2016: 5-19) have argued that crowdfunding is suitable for assisting struggling SMMEs provided that enough mentoring, coaching and monitoring and evaluation techniques are used for ensuring value for money. Frydrych, Bock, Kinder and Koeck (2014: 247-269) have shown the benefits of raising venture capital for emerging South African SMMEs by using innovative methods such as reward-based crowdfunding operations. About half of all newly established South African SMMEs fail before operating for three years (Marivate, 2014: 53-72) due to lack of access to finance and entrepreneurial skills. Comoglio and Botta (2012: 92-102) have recommended the use of high technology and innovative methods for ensuring adequate performance and compliance with environmental regulations in the South African automotive industry. According to the authors, emerging SMMEs in the automotive sector lack the capacity for procuring high technology and innovative systems.

Based on a study conducted in Zimbabwe, Chitokwindo, Hofisi and Mago (2014: 415-423) have shown that the Southern African automotive sector has never been given due recognition by national Governments for the immense contribution it makes to national economies. The authors have pointed out the plight of emerging SMMEs in the automotive sectors of Zimbabwe and South Africa. Lack of access to funding is a key cause of failure among emerging SMMEs. The authors have pointed out that more assistance is needed from national governments, directed at newly established and emerging SMMEs so that they can compete favourably with well-established operators.

Cholakova and Clarysse (2015: 145-172) have argued that crowdfunding with reward is a suitable mechanism for raising venture capital in the South African automotive industry because it enables private sector players to be rewarded for raising money needed for development by using innovative methods. The authors have provided examples from countries such as the United Kingdom, Australia, Germany, Japan, South Kore and the USA in which crowdfunding has been used successfully for raising large amounts of venture capital. Based on a study conducted in India, Bhaumik, Driffield and Pal (2010: 437-450) have shown the benefits of assisting emerging SMMEs in the automotive and pharmaceutical sectors by way of attracting foreign direct investment. The authors have argued that the provision of incentives is a key factor that helps national governments. Bi, Liu and Usman (2017: 10-18) have pointed out that crowdfunding and online offerings should be used as a means of raising funds needed for operation with satisfactory results. The authors have pointed out the need for demonstrating economic stability and suitable macroeconomic policy to foreign investors. Charles and Chucks (2012: 12-21) have shown the benefits of using the Kaizen model for ensuring viability in the South African automotive industry.

The use of innovative systems and applications is essential for ensuring sustained growth and development. Worku and Muchie (2011: 357-366) have argued that the South African private sector must be actively supported and encouraged in order to ease the task of raising the massive amount of money required for ensuring the transfer of high technology, advanced engineering applications and computer aided designs into the South African automotive industry from foreign-owned automotive firms. Jentzsch (2013: 267-280) has argued that the provision of an incentive to private sector operators is vital for ensuring adequate resources that are needed for creating

employment opportunities in the automotive sector. Cholakova and Clarysse (2015: 145-172) have highlighted the benefits of transferring high technological applications and productive systems into South Africa from advanced foreign manufactures. Barnes (2013: 236-259) has recommended the use of economic incentives to the private sector as a means of attracting robust operators into the South African automotive industry.

Charles and Chucks (2012: 12-21) have shown that South Africa does not have enough capacity to grow the local automotive sector without attracting foreign operators and investors. This could be done by providing robust economic incentives, and by creating a conducive macroeconomic environment for foreign investors. De Koker and Jentzsch (2013: 267-280) have shown the need for demonstrating economic stability by creating a liberal labour market that requires South Africa's financial capacity to create the rhetorical goals around employment and economic growth, focusing on South Africa's automotive sector economy since the advent of democracy. The study explores a pecking order model as one of the most influential theories of firm capital structure decisions to develop a framework that could be used for enhancing the current degree of efficiency in meeting the financial needs of emerging SMMEs in the South African automotive sector.

The study conducted by Barnes (2013: 236-259) has found that there is a need for improving the current degree of access to finance by emerging companies in the South African automotive sector. According to the author, there is a need for enhancing the current capital structure of the South African automotive industry. According to the author, the South African automotive industry vision for the year 2035 needs to be vigorously supported by the South African government so that the South African automotive industry grows on a sustainable basis. One of the key transformation agenda items is the plan to increase the number of jobs among black South Africans from 112, 000 (contribution of 6.9% to South Africa's GDP) to 224, 000 by the year 2035. The plan entails to promote ownership of automotive companies by black South Africans to 25% by the year 2035.

South Africa remains plagued by high unemployment and low economic growth despite interventions taken by the South African government. The key obstacles are inability to grow the national economy at a much higher rate, lack of entrepreneurial skills, and failure of government programmes of assistance to SMMEs (Worku, 2018: 295-308). The rate of failure of start-up SMMEs in all economic sectors is quite high (Marivate, 2014). The study conducted by Herrington (2018) has shown that entrepreneurial competencies are relatively smaller among black South Africans. The author has shown that only 7% of South Africans with ages of 18 to 64 years started new business ventures between 2001 and 2016 in comparison with 18% for the rest of Africans. De Koker and Jentzsch (2013: 267-280) have pointed out that South African SMMEs must be able to grow at a high rate in order to alleviate an unemployment rate of 26.7% among the youth. Chitokwindo, Hofisi and Mago (2014: 417) assert that economic growth is slow mostly due to difficulty in securing loans from commercial banks and microfinance agencies. The authors have pointed out that 98.5% of South Africa's economy is made up of SMMEs, whereas SMMEs are only creating 28% of all employments in the economy at the moment.

Barnes (2013: 236-259), Charles and Chucks (2012: 12-21), Cholakova and Clarysse (2015: 145-172) and De Koker and Jentzsch (2013: 267-280) have found that the growth rate among emerging SMMEs in the South African automotive industry is low due to inability to raise loan needed for business operations and new business ventures. There is a need for an alternative method of raising loan money for emerging SMMEs in the automotive industry of Gauteng Province. The study aims to construct a framework that could be used for raising money needed by emerging out that a vast majority of South African SMMEs have failed to raise venture capital.

Objective of study

The overall objective of study was to assess and evaluate the extent to which crowd funding is used by SMMEs operating in the automotive industry of Gauteng Province for raising start-up capital. The study aims to determine the extent to which business loans are accessible to SMMEs operating in the automotive industry of Gauteng Province. A special emphasis will be placed on the ability of emerging SMMEs in the automotive industry of Gauteng Province to secure loans that are needed for business operation from commercial banks. Not enough is known about access to loan services that are provided to emerging SMMEs operating in the automotive industry of Gauteng Province. The study aims to fill the gap by gathering empirical data from members of the South African Retail Motor Industry Organisation (RMIO) with a view to identify factors that affect the ease of securing loans from money-lending institutions.

Methods and materials of study

The design of study was cross-sectional and descriptive (Anderson, Babin, Black & Hair, 2013). Quantitative methods of data collection and analyses were used in the study (Bryman, 2015). Automotive companies affiliated with the South African Retail Motor Industry Organisation (RMIO) were selected for the study. Data was collected from a stratified random sample of size 378 automotive companies operating in the central business district of the City of Johannesburg, Ekurhuleni and Tshwane. Data was collected by using a structured, pretested and validated questionnaire of study. The total number of registered automotive businesses in Gauteng Province is equal to 7, 927 (South African Retail Motor Industry Organisation, 2018:14). Thus, the population size is 7, 927. Quantitative methods such as frequency tables, cross-tab analyses (Hair, Black, Babin and Anderson, 2013), ordered logit analysis (Hosmer and Lemeshow, 2013), MCMC algorithms and Bayesian analysis (Browne and Goldstein, 2010) were used for performing statistical data analyses. The Cronbach Alpha test was used for ensuring reliability and internal consistency (Lewis, Nicholls, Ormston & Ritchie, 2013). The dependent variable of study was raising start-up capital by using crowdfunding.

Literature review

Based on a study conducted in the Eastern Cape, Lloyd, Mey and Ramalingum (2014) have shown that emerging enterprises in the South African automotive industry often struggle to raise development finance due to lack of financial capacity. According to the authors, it is vital to use crowdfunding as a means of alleviating the acute shortage of development finance in emerging automotive enterprises. The annual report published by the South African Retail Motor Industry Organisation (2018) for the financial year 2016/2017 shows that emerging automotive enterprise that are mostly owned by black South Africans need to be provided with improved access to development finance so that they can grow on a sustainable basis. The report shows that emerging automotive enterprises are characterised by lack of specialised skills, inability to use modern technological methods and techniques in automotive engineering, lack of entrepreneurial skills, difficulty in raising loan money from commercial banks, and stiff competition from well-established enterprises. The study conducted by Worku and Muchie (2011) has shown that emerging automotive enterprises are characterised by inability to use computer aided designs, machine learning, computer aided manufacturing, machine learning, predictive technology and robotic engineering.

The study conducted by Shneor and Munim (2019) has shown that crowdfunding can be used by emerging automotive enterprises as a means of raising capital that is needed by poorly equipped enterprises for business operation, business expansion and the mastery of technical skills and expertise. Development economists such as Short, Ketchen, McKenny, Allison and Ireland (2017) have shown that crowdfunding can be used for promoting long-term survival and profitability in emerging SMMEs in developing nations that experience lack of development and venture capital. The authors have recommended the use of mentorship programmes and joint ventures between emerging automotive enterprises and well-established academic and research institutions based on the model used by companies such as BMW in Germany and Hyundai in South Korea. Both companies invest heavily on mentorship programmes for the youth.

Rugman and Collinson (2014) have shown that crowdfunding has made a significant contribution to emerging and poorly resourced SMMEs in all economic sectors in all parts of the world. The authors have pointed out that crowdfunding is vital for alleviating problems such as cumbersome bureaucracy in loan application procedures, lack of capital to be disbursed out to SMMEs, and chronic problems such as corruption and political interference in the management of development finance. Renwick and Mossialos (2017) has outlined the numerous benefits of crowdfunding for SMMEs that operate in poorly resourced and ill-equipped business enterprises.

Crowdfunding is commonly used globally as a means for raising start-up capital and for funding new business initiatives (Agrawal, Catalini & Goldfarb, 2014, 2015; Strausz, 2017). Crowdfunding has been described as a form of financial innovation (Schumpeter, 1912). Crowd funding has been extensively used in cases where it has been difficult or too costly to raise funds needed for starting business ventures with fairly good success and achievement (Ahlers, Cumming, Gunther & Schweizer, 2015). Allison, Davis, Short and Webb (2015) have shown that crowdfunding provides a credible alternative to seeking development finance from commercial banks and microfinance institutions. Bade (2018) has shown the numerous benefits of crowdfunding in markets where there is lack of access to business loans. Studies conducted by Herrington (2018), Marivate (2014), Worku and Muchie

(2011), Worku (2018), Masondo (2018), Muneeza, Arshad and Arifin (2018) have shown that emerging black entrepreneurs struggle significantly to raise adequate start-up capital in SMMEs that are owned and operated by black South Africans. Herrington (2018) has shown that cumbersome loan application procedures and stringent loan repayment conditions are a key obstacle to sustained growth and development in emerging SMMEs in Gauteng Province. Herrington (2018) and Barnes (2013) have identified lack of access to development finance in the South African automotive industry as a key cause of failure in emerging automotive companies that are mostly owned and operated by poorly equipped and poorly skilled black South African entrepreneurs.

Yu, Johnson, Lai, Cricelli and Fleming (2017) have shown that crowdfunding is a valuable method of raising money needed for entrepreneurial investment in developing nations such as South Africa. Zamri, Basir, Agam and Darson (2018) and Zheng, Li, Wu and Xu (2014) have shown that crowdfunding is quite valuable for growing emerging enterprises in developing nations that are characterised by lack of start-up capital and business loans. The authors have argued that crowdfunding is a form of tangible social capital. Tomiczak and Brem (2013) have argued that the use of crowdfunding must be actively promoted in all developing nations so that emerging enterprises have adequate access to start-up and venture capital.

Stanko and Henard (2017) have highlighted the key reasons why the use of crowdfunding is growing exponentially in all parts of the world. According to the authors, central banks do not have enough resources for fulfilling the ever-growing demand for business loans by SMMEs. The administration of business loans is a cumbersome procedure that is too costly and bureaucratic for commercial banks. Sorenson, Assenova, Boada and Fleming (2016) have constructed a framework that is suitable for promoting the use of crowdfunding as a means of expanding innovation and the optimal utilisation of finance in emerging and poorly resourced SMMEs in developing nations such as South Africa.

Rathilall and Singh (2018) have used a Lean Six Sigma framework to enhance the competitiveness in selected automotive component manufacturing organisations. The authors have found that there is a significant association between difficulty in securing development finance and the ability of emerging SMMEs to acquire technological skills that are essential for ensuring sustained growth and profitability. According to Metelka (2014), crowdfunding must be used by all SMMEs that experience difficulty in securing business loans from commercial banks. The authors have shown that crowdfunding is a credible and highly reliable source of alternative funding for emerging SMMEs in all nations of the world. Meyskens and Bird (2015) have argued that crowdfunding and value creation are significantly associated with each other based on a study conducted in Sweden. Crowdfunding is highly valuable to entrepreneurial and high-tech firms in circumstances in which it is not easy to raise venture capital. Lukkarinen, Teich, Wallenius and Wallenius (2016) have explained how valuable online equity crowdfunding campaigns are for emerging SMMEs. According to the authors, an online crowdfunding system enables all potential participants to take part in fundraising initiatives on a continuous and highly efficient basis.

Lin, Lee, Lau and Yang (2018) have constructed a framework that is based on the significant success achieved by the Chinese automotive industry. The framework requires the availability of massive funds for the mastery of highly technical and advanced computer-based automotive engineering and manufacturing skills. The authors have shown how helpful crowdfunding is for raising the capital needed for development, growth and expansion. Mochkabadi and Volkmann (2020) have shown the benefits of using equity based crowdfunding in SMMEs. The authors have argued that crowdfunding is highly valuable for providing financial support to SMMEs, and for promoting the mastery of automotive engineering skills. Herve and Schwienbacher (2018) have shown that there is a significant association between crowdfunding and the ability to innovate and remain profitable.

Hildebrand, Puri and Rocholl (2016) have accounted for adverse incentives in crowdfunding. According to the authors, SMMEs that are better equipped to innovate are capable of resolving their own business related difficulties. Innovation is associated with willingness to accept reasonable risk. Taking business-related risk may be too dangerous for emerging SMMEs. In such cases, the use of equity based crowdfunding mininimses the amount of risk taken by emerging SMMEs (Hornuf & Schwienbacher, 2017). Forbes and Schaefer (2017) have provided a framework that is valuable for ensuring the promotion of successful crowdfunding. The steps provided by the authors are helpful for minimising risk to emerging SMMEs. Often, poorly equipped and under resourced SMMEs face more severe information asymmetry problems. This problem makes it difficult to use traditional methods and sources of development finance such as commercial banks. Such firms are mostly favourable to well-established firms.

Fleming and Sorenson (2016) have argued that equity finance is preferable to emerging SMMEs in the automotive industry. The pecking order theory shows that emerging and poorly developed SMMEs should rather use equity crowdfunding as a means of minimising risk (Frydrych, Bock, Kinder & Koeck, 2014). According to the authors, emerging SMMEs need to rely on equity finance in order to remain profitable. Kaminski and Hopp (2019) and Korschun, Bhattacharya and Swain (2014) have shown that the use of equity crowdfunding is valuable for the promotion of corporate social responsibility, customer orientation and enhanced productivity in SMMEs. Kuppuswamy and Bayus (2017) have shown that crowdfunding projects must be actively monitored and evaluated by national and local governments in order to ensure business ethics and adequate accountability. Lam and Law (2016) have shown that crowdfunding is highly valuable for funding renewable and sustainable energy projects.

Bhaumik and Driffield (2010) have conducted research in the Indian automotive and pharmaceutical industries and have found that the use of crowdfunding as a means of raising capital enables global players such as foreign direct investors to invest in local SMMEs that struggle to acquire adequate funding and technological skills that are essential for sustained growth and profitability. The ability of South Africa to attract large volumes of foreign direct investment can be enhanced by using crowdfunding. Bi, Liu and Usman (2017) have shown that online crowdfunding platforms are more conducive and effective in attracting foreign direct investment. Brem, Bilgram and Marchuk (2019) have argued that crowdfunding platforms have the potential for solving problems such as poverty, unemployment and lack of infrastructure by drawing local problems to the global community. The authors have pointed out that platforms that are created by crowdfunding must be promoted by national and local governments in order for crowdfunding to lead to tangible success. Brown, Mawson and Rowe (2019) have shown the symbiotic relationship between poorly developed and ill-equipped start-up business enterprises, entrepreneurial networks and equity crowdfunding. The ability of emerging SMMEs to use innovative methods and applications depends upon the level of entrepreneurial skills, the degree to which SMMEs can attract potential investors from local and international markets, and the availability of an enabling economic environment.

Results of data analyses

Table 1 shows the general characteristics of the 378 respondents of study who took part in the study. The table shows that about 53% of the 378 respondents who took part in the study have used crowdfunding for raising start-up capital at least once in the past, whereas the remaining 47% of respondents did not do the same. About 47% of respondents have found crowdfunding to be helpful in some way as a means of raising start-up capital in the automotive industry of Gauteng Province. About 74% of respondents in the study were actual owners of their automotive companies. Only 7% of respondents were employed managers. About 47% of respondents were members of the Motor Industry Workshop Association (MIWA), whereas about 36% of respondents were members of the National Association of Automobile Manufacturers of South Africa (NAASP). About 36% of them were members of the South African Motor Body Repairers' Association (SAMBRA). About 17% of respondents had no membership.

Table 1: Use of crowd funding for raising capital (n=378)

Variable of study	Number (Percentage)
Use of crowd funding for raising start-up capital at least once in the past	Yes: 202 (53.44%) No: 176 (46.56%)
Perception on the benefit of crowdfunding for raising start-up capital	Most helpful: 13 (3.44%) Very helpful: 54 (14.29%) Moderately helpful: 81 (21.43%) Slightly helpful: 54 (14.29%) Not helpful at all: 176 (46.56%)
Status of respondent	Owner: 281 (74.34%) Shareholder: 42 (11.11%) Active business partner: 14 (3.70%) Silent business partner: 14 (3.70%) Employed manager: 27 (7.14%)
Membership of automotive association	MIWA: 176 (46.56%)

	SAMBRA: 136 (35.98%) No membership: 66 (17.46%)

Table 2 shows the personal characteristics of respondents who took part in the study. About 43% of respondents had ages of 41 to 50 years. About 22% of respondents had ages of 51 to 60 years. About 61% of respondents were male, whereas the remaining 39% of respondents were female. About 90% of respondents were black South Africans. About 57% of respondents had worked for 5 years or less at the time of data collection. The percentage of respondents who had worked in the industry for 21 years or longer at the time of data collection was 11%. About 43% of respondents had Grade 12 level formal education. About 11% of respondents had Master' degrees.

Table 2: General characteristics of respondents (n=378)

Variable of study	Number (Percentage)
Age category of respondent	30 years or younger: 42 (11.11%) 31 to 35 years: 39 (10.32%) 36 to 40 years: 54 (14.29%) 41 to 50 years: 161 (42.59%) 51 to 60 years: 82 (21.69%)
Gender of respondent	Male: 231 (61.11%) Female: 147 (38.89%)
Race group of respondents	Black: 339 (89.68%) White: 13 (3.44%) Coloured: 13 (3.44%) Asian: 13 (3.44%)
Duration of business operation	5 years or less: 216 (57.14%) 6 to 10 years: 53 (14.02%) 11 to 15 years: 14 (3.70%) 16 to 20 years: 54 (14.29%) 21 years or longer: 41 (10.85%)
Level of education of respondents	Grade 12 or less: 164 (43.39%) Certificate: 106 (28.04%) Diploma: 13 (3.44%) Bachelor's degree: 13 (3.44%) Master's degree: 42 (11.11%)

Table 3 shows frequency counts and percentages for the availability of trained specialists required for basic business operation. About 89% of businesses had certified trade technicians. About 22% of businesses had formally trained marketing specialists. About 25% of businesses had formally trained management specialists. About 11% of businesses had qualified accountants. About 4% of businesses had qualified auditors. About 57% of businesses had specialists who could handle both mechanical and electrical repair works.

Table 3: Assessment of basic skills required for business operation (n=378)

Variable of study	Number (Percentage)
Availability of a certified trade technician in business	Yes: 338 (89.42%) No: 40 (10.58%)

Availability of a formally trained marketing specialist in business	Yes: 83 (21.96%) No: 295 (78.04%)
Availability of a formally trained management specialist in business	Yes: 96 (25.40%) No: 282 (74.60%)
Availability of a formally trained specialist in business sciences	Yes: 41 (10.85%) No: 337 (89.15%)
Availability of a formally trained specialist in accounting	Yes: 42 (11.11%) No: 336 (88.89%)
Availability of a formally trained specialist in auditing	Yes: 14 (3.70%) No: 364 (96.30%)
Availability of a formally trained specialist in mechanical and electrical repairs	Mechanical repairs: 149 (39.42%) Electrical repairs: 14 (3.70%) Both: 215 (56.88)

Table 4 shows frequency counts and percentages for the level of skills that are required for conducting business efficiently. All 378 respondents who took part in the study had sufficient skills in diagnosing car problems. About 33% of respondents actually showed copies of their business plans to the researcher at the time of data collection. The rest did not present their business plans for eye inspection by the researcher at the time of data collection. About 32% of respondents employed their family members in their businesses. About 86% of respondents rented their businesses premises. Only 11% of respondents actually owned their business premises. About 57% of respondents used the services of professional tax practitioners for submitting their tax returns to SARS. About 29% of respondents had enough skills for doing their tax returns to SARS on their own. About 72% of respondents had attended at least one training session in the past on entrepreneurship.

Table 4: Assessment of basic skills required for business operation (n=378)

Variable of study	Number (Percentage)
Level of skills on how to diagnose car problems	Very good: 147 (38.89%) Above average: 122 (32.28%) Average: 82 (21.69%) Below average: 0 (0.00%) Poor or no knowhow at all: 0 (0.00%)
Availability of a business plan	Yes: 163 (43.12%) No: 215 (56.88%)
Inspection of business plan by researcher	Seen by researcher: 123 (32.54%) Not willing to show: 160 (42.33%) Not available: 95 (25.13%)
Employment of family members in business	Yes: 121 (32.01%) No: 257 (67.99%)
Ownership of business premises	Own: 40 (10.58%) Rent: 325 (85.98%) Others: 13 (3.44%)

Submission of tax return to SARS done by	Owner: 108 (28.57%) Employed manager: 40 (10.58%) Tax practitioner: 217 (57.41%) Others: 13 (3.44%)
Attendance of at least one training session on entrepreneurship in the past	Yes: 272 (71.96%) No: 106 (28.04%)

Table 5 shows frequency counts and percentages for sources of initial capital used by the 378 respondents who took part in the study. About 60% of respondents started their businesses by using their own savings. About 22% of them used money from immediate family members for starting business. About 7% of them raised money from commercial banks for starting business. About 53% of cars serviced or maintained by respondents were cars belonging to regular customers. About 25% of cars serviced or maintained by respondents were government-owned cars. About 50% of respondents offered shuttle services to their customers. About 67% of businesses serviced both local and imported cars.

Table 5: Source of initial capital (n=378)

Variable of study	Number (Percentage)
Source of initial capital	Own savings: 226 (59.79%) Loan from bank: 28 (7.41%) Family: 83 (21.96%) Friends: 14 (3.70%) Others: 27 (7.14%)
Types of cars serviced or maintained most of the time	Cars from customers: 201 (53.17%) Government fleet: 96 (25.40%) Insurance referrals: 28 (7.41%) Others: 53 (14.02%)
Arrangement of shuttle services to customers	Yes: 188 (49.74%) No: 151 (39.95%) Others: 39 (10.32%)
Types of cars serviced by business	Local: 124 (32.80%) Local and imported: 254 (67.20%)

Table 6 shows frequency counts and percentages for provinces in which respondents conduct their business operations. About 43% of respondents conduct their main business operations in Gauteng Province. About 11% of respondents conduct their main business operations in Gauteng and Limpopo. About 80% of respondents had adequate marketing skills. About 60% of respondents used word-of-mouth methods for marketing their products, goods and services to potential customers. All respondents had adequate skills in servicing cars.

Table 6: Provinces of main business operation (n=378)

Variable of study	Number (Percentage)
Provinces of main business operation	Gauteng: 163 (43.12%) Gauteng and Limpopo: 40 (10.58%) Gauteng and Mpumalanga: 28 (7.41%) Gauteng, Mpumalanga and Limpopo: 14 (3.70%) Gauteng and Free State: 13 (3.44%)

	Gauteng, North West and Limpopo: 13 (3.44%) Gauteng, Mpumalanga and North West: 53 (14.02%) Gauteng, North West and Mpumalanga: 13 (3.44%) Limpopo: 41 (10.85%)
Level of marketing skills	Good: 28 (7.41%) Above average: 40 (10.58%) Average: 231 (61.11%) Below average: 66 (17.46%) Poor: 13 (3.44%)
Methods used for marketing products, goods and services to potential customers	Word of mouth: 228 (60.32%) Website: 42 (11.11%) Flyers: 40 (10.58%) Radio: 13 (3.44%) Others: 55 (14.55%)
Level of skills in servicing cars	Good: 189 (50.00%) Above average: 92 (24.34%) Average: 97 (25.66%) Below average: 0 (0.00%) Poor: 0 (0.00%)

Table 7 shows frequency counts and percentages for sources of initial capital used by the 378 respondents who took part in the study. About 60% of respondents started their businesses by using their own savings. About 22% of them used money from immediate family members for starting business. About 7% of them raised money from commercial banks for starting business. About 53% of cars serviced or maintained by respondents were cars belonging to regular customers. About 25% of cars serviced or maintained by respondents were government-owned cars. About 50% of respondents offered shuttle services to their customers. About 67% of businesses serviced both local and imported cars.

Table 7: Level of competition from well-established businesses (n=378)

Variable of study	Number (Percentage)
Level of competition from well-established businesses	Intense: 40 (10.58%) More than expected: 68 (17.99%) As expected: 243 (64.29%) Less than expected: 27 (7.14%)
Ease of securing loans from commercial banks	Quite difficult: 173 (45.77%) More difficult than expected: 42 (11.11%) As expected: 109 (28.84%) Less difficult than expected: 14 (3.70%) Quite easy: 40 (10.58%)
Ease of securing loans from the Industrial Development Corporation (IDC)	Quite difficult: 174 (46.03%) More difficult than expected: 27 (7.14%) As expected: 123 (32.54%) Less difficult than expected: 27 (7.14%) Quite easy: 13 (3.44%)
Past history of applying for a business loan at least once in the past	Yes: 246 (65.08%) No: 132 (34.92%)

Table 8 shows frequency counts and percentages for the ease of repayment of loans. About 18% of respondents have found it quite difficult to cope with loan repayment obligations. About 54% of respondents have used brokers in the past. About 65% of respondents started business with a starting capital of R1 million or less. About 7% of respondents had a current capital of R100 million or more at the time of data collection. About 4% of respondents had monthly profits of R100 million or more at the time of data collection.

Table 8: Ease of repayment of loan (n=378)

Variable of study	Number (Percentage)
Ease of repayment of loans	Quite difficult: 68 (17.99%) More difficult than expected: 97 (25.66%) As expected: 147 (38.89%) Less difficult than expected: 14 (3.70%) Quite easy: 52 (13.76%)
Frequency of using brokers	All the time: 14 (3.70%) Sometimes: 152 (40.21%) Never: 212 (56.08%)
Start-up capital in Rand	R1, 000, 000 or less: 244 (64.55%) R1, 000, 001 to R5, 000, 000: 14 (3.70%) R5, 000, 001 to R10, 000, 000: 13 (3.44%) R10, 000, 001 to R50, 000, 000: 14 (3.70%) R50, 000, 001 to R100, 000, 000: 13 (3.44%) R100, 000, 001 or more: 80 (21.16%)
Current capital in Rand	R1, 000, 000 or less: 218 (57.67%) R1, 000, 001 to R5, 000, 000: 40 (10.58%) R5, 000, 001 to R10, 000, 000: 39 (10.32%) R10, 000, 001 to R50, 000, 000: 27 (7.14%) R50, 000, 001 to R100, 000, 000: 27 (7.14%) R100, 000, 001 or more: 27 (7.14%)
Monthly profit in Rand	R1, 000, 000 or less: 229 (60.58%) R1, 000, 001 to R5, 000, 000: 14 (3.70%) R5, 000, 001 to R10, 000, 000: 66 (17.46%) R10, 000, 001 to R50, 000, 000: 41 (10.85%) R50, 000, 001 to R100, 000, 000: 14 (3.70%) R100, 000, 001 or more: 14 (3.70%)

Table 9 shows frequency counts and percentages for the ease of meeting requirements for loan applications. About 29% of respondents indicated that it was easy for them to see a loan service provider. About 28% of respondents indicated that they were treated with respect by the loan officers they visited. About 82% of respondents indicated that they could produce their bank statement from the past in order to show proof of steady income. About 90% of respondents could produce proof of payment of tax to SARS from the past in order to show proof of compliance. About 71% of respondents indicated that they could meet the demand for collateral from money-lending institutions comfortably.

Table 9: Assessment of ease of meeting requirements for loan applications (n=378)

Variable of study	Number (Percentage)
It is easy for me to see a loan service provider	Strongly agree: 11 (2.91%) Agree: 97 (25.66%) Not sure: 216 (57.14%) Disagree: 27 (7.14%) Strongly disagree: 27 (7.14%)
I am treated with respect by my loan officer	Strongly agree: 13 (3.44%) Agree: 95 (25.13%) Not sure: 217 (57.41%) Disagree: 26 (6.88%) Strongly disagree: 27 (7.14%)
I can produce my bank statement from the past in order to show proof of steady income	Strongly agree: 94 (24.87%) Agree: 216 (57.14%) Not sure: 40 (10.58%) Disagree: 28 (7.41%) Strongly disagree: 94 (24.87%)
I can produce my proof of payment of tax to SARS from the past in order to show proof of compliance	Strongly agree: 161 (42.59%) Agree: 190 (50.26%) Not sure: 27 (7.14%) Disagree: 0 (0.00%) Strongly disagree: 0 (0.00%)
I can meet the demand for collateral comfortably	Strongly agree: 14 (3.70%) Agree: 136 (35.98%) Not sure: 120 (31.75%) Disagree: 40 (10.58%) Strongly disagree: 68 (17.99%)

Table 10 shows frequency counts and percentages for the ease of loan repayment conditions and obligations. About 46% of respondents indicated that they were provided with loan amounts that were enough for meeting their needs. About 54% of respondents indicated that the interest rates on their loans were affordable to them. About 60% of respondents indicated that their loan repayment conditions were fair enough. About 54% of respondents indicated that their monthly loan repayment installments were affordable to them. About 61% of respondents indicated that they were satisfied with the overall quality of financial services that are provided to them.

Table 10: Assessment of ease of loan repayment conditions (n=378)

Variable of study	Number (Percentage)
I am provided with the amount of loan that I need.	Strongly agree: 0 (0.00%) Agree: 41 (10.85%) Not sure: 135 (35.71%) Disagree: 94 (24.87%) Strongly disagree: 108 (28.57%)
The interest rate on my loan is affordable to me.	Strongly agree: 27 (7.14%) Agree: 39 (10.32%) Not sure: 136 (35.98%)

	Disagree: 96 (25.40%) Strongly disagree: 80 (21.16%)
My loan repayment conditions are fair enough.	Strongly agree: 27 (7.14%) Agree: 40 (10.58%) Not sure: 162 (42.86%) Disagree: 94 (24.87%) Strongly disagree: 55 (14.55%)
My monthly loan repayment installment is affordable to me.	Strongly agree: 27 (7.14%) Agree: 39 (10.32%) Not sure: 136 (35.98%) Disagree: 96 (25.40%) Strongly disagree: 80 (21.16%)
I am satisfied with the overall quality of financial services that are provided to me.	Strongly agree: 0 (0.00%) Agree: 67 (17.72%) Not sure: 162 (42.86%) Disagree: 68 (17.99%) Strongly disagree: 81 (21.43%)

Pearson's chi-square tests of associations (Hair, Black, Babin and Anderson, 2013) of two-by-two cross-tab analyses were used for assessing the strength of association between the ability to provide students with highly professional admission related services and various socioeconomic characteristics of the 378 respondents who were selected for the study. Table 11 shows significant two-by-two associations that were obtained from the Pearson chi-square test of association (cross-tab analyses). The table shows observed chi-square values and P-values for 10 significant two-by-two associations between the practice of raising start-up capital by using crowd funding and various socioeconomic characteristics of the 378 respondents who were selected for the study. At the 0.05 level of significance, significant associations have P-values that are smaller than 0.05.

Table 11: Results obtained from cross-tab analyses (n=378)

List of 10 variables significantly associated with the practice of raising start-up capital by using crowd funding	Chi-square value	P-value
Province of main operation	140.1013	0.000***
Difficulty in applying for a business loan	130.2273	0.000***
Inability of produce collateral	99.2688	0.000***
Amount of start-up capital needed	95.2174	0.000***
Inability to meet loan repayment conditions	93.4784	0.000***
Status of ownership in business	78.0859	0.000***
Membership of professional association	74.8671	0.000***
Duration of business operation	70.4615	0.000***
Level of education of respondent	69.3776	0.000***
Quality of loan services	66.2943	0.000***

Legend: Significance of association at * P<0.05; ** P<0.01; *** P<0.001

In Table 11, it can be seen that the practice of raising start-up capital by using crowd funding in the automotive industry of Gauteng Province is significantly associated with 10 variables. These 10 variables are: Province of main operation, Difficulty in applying for a business loan, Inability of produce collateral, Amount of start-up capital needed, Inability to meet loan repayment conditions, Status of ownership in business, Membership of professional association, Duration of business operation, Level of education of respondent and Quality of loan services, in a decreasing order of strength.

Ordered logit analysis (Hosmer and Lemeshow, 2013) was used in order to identify key predictors of the practice of using crowd funding for raising start-up capital in the automotive industry of Gauteng Province. The procedure showed that the use of crowd funding for raising start-up capital was significantly influenced by 3 predictor variables. These predictor variables were the province of main operation, difficulty in applying for a business loan, and inability of produce collateral, in a decreasing order of strength. In logistic regression analysis, the measure of effect is the odds ratio. At the 5% level of significance, significant predictor variables are characterised by odds ratios that differ from 1 significantly, P-values that are smaller than 0.05, and 95% confidence intervals that do not contain 1. Table 11 shows odds ratios estimated from ordered logit analysis. It can be seen from the table that all 3 predictor variables were highly significant at the 5% level of significance.

Table 11: Results from ordered logit analysis (n=378)

Factors that affect the practice of using crowd funding for raising start-up capital	Odds Ratio	P-value	95% C. I.
Province of main operation	8.49	0.000	(4.48, 10.55)
Difficulty in applying for a business loan	6.44	0.000	(3.59, 8.01)
Inability to produce collateral	3.89	0.000	(2.67, 5.59)

The percentage of overall correct classification for this procedure was equal to 80.84%. Percentage sensitivity for the fitted logistic regression model was equal to 88.12%. Percentage specificity for the fitted ordered logistic regression model was equal to 90.09%. The P-value obtained from the Hosmer-Lemeshow goodness-of-fit test was equal to 0.1427 > 0.05. This indicates that the fitted logistic regression model is fairly well reliable.

Interpretation of significant odds ratios

The odds ratio of the variable "Province of main operation" is equal to 8.49. This indicates that a respondent whose main operation is in Gauteng Province is 8.49 times more likely to use crowd funding for raising start-up capital in comparison with another respondent whose main operation is outside Gauteng Province.

The odds ratio of the variable "Difficulty in applying for a business loan" is equal to 6.44. This indicates that a respondent who experiences difficulty in applying for a business loan based on traditional methods of loan application is 6.44 times more likely to use crowd funding as a means of raising start-up capital in comparison with another respondent who does not experience difficulty in applying for a business loan based on traditional methods of loan application.

The odds ratio of the variable "Inability to produce collateral" is equal to 3.89. This indicates that a respondent who experiences difficulty in producing collateral in the course of applying for a business loan based on traditional methods of loan application is 3.89 times more likely to use crowd funding as a means of raising start-up capital in comparison with another respondent who does not experience difficulty in producing collateral in the course of applying for a business loan based on traditional methods of loan application.

Makov Chain Monte Carlo (MCMC) algorithms and Bayesian analysis (Browne and Goldstein, 2010) were used for performing bootstrapping simulations. MCMC algorithms are used for solving multilevel problems that involve the construction of constrained variance matrices in cases where linear estimation techniques fail to produce

theoretically reliable estimates of parameters. Table 4.5.1 shows regression coefficients estimated from MCMC algorithms and Bayesian analysis. At the 5% level of significance, influential predictor variables are characterised by estimated regression coefficients that differ from 0 significantly, P-values that are smaller than 0.05, and 95% confidence intervals that do not contain the number 0.

Table 12: Regression coefficients estimated from Bayesian analysis (n=378)

Factors that affect the practice of using crowd funding for raising start-up capital	Regression coefficient	P-value	95% C. I.
Province of main operation	2.14	0.000	(1.50, 2.36)
Difficulty in applying for a business loan	1.86	0.000	(1.28, 2.08)
Inability to produce collateral	1.36	0.000	(0.98, 1.72)

It can be seen from Table 11 that the use of crowd funding for raising start-up capital is significantly influenced by 3 predictor variables. These predictor variables were the province of main operation, difficulty in applying for a business loan, and inability of produce collateral, in a decreasing order of strength. These findings are quite similar to the ones obtained from ordered logit analysis.

Discussion of results

The key purpose of study was to assess and evaluate the ability of SMMEs operating in the automotive industry of Gauteng Province to raise start-up capital by using crowdfunding. The study has found that about 53% of the 378 respondents who took part in the study have used crowdfunding for raising start-up capital at least once in the past, whereas the remaining 47% of respondents did not do the same. The study has also found that the practice of raising start-up capital by using crowd funding in the automotive industry of Gauteng Province was significantly influenced by 3 factors. These factors were the province of main operation, difficulty in applying for a business loan, and inability to produce collateral needed for business loan applications, in a decreasing order of strength.

Brown, Mawson, Rowe and Mason (2018) have shown that there is a significant relationship among entrepreneurial skills and equity crowdfunding in nascent SMMEs. Although there are SMMEs in the automotive sector that use innovative methods and applications for ensuring growth and profitability, such SMMEs do not always succeed in using their innovation as collateral for securing bank loans or for attracting foreign or local direct investment in their business ventures. In such cases, crowdfunding bridges the gap in funding. Buttice, Colombo and Wright (2017) have shown that crowdfunding, social capital and profitability are significantly associated with each other. Cai (2018) has shown that crowdfunding is effective in cases where policy related tools are used for ensuring accountability, equity and respect for the rule of law and compliance with guidelines published by central banks. Following the financial crisis of 2008, crowdfunding has been in demand in all SMME sectors. Crowdfunding is ideal for providing finance for pay for preliminary SMME activities and business operations. There are distinct forms of crowdfunding. These are equity crowdfunding, reward-based crowdfunding, donation-based crowdfunding and loan-based crowdfunding. All forms of crowdfunding are valuable for promoting sustained development in the SMME sector. Chan and Parhankangas (2017) have shown that crowdfunding is valuable for promoting radical and incremental innovation in the automotive industry. Charles and Chucks (2012) have shown how the Kaizen model can be used for promote efficiency in the South African automotive industry. The authors have pointed out that the ability of emerging SMMEs in the automotive sector to benefit from technologically advanced engineering and automotive applications depends upon the degree to which funds are made available to them.

Crowdfunding is valuable to all economic sectors. De Larrea, Altin and Singh (2019) have found that crowdfunding is highly valuable for ensuring profitability in the restaurant industry. De Luca, Margherita and Passiante (2019) have also shown that crowdfunding has a whole range of tangible benefits such as the transfer of entrepreneurial and networking skills in SMMEs. Ellman and Hurkens (2019) have outlined factors that affect the optimal use of crowdfunding in various economic sectors including the automotive industry. The key aspects are equity, accountability and respect for the rule of law. Gamble, Brennan and McAdam (2017) have shown that crowdfunding is highly valuable for ensuring viability in the music industry globally.

Based on a survey conducted in Zimbabwe, Chitokwindo, Hofisi and Mago (2014) have shown that serious shortages of business loans have been successfully alleviated by using equity and online based crowdfunding. Cholakova and Clarysse (2015) have shown that equity investments can be promoted in crowdfunding projects by using a pool of local and international funding, financial resources, technical expertise and entrepreneurial skills. Da Cruz (2018) has argued that chronic shortcomings in leadership and good governance, lack of accountability, poor infrastructural development and lack of technical skills can be effectively addressed by using crowdfunding as a vehicle of transformation in all Sub-Saharan African countries. De Koker and Jentzsch (2013) have argued that equity crowdfunding is highly valuable for ensuring financial equity, financial inclusion and financial integrity in developing nations such as South Africa. Comoglio and Botta (2012) have pointed out that crowdfunding is highly valuable for promoting the production of cleaner car engines and systems by creating a global platform for sharing and benefiting from a pool of expertise in automotive engineering techniques, massive financial resources, good leadership, good auditing, good accounting, good reporting, transparency, good governance and total accountability to shareholders.

Although crowdfunding alleviates the problem of raising capital needed for business operation, SMMEs must possess solid entrepreneurial, marketing and networking skills in order to be able to benefit from crowdfunding initiatives (Leboeuf & Schwienbacher, 2018). Laurell, Sandstrom and Suseno (2019) have proposed a framework that entails the combined use of social media platforms, crowdfunding and members of the press. According to the authors, in addition to enabling SMMEs to generate development finance easily, crowdfunding discourages cumbersome bureaucracy, red tape, political interference, corruption and systemic inefficiencies. The study conducted by Moss, Neubaum and Meyskens (2015) has shown the effect of virtuous and entrepreneurial orientations on microfinance lending and repayment. The authors have found that entrepreneurial, marketing and networking skills are vital for the optimal utilisation of business loans that are generated from crowdfunding initiatives. Lehner, Grabmann and Ennsgraber (2015) have also reported similar findings and assessments. Marivate (2014) and Worku and Muchie (2011) have pointed out that the South African curriculum does not prepare undergraduate students adequately on entrepreneurial, marketing and networking skills. The authors have suggested that it is necessary to ensure alignment and relevance between syllabi used for training young South Africans the practical needs of novice entrepreneurs operating SMMEs in South African towns and cities. The study conducted by Lee, Sameen and Cowling (2015) has shown that crowdfunding alone is not enough for ensuring profitability in emerging South African SMMEs in the automotive sector. Novice operators working in SMMEs must prioritise the need for acquiring adequate entrepreneurial, marketing and networking skills in order to be able to benefit from crowdfunding initiatives.

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